REMEDIATION OF HANSEN DAM LOWER LAKE FILL SITES

I. EXECUTIVE SUMMARY

The primary purpose of Hansen Dam is to control the flow of the Little and Big Tujunga Washes downstream into the Los Angeles River. During excavations conducted in the 1990s to ensure the dam maintains its designed flood control capabilities, two Lower Lakes (as distinct from the recreational swim, fishing and boating lake complex opened in 2001) were created when over-excavated pits filled with groundwater and other inflow associated with the Tujunga Wash. Although first viewed as an attractive nuisance, valued aquatic, riparian and marsh habitat have grown up around these lakes in the intervening years.

The Corps seeks to rehabilitate the two Lower Lakes to the extent practicable without significantly disturbing the marsh and riparian habitat that have grown back since the fill activities occurred. The Corps seeks to sustain lake habitat generally unavailable in the San Fernando Valley, until natural alluvial processes reclaim the area. The lakeshore willow and mulefat margins, tule cattails and mudflats combined with open water and small island habitat, support resident and migratory ducks, shorebirds, waders, and herons that rest, roost and feed off fish and algae in the lake. The Corps and the City of Los Angeles also seek to manage this area over the long term, for such habitat values, by implementing adaptive management protocols and by limiting public access to safe and non-impacting educational, scientific and other interpretive uses.

Its proposed actions, for rehabilitating the Lower Lakes, are the only actions consistent with Corps responsibilities under the Clean Water Act.

Figure 1

Figure 2

II. BACKGROUND

A. History of Hansen Dam

Hansen Dam was constructed between 1939 and 1941 for the primary purpose of providing flood protection for communities downstream. The dam straddles Tujunga Wash just one-half mile below the confluence of the Big and Little Tujunga Washes, which flow out of the San Gabriel Mountains and the Angeles National Forest (Figure 3).

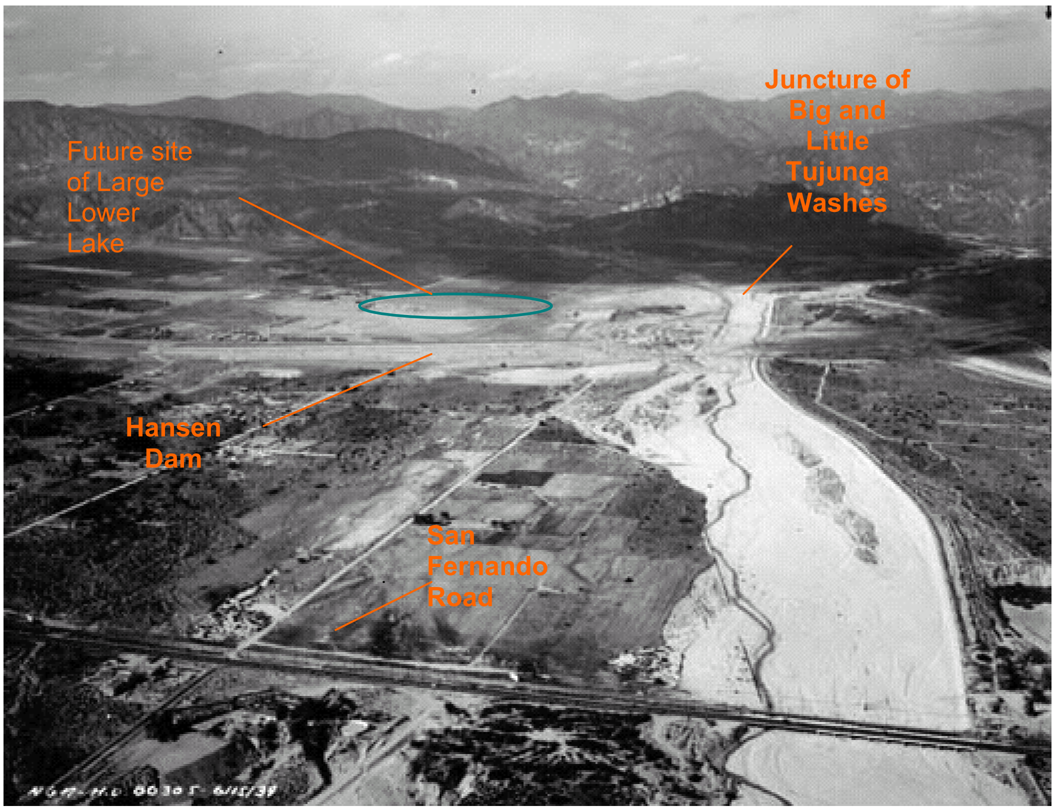

Figure 3: Construction of Hansen Dam in 1939 looking north. Shows Big and Little Tujunga Washes merging above Dam. Note absence of lakes, and that future location of Lower Lakes is bare of vegetation.

Waters leaving the dam basin flow into a concrete channel and empty into the Los Angeles River and eventually into Long Beach Harbor. The City of Los Angeles, which has leased most of the basin since the 1940s, manages the basin according to a Master Plan approved by the Corps.

The City Department of Recreation and Parks focuses their management on recreation facilities located in upper elevations of the basin, above the level of the Lower Lakes.

These facilities include the 10.5-acre recreation swim and fishing lake complex opened in 2001. The area in which the Lower Lakes occur, below these recreation lakes, has been left to evolve as natural habitat (Figure 4).

Figure 4: View east from Recreation Lake Complex looking down toward Large Lower Lake. Note Large Lower Lake abutting active Tujunga Wash.

Because the Lower Lakes area is in the active floodplain of Tujunga Wash, it is subject to natural cycles of flooding, sand and gravel deposition, and stabilization.

B. Lower Lake Formation

Tujunga wash is one of the most active washes in Southern California. The flood of 1969, the current flood of record, inundated the Basin from bank to bank, including the area now occupied by the Lower Lakes (Figure 5).

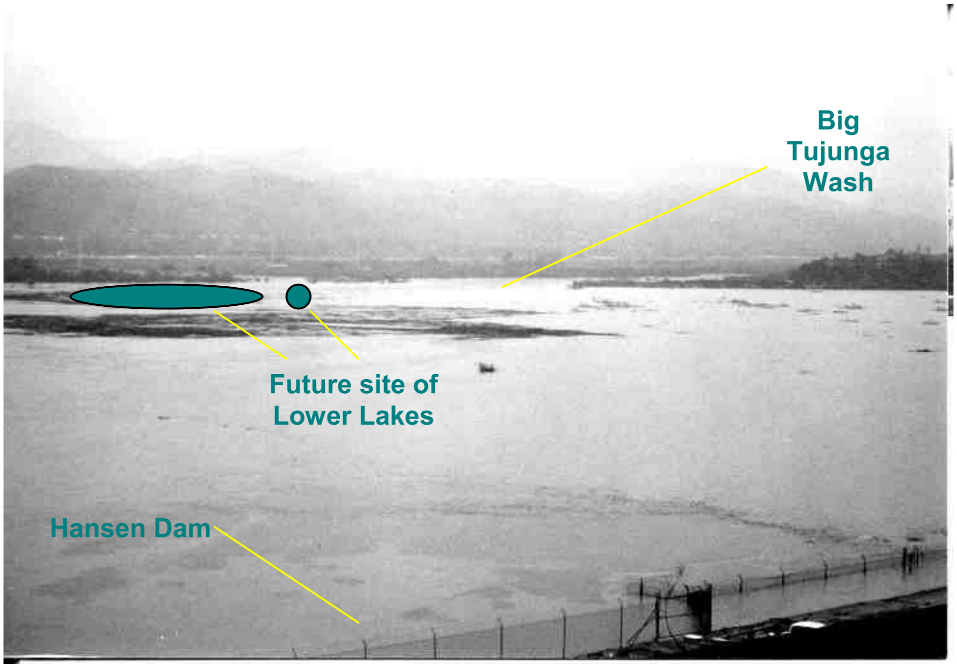

Figure 5: View north from Hansen Dam in Flood of March 1969. Note that future sites of both Lower Lakes were immersed.

To sustain the Dam's flood control capacity, sand and gravel removal operations were undertaken in the late 1980s through the mid-1990s to remove enough accumulated material to restore the basin's design capacity. Two lakes were inadvertently created when two sand and gravel borrow pits filled with groundwater and other inflow associated with Tujunga Wash. They have come to be known as the "Large Lower Lake" and the "Small Lower Lake" (Figures 1 and 2). Before the sand and gravel removal operation ended, the borrow pits were to be sloped to drain toward the dam. For reasons unrelated to the current situation, the sand and gravel removal contract expired before the pits were reconfigured to drain.

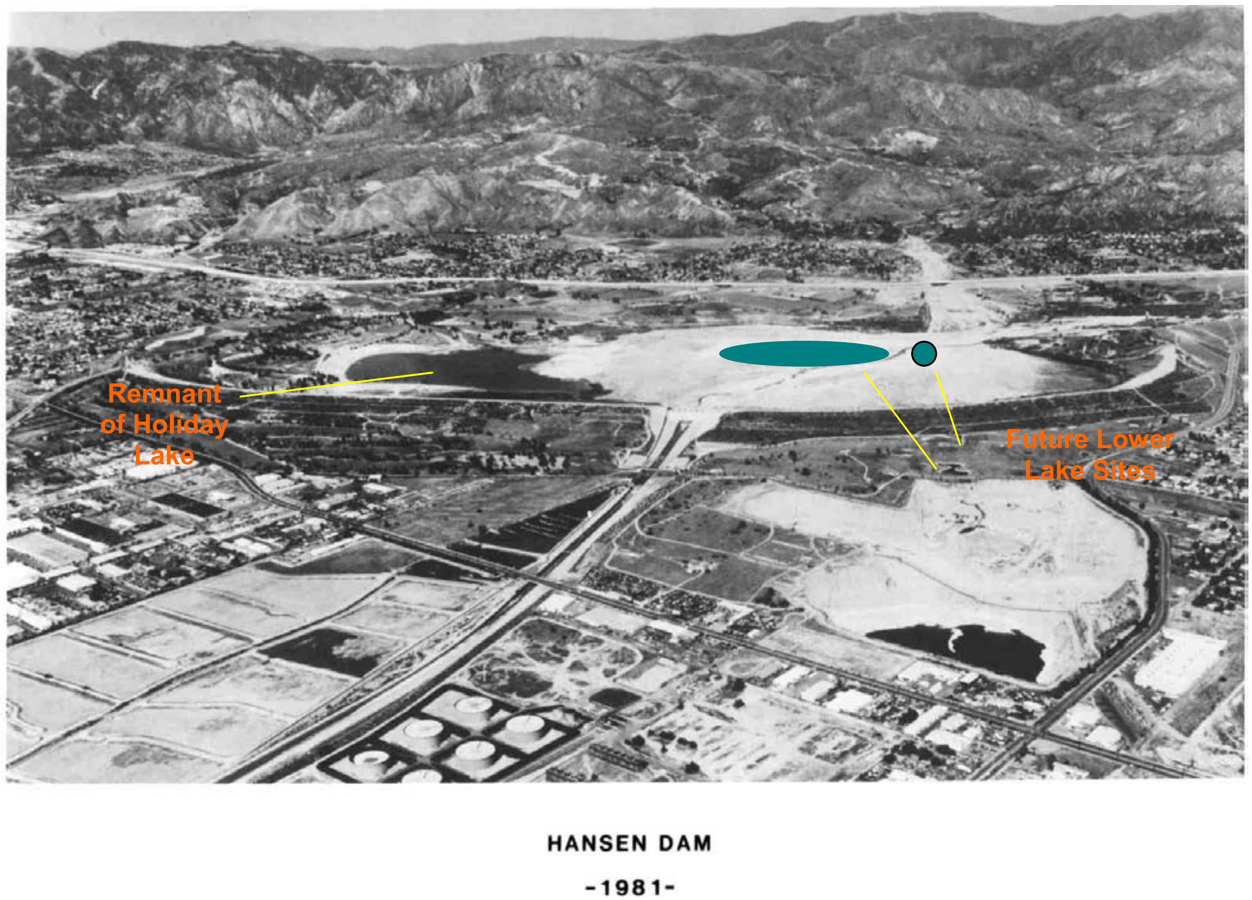

Figure 6: View of basin showing sand and gravel accumulated above Hansen Dam by 1981. Note that future sites of Lower Lakes were buried in sand and gravel.

Based on hydrologic and hydraulic records dating back to construction of Hansen Dam, an average of 604 acre-feet, or equivalent to 974,453 cubic yards, or equivalent to 19,489 50-cubic yard truckloads of alluvium are deposited per year in the Hansen Dam Basin (Figure 6). The total 5150 cubic yards of fill that are the subject of this report (1,650 cubic yards of concrete, 1,300 cubic yards of soil/trash/arundo, and 2,200 cubic yards of clean earthen fill) are equivalent to 3.16 acre-feet, or equivalent to 102 50-cubic yard truckloads, only 0.5 % of the average annual acreage fill deposited naturally in the Basin.

C. Lower Lake Marsh Ecology

Freshwater marshes are threatened for many of the same reasons. Most, if not all, of the historic San Fernando Valley's freshwater marsh habitat has been lost as wetlands were filled for development, and creeks feeding them were altered for flood protection.

Residents of the San Fernando Valley can now observe freshwater marsh and open water habitat above Hansen Dam. Although not a classic tule marsh, the park's wetlands harbor a diversity of aquatic plants, including tules, and a complex wildlife community that relies on these plants for food and shelter. The marsh and open water provide a window back in time of freshwater wetlands once scattered across the Valley (Figures 7, 8, 9, 10 and 11).

Freshwater marsh vegetation is typically dominated by perennial monocots up to six feet in height. This vegetation type typically includes cattails (*Typha* spp.), bulrush (*Scirpus* spp.), sedges (*Carex* spp.), spike rushes (*Eleocharis* spp.), flatsedges (*Cyperus* spp.), smartweed (*Polygonoum* spp.), watercress (*Rorippa* spp.) and yerba mansa (*Anemopsis californica*). Rooted aquatic plant species with floating stems and leaves may also be present, such as pennywort (*Hydrocotyle* spp.), water smartweed (*Polygonum amphibium*), pondweeds (*Potamogeton* spp.), and water-parsley (*Oenanthe sarmentosa*), as well as lake margin plants including various species of willows (*Salix* spp.) and mulefat. Open water habitat typically is unvegetated due to a lack of light penetration. Open water, however, may contain suspended organisms such as filamentous green algae, and phytoplankton, including diatoms. Although floating plants such as duckweed (*Lemna* spp.), water buttercup (*Ranunculus aquatilis*) and mosquito fern (*Azolla filiculoides*) may be present, the open water habitat must be left undisturbed for this to occur.

Freshwater marsh, lake margins and open water habitat support a great diversity of wildlife. The wetlands provide food, water and cover habitat for mammals, birds, reptiles and amphibians. The marsh is an especially important area for migratory birds (Figure 12). Waterfowl, shorebirds, marsh birds and others can all be found in the marsh, lake margins and open water habitats during the spring and fall migrations. Among waterfowl, dabbling ducks exhibit the widest array of habitat preferences; from generalists like mallards to specialized filter feeders like northern shovelers, and to grazers like American Wigeon. The pochards include shallow-water plant eaters of fresh or brackish waters (such as ring-necked and canvasback ducks) and invertebrate predators.

Within open water, zooplankton or animal organisms (including copepods, cladocerans and rotifers) graze upon resident algae and support fish populations. These and marsh plants are home and foraging ground for a whole variety of resident birds. Some of these are shy and surreptitious, like the American bittern and the Virginia rail, and rarely leave the shelter of vegetation. Open-water birds, in contrast, provide a kaleidoscope of color when the morning sun or late sunset illuminates their plumage. Northern harriers, white-tailed kites, short-eared owls, and other raptors patrol the wetlands, scanning for rodents and other small prey. Yellowthroats and song sparrows advertise their territories from the vantage of tule-stem perches.

Variables that can affect such herbaceous wetlands, and resident and migratory wildlife, include rate of water flow, fluctuations in water level, water depth, water and air temperatures, pH and dissolved salts, depth and nature of bottom sediments, organic content of the water and past history of the body of water. The health of the Lower Lakes ecosystems is a function of all these variables, and is remarkably sound for a system less than ten years old. The Corps, City, and Regional Water Quality Board, therefore, concur that remediation for debris removal should focus on non-impacting clean-up and reconfiguration of hazardous slopes. Removal or destruction of moderately mature habitat, to subsequently restore habitat, is not viewed as a sound or reasonable approach. We have agreed, instead, to focus efforts on additional trash removal in the vicinity of the lakes, exotic plant removal, limited excavations to stabilize eroding slopes, and management of stagnant water in a nearby gully.

Figure 7: View of cattails and marsh next to deposit site on Large Lower Lake. Note colonized mudflats.

Figure 8: Views of northwest shoreline of Large Lower Lake showing tule marsh

Figure 9: Views of Large Lower Lake showing tule marsh and willow margins.

Figure 10: View of Small Lower Lake looking south from north shore toward Hansen Dam

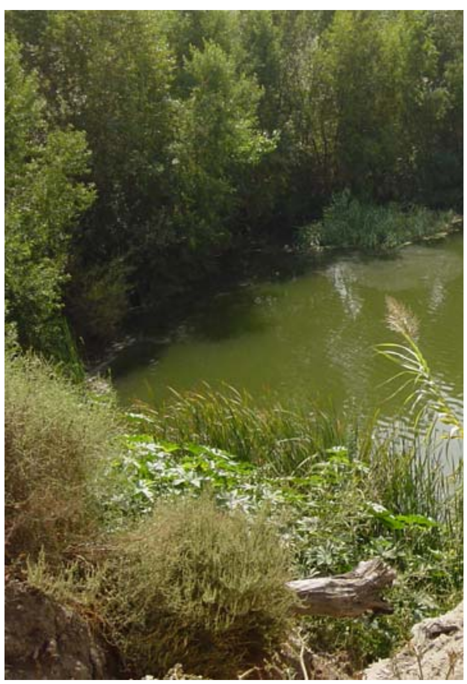

Figure 11: Northern edge of Small Lower Lake where materials were dumped

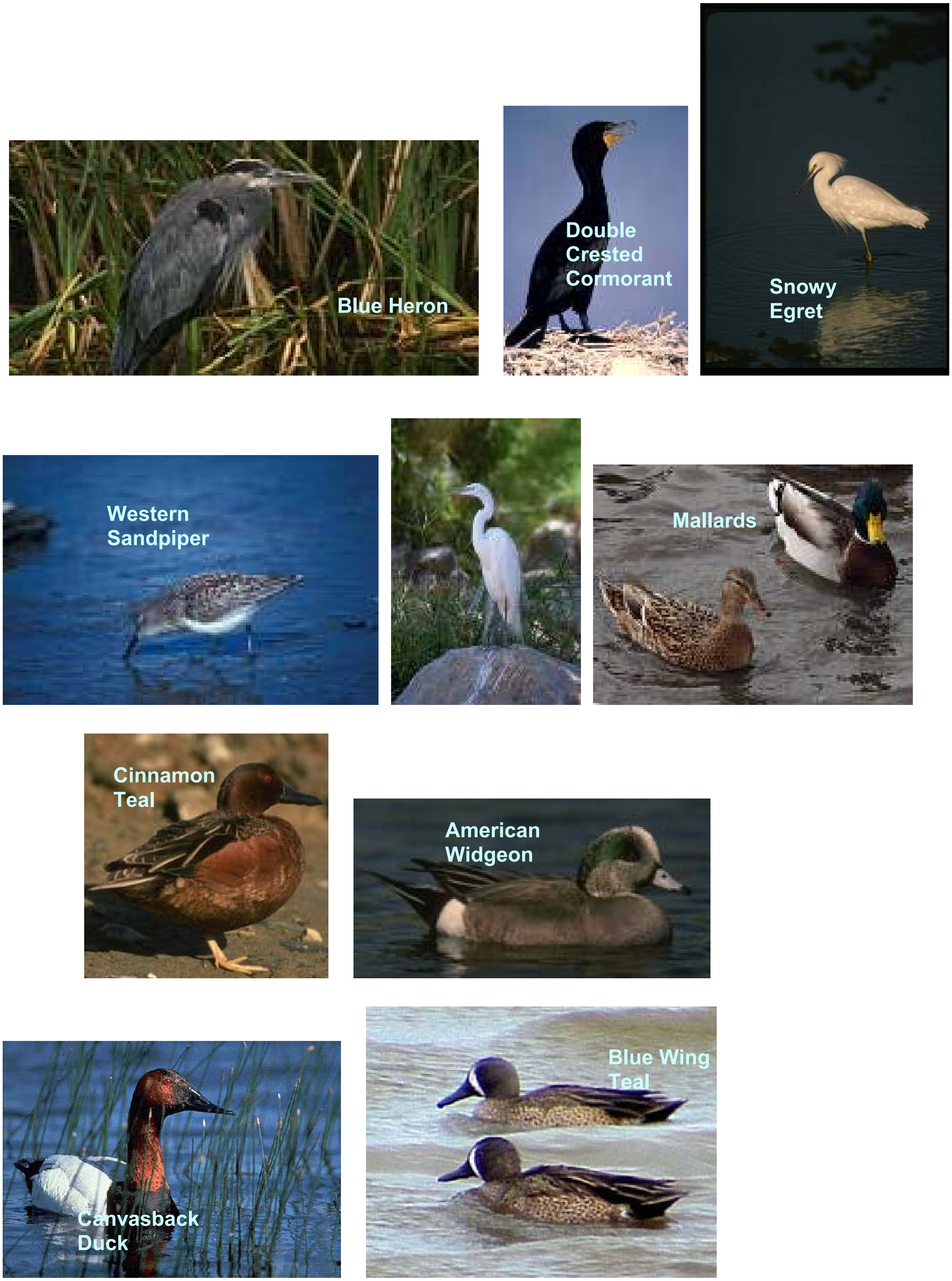

Figure 12. Waterfowl that likely frequent Hansen Dam Lower Lakes

D. Disposal Activities in 2002

1. Large Lower Lake

The first discharge of fill into the Lower Lakes occurred in May 2002, when approximately 1,650 cubic yards of reinforced concrete rubble were deposited in the northwestern corner (the deepest area) of the Large Lower Lake. The access ramp used to approach the lake predated the Corps' fill activities. The concrete fill material had been gathered from the bottom of the Hansen Dam Swim Lake while it was under repair. This material was capped by approximately 2,200 cubic yards of clean, native, soil from the same Swim Lake repair project. The fill area measures 150 feet long by 145 feet wide, at a maximum, and projects little more than five feet into the water (see Figures 1, 13 and 14). The shoreline impacted is less than 3% of the lake's entire shoreline.

Figure 13: View northeast across Large Lower Lake showing deposit site at end of pre-existing access ramp, in 2002. Approximate 145 X 150 foot area of deposit outlined in red.

Figure 14: View southwest across Large Lower Lake looking across toward deposit site (outlined area larger than actual disposal area).

2. Small Lower Lake

In the Spring of 2002, shortly after the first discharge, the Corps placed approximately 1,300 cubic yards of soil mixed with no more than 3% of dead, non-reproductive, chipped and mulched giant reed (*Arundo donax*), and a minor amount of other refuse, in the Small Lower Lake and in several piles north of the lake (Figures 15 and 16). The fill material was collected from channels in the Sepulveda and Whittier Narrows Flood Basins. The Corps cleared these flood channels as part of routine operation and maintenance measures. The fill area measures approximately 170 feet long by 100 feet wide and up to three feet deep (Figure 1). The shoreline impacted is less than 9% of the lake's entire shoreline.

Figure 15: Small Lower Lake. Steep, collapsing north bank. Fill deposits over bank and in piles above bank in area 170 X 100 feet (note inset aerial showing location).

Figure 16: Arundo deposited, and since removed, above north bluff of Small Lower Lake (view south towards Dam across lake).

The Corps ceased all filling activities at the Lower Lakes in June 2002. To determine the potential impact of the fill on water quality, water quality analyses were conducted in December 2002, March 2003, and again in October 2003 by SOTA environmental consultants under contract to the Corps. These studies show that the subject fill activities did not degrade the water quality. The only contaminants detected were also found in upstream background surface water samples, and can be attributed to non-point source pollution associated with over a century of agricultural and urban land use in the watershed above the Basin, as well as from horse manure associated with riding near the lakes.

III. CORPS' CORRECTIVE MEASURES

The Corps initiated corrective measures in the spring and summer of 2003. On July 29, 2003, approximately 150 cubic yards of material still stockpiled above and adjacent to the Small Lower Lake was removed and disposed of in a landfill (Figure 17). No material was left on the shore (Figure 18). The removal was performed with minimal disturbance to the contiguous habitat.

Beginning in July 2003, and continuing to the present, we have been removing all rebar visible along the shoreline of the Large Lower Lake. These efforts are consistent with the Corps' commitment to ensuring the safest possible conditions for people who visit the area. The City and the Corps limit access to both lakes, since the area is generally reserved for natural interpretive uses and is not open to motorized vehicles. Compacted earthen trails remain in the vicinity from the sand and gravel removal operations, which are used for maintenance.

The Corps is eager to proceed with selected rehabilitation and mitigation measures we proposed in our Environmental Assessment, dated November 14, 2003, and other measures discussed with Board staff since then. The Corps is prevented from proceeding until the Regional Board revises its November 21, 2003 order to permit us to do so.

Figure 17: Removal of fill, in July 2003, from Bluff overlooking Small Lower Lake. First view from top of lake; second looking north across lake at eroded slope and equipment on bluff.

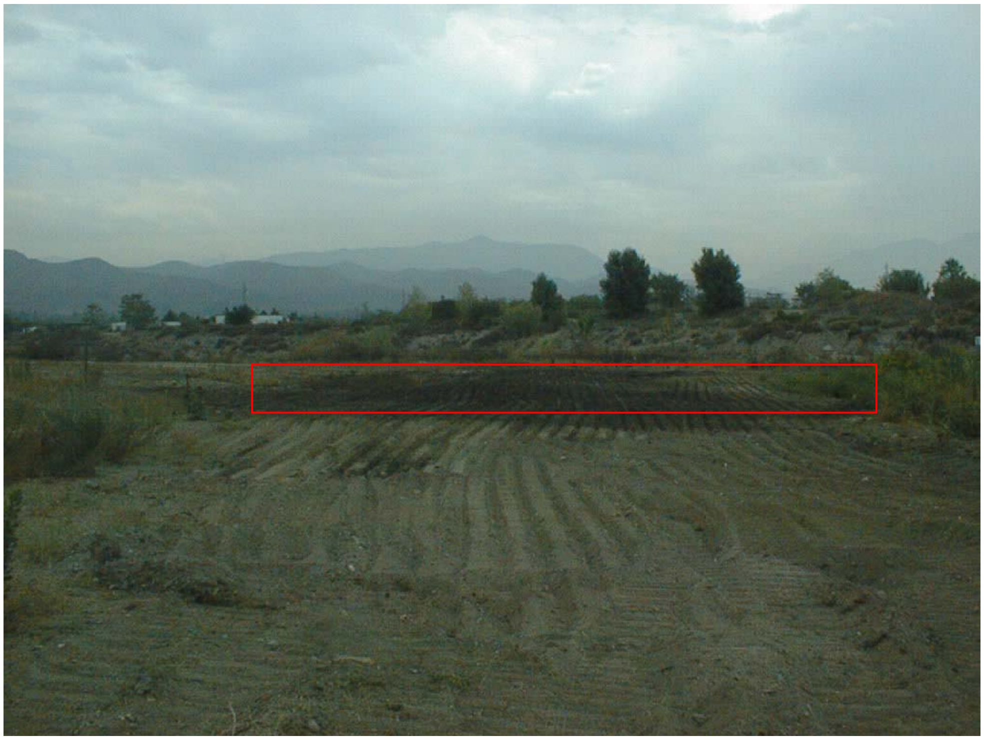

Figure 18: Cleared area above Small Lower Lake, looking northwest across area cleared of debris, and outlined in red.

Figure 19: Note recolonized mudflat on the ramp leading to Large Lower Lake that was cleared of concrete rubble. View northwest across end of access ramp.

IV. RECENT SITE INVESTIGATIONS

In its November 21, 2003 order, the Regional Board questioned the accuracy of the Corps' estimates of the area and volumes of fill placed at the Lower Lakes. The Corps' Environmental Assessment explains the measurements and computations upon which these estimates were based (Appendix A).

Additional site investigations conducted after completion of the Corps' Environmental Assessment have confirmed the accuracy of the area and volume estimates that it sets forth, and support the reasonableness of its remediation and mitigation proposal (Appendices C, D, E and F).

The Environmental Assessment stated that 1,300 cubic yards of fill were placed in and alongside the Small Lower Lake. Subsequent surveys, including measurements of materials that the Corps subsequently removed from the shoreline of the Small Lower Lake, confirm that this estimate was correct (Appendix E).

The concrete materials remaining at the Large Lower Lake are more easily identified than the mulch mixed with soil placed in the Small Lower Lake. The November 21, 2003 order of the Regional Board did not question the Corps' defined area of impact at the Large Lower Lake. Figures for the Large Lower Lake were taken from swim lake construction and repair documents that gave precise measurements for the subject materials (Appendix F).

In December 2003, the Corps completed GPS surveys (Appendix D and E) of the Lower Lakes. Results of those surveys were delivered to the Regional Board on January 20, 2004. In addition, the Corps delivered to the Regional Board copies of construction records (Appendix F) providing quantities of Swim Lake demolition debris, in cubic yards, placed in the Large Lower Lake by the contractor. The construction records support and verify the figures relating to volumes of reinforced concrete placed in the Large Lower Lake that were presented in the Environmental Assessment (Appendix A).

On January 29, 2004, the Corps visually confirmed the extent of the areas impacted by fill activities. This visual inspection of the Lower Lakes complex was conducted with the assistance of trained U.S. Navy divers (Figure 21). Photographs of the surrounding area and of the bottom of both lakes were taken at locations that were marked with buoys to outline the extent of fill at each lake. Global Positioning System (GPS) coordinates of the buoy locations were taken to outline the fill areas. The Corps is overlaying this data on survey plots previously produced. The data collected further supports the estimates of areas impacted by filling at the Lower Lakes, as reported in the Corps' Environmental Assessment (Appendix A).

The Regional Board's initial order questioned the results of water quality testing that the Corps submitted to the Board in its October 15, 2003 submission. In response, the Corps conducted additional water quality testing on October 16, 2003, with the assistance of SOTA, Inc. These test results were consistent with the prior test results, and indicated that levels of contaminants were no higher in the areas of the Lower Lakes where the Corps had placed fill than in upstream background water samples.

Figure 20: Water Quality Testing

Fate and transport modeling studies, two types of data analysis used by hydrologists and environmental scientists, and site-specific risk assessment, are under way. The draft studies further support the conclusions of the earlier water quality studies. We anticipate that the Final Site Assessment Report, with the Fate and Transport Modeling Study and Site Specific Risk Assessment included as appendices, will be completed by the end of April 2004.

Figure 21: Views of U.S. Navy divers at Small (above) and Large (below) Lower Lakes.

V. PROPOSED ACTIONS

A. Debris Removal

The Corps' proposed remediation and mitigation plan, more fully explained in the Environmental Assessment (Appendix A), is designed to remove portions of remaining fill deposited in the Lower Lakes in 2002, and to restore the lakes' original contours to the extent that can be done without significantly disturbing adjacent habitat or habitat that has grown back in since the fill activities occurred. The Corps' plan is the only action proposed to date that is consistent with the Corps' responsibilities under the Clean Water Act and the Guidelines implementing that Act, to perform the Least Environmentally Damaging Practicable Alternative.

The Corps' proposed action includes removal of up to 2,000 cubic yards of fill material from the top 3 feet of the fill area at the Large Lower Lake, and the removal of all identifiable fill material at the Small Lower Lake. Because micro-flora and fauna have colonized these shorelines and concrete rubble (Figures 22, 23), Corps and Regional Water Quality Board (RWQB) staff will work with professional biologists, on site, to determine the precise removal actions.

Figure 22: Close-ups of Large Lower Lake shoreline where deposition occurred, showing colonization by algae and micro-invertebrates.

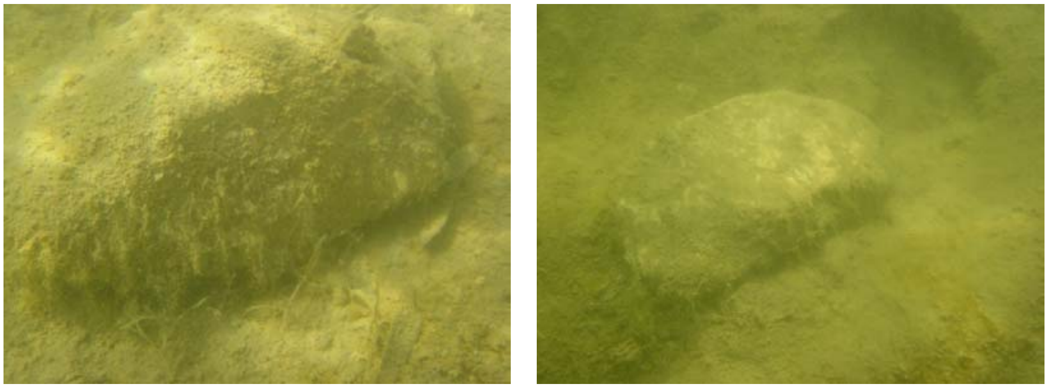

Figure 23: Pieces of disposed concrete rubble colonized, like rocks, with algae in Large Lower Lake.

All removal actions will be accomplished using a long- reach excavator, like the one pictured in Figure 24. At each of the lakes, the excavation equipment would be positioned to minimize impacts to the surrounding habitat. Removal activities will avoid disturbing the densely vegetated fresh water marsh areas that exist at both lakes, and silt curtains will be installed during excavation to trap any suspended particulates and thus prevent adverse turbidity impacts. A tentative schedule for these activities, mitigation and follow up adaptive management measures is provided at Table 1. To ensure that the removal activities are successful, visual surveys, including photographs using the same GPS coordinates and buoy locations used for the January 29, 2004 visual survey, will be conducted. Quarterly monitoring of the water quality at both lakes would continue for one year after removal.

Figure 24: Example of long-reach excavator proposed for use at Lower Lakes

1. Large Lower Lake

The Corps proposes to restore the shoreline of the Large Lower Lake to the maximum extent practicable without causing additional environmental damage (excessive turbidity, damage to the established shoreline native plants, etc.). Sufficient fill material that is visible from the surface would be removed to approximate the original shoreline configuration. The slope of the shoreline may also be modified to promote native plant growth. Up to 2,000 CY of the 3,850 CY originally placed at the site would be removed to restore the 150-foot length of shoreline if that level is deemed environmentally safe.

The fill removal would involve the use of a long-reach excavator, bulldozer, front-end loader, water truck, and dump trucks, and is estimated to take approximately 8 days to complete in conjunction with the rehabilitation work on the Small Lower Lake. A maximum of 100 truck trips would be required to conduct the removal, with truck trips occurring in conjunction with truck trips for the rehabilitation work on the Small Lower Lake. Because the subject roads are inaccessible to the public, this work would not reduce access to the Hansen Dam Recreational Area. At the Large Lower Lake, equipment would be staged 5 feet back from the shoreline to begin extraction at the toe of the fill, and would be moved back incrementally to continue extraction.

Mixed fill will be taken to approved recycling and, or, disposal facilities.
Excavated material will be temporarily stockpiled adjacent to the extraction sites, to allow excess water to drain from the material prior to removal for proper disposal. After draining, the materials will be disposed of in an approved landfill. Any clean soil from the Large Lower Lake will be recycled through beneficial re-use.

2. Small Lower Lake

At the Small Lower Lake, an access pad would be created by partially flattening the unsafely steep and eroding slope there. The bluff, now about 20-feet high, would be flattened to a slope no steeper than 3H:1V (Figure 25). A 10-foot wide bench would be created 2-feet above the waterline toe of the regraded slope, to provide for any future underwater slope adjustment. This would be accomplished through the removal of about 1,200 CY of material from about 100 feet of shoreline. Laying back the slope would alleviate both the safety concern and promote vegetation growth.

Removal of the fill and grading of the bank would involve the use of a long-reach excavator, bulldozer, front-end loader, water truck, and dump trucks, and is estimated to take approximately three weeks to complete. A maximum of 85 truck trips would be required to conduct the removal. The excavated bluff material may be used to create an uncompacted berm along the downslope edge of the adjacent temporary access road to divert typical runoff away from the regraded bluff. To minimize visual impacts, such a berm would be no higher than 5-feet above natural grade.

Mixed fill will be taken to approved recycling and, or, disposal facilities.
Excavated material will be temporarily stockpiled adjacent to the extraction sites, to allow excess water to drain from the material prior to removal for proper disposal. After draining, the materials will be disposed of in an approved landfill.

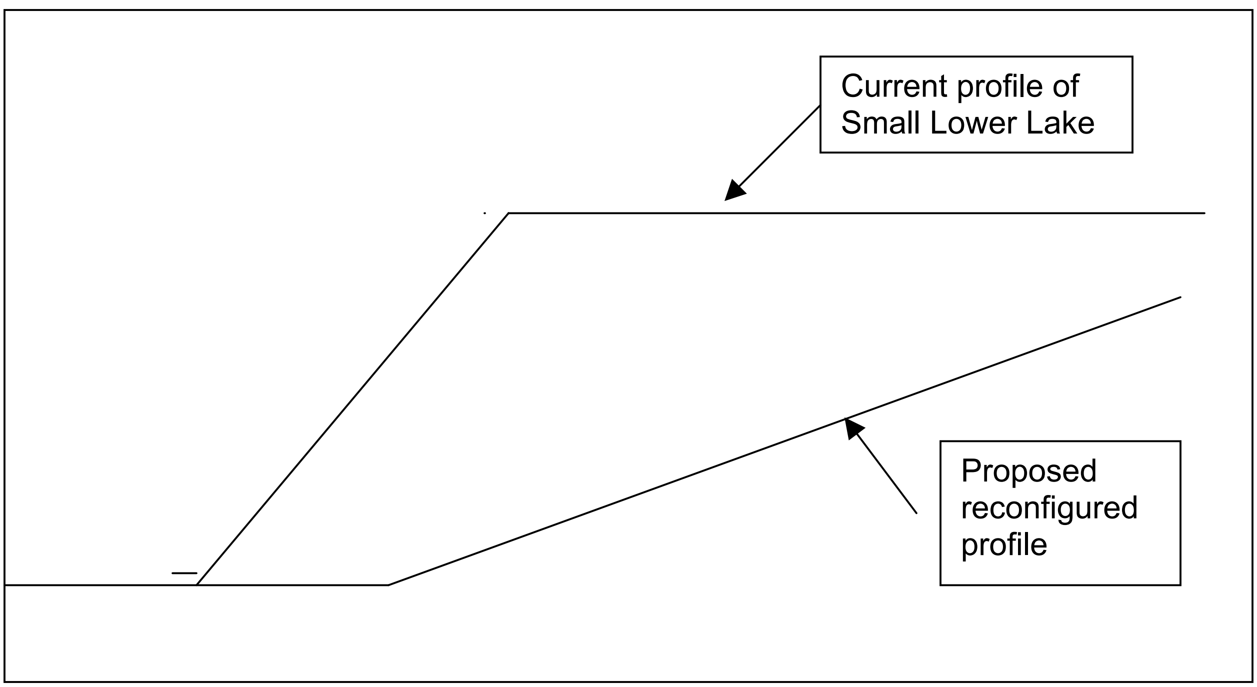

Figure 25: Steep, collapsing north bank of Small Lower Lake and profile drawing showing proposed profile.

B. Mitigation

1. Large Lower Lake

After removal of visible and protruding rubble and reshaping of the shoreline, vegetation would be restored using species that naturally occur in the basin. The restoration would be managed to avoid disturbance to existing native vegetation around the site, unless the vegetation is degraded or would benefit from the planting of additional species (e.g., willow or cottonwood). Non-native plants occurring in the area would be removed, according to established protocols, before planting.

The Large Lower Lake covers about 62 acres. Of that amount, the total area disturbed during the original fill placement and proposed fill removal is about 0.5 acre. The maximum area restored, at 3:1 ratio, would be about 1.5 acres, including the disturbed area and an area of up to 1-acre around it. One or more of the following may be used for restoration: 1) container stock of different sizes, inoculated with native fungal inoculums collected from the site or its vicinity and grown within a radius not exceeding 50 miles from the project site; 2) cuttings collected from native plants growing within the Basin; 3) hand-seeding or hydro-seeding with pure live seed; and 4) other sources (e.g., plant tubes, pole cuttings, rooted cuttings, etc.). A palette of riparian species such as Goodding's willow, sandbar willow, Fremont cottonwood, tule cattails, and mulefat will be selected according to the terrain hydrology in question. The restored area would be provided with an adequate water source, if needed, and monitored for a period of five years. Additional plantings would be provided if performance criteria are not met. Native vegetation has flourished in the vicinity of this lake since the fill activity took place without human intervention. Therefore the Corps expects little post-restoration replanting will be required.

2. Small Lower Lake

After grading of the banks, vegetation would be restored to the site using species that naturally occur within the Basin. Restoration would be managed to minimize disturbance to existing native vegetation around the site unless the vegetation is degraded or would benefit from the planting of additional species (e.g., willow or cottonwood). Non-native plants in the area would be removed before planting, according to established protocols. Arundo not previously removed under existing Operations Division protocols would also be treated and removed.

The Small Lower Lake covers 5 acres. Of this amount, the combined area disturbed during the original placement of fill, and the proposed fill removal is about 0.3-acre. The maximum area to be restored, at a 3:1 ratio, would be about 0.9-acre, including the 0.3-acre disturbed and up to 0.6-acre surrounding it. One or more of the following may be used for restoration: 1) container stock of different sizes, inoculated with native fungal inoculums collected from the site or its vicinity and grown within a radius not exceeding 50 miles from the project site; 2) cuttings collected from native plants growing within the Basin; 3) hand seeding or hydro-seeding with pure live seed; and 4) other sources (e.g., plant tubes, pole cuttings, rooted cuttings, etc.). A palette of riparian species such as Goodding's willow, sandbar willow, Fremont cottonwood, and mulefat will be selected for lower areas near the lake. Plants recommended for transitional areas between riparian and coastal sage scrub include mule fat, blue elderberry (*Sambucus mexicana*), wild grape (*Vitis girdiana*), California blackberry (*Rubus ursinus*) and scale broom (*Lepidospartum squamatum*). Recommended coastal sage scrub plants include, shrubs and subshrubs such as California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), yerba santa (*Eriodictyon trichocalyx*), and laurel sumac (*Malosma laurina*), and Davidson's Bush mallow. In addition, annual and perennial herbs such as chia *(Salvia columbarae*), penstemon (*Penstemon spectabilis*), and California poppy (*Eschscholzia californica*), are recommended to increase habitat diversity.

The restored area would be provided with an adequate water source, if needed, and monitored for a period of five years. Additional plantings would be provided if performance criteria were not met. Native vegetation has flourished in the vicinity of this lake since the fill activity took place without human intervention. Therefore, the Corps expects little post-restoration replanting will be required.

3. Alternative Actions

The Corps has chosen its proposed action because the Large Lower Lake supports marsh and/ or riparian habitat around its entire perimeter, save for the pre-existing, highly compacted access ramp used for disposal. Restoration, therefore, will also emphasize removal of exotic vegetation and trash around the entire perimeter of both the Large and Small Lower Lakes, which will have no adverse impact. Since it has taken some ten years for this habitat to develop, clearing and replanting outside the immediate impact area to achieve some mitigation ratio above 3:1 would seriously detract from existing habitat values. The success of habitat components would be difficult to emulate by replanting.

Restoration areas will be flagged off to discourage casual access to either lake along pre-existing ramps and trails established during the sand and gravel removal episode. Adaptive management measures to discourage public access and trespass will also be implemented.

In addition to these measures, an area measuring approximately 150 X 100 feet between the recreation lake complex and the Large Lower Lake, in which ponded stagnant water has accumulated, will be drained and restored in conjunction with other activities taken to manage drainage from the recreation lake complex and adjacent sport fields into the Large Lower Lake.

Table 1. Tentative Schedule of Remediation Activities

Project Phase	Start Date	Finish Date
Phase 1 Planning (Develop Debris removal, trash collection, and grading plans; coordinate plans with RWQB and USFWS; and avoid impacting activities during Least Bell's vireo and other birds' nesting seasons)	Spring/Summer 2004	September 2004
Phase 2 Construction (Regrade Small Lower Lake; remove selected debris from Lower Lakes; and remove trash from vicinity of lakes)	October 15, 2004	November 30, 2004
Phase 3 Monitoring and Adaptive Management; O&M (Adaptive management of Lower Lakes with focus on disposal and regraded areas)	December 2004	December 2009
Phase 4 O&M (Work with City of L.A., other potential sponsors and interested parties to refocus Master Plan and future planning on conservation of freshwater marsh and riparian habitat in Hansen Dam Basin)	December 2004	End date to be determined