SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION
50 California Street • Suite 2600 • San Francisco, California 94111 • (415) 352-3600 • Fax: (415) 352-3606 • www.bcdc.ca.gov

January 3, 2013

Application Summary
(For Commission consideration on January 17, 2013)

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Staff Assigned: Michelle Burt Levenson (415/352-3618, michellel@bcdc.ca.gov)

Summary

Applicant: U.S. Army Corps of Engineers

Location: In the Commission's salt pond jurisdiction, in Ponds 6, 6A, 7, 7A and 8, in the Napa River and Huichica Units of California Department of Fish and Wildlife's Napa Sonoma Marshes Wildlife Area (NSMWA), located west of and adjacent to the Napa River, Napa County (Exhibits 1 and 2).

Project: The proposed project is the third and final phase of the Napa-Sonoma Marshes Restoration Project. The project would be implemented through of a joint Federal and State partnership between the U.S. Army Corps of Engineers (Corps) and the California Department of Fish and Wildlife (CDFW). The Corps would fund and construct the project. CDFW would also fund, monitor and be responsible for long-term maintenance of the project. These actions are interrelated and require Commission authorization. For this reason, the summaries for the permit amendment and concurrence are identical.

The project would result in improvements (e.g., installation of water control structures, embankment stabilization, dilution of brine) to five former salt ponds that would facilitate habitat enhancement and management within individual ponds, and between ponds and adjacent sloughs. The project would provide 1,900 acres of managed pond habitat that would be managed for waterfowl, shorebirds and fish. In addition, the project would enhance existing, informal

public access that extends from the Bucchli Station Staging Area to Napa Slough, along the eastern levee of Ponds 7/7A, and around the northern and eastern levees of Pond 8. Public access improvements would include providing ADA-accessible, 10-foot-wide, public access trail(s), interpretative signage and informal seating (Exhibit 6).

Issues Raised: The staff believes that the application raises seven primary issues: (1) whether the project is consistent with the McAteer-Petris Act and *San Francisco Bay Plan* (Bay Plan) policies regarding fill; (2) whether the project would provide maximum feasible public access consistent with the project; (3) whether the project is consistent with the Bay Plan policies on salt ponds; (4) whether the project is consistent with the Bay Plan policies on natural resources including the policies on *fish, other aquatic organisms and wildlife; tidal marshes and tidal flats; and subtidal areas*; (5) whether the project is consistent with the Bay Plan policies on water quality; (6) whether the project is consistent with the "wildlife refuge" priority use designation for the site; and (7) whether the proposed project is consistent with the Bay Plan policies on Climate Change.

Background

The project site is part of the overall Napa-Sonoma Marshes Wildlife Area that encompasses a total of 17,000 acres. Historically the project site was predominantly tidal marsh in the Napa River floodplain. In the last century, embankments were constructed to preclude tidal action, allowing the project site to be used for agricultural purposes. Commercial salt production at the entire site began in the early 1950s and continued into the 1990s. Water from San Pablo Bay was conveyed successively through the numbered ponds (Ponds 1 and 1A, Pond 2, Pond 2A, etc.). As water evaporated, the salt concentration became increasingly concentrated in each successive pond. After reaching Pond 8, the saline concentrate was pumped to the east side of the Napa River to be further concentrated and processed. Pond 7 was used as a bittern pond, a repository of concentrated soluble salts, remaining after sodium chloride was harvested.

In 1994, Cargill Salt sold the Napa salt ponds to the State of California, which, in turn, assigned management of the ponds to the California Department of Fish and Wildlife (CDFW). All of the former salt ponds are currently managed for wildlife and fish habitat. While Ponds 2A, 3, 4, 5, as well as all ponds and crystallizers on the east side of the Napa River approximately 4,700 acres have been returned to tidal action, Ponds 1, 1A, and 2 as well as the ponds that are the subject of this application are and would continue to be operated as managed ponds (a total of approximately 3,600 acres).

The proposed project is the final phase of the larger Napa-Sonoma Marshes Restoration Project that includes the restoration and management of a total of 13 former salt ponds for wildlife. In 2004, the Corps received Congressional approval to restore Ponds 4 through 8 through the Water Resources Development Act of 2007. Between 2004 and 2007, CDFW completed the restoration of Ponds 1 through 5. On May 19, 2005, the Commission approved BCDC Permit No. 8-04, authorizing the conversion of salt ponds 1, 1A, 2, 2A, 3, 4, and 5 and the All American Canal to managed wetland and tidal marsh habitat. On October 4, 2007, the Commission approved Material Amendment No. One to BCDC Permit No. 8-04 authorizing the conversion of the former Cargill North Bay Plant Site ponds (9, 10, W1, W2, W3, CB1-CB6, B-1, CB7-CB9, Unit 3, B-2 and B-3) to tidal action.

The primary purpose of the proposed project is to improve the ability to manage Ponds 6, 6A, 7, 7A and 8 to provide enhanced wildlife habitat. The Corps and CDFW have entered into a "cost-share" agreement for the project such that 65-percent of project costs for Ponds 4 through 8 are paid through Federal funding and 35-percent through State funds. As part of this program, embankments would be strengthened and raised to prevent flooding of adjacent property and the release of bittern (Exhibits 3, 4 and 5). The work also includes installation of up to 18 water control structures, and two solar-powered fish screens. In addition, the project has been designed to provide for the safe and slow dilution of bittern in Pond 7 over an approximately 10-year period. Diluted bittern would be discharged into the Napa River once concentrations are consistent with the limits set forth in the NPDES Permit issued by the Regional Water Quality Control Board (RWQCB) for the project. Dilution of the bittern would be accomplished by modifications to water control structures in Pond 7 (the "donut") that would allow for the mixing of bittern with ambient water from Ponds 7A and 8 in an existing small pond adjacent to Ponds 7 and 7A (the "donut").

Currently, salinity in Pond 7 varies seasonally from a bittern salt crust to approximately 300 parts per thousand (ppt) during the rainy season. Salinity in Ponds 6, 6A, and 7A varies with the season and ranges from less than 20 ppt to approximately 60 ppt. Pond 8 has been restored to ambient conditions, and salinity within that pond ranges from 2.5 ppt to 22 ppt, similar to the salinity found in the Napa River and adjacent sloughs. Pond 7 is hydrologically isolated from the other ponds, the Napa River and adjacent sloughs to protect them from potential bittern contamination.

Project Description

Project Details: The applicant describes the project as follows (Exhibits 3 through 5):

1. **In the Commission's salt pond jurisdiction:**

   a. **Ponds 6/6A:** Convert two former salt ponds to managed ponds by doing the following: (1) excavate a total of 7,200 cubic yards of material from Ponds 6/6A and place the material over 132,000 square feet (3 acres) on the existing embankment separating Pond 6 from Pond 6A to strengthen it; (2) place a total of 4,000 cubic yards of rip rap over 40,000 square feet (1 acre) of the embankment separating Pond 6A from Napa Slough; (3) install, use and maintain a total of six 36-inch-in-diameter outfalls with gates, six 36-inch-in-diameter culverts with gates, and six 36-inch-in-diameter inlets with gates; (4) demolish the existing siphon that hydrologically connects Ponds 6A with Pond 7A; (5) breach the "donut" (the circular, earthen bermed small pond with multiple intakes used to distribute water through the canal and siphon system) connecting Pond 6A and the Pond 6A canal and install a new water control structure north of the Pond 6 donut to provide flow from the Pond 6/6A canal into Pond 6; (6) use and maintain the existing Pond 6 "donut" and install a new 48-inch-in-diameter intake, and (7) install, use and maintain up to 2,300 square feet of walkways that would allow access to and maintenance of water control structures.

   b. **Ponds 7/7A:** Convert two former salt ponds to managed ponds by doing the following: (1) excavate a total of 10,000 cubic yards of material from the mixing chamber and the Pond 6A/7 Siphon Basin and place the material over 200,000 square feet (5 acres) of existing embankments primarily between Ponds 7 and 7A, raising these structures to heights varying from 7 feet NAVD to 9- to 10-feet NAVD, and creating 3:1 side slopes; (2) excavate a total of 8,000 cubic yards of material from Ponds 7/7A and use the material to widen portions of the existing internal embankment that bisects Ponds 7 and 7A, creating approximately 90,000 square feet (2 acres) of nesting and cover habitat for the special-status Western snowy plover and the California least tern (as required for mitigation by the U.S. Fish and Wildlife Service); (3) excavate the existing channel along the eastern side of Pond 7 lowering the invert (bottom) elevation from 2 to 0 feet NAVD 88; (4) replace, use and maintain all existing water control structures with appropriately sized structures. A total of two culverts, two outfalls and two inlets (all gated) would be installed; (5) improve the existing "donut" by grading the donut, installing an air bubbler system with a 114-foot-long sheetpile baffle that will cover 1,030 square feet; (6) install, use and maintain 1,105 square feet of walkways that will allow access to and maintenance of water control structures; (7) install, use and maintain a 120-square-foot precast, concrete maintenance building that would house control systems for the bubbler system; and (8) improve, use and maintain a 10-foot wide, 5,654 foot long (a total of 56,540 square feet) public access path with an ADA-accessible gravel surface along the eastern perimeter of Ponds 7A/7:

   c. **Pond 8:** Convert a former salt ponds to a managed pond by doing the following: (1) excavate up to 13,000 cubic yards of material from the Pond 8 borrow ditch and/or pond bottom and place the material along

approximately 235,000 square feet (5 acres) of Pond 8, raising the embankment from 5 feet to up to 10 feet NAVD with a top width of 10 feet and 3:1 side slopes; and (2) improve and use a 10-foot-wide, 6,110-foot-long (61,110 square feet) public access path with an ADA-accessible gravel surface along the northern and eastern levees of Pond 8.

Fill: The proposed restoration project would involve the excavation of approximately 40,000 cubic yards of material from pond borrow ditches and dredge areas and the placement of the material over 600,000 square feet (11 acres) of embankments in the Commission's salt pond jurisdiction. Fill would be placed in the salt ponds for embankment strengthening and maintenance, and would raise the heights of the embankments to 100-year-flood elevations, protecting surrounding areas from flooding and minimizing the risk of possible unplanned bittern releases. In addition, fill associated with the construction of maintenance walkways (2,000 cubic yards over 1,951 square feet), rock rip-rap along Pond 6A (4,000 cubic yards along 40,000 square feet) and water control structures (18,000 square feet) is proposed. The project would result in the placement of a total of 40,000 cubic yards of material over 500,000 square feet (16 acres).

Public Access: The project area is currently accessible to the public from multiple public roads and waterways and is a popular fishing, hunting, boating and bird watching destination in the North Bay (Exhibit 2). Ponds 7, 7A and 8 are currently accessible by land via informal footpaths on the tops of embankments. The surfaces of the existing footpaths are either earthen or gravel and are of inconsistent heights and widths. The informal paths are not ADA-accessible. Ponds 6 and 6A are island ponds and are only accessible by boat. Two public boat launch ramps currently exist at Cuttings Wharf and Hudeman Slough. There are two parking areas that allow access to the site. A formal, CDFW-managed parking lot is located just north of Pond 7A that is accessible from Buchli Station Road. This parking lot provides parking for 16 vehicles and 1 handicapped accessible space, as well as a restroom facility. An informal parking area on County-owned property is located at the end of Milton Road (near Pond 8). Parking is also available on County-owned property along portions of the west side of Milton Road.

Public access proposed with the project would consist of improving the existing informal access on the east side of Ponds 7/7A and along the northern and eastern levees of Pond 8. Such improvements would include providing a consistent width of 10 feet and applying an ADA-accessible gravel surface treatment at Pond 8. In addition to pathway improvements, the applicant proposes to install interpretative signage at various locations along the public access pathway. Lastly, rustic seating (e.g., large logs, boulders), in keeping with the natural setting of the site, is proposed at the terminus of the Pond 7 path, and may be installed at one or two locations along the path, consistent with input from the Commission's Design Review Boards.

In total, the project would provide 7,913 feet (1.5 miles) of improved public access along the east side of Ponds 7/7A and 6,314 feet (1.2 miles) along the northern and eastern perimeters of Pond 8.

Priority Use: The proposed project is located in an area designated as salt pond/managed wetland and a Wildlife Refuge priority use area on Bay Plan Map No. 2.

Schedule and Cost: The applicant would begin construction in June 2013. Construction completion is anticipated in August 2018. The total cost of the project would be $21,899,000.

Staff Analysis

A. **Issues Raised:** The staff believes that the application raises seven primary issues: (1) whether the project is consistent with the McAteer-Petris Act and *San Francisco Bay Plan* (Bay Plan) policies regarding fill; (2) whether the project would provide maximum feasible public access consistent with the project; (3) whether the project is consistent with the Bay Plan policies on salt ponds; (4) whether the project is consistent with the Bay Plan policies on natural resources including the policies on *fish, other aquatic organisms and wildlife; tidal marshes and tidal flats; and subtidal areas*; (5) whether the project is consistent with the Bay Plan policies on water quality; (6) whether the project is consistent with the "wildlife refuge" priority use designation for the site; and (7) whether the proposed project is consistent with the Bay Plan policies on Climate Change.

1. **Fill.** The project would result in fill within the Commission's salt pond jurisdiction. The Commission may allow fill in its salt pond jurisdiction only when it meets the fill requirements identified in Section 66605 of the McAteer-Petris Act that state, in part: (a) the fill should be the minimum amount necessary to achieve the purpose of the fill; and (b) the nature, location, and extent of any fill should minimize harmful effects to the Bay including the volume, circulation, and quality of water, fish and wildlife resources, and marsh fertility. The purpose of the fill placed for the proposed project would be to strengthen and raise existing embankments and to install water control structures and maintenance walkways to allow access to these control structures for management and maintenance purposes.

   a. **Minimum Amount Necessary.** The applicant states that the fill proposed as part of the project, approximately 46,000 cubic yards of material, would be the minimum amount necessary to provide for the long-term stability of embankments, reduce the overtopping of embankments, and to prevent the uncontrolled release of bittern which could adversely affect both fish and wildlife. The proposed size of the water control structures are the minimum necessary to allow for the slow and controlled dilution and release of bittern from Pond 7 and to allow for the long-term management of all ponds as open water habitat for wildlife. The fill would minimize harmful effects to the Bay by strengthening embankments around Pond 7, preventing the release of deleterious bittern into the Napa River and adjacent sloughs, and provide for the enhanced management of wildlife and fish habitat.

   The Commission should determine whether the fill placed as part of the restoration would be the minimum amount necessary to construct the project.

   b. **Minimizing Impacts.** In addition to Section 66605 of the McAteer-Petris Act regarding effects of fill on water volume and circulation, the Bay Plan policies on water surface area and volume state that, "[w]ater circulation in the Bay should be maintained, and improved as much as possible. Any proposed fills, dikes or piers should be thoroughly evaluated to determine their effects on water circulation and then modified as necessary to improve circulation or at least to minimize any harmful effects."

   The placement of fill associated with the project would only occur within the Commission's salt pond jurisdiction and is designed and managed to increase water exchange between the ponds and the Bay and to safely eliminate bittern. Such exchange would benefit the Bay's water circulation and volume, and would increase fish and wildlife and marsh fertility. There is no upland location for the project because the purpose of the project is enhanced management of open water habitat in salt ponds. The applicant has also developed a Habitat Mitigation and Monitoring

Plan for the project to address the project's potential impacts to natural resources and ways to minimize and avoid such adverse impacts through using adaptive management and protective measures.

The Commission should determine whether the fill placed as part of the part of the project would be placed in a manner that would minimize impacts to the Bay.

2. **Maximum Feasible Public Access.** Section 66602 of the McAteer-Petris Act states that "…existing public access to the shoreline and waters of the…[Bay] is inadequate and that maximum feasible public access, consistent with a proposed project, should be provided." Regarding salt ponds, Section 66602.1 of the McAteer-Petris Act states, in part, that "…if any such areas are authorized to be developed and used for other purposes [i.e., not salt ponds, managed wetlands, or open water areas], the development should provide maximum public access to the Bay consistent with the proposed project…."

The Bay Plan Public Access policies state in part, "[p]ublic access to some natural areas should be provided to permit study and enjoyment of these areas. However, some wildlife are sensitive to human intrusion. For this reason, projects in such areas should be carefully evaluated in consultation with appropriate agencies to determine the appropriate location and type of access to be provided…" (Policy No. 3). The policies further state, "…[p]ublic access should be sited, designed and managed to prevent significant adverse effects on wildlife…" and "…[p]ublic access improvements provided as a condition of any approval should be consistent with the project and the physical environment, including protection of the Bay natural resources, such as aquatic life, wildlife and plant communities, and provide for the public's safety and convenience. The improvements should be designed and built to encourage diverse Bay–related activities and movement to and along the shoreline, should permit barrier free access for the physically handicapped, and should be identified with appropriate signs…." (Policy No. 6). Finally, the policies state, "[p]ublic access should be integrated early in the planning and design of Bay habitat restoration projects to maximize public access opportunities and to avoid significant adverse effects on wildlife" (Policy No. 4).

Currently, there is informal public access on the embankments of Ponds 7/7A and Pond 8. Ponds 6/6A are accessible only by boat and are "island" ponds. The surfaces of the existing footpaths are either earthen or graveled and are of inconsistent heights and widths. The informal paths are not ADA-accessible. There are two parking areas that allow access to the site. A formal, CDFW-managed parking lot is located just north of Pond 7A that is accessible from Buchli Station Road. This parking lot provides parking for 16 vehicles and 1 handicap accessible space, as well as a restroom facility. An informal parking area is located on County-owned property at the end of Milton Road (near Pond 8), and informal parking is also available on County-owned property on portions of the west side of Milton Road. Ponds 7/7A and 8 are popular destinations for hunters, bird-watchers, anglers and hikers.

In the original application and as described in the November 21, 2012 Staff Summary previously mailed for this project, the public access proposed with the project included improvements to the embankment access along the eastern perimeter of Ponds 7/7A, informal access along the embankment that bisects Ponds 7 and 7A that would be open for six months of the year, and improvements to all the embankments encompassing Pond 8 (a 10-foot-wide, all weather surfaced path). Since the mailing of the November 21, 2012 staff summary, the public access proposal has been modified. While access improvements consisting of an ADA-accessible gravel surface and 10-foot-wide trail is still proposed along the tops of the eastern embankment of Ponds 7/7A, informal seasonal access along the internal embankment that bisects Ponds 7/7A would not be

provided and an improved 10-foot-wide public access path would only be provided on the northern and eastern embankments of Pond 8 (although informal access would be available along the western embankment).

The project proponent states that since the original public access proposal, consultation with the U.S. Fish and Wildlife Service (USFWS) has been completed and a Biological Opinion (BO) has been issued for the project. The BO requires the applicant to enhance existing nesting habitat for the federally-threatened Western snowy plover and the federally-endangered California least tern on the internal embankment that bisects Ponds 7 and 7A. By increasing nesting habitat along this internal levee, it is hoped that more snowy plovers and least terns will nest on this embankment. The applicant states that seasonal public access along this section of embankment would potentially directly impact site's attractiveness for these two special-status species and would limit the ability to adaptively manage the site to ensure success of the mitigation required under the BO. The project proponent contends that many factors affect nesting success and it is difficult to determine how the birds will behave from year to year. Such factors include predation and prey changes, disturbance, weather and changes in migratory and wintering habitat(s). In the past, the least tern and plover colonies have utilized created islands at the Napa Plant Site (on the west side of the Napa River), as well as the internal embankment at Ponds 7 and 7A. While nesting data is limited to the past four years, it is clear that small changes in nesting habitat can have a dramatic affect on nesting success. The project proponent is concerned that allowing public access on the internal embankment would disturb nesting habitat and would potentially increase the incidences of predation on the special-status bird species. To protect the existing and enhanced nesting habitat, the applicant has eliminated access along this internal embankment (the levee separating Ponds 7 and 7A) from its public access proposal. The public access improvements currently proposed on the eastern Pond 7/7A embankment would consist of a 5,564 linear foot, 10-foot-wide trail with ADA-accessible gravel. In addition, interpretative signs would be installed at four locations along the eastern embankment of Ponds 7 and 7A. The signs would provide information on the history of the site as well as the ecology of several species that inhabit the ponds. In addition, rustic seating, in keeping with the natural setting of the site, is proposed at the southern end of the eastern trail.

In addition, public access along Pond 8 has been modified since the applicant's original proposal. Rather than providing improved access (e.g., ADA-accessible gravel over a 10-foot-wide path) along all the embankments encompassing Pond 8, the applicant proposes to improve the northern and eastern embankments of Pond 8 and leave the western embankment open to public access use, but unimproved (there is currently a 2-foot-wide casual path on the western embankment). The public access improvements proposed on the eastern and northern Pond 8 embankments include leveling the surfaces of the embankments, applying an ADA-accessible gravel surface and providing a minimum 10-foot wide public access path. This portion of public access is 6,314 linear feet long. Informal, unimproved access (4,296 linear) would still be available along the western perimeter on Pond 8. In addition to improving the existing footpath around the northern and eastern embankments of Pond 8, one interpretative sign would be provided at the southern tip of the pond. The proponent states that when the original proposal was submitted back in early 2010, the design plans were still in the development phase. Since that time, it was determined that the western embankment did not need to be raised or strengthened, hence no work would occur on this embankment, making improvements to the trail on the western embankment cost prohibitive, and that increasing access along the western embankment could potentially affect valuable wildlife and special-status species habitat adjacent to Mud Slough.

The primary goal of the project is to enhance habitats for a number of fish and wildlife species. These habitat enhancements would increase the recreational potential of the site. As the site evolves and the habitats mature, the site would be more attractive to the public as species populations and diversity increase. Thus, the restoration activities can be expected to enhance access and recreation at the site and make it a more desirable destination for hikers, boaters, bird watchers, anglers and possibly hunters.

The Commission should determine whether the proposed public access is the maximum feasible public access consistent with the project.

3. **Salt Pond Policies.** The Bay Plan Salt Pond policies state, in part, that "[t]he use and maintenance of salt ponds for salt production should be encouraged" (Policy No. 1). The policies also state that "[i[f the owner of any salt ponds withdraws any of the ponds from their present uses, the public should make every effort to buy these lands and restore, enhance or convert these areas to subtidal or wetland habitat. This type of purchase should have a high priority for any public funds available, because opening ponds to the Bay represents a substantial opportunity to enlarge the Bay and restoring, enhancing or converting the ponds can benefit fish, other aquatic organisms and wildlife, and can increase public access to the Bay." The policies further state that, "[a]ny project for the restoration, enhancement or conversion of salt ponds to subtidal or wetland habitat should include clear and specific long-term and short-term biological and physical goals, success criteria, a monitoring program, and provisions for long-term maintenance and management needs. Design and evaluation of the project should include an analysis of: (a) the anticipated habitat type that would result from pond conversion or restoration, and the predicted effects on the diversity, abundance and distribution of fish, other aquatic organisms and wildlife; (b) potential fill activities, including the use of fill material such as sediments dredged from the Bay and rock, to assist restoration objectives; (c) flood management measures; (d) mosquito abatement measures; (e) measures to control non-native species; (f) the protection of services provided by existing public facilities and utilities such as power lines and rail lines; (g) siting, design and management of public access to maximize public access and recreational opportunities while avoiding significant adverse effects on wildlife; and (h) water quality protection measures that include management of highly saline discharges into the Bay; monitoring and management of mercury methylation and sediments with contaminants; managing the release of copper and nickel to the Bay; and the minimization of sustained low dissolved oxygen levels in managed ponds" (Policy No. 3).

   a. **Water Quality.** Water quality conditions in Ponds 6/6A, 7A and 8 are similar to those conditions found in adjacent sloughs and the Napa River and vary with the seasons and the tide. Salinity Pond 8 is at ambient conditions, and ranges from these 2.5 parts per thousand (ppt) to 22 ppt. Salinities in Ponds 6, 6A, and 7A range from less than 20 ppt to approximately 60 ppt. Pond 7 is a former bittern pond, a repository of concentrated soluble salts found in Bay water other than sodium chloride. Because the majority of sodium chloride has been removed from the bittern, its ion balance is different than the ion balance in sea water. As a result concentrated bittern can have toxic effects on aquatic organisms due to this ion balance. Conditions in the bittern pond range from a bittern salt crust in the dry season to approximately 300 ppt at bank full volume during the rainy season. Pond 7 is hydrologically isolated from adjacent sloughs and the Napa River due to the high bittern concentrations.

      A primary goal of the project is to dilute bittern concentrations in Pond 7 over a ten-year period and slowly release the diluted mixture to Napa Slough. To accomplish this, the existing "donut" would be modified, creating a mixing chamber where bittern from Pond 7 would be mixed at a ratio of 1:99 with ambient water from

Ponds 7A and Pond 8, in accord with the National Pollutant Discharge and Elimination System (NPDES) permit issued for the project (NPDES No. CA0030201, Order No. R2-2011-0035).

b. **Flood Protection.** Although the embankments surrounding Ponds 7/7A and 8 were constructed to reclaim the land for agriculture, and were later maintained to protect the salt ponds, they currently provide de facto flood protection for lands surrounding these ponds. Besides nearby Ramal Road which is approximately 0.5 mile north of Pond 7, lands surrounding Ponds 7/7A are undeveloped and are designated for wildlife habitat. The embankments surrounding Pond 8 also provide de facto flood protection, however Pond 8 is adjacent to Milton Road and corresponding residential development along this road.

The embankments surrounding Ponds 6/6A, 7/7A and 8 were never intended to serve as flood protection. At certain locations the embankment heights are below Mean Higher High Water (MHHW) level for the site of 6.2 feet NAVD 88. The project would result in the raising of embankments such that all embankments would be above the MHHW. Embankment heights would range from 7 feet NAVD for internal embankments to 9- to 10-feet NAVD for outboard embankments; the majority of embankments would be 8 feet NAVD. Several models were used to determine the appropriate height of the embankments including the 100-year flood FEMA maps, a wave run-up analysis and the 100-year storm event stage volume. Additional consideration was also given to the need for freeboard, erosion and soil stability.

c. **Invasive Species.** In order to control invasive species at the restoration site, the applicant proposes to monitor for non-native *Spartina* and its hybrids and work with the San Francisco Estuary Invasive Spartina Project to ensure regional coordination. Reasonable efforts would be made to eradicate or control invasive species such as pampas grass, giant reed, ice plant and various species of broom for the duration of the monitoring period.

The applicant has prepared a habitat mitigation and monitoring plan that describes the design, implementation, and goals of the restoration project. The plan also includes performance measures for evaluating the success of the restoration and adaptive management methods should goals and success criteria fail to be met. Details regarding the mitigation and monitoring plan are discussed below in the section entitled, "Natural Resources Policies."

4. **Natural Resource Policies.** The Bay Plan policies on Fish, Other Aquatic Organisms and Wildlife state: "[t]o assure the benefits of fish, other aquatic organisms and wildlife for future generations…the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored, and increased" (Policy No. 1). These policies also state that "[t]he Commission should consult with the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service whenever a proposed project may adversely affect an endangered or threatened plant, fish, other aquatic organism or wildlife species…[and] give appropriate consideration of [their] recommendations in order to avoid possible adverse impacts of a proposed project on fish, other aquatic organisms and wildlife habitat" (Policy No. 2). The policies further state that "[t]he Commission may permit a minor amount of fill or dredging in wildlife refuges, shown on the Plan Maps, necessary to enhance fish, other aquatic organisms and wildlife habitat or to provide public facilities for wildlife observation, interpretation, and education" (Policy No. 5).

The Bay Plan policies on Tidal Marshes and Tidal Flats state, "where and whenever possible, former tidal marshes and tidal flats that have been diked from the Bay should be restored to tidal action in order to replace lost historic wetlands or should be managed to provide important Bay habitat functions…." The policies also state, "[a]ny tidal restoration project should include clear and specific long-term and short-term biological and physical goals, and success criteria and a monitoring program to assess the sustainability of the project. Design and evaluation of the project should include an analysis of: (a) the effects of sea level rise; (b) the impact of the project on the Bay's sediment budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential invasive species introduction, spread and their control; (f) rates of colonization by vegetation, where applicable; (g) expected use of the site by fish, other aquatic organisms and wildlife; and (h) site characterization. If success criteria are not met, corrective measures should be taken…." The policies further state that "[b]ased on scientific ecological analysis and consultation with the relevant federal and state resource agencies, a minor amount of fill may be authorized to enhance or restore fish, other aquatic organisms or wildlife habitat…."

The Bay Plan policies on Subtidal Areas state that, "[s]ubtidal restoration projects should be designed to: (a) promote an abundance and diversity of fish, other aquatic organisms and wildlife; (b) restore rare subtidal areas; (c) establish linkages between deep and shallow water and tidal and subtidal habitat in an effort to maximize habitat values for fish, other aquatic organisms and wildlife; or (d) expand water open areas in an effort to make the Bay larger…." (Policy No. 3). The Bay Plan policies on subtidal habitats also state that subtidal restoration projects should be monitored for the same components that are required in the tidal marsh and tidal flats policy described above.

a. **Fish, Other Aquatic Organisms and Wildlife.** Historically, the project site was predominantly tidal marsh in the floodplain of the Napa River with complex drainage networks. Around the turn of the century, embankments were constructed to preclude tidal action, allowing the resulting land to be used for agriculture. Commercial salt production by solar and wind evaporation began in the early 1950's and continued into the early 1990's. In 1994, the property was conveyed to the State of California and has been managed for wildlife and habitat purposes since that time. The project site provides habitat for several special-status species and is designated as "critical habitat" for the threatened Western Snowy plover. In fact, the embankment that bisects Ponds 7/7A is a known nesting location for the Western snowy plover and the endangered California least tern.

   The proposed project would enhance open-water habitat over approximately 1,900 acres by improving water quality and allow the ponds to be managed as open water ponds into the future. The project would also decrease and ultimately remove bittern from Pond 7, a deleterious substance to fish and wildlife, and would strengthen the embankment that separates Pond 7 from other nearby water bodies. With project implementation the ponds would be managed for different species such that Ponds 6/6A and 7/A would be converted to shallow-water managed ponds for shorebirds during the dry season and maintain water depths appropriate to waterfowl during the wet season, and Pond 8 would remain a deep water pond for waterfowl.

   The applicant has completed consultation with U.S. Fish and Wildlife Service (USFWS), Endangered Species Branch (ESB). The Biological Opinion dated October 31, 2012, represents the USFWS opinion on the effects of the proposed action on the threatened delta smelt (*Hypomesus transpacificus*), endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), endangered California clapper rail (*Rallus longirostris obsoletus*), threatened western snowy plover (*Charadrius alexandrinus nivosus*),

and the endangered California least tern (*Sternula antillarum browni*). The USFWS concurs that the proposed project is not likely to adversely affect any of these species.

USFWS has also determined that the proposed project is not likely to result in jeopardy to the continued existence of the California clapper rail, California least tern, Western snowy plover, the salt marsh harvest mouse, or delta smelt, provided the reasonable and prudent measures and the implementation of the conservation and avoidance measures as described in the Biological Opinion and appearing in the Biological Assessment and the Habitat Mitigation and Monitoring Plan prepared for the project are implemented. In the event that the project would result in temporary impacts to the harvest mouse or clapper rail, the USFWS has issued an Incidental Take Statement for these two species. Conservation measures recommended by both agencies would be incorporated into pre-construction and construction activities associated with the project. Measures contained in the Biological Opinion that would be implemented to reduce impacts to special-status species include increasing the available nesting habitat for the California least tern and the Western snowy plover along the embankment that bisects Ponds 7/7A, resulting in an increase of 2.0 to 2.5 acres of potential nesting and cover habitat for these species. In addition, fish screens would be used on the Pond 7A intake structure to prevent the entrainment of juvenile and adult delta smelt, and intake of water into Pond 7A would be avoided if delta smelt larvae are detected.

The overall restoration project would result in a net benefit for the Bay's natural resources by increasing habitat for the harvest mouse and clapper rail, and enhancing foraging and roosting habitat for migratory waterfowl and shorebirds. The benefits of providing increased habitat for these species are expected to outweigh the relatively small, potential impacts to individual animals associated with the construction and maintenance of the proposed project.

The applicant has developed a habitat-monitoring plan for the restoration project that includes performance criteria and adaptive management strategies over a 15-year period. The monitoring plan would measure salinity, pH, dissolved oxygen, temperature, turbidity, sedimentation, use of the site by birds and small mammals, and colonization by invasive plant species, including non-native cordgrass. The site improvements would allow the applicant flexibility in managing the circulation of water on the site as well as other important water quality factors such as water depth, salinity, pH, and dissolved oxygen.

The Commission should determine whether the project is consistent with its policies regarding Fish, Other Aquatic Organisms, and Wildlife, Tidal Marshes and Tidal Flats, and Subtidal Areas.

5. **Water Quality Policies.** The Bay Plan policies on water quality state that "[b]ay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality. Fresh water inflow into the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses. The policies also state that "[w]ater quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's Basin Plan and should be protected from all harmful or potentially harmful pollutants. The policies, recommendations, decisions, advice, and authority of the State Water Resources Control Board and the Regional Board should be the basis for carrying out the Commission's water quality responsibilities" (Policy No. 2). Finally, the policies also state that "[n]ew projects should be sited, designed, constructed, and maintained to prevent or, if

prevention is infeasible, to minimize the discharge of pollutants into the Bay by: (a) controlling pollutant sources at the project site; (b) using construction materials that contain nonpolluting materials; and (c) applying appropriate, accepted, and effective best management practices; especially where water dispersion is poor and near shellfish beds and other significant biotic resources" (Policy No. 3).

a. **Water Quality.** As discussed in detail above, salinity in Pond 8 is similar to those concentrations found in nearby sloughs and the Napa River. Salinities in Ponds 6, 6A, and 7A are elevated slightly compared to ambient conditions, and will are expected to achieve ambient salinity within one to two months of completion of construction. The rate of discharge from these ponds will be considerably lower than that which occurred through breaching of Ponds 3, 4, and 5, as well the as the Napa Plant Site (a total of four separately monitored breaching events). Past experience with these breaching events has shown that localized salinity increases during the salinity reduction period were well within the RWQCB permit requirements. There is also a natural daily fluctuation in ambient salinity of approximately 5 ppt. Salinity within the ponds and the receiving waters will be monitored as a condition of the RWQCB permit, and the gates installed on the various culverts provide control over the rate of discharge, should any unexpected increases in salinity be identified.

   Conditions in Pond 7 differ greatly to those found in the other ponds since it was historically used to store bittern. Bittern, a by-product of the salt-making process, has a different ion balance than that which is found in seawater. Due to this ionic imbalance, concentrated bittern is deleterious to aquatic organisms and wildlife. In addition, the brine contained in Pond 7 is characterized by concentrations of priority pollutant metals such as copper and nickel that, due to the high concentration of the brine, exceed Regional Water Quality Control Board objectives.

   Originally the Regional Water Quality Control Board issued Order No. R2-2004-0063) for the restoration of and management of Ponds 1 through 6. However, this order did not contain authorization for the maintenance and operation of Ponds 7, 7A and 8. On June 8, 2011, the RWQCB issued an additional certification (CIWQS Place No. 654284) to address these ponds. In addition to these orders, the RWQCB issued a separate NPDES (CA 0030101) to ensure that the discharge of diluted bittern from Pond 7 complied with water quality limits.

The Commission should determine whether the proposed project is consistent with the policies on Water Quality.

6. **Priority Use Designation.** The proposed project is located in an area designated as a salt pond/managed wetland and as a Wildlife Refuge priority use area on Bay Plan Map No. 2. The project would be consistent with the priority use designation for the site as it would enhance and result in the improved management of 1,900 acres of wildlife and fish habitat in the Napa River Unit of the Napa-Sonoma Marshes Wildlife Area.

7. **Climate Change.** The Bay Plan policies on "Climate Change" state that, "[u]ntil a regional sea level adaptation strategy can be completed, the Commission should evaluate each project proposed in vulnerable areas on a case-by-case basis to determine the project's public benefits, resilience to flooding, and capacity to adapt to climate change impacts. The following specific types of projects have regional benefits, advance regional goals, and should be encouraged, if their regional benefits and their advancement of regional goals outweigh the risk from flooding…(d) a natural resource restoration or environmental enhancement project…."

The public benefits of the proposed project are numerous. Project improvements would enhance the ability to manage the site for wildlife and fish purposes, would protect areas that provide habitat for several species, some of which are federally-endangered, and would provide interesting and unique public access opportunities to a remote area of the Bay.

The project would result in the raising and strengthening of existing embankments. The specifications for the embankment improvements were generated using 100-year flood FEMA maps, a wave run-up analysis and the 100-year storm event stage volume to determine the appropriate heights and slopes for the embankments. Over time, if sea level rose such that it became to difficult and costly to maintain the embankments to prevent intrusion of tidal waters and the embankments were overtopped or breached, the site would continue to provide valuable wildlife and fish habitat, although of a different kind than currently envisioned. It is uncertain whether the public access that is currently proposed could withstand the effects of future sea level rise. The Commission should consider whether it is appropriate to condition the permit issued for the project such that alternative inland public access around the pond's landward boundaries be provided in the event that the proposed access is damaged and/or inaccessible as a result of sea level rise.

The Commission should determine whether the proposed project is consistent with the Bay Plan policies on Climate Change.

B. **Review Boards**

1. **Engineering Criteria Review Board.** The Engineering Criteria Review Board did not evaluate the proposed project.
2. **Design Review Board.** The Commission's Design Review Board (DRB) reviewed the proposed project on August 9, 2010. The DRB commented that the public access was in keeping with the natural setting of the site and appeared to be consistent with the anticipated use of the site. The Board recommended that rustic seating be installed at the southern tip of the Pond 7/7A public access trail. The project proponents have complied with this recommendation and plan to install such seating at this location. The DRB has not reviewed the revised public access proposal.

C. **Environmental Review.** In November 2006, the California Department of Fish and Wildlife, acting as lead agency under the California Environmental Quality Act, certified the Final Environmental Impact Report for the project. A summary of the Final EIR is attached as Exhibit 6.

D. **Relevant Portions of the McAteer-Petris Act**

1. Section 66602.1
2. Section 66605
3. Section 66632

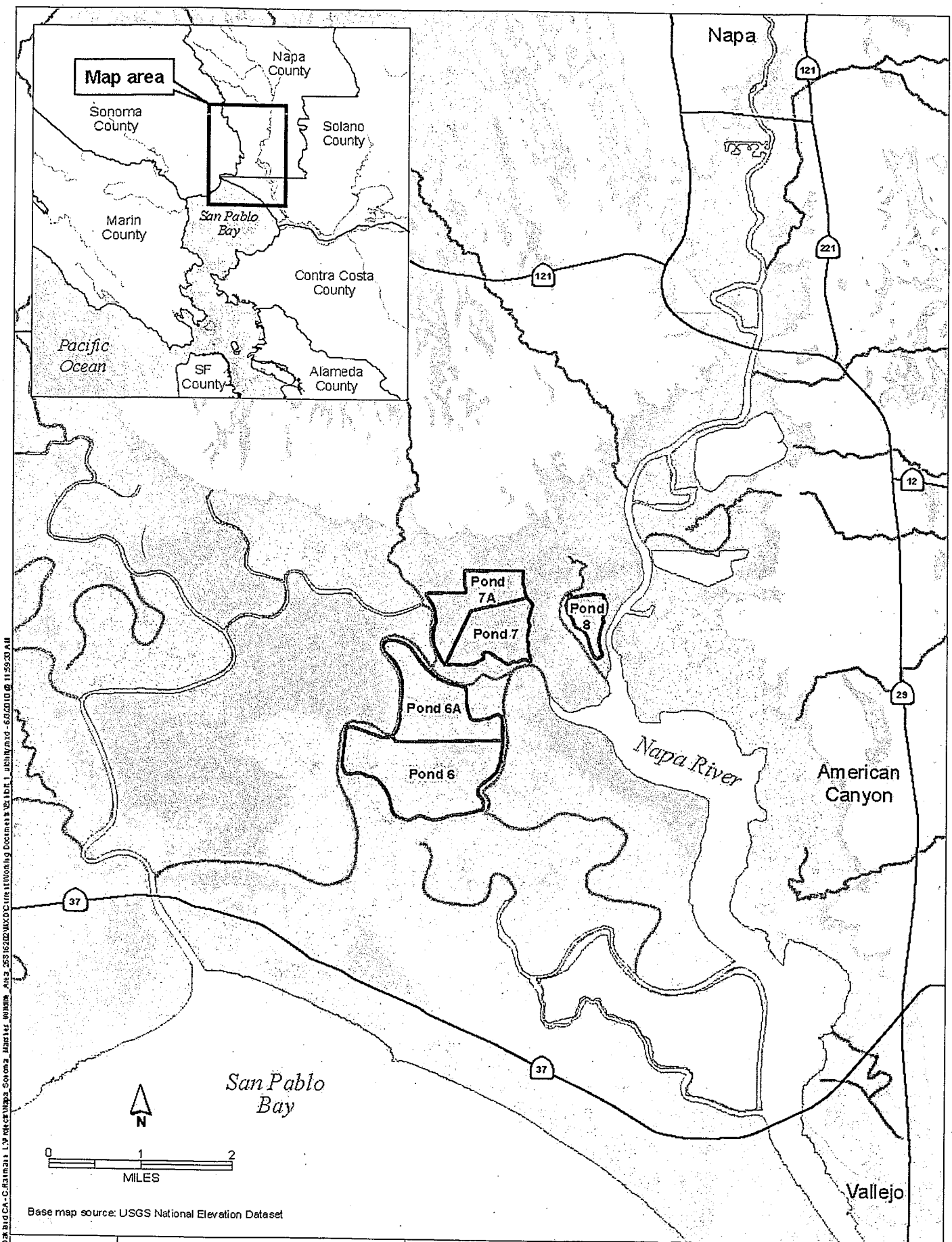
E. **Relevant Portions of the San Francisco Bay Plan**

1. *San Francisco Bay Plan* Policies on Fish, Other Aquatic Organisms, and Wildlife (page 15)
2. *San Francisco Bay Plan* Policies on Water Quality (page 17)
3. *San Francisco Bay Plan* Policies on Water Surface Area and Volume (page 20)
4. *San Francisco Bay Plan* Policies on Tidal Marshes and Tidal Flats (page 21)
5. *San Francisco Bay Plan* Policies on Subtidal Areas (page 27)

6. *San Francisco Bay Plan Policies* on Public Access (page 66)
7. *San Francisco Bay Plan Policies* on Salt Ponds (page 72)
8. *San Francisco Bay Plan Policies* on Climate Change (page 31)

Exhibits

A. **Vicinity Map, Exhibit 1**
B. **Project Location, Exhibit 2**
C. **Site Plan-Ponds 6/6A, Exhibit 3**
D. **Site Plan-Ponds 7/7A and 8, Exhibits 4 & 5**
E. **Public Access Plan, Exhibit 6**
F. **Summary of Final EIR, Exhibit 7**



Base map source: USGS National Elevation Dataset

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California Department of Fish and Game
Napa-Sonoma Marshes Wildlife Area

Exhibit 1
Project vicinity

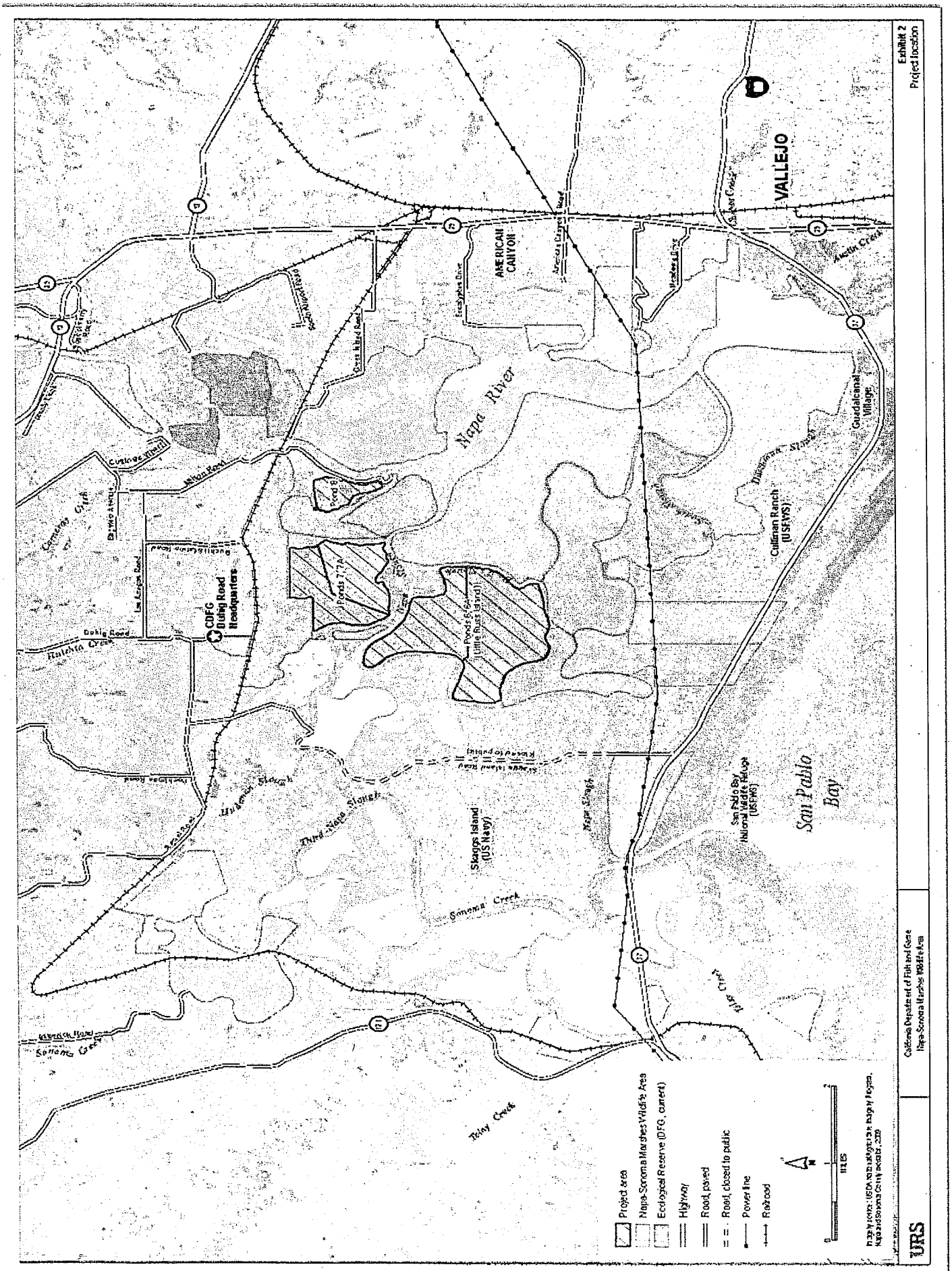
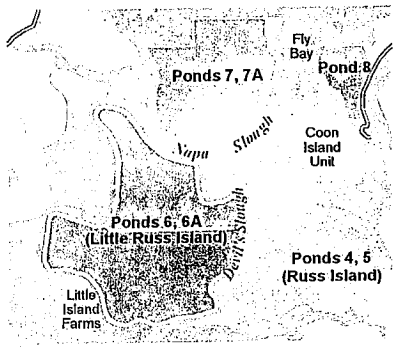
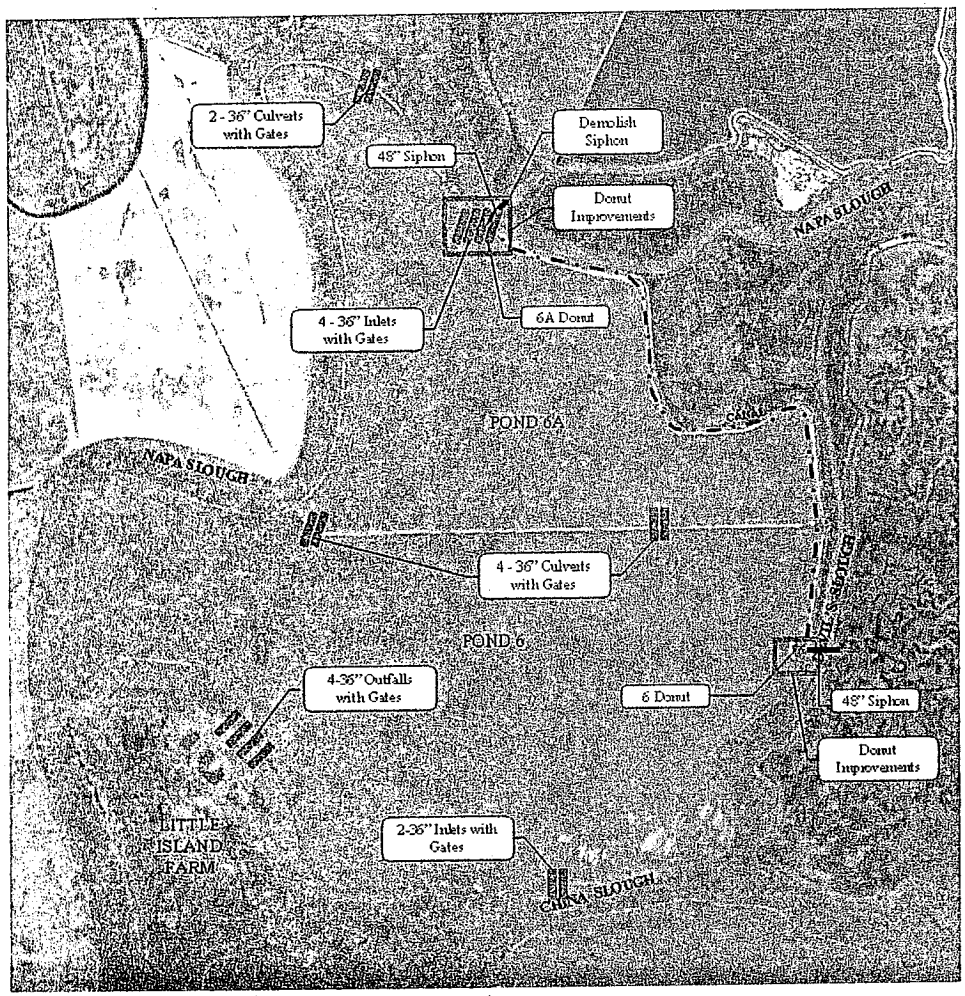


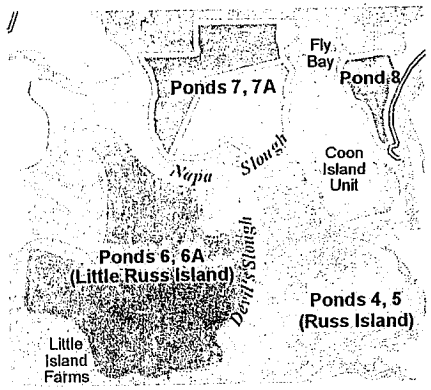
Exhibit 2-Project Location



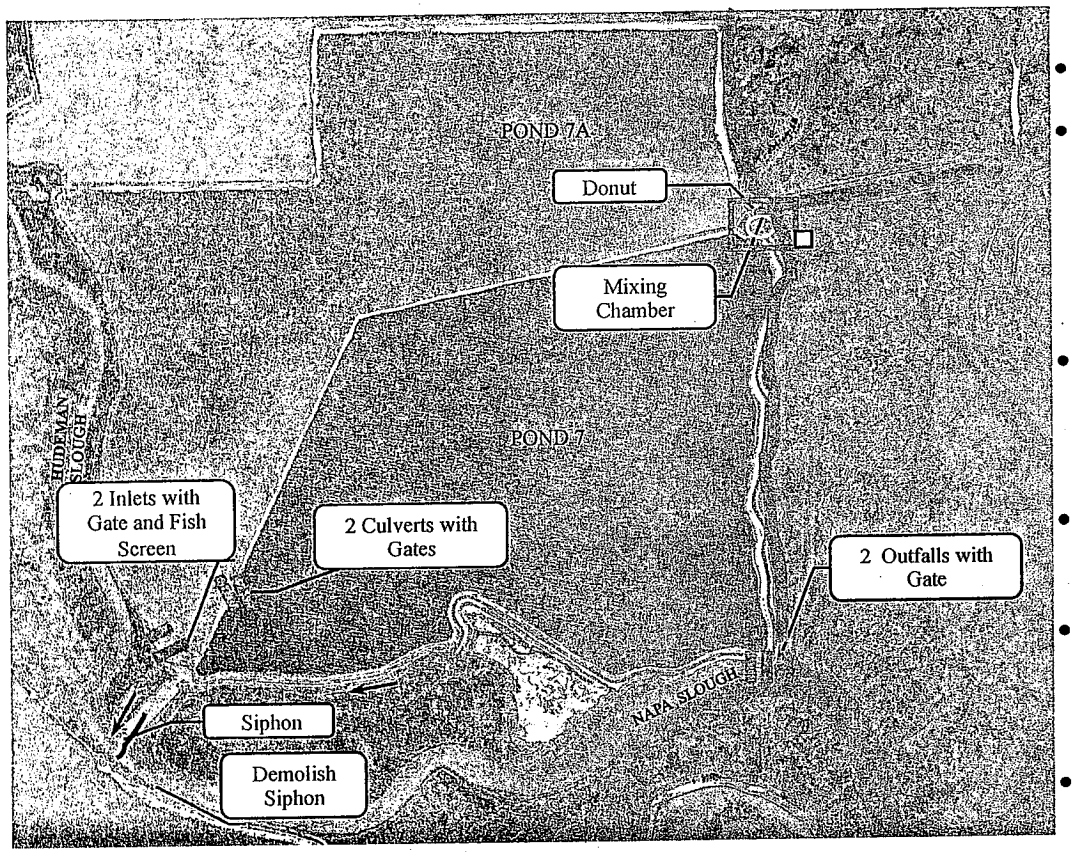
Ponds 6/6A Improvements



- Boat access only
- 7 water control structures will be installed
  - provide intake water from surrounding sloughs.
  - will include support platforms , wooden piles, and buried pipes.
- Maintenance walkways (catwalks) will provide access for gate operation
  - ex: approach deck will be 16.9 ft x 6.5 ft and 7.2 feet above the invert of the pipes
- Embankment repairs:
  - Raise crest elevation
  - Improve slope
  - Provide small area of rip rap erosion protection

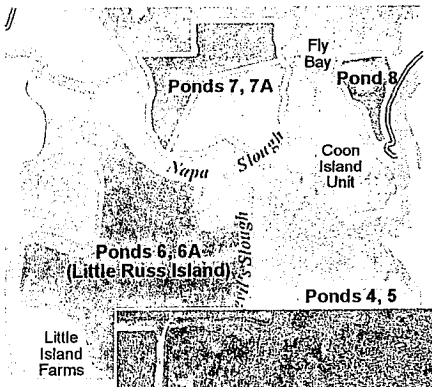


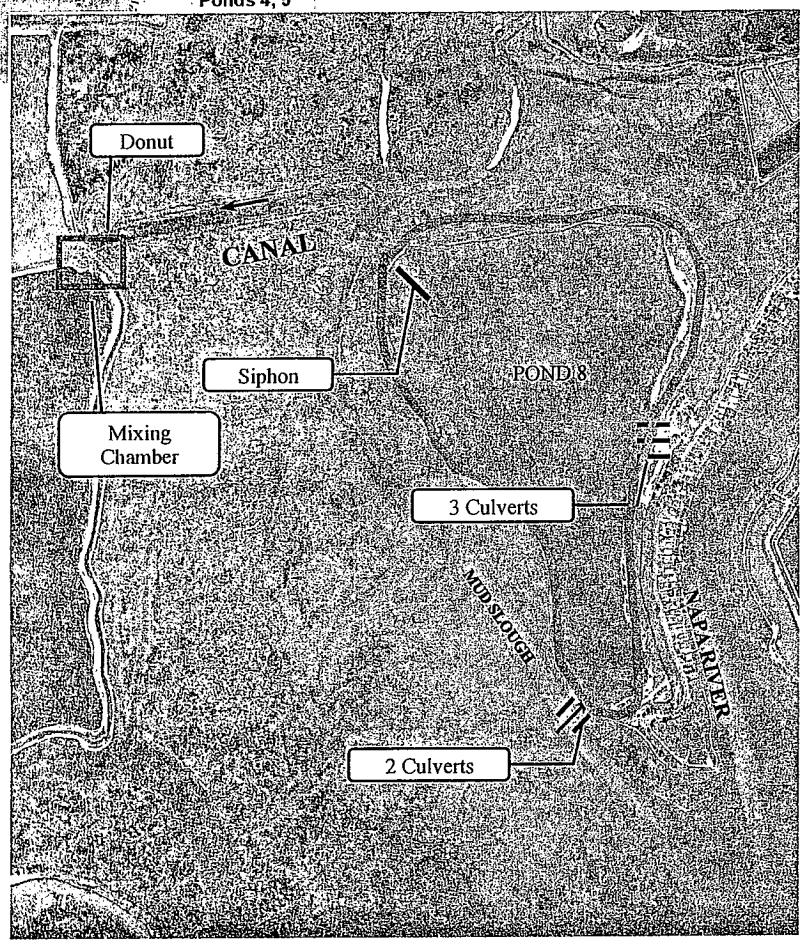
Ponds 7 and 7A



- 5654 feet, over 1 mile, of **improved recreational pathways.**
  - 10 feet wide
  - 56,540 square feet
- Interpretive signage
- 6 water control structures
  - intake water, outflow, and surrounding dilution water to mixing chamber
  - will include support platforms , wooden piles, and buried pipes.
- Bittern mixing chamber with 120 sq ft control building
  - security and vandalism prevention
- Maintenance walkways
  - As at Pond 6
- Embankment repairs:
  - Raise crest elevation
  - Improve slope
- 2 fish screens at Napa Slough intake into Pond 7A
- Signage and visual barrier(s) for sensitive species habitat area

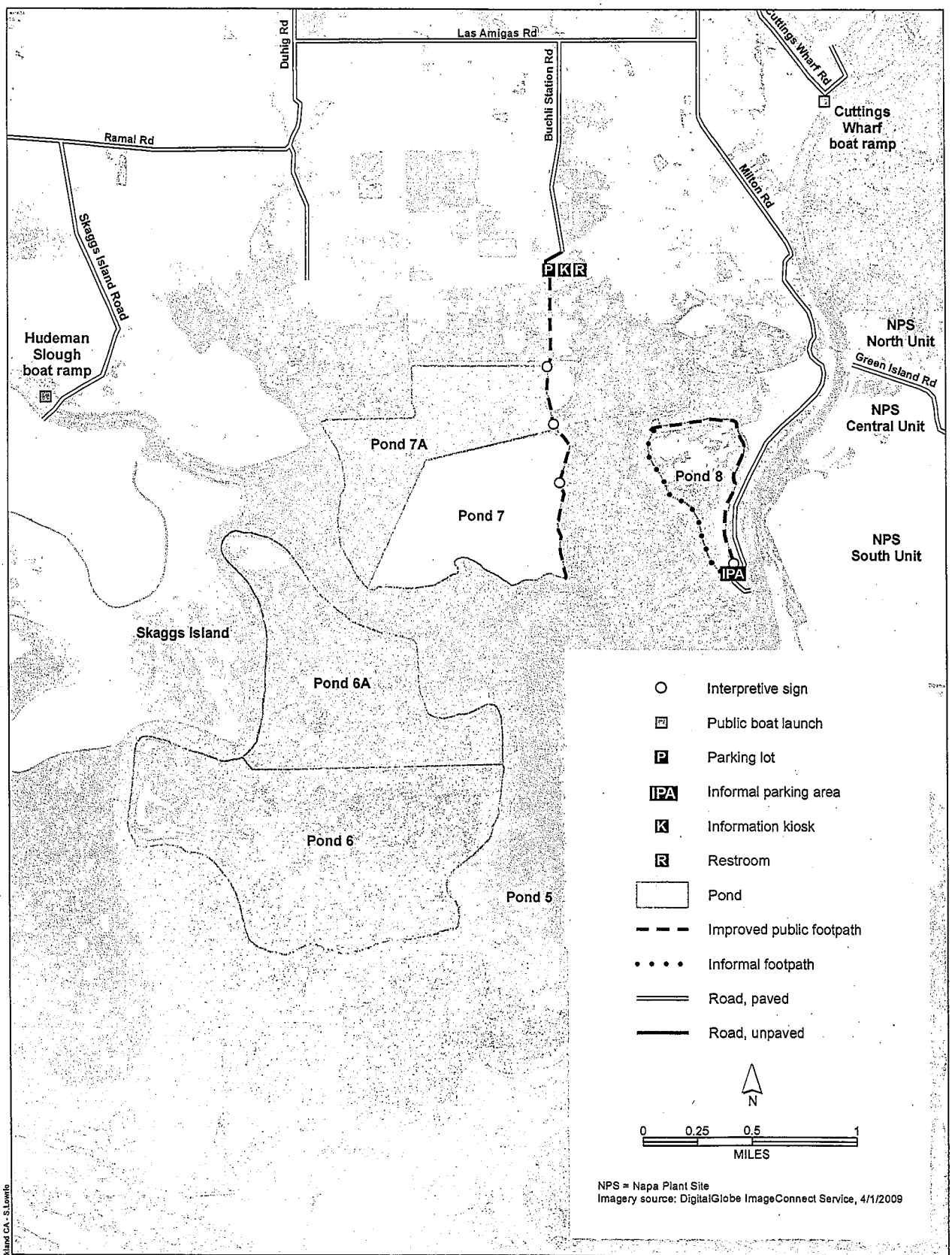
Pond 8 Improvements





- **6110 feet (1.2 miles) of improved recreational pathways.**
  - Width determined by embankment top width after repairs; embankments will not be widened to accommodate pathway
  - Approximately 60,000 square feet
- Replace water control structure between Pond 8 and mixing chamber
- Embankment repairs:
  - Raise crest elevation
  - Improve slope
- 2 existing fish screens at intakes will remain
- Interpretive sign

Exhibit 5-Site Plan-Pond 8



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Napa-Sonoma Marshes Wildlife Area

DRAFT

Exhibit 6
Public access at project site

Summary

S.1 Project Background

The California State Coastal Conservancy (Coastal Conservancy), U.S. Army Corps of Engineers (Corps), and California Department of Fish and Game (DFG) (project sponsors) are proposing a salinity reduction and habitat restoration project for the 9,456-acre Napa River Unit of the Napa-Sonoma Marshes Wildlife Area (NSMWA) (Napa River Unit). The parcel was purchased with funds from the Shell Oil Spill Settlement, State Lands Commission, Wildlife Conservation Board, and the Coastal Conservancy. The Napa River Unit is located at the northeast edge of San Pablo Bay, adjacent to the Napa River (Figure S-1).

The Napa River Unit was first diked off from San Pablo Bay during the 1850s for hay production and cattle grazing. Dike construction continued for several years and much of the land was converted to salt ponds in the 1950s for salt production through the solar evaporation of bay water. In the early 1990s, Cargill Salt Company stopped producing salt in the ponds on the west side of the Napa River and sold the evaporator ponds to the State of California, which assigned ownership and management to DFG.

The site consists of 7,190 acres of salt ponds and levees and 2,266 acres of fringing marsh and slough. For the purpose of this document, Ponds 1, 1A, 2, 3, 4, 5, 6, and 6A will be referred to as the *lower ponds*. Ponds 7, 7A, and 8 will be referred to as the *upper ponds*. The lower ponds are located south of Napa Slough; the upper ponds are located north of Napa Slough. Detailed site topography was collected and used for the project as described in Chapter 3, "Hydrology." Additional pond salinity and water quality information is provided in Chapter 4, "Water Quality."

Restoration of the Napa River Unit has long been a vision for local resource agencies, conservationists, and planners. It is one of the largest tidal restoration projects on the west coast of the United States, and one of many restoration projects throughout the San Francisco Bay area. Baywide restoration planning, including historical and existing conditions and future habitat recommendations, was conducted as part of the Baylands Ecosystem Habitat Goals Project (Goals Project 1999) and provides a regional framework for this project.

EXHIBIT 7

S.2 Purpose and Need

The purpose of the project is to restore a mosaic of habitats, including tidal habitats and managed ponds, to this property and provide for better management of ponds in the Napa River Unit to support populations of fish and wildlife, including endangered species, migratory waterfowl, shorebirds, and anadromous and resident fish. Other important benefits of the project include improved water quality, the potential use of recycled water, and enhanced public open space and wildlife-compatible recreation opportunities. The long-term goal is to produce a natural, self-sustaining habitat that can adjust to naturally occurring changes in physical processes with minimum ongoing intervention.

The project is needed because of

- historical losses of marsh ecosystems and habitats;
- increasing salinity and declining ecological value in several of the ponds;
- deterioration of levees, which could lead to levee breaches and uncontrolled high-salinity discharges, resulting in potential fish kills;
- deterioration of water control structures, which exacerbates the increase in salinity;
- increased restoration costs associated with site deterioration;
- increasing operation and maintenance costs; and
- inadequate water supply, especially during the summer months, resulting in increased salinity, acidic conditions, and drying out of some ponds in summer.

Restoring tidal wetlands, including tidal marsh, within the Napa River Unit would benefit the natural environment by creating

- a large area of contiguous tidal marsh for a diversity of fish and wildlife, including threatened and endangered species (salt marsh harvest mouse, California clapper rail, and black rail);
- a greater variety of slough channel sizes, a large increase in slough habitat, and greater connections among San Pablo Bay, the Napa River, and the tidal salt marsh, which would benefit estuarine fish, including listed species (Delta smelt, splittail, steelhead trout, and chinook salmon) and other aquatic species, such as the Dungeness crab;
- a natural, self-sustaining system that could adjust to naturally occurring changes in physical processes, with minimum ongoing intervention;
- large tracts of tidal marsh that extend up the Napa River that allow fish and wildlife species to adjust to changes in salinity that occur seasonally and over longer periods because of variations in precipitation;
- increased tidal prism that would scour slough channels, eventually creating large tidal channels, benefiting fish and diving waterfowl;

- improved tidal circulation throughout the system, improving water quality; and
- greatly increased production of organic detritus by tidal marshes, increasing the ecological productivity of San Pablo Bay.

Diking or filling has destroyed approximately 82% of the original tidal wetlands of the San Francisco Bay area (Goals Project 1999). The loss of tidal wetlands has greatly reduced the amount of habitat available to many species of fish and wildlife. Several animal and plant species native to California, including the salt marsh harvest mouse and the California clapper rail, have been federally and state listed as endangered as a result of the severe reduction of wetland habitats.

Salinity is increasing and ecological values are declining in several of the ponds in the Napa River Unit. DFG's ability to maintain the levee system and to control water levels, salinity, and water quality in the ponds is limited by funding and infrastructure constraints. The primary limitations to DFG's successful management are the high cost of running poorly performing water intake pumps and the low hydroconnectivity between ponds. The current pumps do not supply enough water to prevent increases in salinity concentrations, especially during seasonal periods of low precipitation and high water evaporation. Upgraded water intake pumps combined with levee reconstruction would result in improved hydroconnectivity and would enable DFG to improve migratory waterfowl management activities.

Several of the salt pond levees are deteriorating. The ponds are considered a potential threat to the ecology of the north bay region because of the presence of large quantities and high concentrations of residual salts. It has been estimated that there are 2–4 million tons of salt in the ponds. During the commercial production of salt, the solar evaporation system moved bay water through the ponds in sequence as the salts became concentrated. As a result, the ponds further along in the system have salinity levels that exceed the salinity level of seawater (ranging from approximately 32 parts per thousand [ppt] to more than 400 ppt).

The salt production process also concentrated soluble salts other than sodium chloride. These additional salts were generally not harvested and accumulated in the pond system in solutions and precipitates known as *bittern*. The uncontrolled release of bittern would be detrimental to the aquatic environment. Additionally, the drying action of salt ponds creates undesirable low pH (acidic) values.

The annual evaporative water loss from the salt ponds substantially exceeds the amount of water replaced by annual rainfall. Therefore, without active water management, the salt ponds would become increasingly saline and turn into seasonally wet salt flats—or worse, bittern ponds—resulting in the loss of most of their present habitat value for waterbirds and other wildlife species.

Although the water lost through net evaporation can be replaced by water drawn from San Pablo Bay and the lower Napa River, these sources also contain salts that will become concentrated in the ponds over time. The limited capacity and

high operating costs of the pumps used to draw water into the ponds are also problematic. Additional infrastructure constraints further limit the ability of DFG to move replacement water into the ponds.

S.3 Alternatives Screening Process

Several approaches were used to develop and screen alternatives for the Napa River Salt Marsh Restoration Project, including using a restoration decision flowchart developed by the project team (Figure S-2) and the Corps's *Economic and Environmental Principles and Guidelines for Water Related Land Resources Implementation Studies* identified in the Corps's *Planning Guidance Notebook (ER 1105-2-100)* (U.S. Army Corps of Engineers 2000a), which includes screening based on effectiveness, efficiency, completeness, and acceptability. Environmental, economic, and social screening criteria were also used to evaluate and screen restoration components.

Each of the alternatives includes salinity reduction and habitat restoration features. Because of the complexity of the restoration and desalination process, restoration options and salinity reduction options were developed and analyzed separately. A wide range of both types of options was identified and evaluated at a screening level. Options that were identified as viable in the first round of screening were retained for more detailed evaluation. Project alternatives were then created by combining salinity reduction options and habitat restoration options in various combinations (see Chapter 17, "Integration of Options and Alternative Selection"). Salinity reduction options were further subdivided into two components—the salinity reduction process, and supplemental (fresh or recycled) water delivery. By evaluating the salinity reduction and habitat restoration options separately, the maximum feasible range of integrated alternatives was considered.

Preliminary screening of the salinity reduction options was achieved by conducting initial hydrologic modeling runs to determine the feasibility of various salinity reduction approaches. The water delivery options were evaluated by assessing the economic and institutional feasibility. The habitat restoration options were screened by characterizing the evolution of the site over time with varying assumptions. The most viable options were carried forward for consideration as potential project options. Potential habitat restoration options were then presented to the Napa-Sonoma Marsh Restoration Group for review and critique.

Twenty-four salinity reduction, seven habitat restoration, and three supplemental water delivery options were considered at the screening stage. Of these, 21 salinity reduction options, three habitat restoration options, and two water delivery options were eliminated from further analysis because of criteria described above. These options fall into several general categories:

- salinity reduction options:
  - reverse operation of the ponds,

- concentration of brine in one or more central ponds,
- physical removal of the bittern,
- use of only recycled water to desalinate all ponds, and
- flood event salinity reduction;

- water delivery options:
  - maximum recycled water delivery and
  - use of site groundwater;
- habitat restoration options:
  - species-focused options,
  - land exchange, and
  - sediment-import options.

S.4 Intent and Scope of the EIR/EIS

The intent of this environmental impact report/environmental impact statement (EIR/EIS) is to disclose the environmental impacts associated with this restoration project. The restoration effort would have substantial habitat benefits by restoring portions of the Napa River Unit to a mosaic of wildlife habitats consisting of managed ponds and tidal marsh but may result in significant hydrologic, water quality, and biological effects.

In accordance with both California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) regulations, this document individually describes environmental effects caused by the construction, operation, and maintenance activities related to restoring the Napa River Unit. It focuses on key issues, including hydrology, water quality, biological resources (vegetation, wildlife, and aquatic resources), and geology and soils. Other resource topics such as air quality, hazardous materials, noise, land use, recreation, and cultural resources are also addressed in this document.

S.5 Options Evaluated in This EIR/EIS

Three sets of options are evaluated in this EIR/EIS. Because both salinity reduction and habitat restoration are required to complete the project, the habitat restoration options are combined with appropriate salinity reduction options and water delivery options (Chapter 17, "Integration of Options and Alternative Selection") to document the full extent of potential impacts associated with complete alternatives. In addition, both CEQA and NEPA require evaluation of a no-project alternative. This section describes first the No-Project Alternative, then the salinity reduction options, the water delivery options, and the habitat restoration options.

S.5.1 No-Project Alternative

Under this alternative (depicted in Figure S-3), site conditions would continue to deteriorate and salinity in the ponds would continue to increase. DFG would manage the site to reduce day-to-day pond salinity, if possible, by taking San Pablo Bay water into Ponds 1 and 1A and Napa River water into Pond 8 and moving water through the pond system via water control structures. Annually there would be a net increase in the total salt load within the ponds. Water would be delivered to the system from two locations: the new intake at Pond 8 and the pump station that transfers water from Pond 1 into Pond 2. The flow from the intakes to the remaining ponds is driven by elevation ("head") differential. The ponds would be expected to dry out more frequently as siphons continue to be or become inoperable as a result of increased salinity gradients. Other water control structures would continue to deteriorate, reducing DFG's ability to manage water levels and pond salinity for wildlife habitat.

As long as DFG attempts to maintain the ponds' water levels by compensating for annual net evaporation, the salt mass in the ponds would increase dramatically from year to year. In the short term, depending on the amount of make-up water available for each pond, some ponds could dry out each year. In the long term, the increasing salinity in the ponds would reduce evaporation rates sufficiently that the estimated available amount of water would be sufficient to keep the ponds wet all year. As long as the amount of make-up water delivered to the ponds was kept the same, water levels would then slowly start to rise, and eventually water deliveries would have to be cut back to avoid overfilling the ponds. However, salinities in the ponds, even after the wet season, would soon exceed 350 ppt (the approximate solubility of sodium chloride), and sodium chloride would start to precipitate. As the salinity continues to increase, the liquid in the ponds would gradually turn into bittern; all the sodium chloride would precipitate, and the remaining brine would have the same composition as the bittern waste left over after the saltmaking process.

Although DFG would attempt to manage the ponds, as long as there is not a flow-through system, sufficient salt would accumulate in the ponds that all of the ponds that lack flow-through capability (i.e., Ponds 4–8) would turn first into highly saline brine and then into bittern ponds with a large precipitated salt mass. Thus, all of the ponds would eventually pose the type of ecological hazards currently posed by Pond 7. Coupled with the inevitable deterioration of the levees, the ponds would present a serious ecological threat.

Ongoing erosion of inboard levees by wind and waves and scour of outboard levees, in conjunction with high tides and high rainfall events, would likely result in one or more levee breaches. DFG would potentially fix the levees on an emergency basis as needed. Because of the remote locations and emergency contracting issues, however, these repairs often cannot be started in a timely manner, and much of the potential damage (i.e., possible fish kills) resulting from uncontrolled releases of highly saline water or bittern would be instantaneous.

In August 2002, an unknown party dug a small 2-foot-wide ditch between Pond 3 and South Slough. While this ditch provided some water exchange in Pond 3, it is also located very close to the siphon leading from Pond 3 to Pond 4 and, if it widens, could undermine the siphon, leading to a possible release from Pond 4. DFG subsequently obtained an emergency exemption to create a small 2-foot-wide ditch on the southeast side of Pond 3 to take the pressure off of the ditch on South Slough by facilitating some circulation of water in and out of Pond 3. USGS is currently monitoring salinity within and outside the small ditches. Initial findings indicate that the small amount of tidal exchange that occurs through these ditches has a negligible effect on water quality in the adjacent sloughs (Schoellhamer pers. comm.).

S.5.2 Salinity Reduction Options

Salinity reduction is the first step in the habitat restoration process. Currently, many of the ponds have salinities that either preclude use of the ponds by wildlife, or limit use of the ponds to a very small number of species seasonally. Reducing the salinities in the ponds to a level that makes the ponds usable for a wide range of wildlife would be the first step in enhancing the habitat value of the ponds. Generally, once the ponds are desalinated, they could be opened up to tidal action or maintained as managed.

Salinity reduction is not currently required for Ponds 1, 1A, 2, and 2A. Ponds 1, 1A, and 2 all have salinities that are at or near ambient conditions (i.e., salinity levels near San Pablo Bay/Napa River levels), and Pond 2A has been restored to tidal marsh. Ponds 1, 1A, and 2 have water exchange (i.e., they can continue to function as ponds in the long term without salinity build-up in the ponds).

All salinity reduction options would use the existing water conveyance infrastructure to the degree possible. However, the existing water conveyance structures are deteriorated, and the engineering evaluation suggests that all siphons would require refurbishing or replacement. In addition, all three options require construction and/or repair of intakes, outfalls, and other water conveyance structures (such as pumps, siphons, weirs, and fish screens).

Levee repairs would be conducted at the start of the desalination period for those ponds requiring desalination. The amount of repairs required depends on the desalination option selected, because different ponds would be desalinated at different rates under the different options (i.e., the duration for which the levees would have to retain their integrity, and which levees are required to retain their integrity, vary by option). For ponds that require a long time for desalination (e.g., Pond 7), levee maintenance would be required before and during the desalination period. It is estimated that 5% of all levees would require repairs every year.

S.5.2.1 Salinity Reduction Option 1: Napa River and Napa Slough Discharge

Under this option, salinity reduction in the lower ponds (3, 4/5, and 6/6A) would be achieved through a phased approach: restoration to near ambient Napa River salinity levels would begin at Pond 3, then continue to Ponds 4/5, and then to Ponds 6/6A. Primary discharges from the lower ponds would be to the Napa River. Salinity reduction in the upper ponds (7, 7A, and 8) would be carried out in a parallel phase. Primary discharges from the upper ponds would be to Napa Slough.

With a phased salinity reduction process, each pond would achieve full habitat value as soon as possible. Ponds that are slated to remain managed ponds would be fully functioning habitat as soon as salinity reduction is completed. Each of the ponds that is slated to be opened up to tidal action could be opened up to tidal action as soon as its salinity and water quality parameters are in the appropriate range as determined by the San Francisco Bay Regional Water Quality Control Board (RWQCB) and other regulatory agencies.

One of the concerns associated with existing conditions at the Napa River Unit is that one or more of the pond levees could breach and that that breach would result in an uncontrolled release of saline brine. However, controlled, managed breaches into the Napa River, especially for the less saline ponds, represent a potentially effective means of desalinating some of the ponds. The goal of the breaches proposed under this scenario would be to desalinate the ponds. Additional breaches would be added to allow full tidal exchange and return the ponds to tidal habitats.

The portion of the Napa River adjacent to Ponds 3 and 4/5 experiences a significant daily tidal flow, which would result in a high dilution rate for brines discharged in this area. Modeling has shown that controlled breaches for the lower ponds can be an effective means of desalinating these ponds.

Consequently, Salinity Reduction Option 1 has three suboptions: Option 1A, "Napa River and Napa Slough Discharge"; Option 1B, "Napa River and Napa Slough Discharge and Breach of Pond 3"; and Option 1C, "Napa River and Napa Slough Discharge with Breaches of Ponds 3 and 4/5" (Figures S-4, S-5, and S-6). The difference between the suboptions is in the way in which desalination of Ponds 3 and 4/5 would be conducted (via constructed intakes and outfalls, or via breaches).

S.5.2.2 Salinity Reduction Option 2: Napa River and San Pablo Bay Discharge

Numerous reverse flow alternatives were considered but eliminated because they would increase desalination time (delay the time at which one or more ponds could be opened to tidal action) and could lead to unacceptably high increases in

Pages S-9 through S-13
intentionally not included

Table S-3. A summary of beneficial impacts associated with each alternative is contained in Table S-4.

S.9 Impact Conclusions

S.9.1 Environmentally Superior Alternative

The environmentally superior alternative is the alternative that would cause the least damage to the biological and physical environment and that would protect, preserve, and enhance the historical, cultural, and natural resources of the project area. As the proposed project is a restoration project, all alternatives, by definition, would benefit the biological and physical environment and are designed to enhance the natural resources in the project area. However, Alternative 6 is considered the environmentally superior alternative because it would result in relatively quick salinity reduction of the lower ponds (several weeks for Pond 3 and several months for Pond 4/5), reducing the potential for adverse effects to aquatic resources. Construction-related ground disturbance associated with this alternative is equivalent to Alternatives 1, 2, 5, 7, and 8, and less than Alternative 3. While there would be more construction-related ground disturbance than under Alternative 4, Alternative 4 does not result in the optimal mix of restored habitats. The short period of time for salinity reduction helps the habitat restoration process proceed sooner under Alternative 6 than all others except Alternative 5 (which requires the use of fill). Alternative 6 provides a mixture of pond and tidal marsh habitats that meets the project objectives and is phased in in a way that would minimize current and future adverse effects.

The No-Project Alternative is not considered the environmentally superior alternative because of the continued deterioration of the site and potential for long-term adverse water quality effects.

S.9.2 Irreversible or Irretrievable Commitments of Resources

The project would result in the irretrievable commitment of fossil fuels and other energy sources to build, operate, and maintain the wetlands. The restoration of the site to wetlands, however, is not considered an irreversible or irretrievable commitment because the landscape could be converted to other land uses in the future.

S.9.3 Environmental Commitments

The Corps and DFG will adhere to several basic environmental commitments as part of the project, including preconstruction surveys for wildlife and plants, and implementing the Bay Area Air Quality Management District's (BAAQMD's)

soil management best management practices (BMPs) to minimize airborne dust. BMPs may include the following list:

- All construction areas, unpaved access roads, and staging areas will be watered as needed during dry soil conditions, or soil stabilizers will be applied.
- All trucks hauling soil or other loose material will be covered or have at least 2 feet of freeboard. Wherever possible, construction vehicles will use paved roads to access the construction site.
- Vehicle speeds will be limited to 15 mph on unpaved roads and construction areas, or as required to control dust.
- Streets will be cleaned daily to remove soil material carried onto adjacent public streets.
- Soil stabilizers will be applied daily to inactive construction areas as needed.
- Exposed stockpiles of soil and other excavated materials will be enclosed, covered, watered twice daily, or applied with soil binders as needed.
- Vegetation will be replanted in disturbed areas as quickly as possible following the completion of construction.

In addition, under the habitat restoration options, pond management in the long term would be based on a DFG management plan, which could be developed under DFG and CEQA guidelines.

S.9.4 Growth Inducement

Section 15162.2(d) of the State CEQA Guidelines requires that an EIR address the potential growth-inducing impacts of a proposed project. Specifically, 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."

The salinity reduction and habitat restoration components of the project would not contribute to regional urbanization as no urban infrastructure or facilities are proposed as part of the project; therefore, they would not result in any growth-inducing effects. However, implementation of the Water Delivery Option could have a growth-inducing impact relative to the potential future use of recycled water for agricultural irrigation. The growth of agricultural activity in the north bay region is currently constrained by the availability of water suitable for irrigation. The provision of recycled water suitable for agricultural irrigation could foster economic growth in the north bay region, especially relative to vineyard operations in Napa and Sonoma Counties.

S.9.5 Unresolved Issues

Several issues remain unresolved as part of the project, including exact impacts on hydrology, water quality, and biological resources. As the final hydrologic modeling has not been completed, the magnitude of the hydrologic effects remains unknown; there would likely be areas of scour and increased velocities that result in localized erosion. However, specific modeling, design refinement, and monitoring would ensure that these effects are minimized. Similarly, the final water quality analysis is not complete for salinity reduction with and without the use of recycled water, but predicted discharge concentrations are within a range that DFG can manage to achieve water quality objectives. Furthermore, ongoing monitoring and compliance with the San Francisco Bay RWQCB standards will ensure that these effects are minimized. The recycled water program component remains unresolved as specific WWTPs have not indicated whether they would participate; however, further environmental compliance would be required for the programmatic components analyzed.

The long-term evolution of habitats in the project area would affect biological resources, and some of these effects remain unresolved. There remains some uncertainty about the rate of evolution of the habitats, as there are assumptions associated with sediment deposition rates, waterborne sediment resuspension rates, and plant colonization rates. Although the analysis is conservative, portions of the project could take more or less time to evolve. The long-term use of the site by migratory waterfowl and endangered species also remains unresolved, but would be monitored and future management decisions would be influenced by this information. Similarly, contaminants and potential bioaccumulation could pose a threat to the long-term ecological health of some wildlife and aquatic resources. These resources would also be monitored over time to determine the most appropriate management decisions for the project area.

S.9.6 Issues of Known Controversy

The public and the resource agencies are largely supportive of this project; however, several areas of known controversy exist, particularly related to water quality and ecosystem effects. Water quality concerns relate to the potential for adverse environmental effects on aquatic resources, including those effects resulting from the potential project discharges. The ecosystem concerns relate to the short-term impacts and long-term evolution and use of the site by various fish and wildlife species (i.e., controversy over whether endangered species habitat [marsh] should take priority over migratory waterfowl habitat [ponds]). Two other potential areas of controversy relate to how quickly the levees are likely to deteriorate, thereby necessitating quick salinity reduction, and the potential interim loss of accreted marsh habitat.

S.10 Permit and Environmental Review and Consultation Requirements

In addition to CEQA and NEPA, the Napa River Salt Marsh Restoration Project will require compliance with other federal, state, regional, and local environmental laws, including

- Section 7 of the federal Endangered Species Act;
- the Magnuson-Stevens Fishery Conservation and Management Act;
- the Fish and Wildlife Coordination Act;
- Sections 404, 401, 402, and 313 of the Clean Water Act;
- the Clean Air Act;
- the Coastal Zone Management Act;
- the National Historic Preservation Act;
- Executive Order 11988—Floodplain Management;
- Executive Order 11990—Protection of Wetlands;
- Executive Order 12898—Environmental Justice;
- the Migratory Bird Treaty Act;
- the McAteer-Petris Act;
- the California Fish and Game Code (Section 1600 Lake or Streambed Alteration Agreement program);
- California Department of Transportation encroachment permit requirements;
- disabilities regulations (Americans with Disabilities Act, Rehabilitation Act, and Architectural Barriers Act); and
- National Pollutant Discharge Elimination System permitting and Section 401 water quality certification processes through the San Francisco Bay RWQCB and State Water Resources Control Board.

S.11 Public Involvement and Scoping

The project sponsors have provided the public and public agencies several opportunities for involvement with the project, which included discussions about key issues for the EIR/EIS. These opportunities occurred at public meetings in 1998 and 2001 and a series of agency and restoration planning meetings between 1998 and 2002.

The public involvement process was initiated when the Coastal Conservancy issued a notice of preparation for the project on July 17, 1998, and the Corps issued a notice of intent for the project on July 16, 1998 (63 *Federal Register*

136). The first public scoping meeting was held on July 21, 1998, in the Napa County Board of Supervisors offices. The second public workshop was held on October 23, 2001, in the Napa City-County Library Community Meeting Room, Napa, California.

Specific questions raised during scoping include the following:

- How would the project affect existing species and habitat?
- Would fish be entrained in pumps or trapped in the ponds?
- Would viable populations of threatened and endangered species be maintained in the area during construction and implementation?
- Would construction of the project be planned around critical time periods for different species?
- Would the sources of fresh water be turned off when desalination is finished?
- Would the use of fresh water change the salinity balance of the system?
- Would the project sponsors coordinate with the mosquito abatement districts and other agencies, particularly the U.S. Fish and Wildlife Service (USFWS), to make sure this project does not interfere with their objectives?
- Would opening up the ponds too quickly lead to a scouring out of vegetation in the slough channels?
- Would the waters become too deep for high-tide roosting of shorebirds?
- Would wintering diving birds that use Ponds 1, 1A, 2, and 3 be adversely affected by the project?
- Is dilution the most appropriate solution?
- What other alternatives have been studied?
- What are the potential impacts on privately and publicly held adjacent lands?
- Are there public health implications associated with the use of recycled water?
- Would discharged diluted salt pond water affect the Napa River, San Pablo Bay, or sloughs of the Napa River Unit?

These issues are presented and analyzed in this EIR/EIS for decision-makers to evaluate the project. An initial study was prepared for the project and is included as Appendix A.

The Napa-Sonoma Marsh Restoration Group, a technical working group, held meetings intermittently between 1998 and 2002 and monthly to quarterly meetings beginning in August 2001. The initial purpose of these meetings was to coordinate data collection efforts and update key stakeholders on the status of the project. More recent meetings were designed to update stakeholders on the technical analysis of the project, and obtain input and critiques of the technical analysis (e.g., salinity modeling) and habitat restoration and salinity reduction

approaches to be evaluated in the EIR/EIS. Members of this group included staff from

- the Coastal Conservancy;
- the Corps;
- DFG;
- the University of California, Davis;
- the U.S. Geological Survey;
- the San Francisco Estuary Institute;
- Save The Bay;
- The Bay Institute;
- the San Francisco Bay RWQCB;
- Ducks Unlimited;
- Cargill, Inc.;
- the National Audubon Society;
- the Napa County Resource Conservation District;
- the Southern Sonoma County Resource Conservation District;
- USFWS;
- the National Marine Fisheries Service;
- the Sonoma, Napa, and Solano County Mosquito Control Districts;
- the San Pablo Bay National Wildlife Refuge;
- San Francisco Bay Joint Venture;
- San Francisco Bay Conservation and Development Commission; and
- Sonoma County Water Agency.

S.2 Purpose and Need

The purpose of the project is to restore a mosaic of habitats, including tidal habitats and managed ponds, to this property and provide for better management of ponds in the Napa River Unit to support populations of fish and wildlife, including endangered species, migratory waterfowl, shorebirds, and anadromous and resident fish. Other important benefits of the project include improved water quality, the potential use of recycled water, and enhanced public open space and wildlife-compatible recreation opportunities. The long-term goal is to produce a natural, self-sustaining habitat that can adjust to naturally occurring changes in physical processes with minimum ongoing intervention.

The project is needed because of

- historical losses of marsh ecosystems and habitats;
- increasing salinity and declining ecological value in several of the ponds;
- deterioration of levees, which could lead to levee breaches and uncontrolled high-salinity discharges, resulting in potential fish kills;
- deterioration of water control structures, which exacerbates the increase in salinity;
- increased restoration costs associated with site deterioration;
- increasing operation and maintenance costs; and
- inadequate water supply, especially during the summer months, resulting in increased salinity, acidic conditions, and drying out of some ponds in summer.

Restoring tidal wetlands, including tidal marsh, within the Napa River Unit would benefit the natural environment by creating

- a large area of contiguous tidal marsh for a diversity of fish and wildlife, including threatened and endangered species (salt marsh harvest mouse, California clapper rail, and black rail);
- a greater variety of slough channel sizes, a large increase in slough habitat, and greater connections among San Pablo Bay, the Napa River, and the tidal salt marsh, which would benefit estuarine fish, including listed species (Delta smelt, splittail, steelhead trout, and chinook salmon) and other aquatic species, such as the Dungeness crab;
- a natural, self-sustaining system that could adjust to naturally occurring changes in physical processes, with minimum ongoing intervention;
- large tracts of tidal marsh that extend up the Napa River that allow fish and wildlife species to adjust to changes in salinity that occur seasonally and over longer periods because of variations in precipitation;
- increased tidal prism that would scour slough channels, eventually creating large tidal channels, benefiting fish and diving waterfowl;