JURISDICTIONAL DELINEATION

FOR

LAKE GREGORY

SEDIMENT MANAGEMENT AND BIORETENTION PROGRAM

Prepared for:

County of San Bernardino
Regional Parks Department
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1.0 INTRODUCTION

1.1 PROJECT LOCATION

Lake Gregory is located in the San Bernardino Mountains approximately 72 miles east of Los Angeles and 14 miles north of San Bernardino in the community of Crestline (see Figure 1). The lake is accessible via Lake Drive (see Figure 2). The project site is located in Section 23, Township 2 North, Range 4 West, San Bernardino Baseline and Meridian of the San Bernardino North USGS 7.5-minute topographic quadrangle.

1.2 PROJECT DESCRIPTION

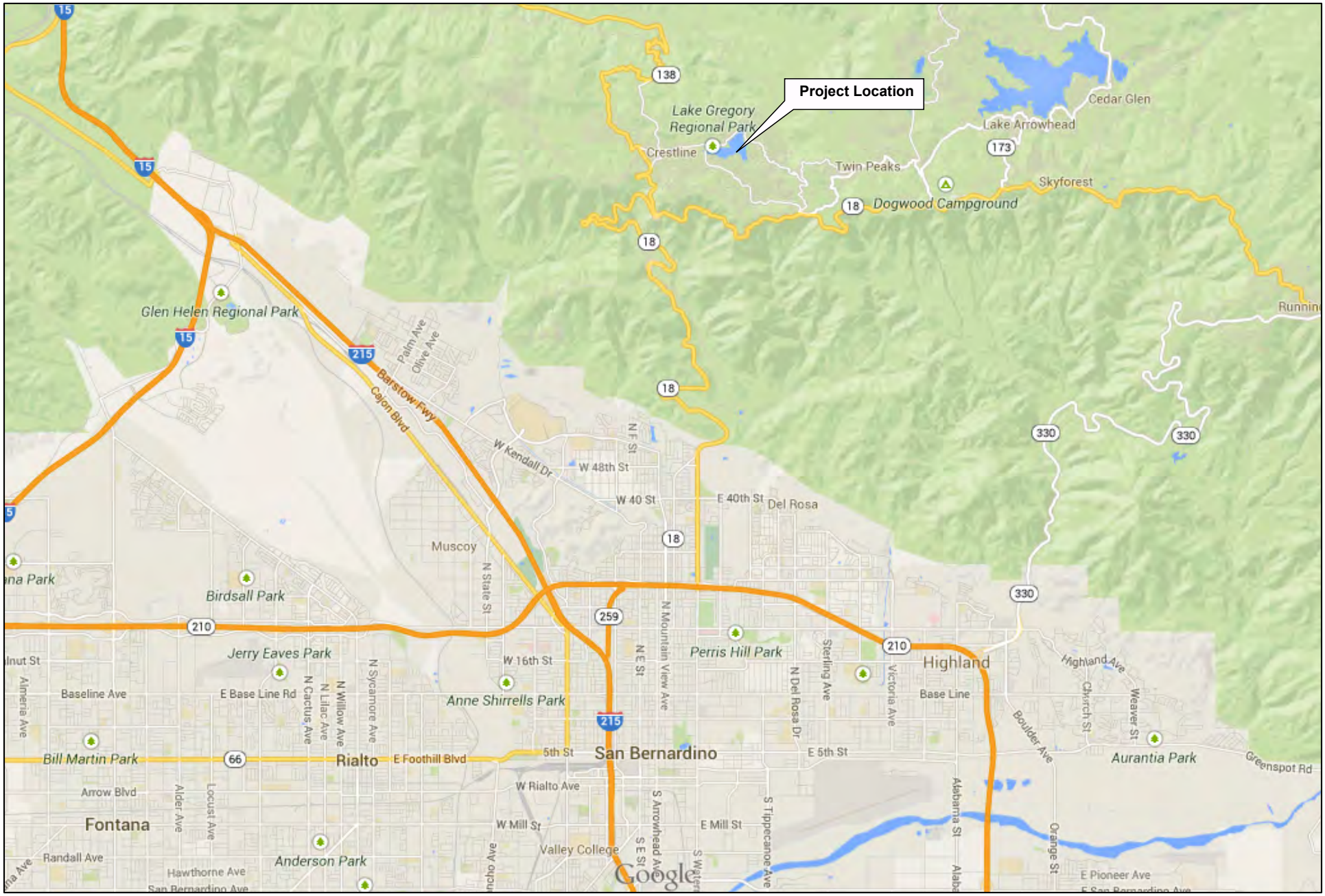
The San Bernardino County Regional Parks Department (Regional Parks) operates Lake Gregory as a regional park that offers year round recreational opportunities to its patrons. Amenities available at the park are anchored by Lake Gregory and include: seasonal boating and swimming, and year round shore fishing, picnic facilities, exercise stations, a skate park, and a dog park.

Lake Gregory is a man-made lake naturally fed by storm runoff and snow melt from the east and west forks of Houston Creek. The normal water level of the lake is set by the Lake Gregory Dam spillway at 4,517 feet above mean sea level. The capacity of the lake is increased by three feet in depth in the spring and summer months via the installation of flashboards on the lake spillway. The flashboards are removed on September 10th of each year. Water levels at the lake may fluctuate by up to five feet below the spillway elevation depending on the season's precipitation.

Regional Parks proposes to establish a sediment management and bioretention program for the near-term and on-going maintenance for silt removal to improve the lake's beneficial uses. The Proposed Project's objectives are to establish a plan for routine maintenance of the lake in order to improve water clarity and quality, enhance recreational features, and improve fishery habitat resources of the lake. Regional Parks proposes to conduct maintenance activities on a year-round basis with seasonal restrictions on certain activities.

Lake Gregory Sediment Management and Bioretention Program

The Lake Gregory sediment management and bioretention program encompasses four primary areas around the lake that have been identified for the removal of accumulated sediment and development of new/improved debris basins designed to prevent future settlement from impacting lake bottom elevations, isobaths and the lake's aquatic habitat. The four primary project areas are shown on Figure 3 and described as follows:



REGIONAL VICINITY

Lake Gregory Sediment Management
and Bioretention Program
San Bernardino County, California

FIGURE 1

N

0 2
Approximate Miles

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PROJECT LOCATION

Lake Gregory Sediment Management
and Bioretention Program
San Bernardino County, California

FIGURE 2

N

0 600

Approximate Feet

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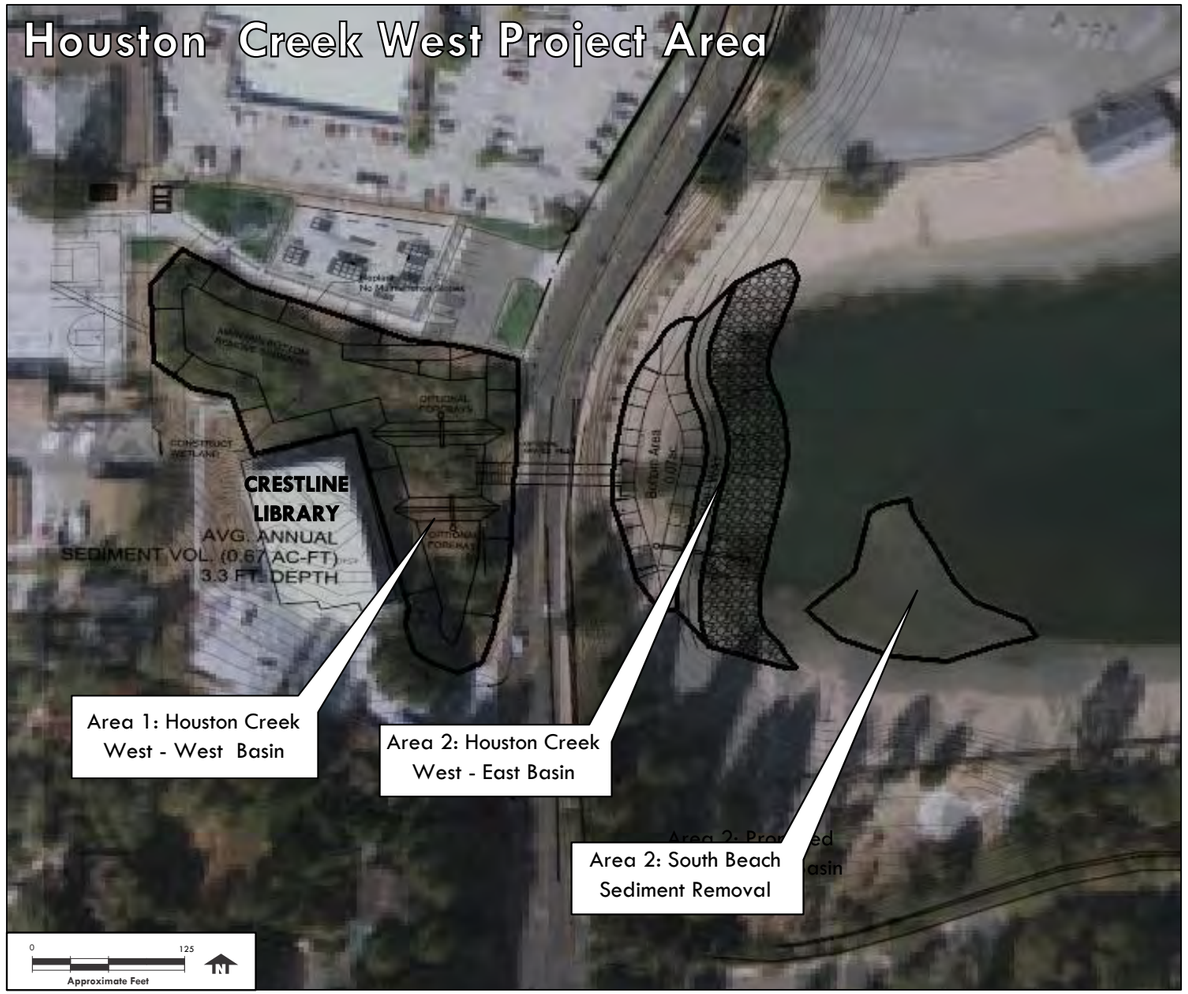

Source: Albert A. Webb Associates, Lake Gregory Debris Reduction Study, Conceptual Debris Basins. Aerial: San Bernardino County, 10/2013

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PROJECT PLANS

Lake Gregory Sediment Management and Bioretention Program
San Bernardino County, California

FIGURE 3

Houston Creek West

Area 1: Existing Houston Creek West – West Debris/Sediment Basin

This existing debris basin is located on the west side of Lake Gregory Drive adjacent to the Crestline Public Library. Basin improvements within this area will create an approximate 0.85-acre basin area encompassing an approximate 14,800 square foot soft bottom area.

Construction of the improved basin will entail the excavation of approximately 1,660 cubic yards of accumulated sediment material and will include the importation of approximately 120 cubic yards of rip-rap materials to armor portions of the basin side-slopes.

Area 2: Proposed Houston Creek West – East Debris/Sediment Basin

This new sediment basin will be developed on an approximate 1-acre area located on the east side of Lake Gregory Drive across from the Crestline Public Library. This area has historically been the inlet area for Houston Creek into Lake Gregory. Basin development will entail creation of a raised basin designed to capture excess sediment flows from the Houston Creek West-West Debris Basin and prevent impact on the lake's aquatic system.

Construction of this basin will entail the placement of approximately 7,700 cubic yards of fill and rip-rap below the lake's Ordinary High Water Mark (OHWM) and placement of approximately 2,750 cubic yards of fill, rip-rap, and concrete above the OHWM.

Additionally, site preparation for construction of the Area 2 basin will involve the removal of approximately 1,300 cubic yards of sediment in the Lake Gregory swim area along the South Beach, the majority of which is located below the OHWM. Sediment removal at this location would occur as a one-time activity. Continued regular maintenance for sediment control of the beach area following construction of the sediment basins would occur as described below in the proposed Lake Gregory On-Going Maintenance Program.

Houston Creek South

Area 3: Proposed Houston Creek South Debris/Sediment Basin and Channel

This basin will be developed on an approximate 1.2-acre area located on the south side of the existing 72-inch Houston Creek outlet culvert (See Figure 3). Under existing conditions the culvert transmits flow from an approximately 853-acre watershed to the ephemeral channel that discharges to the lake. Constructing this new basin will require excavation of approximately 9,950 cubic yard of materials and placement of approximately 167 cubic yards of rip-rap.

The existing approximate 900-foot linear channel will be reconstructed and re-contoured to restore storm flow capacities. Restoration and re-contouring will entail excavation of approximately 1,250 cubic yards of accumulated sediment and debris from within the channel. Approximately 534 cubic yards of gabions and 711 cubic yards of Reno mattress reinforcement materials will be placed within the channel on the side slopes to protect them from future

erosion. The channel will remain a soft-bottom channel. The channel outlet will be re-contoured to discharge into the lake approximately 50 feet south of its current outlet location.

Area 4: Sediment Removal

Accumulated sediment since 1980's has created an approximately 1.29-acre sand delta formation at the outlet of the south fork of Houston Creek where it enters the lake. The sediment management program will accommodate removal of approximately 12,300 cubic yards of this accumulated sediment reducing the sand delta by approximately 0.85 acres.

Additional sediment will be removed from an approximately 0.25 acre area on the shore opposite from the delta (Sediment Outlet 6 on Figure 4). Sediment accumulation at this location has led to the formation of a sand beach. Sediment at this location was previously removed from above the shoreline as part of the 2009 Lake Gregory sediment removal project. It is anticipated that 5,000 to 10,000 cubic yards of sediment will be removed from this location in order to return the shore to baseline conditions. In Area 4, approximately 7,500 to 10,000 cubic yards will be removed from below the OHWM.

At the conclusion of these one-time construction projects it is anticipated that excessive sediment routinely entering the lake will be effectively controlled and the lake will have been restored to its approximate 1995 condition. To maintain lake conditions, an on-going maintenance program is proposed and outlined below.

Lake Gregory Maintenance Program

The Lake Gregory Maintenance Program will entail a number of maintenance activities that may be conducted during the Park Operational Season of April to September as determined necessary. These activities include:

- Aquatic plant weed control via application of aquatic herbicides based upon and consistent with the written application recommendations and best management practices of the County's State General NPDES Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control (CAG990005). These activities conditionally take place prior to the swim beach opening on Memorial Day weekend, and on selective days during the season when the swim beach is closed, allowing time for absorption and dissipation.
- Swim beach area lake bottom footfall and/or foot contact grooming below the water line to a depth of six (6) feet based on current elevation. Grooming will be accomplished manually and mechanically. To an approximate depth of three feet, workers with landscape and debris rakes will manually groom the lake bottom surface, removing foreign objects and decaying plant material; while ensuring a consistent, contoured and safe foot contact area for swimmers. To an approximate depth of six (6) feet, a power boat pulled drag will be used at low speed to accomplish the same tasks and minimize turbidity. All material removed from the lake will be disposed of in a safe and legal manner.

N

0 600

Approximate Feet

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LAKE OUTLET SEDIMENT REMOVAL LOCATIONS

Lake Gregory Sediment Management
and Bioretention Program
San Bernardino County, California

FIGURE 4

Proposed on-going maintenance activities would be conducted as necessary and limited to the Park Non-operational Season (off-season) period of September through March. The following activities will be conducted as determined necessary by Park management staff to ensure protection of the lake, the fishery, and the recreational resources available at Lake Gregory Regional Park. Maintenance activities limited to the Off-Season include:

- Houston Creek West - West Debris Basin, debris and sediment removal. Accumulated debris and sediment within the bed of this existing debris basin would be completed by mechanical means including wheeled and tracked vehicles when necessary, or at a minimum semi-annually. No wheeled or tracked vehicles will be allowed on the vegetated basin side slopes except on the designated access ramp(s). Care will be taken to preserve the side slope vegetation as much as practical to provide for enhanced riparian and wetlands habit.
- Houston Creek West - East Sediment Basin, sediment removal. Accumulated sediment within the new basin will be removed by mechanical means but limited to long-reach excavators and/or wheeled vehicles when necessary, or at a minimum semi-annually. No tracked vehicles will be allowed below the OHWM.
- Houston Creek South Debris Basin. Debris and sediment removal. Accumulated debris and sediment within the bed of this debris basin would be completed by mechanical means including wheeled and tracked vehicles when necessary, or at least semi-annually. No wheeled or tracked vehicles will be allowed on the vegetated basin side slopes except on the designated access ramp(s). Care will be taken to preserve the side slope vegetation as much as practical to provide for enhanced riparian and wetlands habit.
- Tree and shrub pruning and management. All debris and sediment basins side slopes will be routinely maintained to keep the soft bottom basins accessible by maintenance vehicles. This may require periodic tree and shrub pruning so the equipment necessary for accumulated sediment removal can safely and effectively maneuver within the basin areas.
- Lake sediment maintenance removal at outlet locations. Sediment removal will be completed by mechanical means at the identified locations of culvert outlets on the perimeter of the lake. Access and topography varies by location; therefore, excavation methods would be site-specific to each of the outlet locations. Approximately 31 pipe outlets have been identified around the Lake Gregory perimeter, regular maintenance is proposed at 13 of the lake outlets (see Figure 4). Lake outlets vary in size from 4-inches to 36-inches and contribute to lake sedimentation at varying rates. Lake sediment removal at the 13 outlet locations identified on Figure 4 is proposed to occur as determined necessary by the Park operating staff. Sediment removal would occur under the following conditions:
    - Sediment removal: accumulated sediment removal at the designated locations would be completed by mechanical means including wheeled and tracked vehicles when necessary. All sediment removal will be completed while equipment is located above the lake's OHWM.

- Culvert pipe repair: sediment loads travelling through inlets to the lake have resulted in clogged inlets in the past. When an inlet is observed to be clogged or flow is observed to be obstructed by sediment by the Park's operating personnel, culvert outlet cleaning and grooming will be scheduled. All culvert pipe repair and maintenance activities would be limited to occur during the Off-Season. Access and topography varies at each of the culvert inlets; thus, maintenance methodologies may vary by location. However, all culvert maintenance would be conducted using equipment situated outside of the lake's OHWM.

2.0 PURPOSE OF JURISDICTIONAL DELINEATION

The purpose of this jurisdictional delineation is to:

- Determine if any state or federal jurisdictional waters are present within the project property;
- Determine if the project will have any impacts on jurisdictional waters.
- Determine if the project proponent will be required to obtain state or federal permits for impacts to jurisdictional waters; and
- Recommend mitigation measures to offset impacts to state or federal jurisdictional waters.

3.0 REGULATORY BACKGROUND

3.1 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE STREAMBED ALTERATION AGREEMENT

The California Department of Fish and Wildlife (CDFW) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the law requires any person, state or local governmental agency, or public utility to notify the CDFW before beginning an activity that will substantially modify a river, stream, or lake. If the CDFW determines that the activity could substantially adversely affect an existing fish and wildlife resource, a Section 1602 Lake or Streambed Alteration Agreement is required.

For the purposes of clarification a "stream" is defined by the state *as a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes water courses having a surface or subsurface flow that supports or has supported riparian vegetation.*

3.2 REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) 401 CERTIFICATION/ WASTE DISCHARGE REQUIREMENTS

The Regional Water Quality Control Board (RWQCB) regulates activities pursuant to Section 401(a)(1) of the federal Clean Water Act (CWA) as well as the Porter Cologne Act (Water Code section 13260). Section 401 of the CWA specifies that certification from the State is required for any project requesting a federal license or permit to conduct any activities including, but not

limited to the construction or operation of facilities that may result in any discharge into navigable waters. The certification shall originate from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable water at the point where the discharge originates or will originate. Any such discharges will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of the CWA. The Porter Cologne Act requires "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge. Discharge of fill material into "waters" of the State which does not fall under the jurisdiction of the United States Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act, may require authorization through application of waste discharge requirements or through waiver of Waste Discharge Requirements.

3.3 UNITED STATES ARMY CORPS OF ENGINEERS CLEAN WATER ACT 404 PERMIT

The USACE regulates "discharge of dredged or fill material" into wetlands and Waters of the United States, which includes tidal waters, interstate waters, and "all other waters, interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce or which are tributaries to waters subject to the ebb and flow of the tide" (33 C.F.R. 328.3(a)), pursuant to provisions of Section 404 of the Clean Water Act.

The USACE requires that the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratories, 1987) be used for delineating wetlands and Waters of the United States. Additionally, in 2008 the USACE published the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* for the delineation of non-wetland waters in the arid west. To qualify for wetlands status; vegetation, soils, and hydrologic parameters must all be met. "Waters" of the U.S. are delineated based upon the "ordinary high water mark" (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in vegetation within rivers and streams.

For the purposes of this section, the term "fill" is defined as material placed in Waters of the United States where the material has the effect of:

- Replacing any portion of a Water of the United States with dry land; or
- Changing the bottom elevation of any portion of a Water of the United States.

Examples of such fill material include, but are not limited to: rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mining or other excavation activities, dredging spoils, and materials used to create any structure or infrastructure in the Waters of the United States. The term fill material does not include trash or garbage.

The definition of "discharge of dredged material" is defined as any addition of dredged material into, including redeposit of dredged material other than incidental fallback within, the Waters of the United States. The term includes, but is not limited to, the following:

- The addition of dredged material to a specified discharge site located in Waters of the United States;
- The runoff or overflow, associated with a dredging operation, from a contained land or water disposal area; and
- Any addition, including redeposit other than incidental fallback, of dredged material, including excavated material, into Waters of the United States which is incidental to any activity, including mechanized land clearing, ditching, channelization, or other excavation.

The term *discharge of dredged material* does not include the following:

- Discharges of pollutants into Waters of the United States resulting from the onshore subsequent processing of dredged material that is extracted for any commercial use (other than fill). These discharges are subject to section 402 of the Clean Water Act even though the extraction and deposit of such material may require a permit from the Corps or applicable State.
- Activities that involve only the cutting or removing of vegetation above the ground (*e.g.*, mowing, rotary cutting, and chain-sawing) where the activity neither substantially disturbs the root system nor involves mechanized pushing, dragging, or other similar activities that redeposit excavated soil material.
- Incidental fallback.

4.0 METHODOLOGY

4.1 PRE-SURVEY INVESTIGATIONS

Prior to the site visit, the project location was reviewed and studied for information that would aid in determining the potential for wetlands; permanent, intermittent or ephemeral drainages and associated resources; and, project impacts associated with the wetland, riparian, or streambed resources onsite.

Project plans, topographic maps, and satellite imaging were examined to establish an accurate project location, project description, potential drainages, wetlands, vegetation, watershed, soils, and surrounding land uses.

4.1.1 PROJECT SETTING

Lake Gregory is located in the San Bernardino Mountains approximately 14 miles north of the City of San Bernardino. The lake sits at an elevation of 4,520 feet above mean sea level in San Bernardino County. The primary water sources for the lake are the east and west forks of Houston Creek.

4.1.2 HYDROLOGY

The project site is identified by the National Hydrography Dataset to be located in Hydrologic Unit Code-12 No. 180902080201 in the West Fork Mojave River watershed.

Albert A. Webb Associates (Webb) completed a hydrologic study of the project watershed to conduct a debris yield analysis in support of a conceptual debris/desilting basin design (Webb 2013). The objectives were to study the major tributary drainage areas to Lake Gregory for the 2-, 5-, 10-, 25-, 50-, and 100-year storm events and to calculate the potential for debris production in each drainage area.

Two major tributary watersheds drain to the lake: 1) Houston Creek West; and 2) Houston Creek East (see Figure 5). Outflows from the lake flow to Houston Creek North via a spillway and diversion tunnel.

The Houston Creek West watershed is approximately 415 acres and encompasses a highly developed and densely populated area. The Houston Creek East Watershed is approximately 853 acres and is the largest drainage tributary area to the lake. The east watershed encompasses developed residential areas and undeveloped natural areas.

4.1.3 SOILS

The USDA Natural Resources Conservation Service's Soil Survey identifies two soil types in the project area. These soil types are shown on Figure 6 and include:

- Oak Glen family-Riverwash association (AeD), partially hydric; and
- Morical-Wind River families complex (MbF), not hydric.

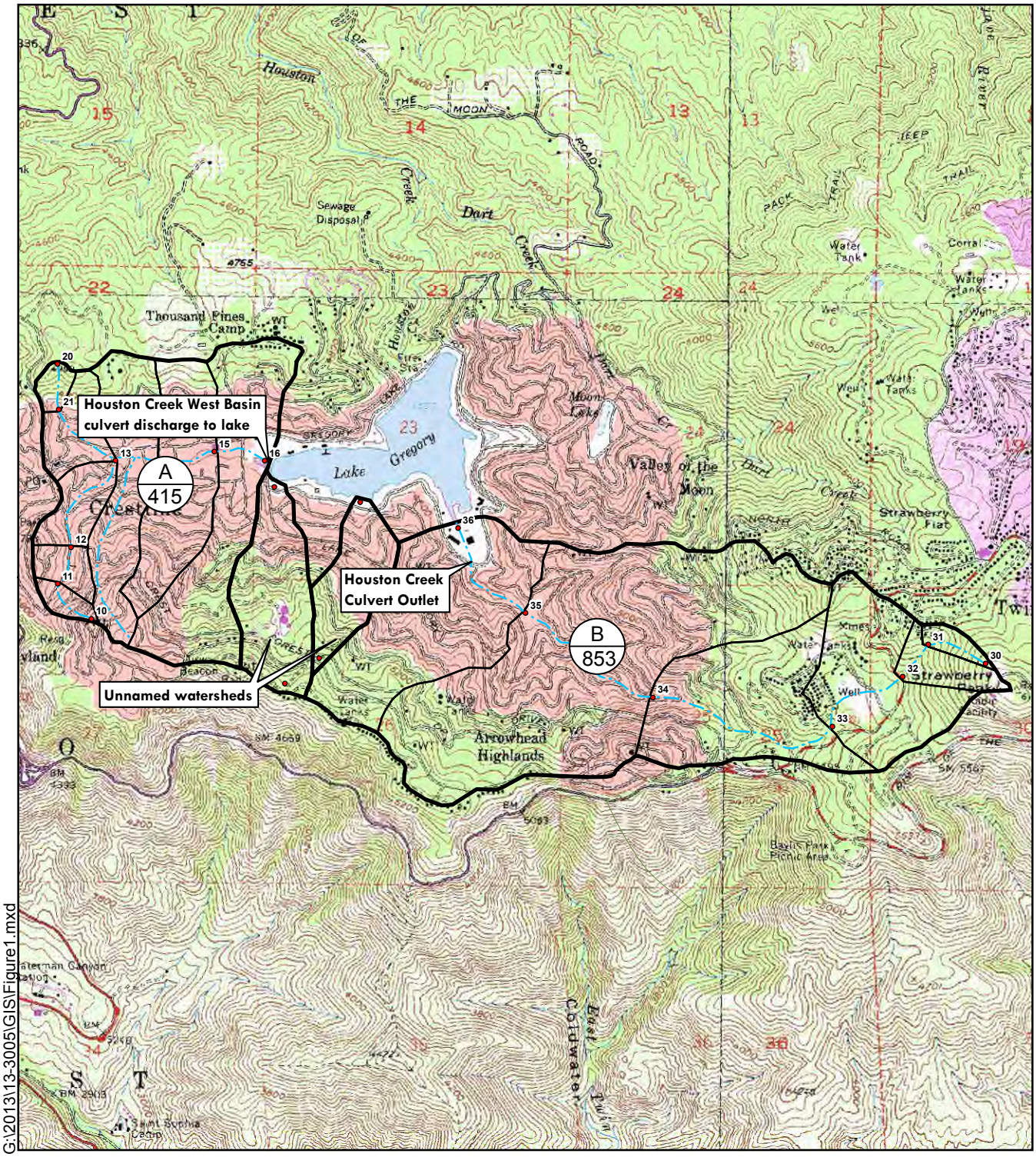
The predominant soil unit around Lake Gregory is Morical-Wind River families complex; this complex is not listed as a hydric soil in the National Hydrography Dataset. Oak Glen family-Riverwash association soils occur on the west side of the project area, at the location of the existing Houston Creek West – West Debris Basin. Oak Glen family-Riverwash association is identified as partially hydric by the Natural Resources Conservation Service.

4.1.4 NATIONAL WETLANDS INVENTORY

The project site was reviewed in the U.S. Fish and Wildlife Service's National Wetland Inventory Maps. Currently the FWS Inventory does not report stream or wetland data for the San Bernardino North Quad. The "no data" status does not imply that potentially jurisdictional stream or wetland resources do not exist at the site.

4.1.5 FLOOD ZONE

The project site was reviewed in the Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) system. The site is located on Map Number 0671C9735H, revised on August 28, 2008. See Figure 7.



G:\2013\13-3005\GIS\Figure1.mxd

LEGEND

A: Houston Creek West Watershed (415 acres)
B: Houston Creek East Watershed (853 acres)

N
W E
S

0 1,500 3,000 4,500 Feet

Source: Albert A. Webb Associates, Figure 1: Hydrology Map Lake Gregory Hydrology Study

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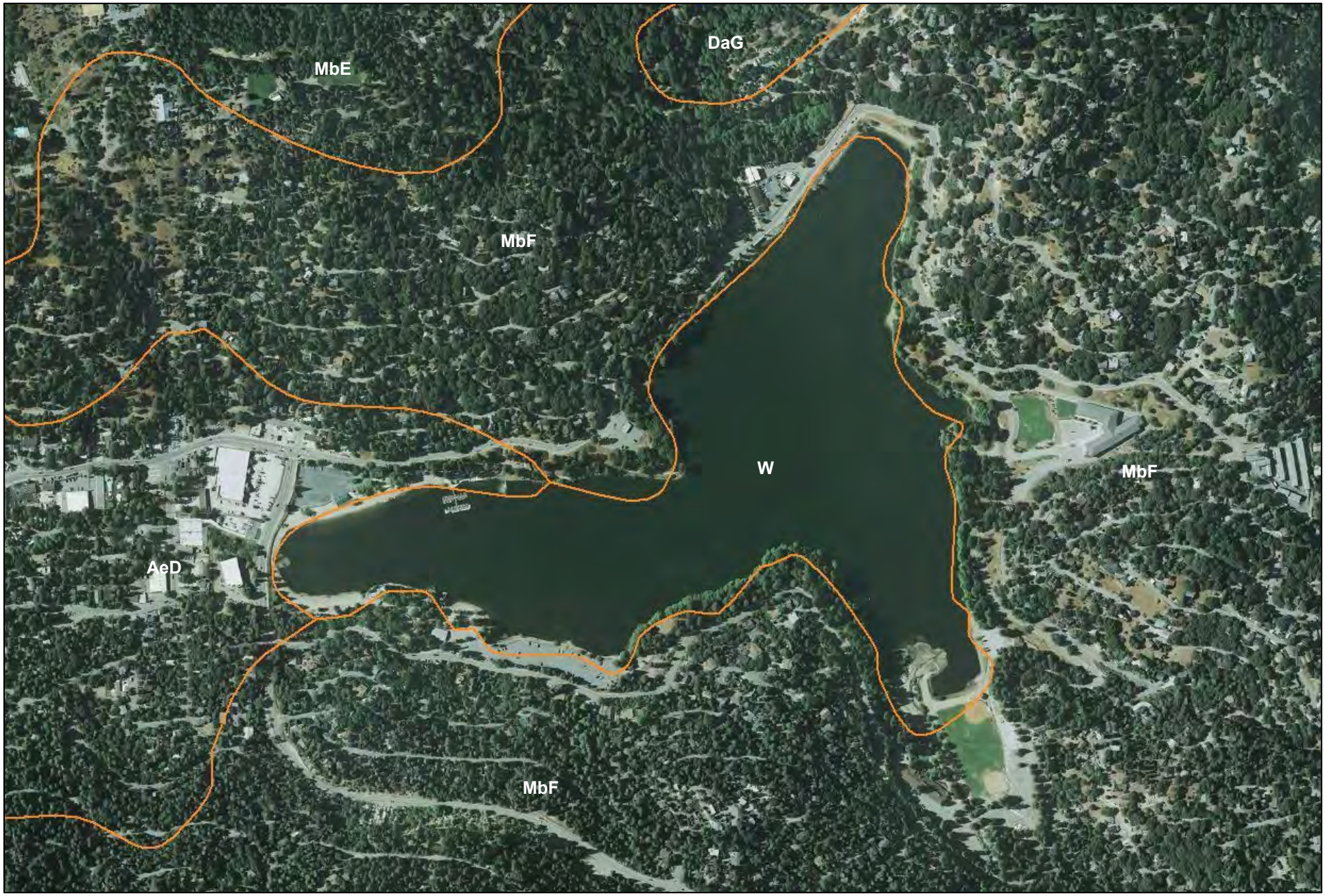
HYDROLOGY MAP

Lake Gregory Sediment Management
and Bioretention Program
San Bernardino County, California

FIGURE 5



Source: Natural Resources Conservation Service Web Soil Survey

SOIL MAP

Lake Gregory Sediment Management
and Bioretention Program
San Bernardino County, California

FIGURE 6

LEGEND

AeD	Oak Glen Family-Riverwash Association, partially hydric
DaG	Wapi-Pacifico Families-Rock Outcrop Complex, not hydric
MbE	Morical-Wind River Families Complex, not hydric
MbF	Morical-Wind River Families Complex, not hydric
W	Water Area

N

0 640

Approximate Feet

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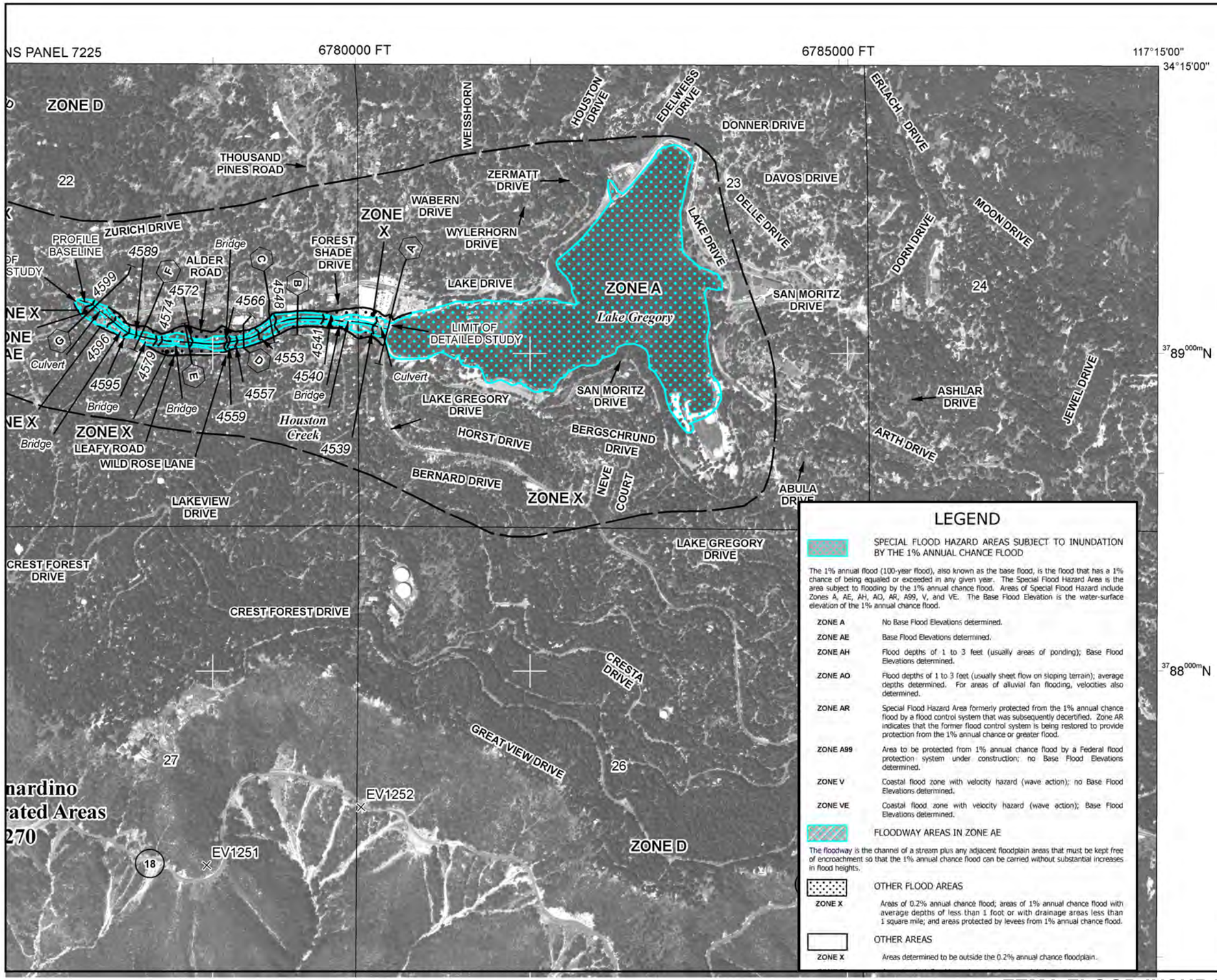

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 7935H

FIRM

FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 7935 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SAN BERNARDINO COUNTY	060270	7935	H
SAN BERNARDINO, CITY OF	060291	7935	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 06071C7935H

MAP REVISED AUGUST 28, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Source: F-MIT On-Line, retrieved January 13, 2014

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FEMA FLOOD INSURANCE RATE MAP DESIGNATIONS

Lake Gregory Sediment Management and Bioretention Program
San Bernardino County, California

FIGURE 7

The limits of Lake Gregory are designated as Zone A. Zone A is defined as "areas with a 1% annual chance of flooding and 26% chance of flooding over the life of a 30 year mortgage". No detailed analyses are performed for these areas and the FIRM does not identify depth of base flood elevations for this zone.

The Houston Creek West – West Basin (adjacent to the library) is located at the boundary of Zone A and Zone X (shaded). Zone X (shaded) is defined as areas with a "0.2% annual chance of flood, areas of 1% annual chance of flood with average depths of less than one foot, or drainage areas less than one square mile, and areas protected by levees from 1% annual chance of flood."

The Houston Creek South basin and channel are located in Zone X (unshaded). Zone X (unshaded) is defined as outside of the 0.2% annual chance floodplain. These areas are characterized as areas of minimal flood hazard and are usually depicted on Flood Insurance Rate Maps as above the 500-year flood level.

4.2 FIELD SURVEYS

Field surveys were conducted on September 7 and 14, 2012 by Lilburn Corporation to gather field data and field verify potential jurisdictional drainages and wetlands, resources associated with jurisdictional drainages and wetlands, and potential project impacts to jurisdictional drainages and wetlands. Field conditions were verified in November 2013 for completion of this report. The field survey study area included a general assessment of all habitat on the perimeter of the lake and pedestrian surveys of the project Areas 1, 2, 3, and 4. Representative photographs of the survey areas are included in Appendix A.

4.2.1 Jurisdictional Drainages

Jurisdictional drainages were identified by looking for features such as a bed, bank or channel. Where riparian vegetation was present, the drip line of the outer edge of the vegetation was used as the measuring criteria. Where the presence of an OHWM was evident, a second measurement was taken for the width of the OHWM and recorded. The guidelines followed for identification of jurisdictional drainages are those outlined in the 2008 *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States.*

The OHWM is defined as: "the line on the shore established by fluctuation of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, or presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area."

Areas measured were recorded using hand-held GPS for accurate location reference. Data gathered in the field was then imported into Global Mapper, a geographic information system (GIS) for further evaluation. Field notes, field data, and GIS were used to compile an accurate assessment of jurisdictional drainages.

4.2.2 Wetlands

Where changes in plant community composition were apparent, the area was examined for the possibility of wetlands. Whether or not adjacent to "Waters of the U.S.", the potential wetland area was evaluated for the presence of the three wetland indicators: hydrology, hydric soils and hydrophytic vegetation. The guidelines followed are those established in the 1987 *Army Corps of Engineers Wetland Delineation Manual* and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*.

5.0 RESULTS

5.1 VEGETATION COMMUNITY

The basin construction areas and all proposed maintenance areas were evaluated for dominant vegetation type where vegetation was present (see Figure 8). Vegetation community descriptions follow Sawyer et al. *A Manual of California Vegetation Second Edition (2008).*

Red Willow Thickets

Red willow thicket (*Salix laevigata* woodland alliance) vegetation was observed to occur at the existing Houston Creek West – West Basin, the ephemeral channel, and delta (Areas 1, 3, and 4). Additional species observed at this location include: cattails (*Typha angustafolia*), alder (*Alnus* sp.), blackberry (*Rubus* sp.), common maidenhair fern (*Adiantum capillus*), sedge (*Carex* sp.), goosefoot (*Chenopodium* sp.), tall flat sedge (*Cyperius* sp.), rushes (*Juncus* sp.), Muller oak (*Quercus cornelius*), stinging nettle (*Urtica dioica*), and western ragweed (*Ambrosia psilostachya*).

Ponderosa Pine Forest

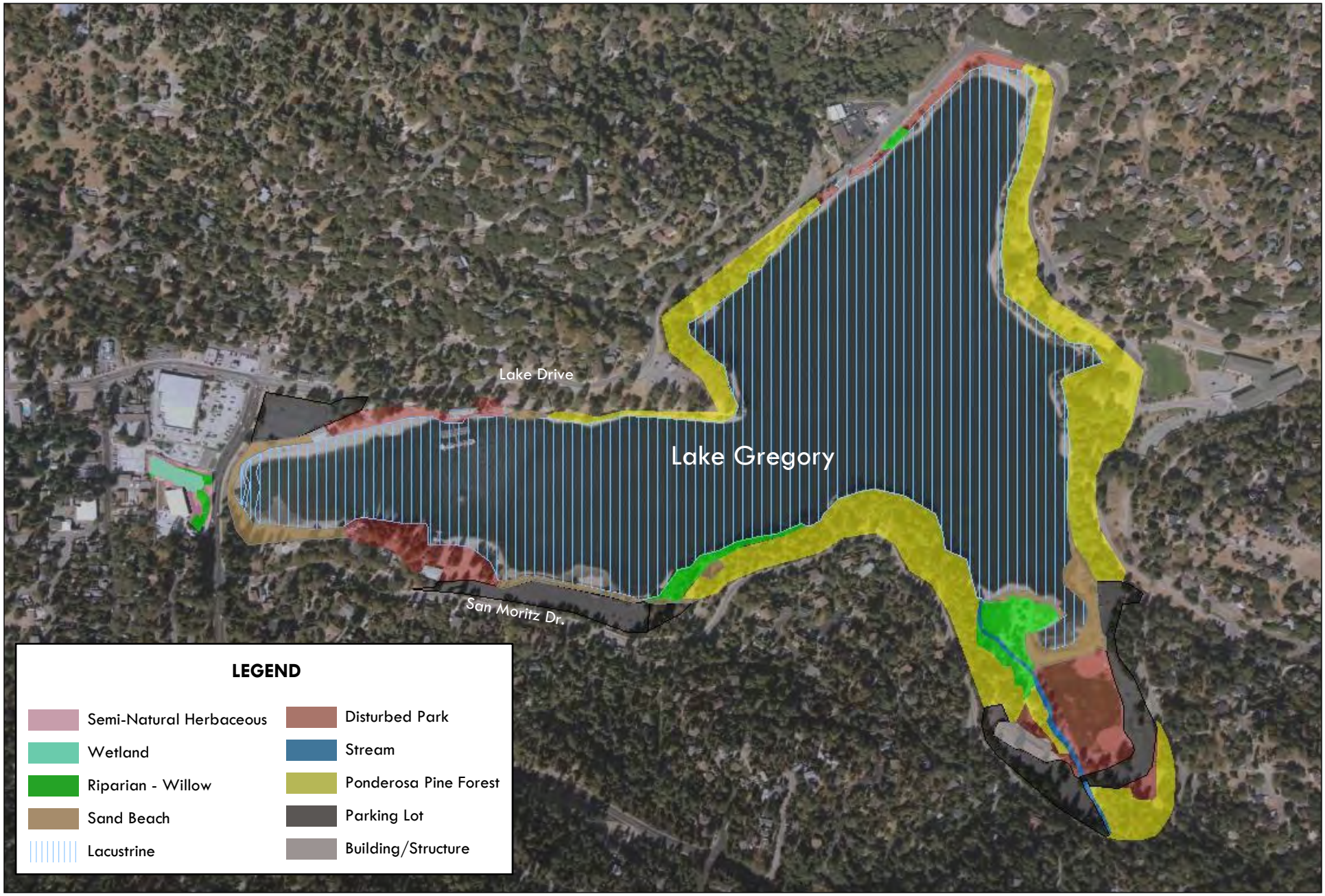
Portions of the survey area with *Pinus* ponderosa dominant tree canopy were mapped as Ponderosa pine forest (*Pinus ponderosa* forest alliance). Ponderosa pine forest occurs on the edges of the park in areas upland of the lake.

Semi-Natural Herbaceous Stands

Semi-natural herbaceous vegetation was observed in Area 1. Semi-natural herbaceous vegetation includes native and/or non-native annuals that respond positively to regular frequent disturbance including, fire, disking, intermittent flooding, or heavy gracing. Species observed during the survey included: *Bromus diandrus*, *Brassica nigra*, *Hirshefeldia incana*, and *Bromus carinatus.*

5.2 OTHER HABITATS

Portions of the project site that did not follow vegetation series as described by Sawyer et. al. were classified as other habitats. These areas are characterized by anthropogenic disturbance associated with park facilities and development.



N

0 600

Approximate Feet

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VEGETATION AND HABITAT MAP

Lake Gregory Sediment Management
and Bioretention Program
San Bernardino County, California

FIGURE 8

Lacustrine Habitat

Lake Gregory is classified as lacustrine habitat. Lacustrine habitats are inland depressions or dammed riverine channels containing standing water. Lacustrine habitat is subdivided into the limnetic zone (deep open water), littoral zone (near shore-lake habitat), and shore (water border with less than two percent vegetation cover).

Stream Habitat

Stream habitat consists of water, streambed material, instream and bank vegetation, and instream structure such as boulders, logs, tree roots, and undercut banks. Stream habitat was mapped in the south portion of the park near the Lake Gregory ball fields.

Wetland Habitat

Shallow aquatic habitat defined by the presence of three environmental parameters, hydrology (presence or evidence of a water source), hydric soils (inundated or saturated soils conditions resulting from permanent or periodic inundation by ground water or surface water), hydrophytic vegetation (vegetation typically adapted for life in saturated conditions).

Sand Beach

Sand beaches on the perimeter of Lake Gregory are maintained by Park staff and provide park patrons with access to the lake for swimming. Areas identified as sand beach have no dominant vegetation.

Disturbed Park

Areas described as disturbed park include portions of the park where natural vegetation has been removed and replaced with ornamental species or open land uses, such as the ball fields.

Parking Lot

Asphalt parking lots found throughout the perimeter of the park have no dominant vegetation type and do not provide habitat.

Building/ Structure

Several buildings occur throughout the park and in the vicinity of the proposed basin/maintenance sites.

5.3 AGENCY JURISDICTION FINDINGS

5.3.1 California Department of Fish and Wildlife

The California Department of Fish and Wildlife has jurisdiction, under the Lake and Streambed Alteration Program, over portions of the site identified as stream or lake as defined by the presence of a bed, bank or channel and where riparian vegetation was present on a bank to the outside drip-line of the vegetation. CDFW has jurisdiction over Areas 1, 2, and 4, over the channel portion of Area 3, and over the locations proposed for on-going maintenance sediment removal.

5.3.2 United States Army Corps of Engineers

Streams and Non-Wetland Resources

The normal water level at Lake Gregory is set by the dam spillway at 4,517 feet above mean sea level (amsl). Regional Parks may increase the capacity of the lake by up to three feet in the spring and summer months via the installation of flashboards on the lake spillway. The flashboards must be removed each year by September 10th. Water levels at the lake fluctuate by up to five feet below the spillway elevation depending on the season's precipitation. The Army Corps of Engineers (USACE) has defined the location of the OHWM at elevation 4,517 amsl (Personal Communication, pre-project meeting 11-13-2012). Proposed project activities at the lake, including the proposed Houston Creek West – East Basin, the delta sediment removal, and the locations proposed for maintenance sediment removal occurring below 4,517 amsl would be subject to the jurisdiction of the USACE. Additionally, the USACE would assert jurisdiction over the tributary ephemeral channel in the south project area and wetland resources in the Houston Creek West – West Basin. The Arid West Ephemeral and Intermittent Streams OHWM Datasheets are included in Appendix B.

Wetland Determination

The Houston Creek West – West Basin (next to library) and the ephemeral channel/delta were evaluated for wetlands. The two areas were the only areas identified to potentially have all three parameters required to meet the federal criteria for classification of wetlands. A wetland determination data form was completed for each of the locations to determine wetland status. The wetland determination data forms are included in Appendix C.

The existing west debris basin located next to the library was determined to be a wetland. The site was identified to have wetland hydrology, hydric soils, and hydrophytic vegetation present.

The delta and channel in the Houston Creek South project area were not identified to meet the three parameters for wetlands. The site was determined to have wetland hydrology; however, no positive indicators for hydric soils or hydrophytic vegetation were recorded. This area is characterized as a sand bar that undergoes constant scour, erosion, and sediment build up depending on water flow. It is possible that hydric soils have not developed at this location due to these dynamic processes.

5.3.3 Regional Water Quality Control Board

Clean Water Act Section 401 Certification is required if any permit or license is issued by a federal agency for any activity that may result in a discharge into Waters of the State to ensure that the proposed project will not violate State water quality standards. If a proposed project does not require a permit or license issued by a federal agency, but has the potential to impact Waters of the State through dredge or fill activities, the RWQCB has the option to regulate the activities via Waste Discharge Requirements. The proposed project activities in Area 1, 2, 4, and the channel portion of Area 3, as well as the locations proposed for maintenance sediment

removal would be subject to a Section 404 Permit from the USACE, and therefore would require a 401 Certification from the Lahontan Regional Water Quality Control Board.

5.4 IMPACT EVALUATION

Jurisdictional drainages and lake areas were evaluated to identify potential impacts associated with the proposed project. The site plan was referenced to quantify the area to be impacted by the proposed project plans. Construction footprint, vegetation, wildlife, hydrology, and water quality impacts were all identified and recorded. The jurisdictional drainages were also evaluated for their conductivity to "navigable waters" as described in the Clean Water Act. The Proposed Project would result in impacts to jurisdictional resources under the jurisdiction of the California Department of Fish and Wildlife, United States Army Corps of Engineers, and the Lahontan Regional Water Quality Control Board; quantified impacts per the jurisdiction of each of the agencies are summarized in Table 1. Potential impacts per the jurisdiction of each of the regulatory agencies are discussed in turn below.

One time removal of accumulated sediment at the Lake Gregory south beach swimming area, delta, and on the east shore opposite the delta will establish a baseline lake surface area for future maintenance. Sediment removal at these locations would increase the lake surface area and re-establish aquatic resources lost to accumulated sediments. Establishment of a surface area baseline and implementation of a maintenance program to maintain the baseline would result in beneficial impacts for the gain of aquatic resources and functions.

Table 1
Impacts to Jurisdictional Resources

Habitat	CDFW (acres)		USACE (acres)		RWQCB (acres)	
Lacustrine	0.47	Permanent	0.47	Permanent	0.47	Permanent
	0.22	Temporary	0.22	Temporary	0.22	Temporary
Red Willow Thicket-Riparian	0.50	Permanent	0	Permanent	0	Permanent
	0.26	Temporary	0.25	Temporary	0.25	Temporary
Stream	0.06	Permanent	0.06	Permanent	0.06	Permanent
	0.36	Temporary	0.23	Temporary	0.23	Temporary
Wetland	0.38	Permanent	0.38	Permanent	0.38	Permanent
Total Acreage	1.41	Permanent	0.91	Permanent	0.91	Permanent
	0.84	Temporary	0.70	Temporary	0.70	Temporary

5.4.1 California Department of Fish and Wildlife

The California Department of Fish and Wildlife regulates impact to rivers, streams, and lakes under the California Fish and Game Code. Implementation of the proposed project would result in impacts to approximately 2.25 acres of wetland, riparian, stream, and lacustrine habitat under the jurisdiction of CDFW. Permanent impacts within the jurisdictional area of CDFW would occur at the wetland in the Houston Creek West – West Basin (Area 1), the lacustrine habitat in the proposed Houston Creek West – East Basin (Area 2), the ephemeral stream in the proposed Houston Creek South Basin (Area 3), and in the riparian habitat at the delta (Area 4). Temporary impacts would occur in lacustrine habitat where sediment removal is proposed (Areas 2 and 4)

and riparian and stream habitat along the channel realignment (Area 3). Potential project impacts to resources under the jurisdiction of the CDFW are quantified in Table 1 and identified in Figure 9.

5.4.2 United States Army Corps of Engineers

Under Section 404 of the Clean Water Act, the United States Army Corps of Engineers regulates dredge and fill activities in waters of the U.S. Implementation of the proposed project would result in approximately 1.61 acres of impacts to wetland, stream, and navigable waters under the jurisdiction of the USACE. Permanent impacts within the jurisdictional area of the USACE would occur at the wetland in the Houston Creek West – West Basin (Area 1), the lacustrine habitat in the proposed Houston Creek West – East Basin (Area 2), and at the ephemeral stream in the proposed Houston Creek South Basin (Area 3). Temporary impacts would occur in lacustrine habitat where sediment removal is proposed (Areas 2 and 4) and riparian and stream habitat along the channel realignment (Area 3). Potential project impacts to resources under the jurisdiction of the USACE are quantified in Table 1 and identified in Figure 10.

5.4.3 Regional Water Quality Control Board

Implementation of the proposed project would result in permanent and temporary impacts to 1.61 acres of wetland, stream, and navigable water resources under the jurisdiction of the USACE, therefore, implementation of the project would be subject to a CWA Section 401 Certification from the Lahontan Regional Water Quality Control Board for impacts as quantified in Table 1.

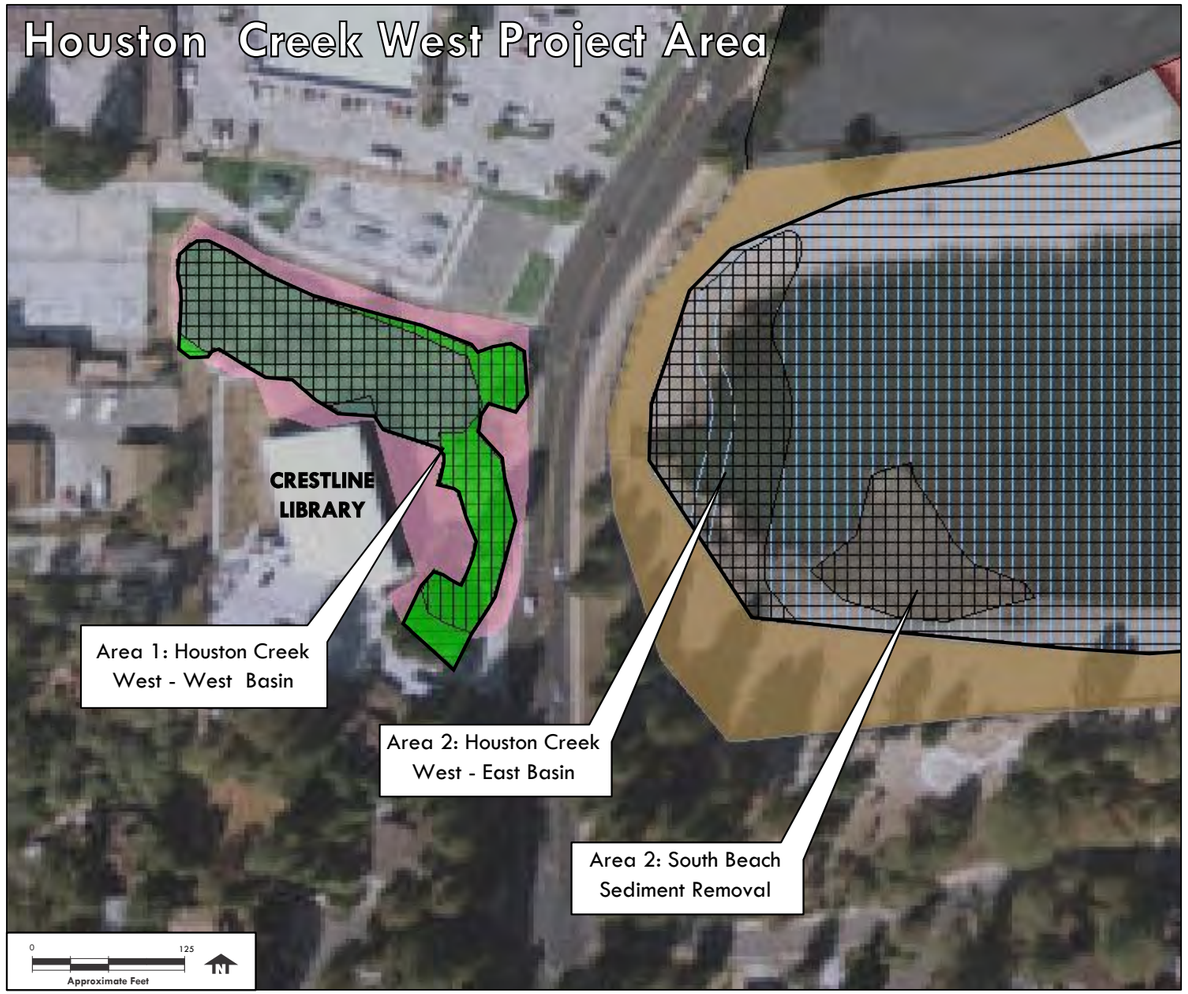
6.0 IMPACT AVOIDANCE, MINIMIZATION, AND COMPENSATORY MITIGATION RECOMMENDATIONS

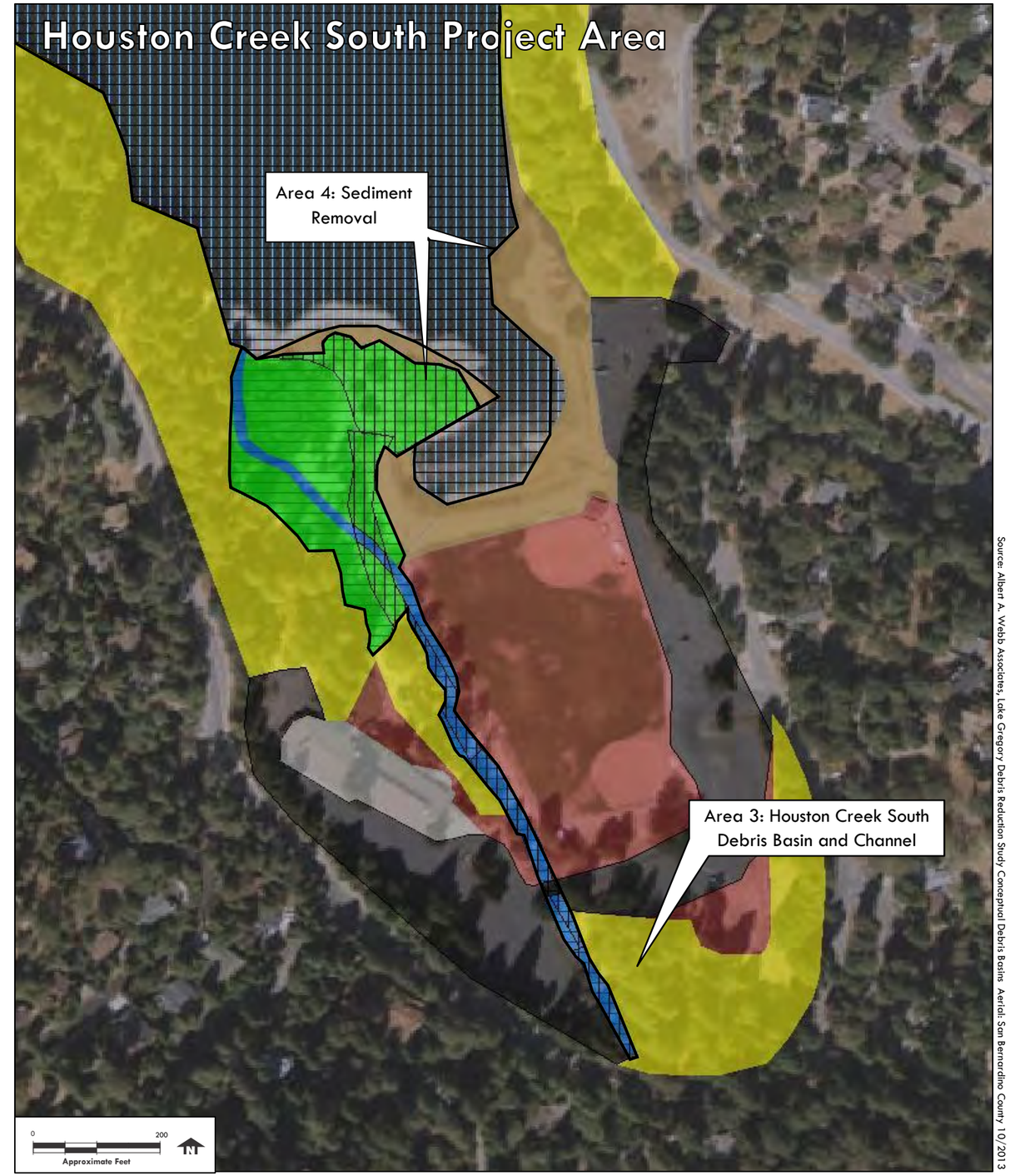
Implementation of the proposed project would result in impacts to resources subject to the jurisdiction of State and federal regulatory agencies. Implementation of the following recommended mitigations measures would reduce potential impacts to jurisdictional resources.

<u>Mitigation to Avoid/Minimize Impacts to Waters of the U.S. and Waters of the State</u>

Implementation of the proposed project would result in the construction of sediment and debris basins in areas identified as waters of the U.S. and waters of the State. Potential impacts to jurisdictional waters are outlined in Table 1. The following recommendations should be implemented to avoid and minimize potential impacts.

- A Section 404 Permit must be obtained from the USACE prior to any impacts to Waters of the U.S. As proposed, individual project components may qualify for Department of the Army Nationwide Permits as reissued in 2012; however, upon review of the Preconstruction Notification, the USACE may find that the Proposed Project is subject to an Individual Permit. A Section 401 Certification must be obtained from the Lahontan Regional Water Quality Control Board for all proposed impacts to waters of the State; the USACE would require a 401 Certification prior to issuing a 404 Permit. A Section 1602





Source: Albert A. Webb Associates, Lake Gregory Debris Reduction Study Conceptual Debris Basins Aerial: San Bernardino County 10/2013

LEGEND

- Disturbed Herbaceous
- Wetland
- Riparian - Willow
- Sand Beach
- Lacustrine
- Impacts to CDFW Jurisdictional Areas
- Disturbed Parkland
- Stream
- Yellow Pine Forest
- Parking Lot
- CDFW Jurisdictional Areas

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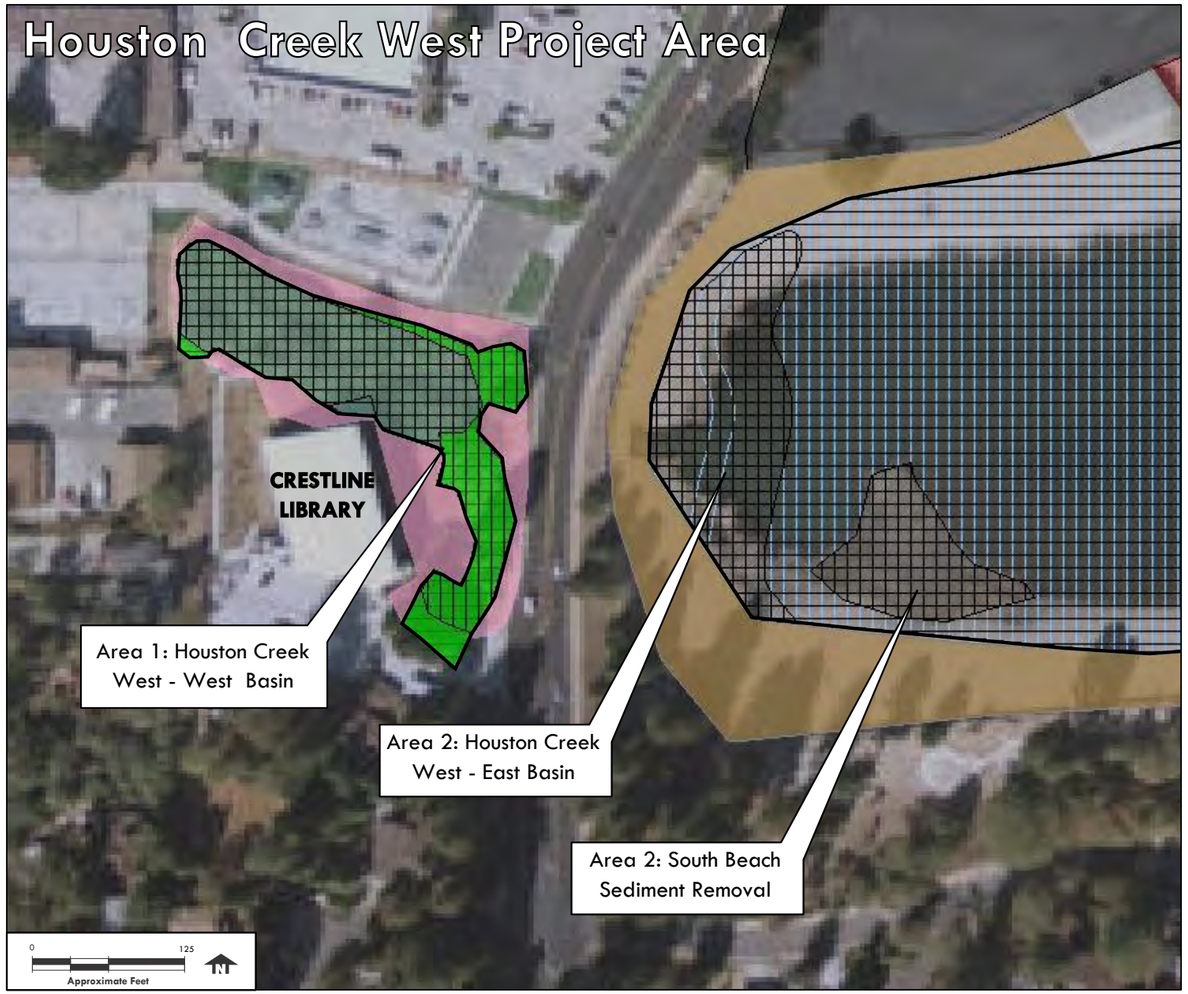
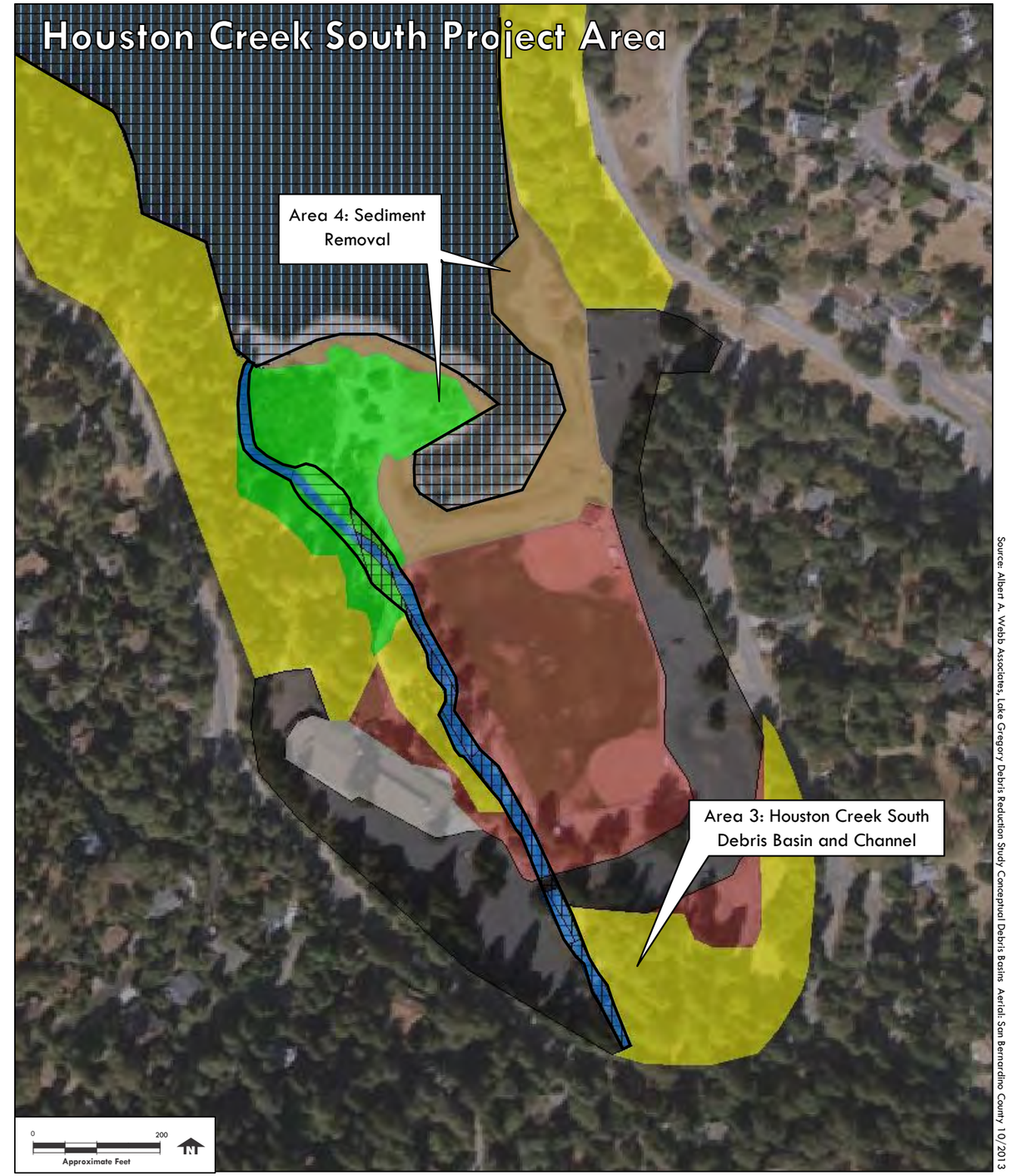
CDFW JURISDICTION AND IMPACTS

Lake Gregory Sediment Management and Bioretention Program
San Bernardino County, California

FIGURE 9





Source: Albert A. Webb Associates, Lake Gregory Debris Reduction Study Conceptual Debris Basins Aerial: San Bernardino County 10/2013

LEGEND

- Disturbed Herbaceous
- Wetland
- Riparian - Willow
- Sand Beach
- Lacustrine
- Impacts to ACOE Jurisdictional Areas
- Disturbed Parkland
- Stream
- Yellow Pine Forest
- Parking Lot
- ACOE Jurisdictional Areas

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ACOE JURISDICTION AND IMPACTS

Lake Gregory Sediment Management and Bioretention Program
San Bernardino County, California

FIGURE 10

Lake and Streambed Alteration Agreement must be obtained from CDFW prior to impacts occurring to waters of the State.

- No extraction of accumulated sediment, other than in the designated areas in the immediate vicinity of the lake's shoreline will occur.
- To minimize water quality impacts associated with disturbance during removal of sediment on the lake's shoreline, the contractor shall create a berm barrier between the lake and the sediment stockpile in order to reduce any incidental drainage to the lake.
- All excavated sediments shall be removed to an upland area where they are not subject to redepositing in surface waters.

Best Management Practices Mitigation

- All construction equipment must be clean and free from oil, grease and loose metal material, and must be removed from service if necessary to protect water quality.
- Construction equipment staging/storage shall occur in a designated upland area.
- All litter shall be removed from the construction area and disposed of in an appropriate manner at the end of each construction day to ensure that no litter enters riparian areas or jurisdictional waters.

Compensatory Mitigation

- The applicant shall provide compensatory mitigation for unavoidable permanent impacts to riparian and wetland habitat at a minimum 1:1.5 ratio. Compensatory mitigation may include restoration or creation of habitat as agreed to by the Proponent and regulatory agencies.

7.0 CONCLUSION

Regional Parks proposes the construction of debris/sediment basins and implementation of an on-going maintenance program for silt removal at Lake Gregory to minimize long-term sedimentation impacts to the Lake, its fishery and its beneficial uses. One time construction activities associated with construction of the proposed debris/sediment basins, channel realignment, and sediment removal at the delta would result in impacts to approximately 2.25 acres under the jurisdiction of the CDFW and 1.61 acres under the jurisdiction of the USACE and RWQCB. Impacts associated with culvert maintenance and sediment removal are not defined and would occur on an as-needed basis as determined by the Park operating staff. Impacts associated with these activities would be sited to minimize disturbance to the adjacent habitat and lake as much as practicable.

The lake, ephemeral channel, and the adjacent riparian and wetland areas are subject to the jurisdiction of the California Department of Fish and Wildlife, the Lahontan Regional Water Quality Control Board, and the U.S. Army Corps of Engineers. Applicable regulatory permits will be obtained prior to project implementation. It is recommended that mitigation in Section 6 of this report be implemented as part of the project when submitting permit applications to the regulatory agencies.

8.0 REFERENCES

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APPENDIX A
REPRESENTATIVE SITE PHOTOS

Representative Site Photos
Lake Gregory Jurisdictional Delineation

View of the Houston Creek West – West Basin wetland looking north from the library viewing deck.

Proposed location of Houston Creek West – East Basin and sediment removal.

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Representative Site Photos
Lake Gregory Jurisdictional Delineation

View of the parking lot, the channel, and the ponderosa pine forest at the proposed location for the Houston Creek South Basin.

North portion of ephemeral channel.

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Representative Site Photos
Lake Gregory Jurisdictional Delineation

South portion of the ephemeral channel with the sand delta visible in the background.

View of sand delta and riparian vegetation looking east.

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APPENDIX B
ARID WEST EPHEMERAL AND INTERMITTENT STREAMS OHWM DATASHEETS

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Lake Gregory Sediment Management and Bioretention Program
Project Number:
Stream: ephemeral channel to the lake
Investigator(s): Lorraine Bueno

Date: 11-1-2013
Town: Crestline
Photo begin file#:

Time:
State: CA
Photo end file#:

Y [XX] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [XX] Is the site significantly disturbed?

Location Details: wp. 699

Projection:
Datum:
Coordinates: 34d14m17.56s N, 117d15m54.98s W

Potential anthropogenic influences on the channel system:
There is an adjacent walking trail, a ball park, and dog park. Users frequently walk across the channel.

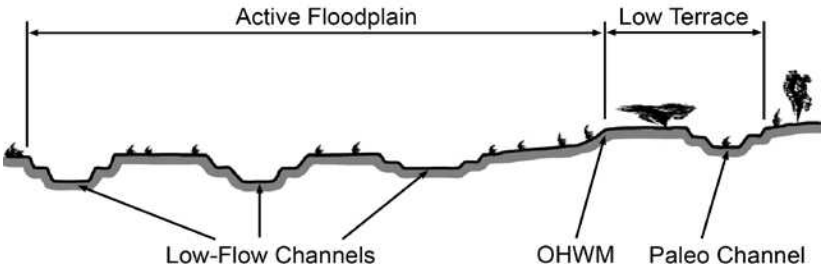
Brief site description: The channel is bound by ponderosa pine forest on one side and a parking lot on the other. There is a large culvert inlet on the south end of the the channel into the park. There are large boulders on the forest side of the bank (2-4' boulders).

Checklist of resources (if available):

- [XX] Aerial photography
  Dates:
- [XX] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [ ] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [XX] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

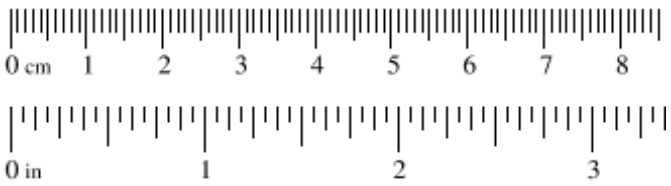


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [ ] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [XX] GPS
   - [ ] Other:

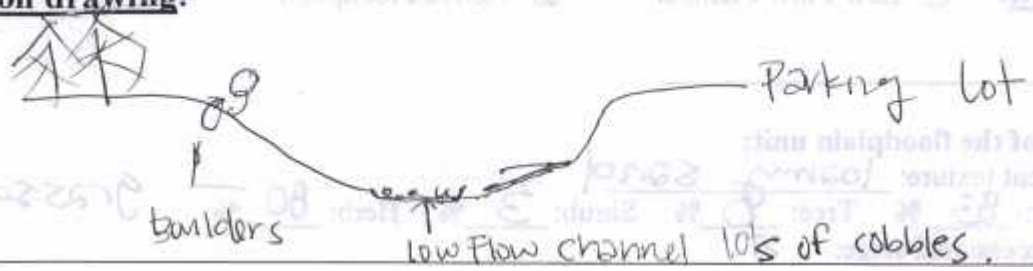
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
	10.08	256	Boulder	Gravel
	2.56	64	Cobble	
	0.157	4	Pebble	
	0.079	2.00	Granule	
	0.039	1.00	Very coarse sand	Sand
	0.020	0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	Silt
1/32	0.00061	0.0156	Medium silt	
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: _____

Indicators:

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [ ] Break in bank slope
- [ ] Other: _____
- [ ] Other: _____

Comments:

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: 699

Characteristics of the floodplain unit:

Average sediment texture: Coarse cobbles 4-5"

Total veg cover: 55 % Tree: 00 % Shrub: 00 % Herb: 55 %

Community successional stage:

- [x] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: Loamy Sand

Total veg cover: 83 % Tree: 00 % Shrub: 33 % Herb: 80 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Limit of herbaceous vegetation.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Lake Gregory Sediment Management and Bioretention Program
Project Number:
Stream: ephemeral channel to the lake
Investigator(s): Lorraine Bueno

Date: 11-1-2013
Town: Crestline
Photo begin file#:

Time: 12:22 pm
State: CA
Photo end file#:

Y [XX] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [XX] Is the site significantly disturbed?

Location Details: wp. 700

Projection: **Datum:**
Coordinates: 34d14m23.24s N 117d15m57.89s W

Potential anthropogenic influences on the channel system:
There is an adjacent walking trail adjacent to the low terrace and a lodge on the west side of the channel. Users frequently walk across the channel.

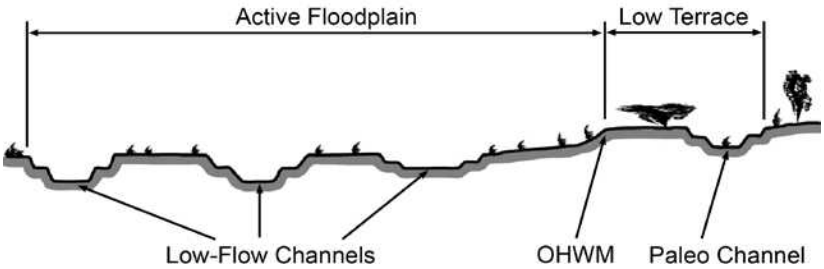
Brief site description: The channel broadens in this portion and banks are not as defined as upstream. There is concrete mat reinforcement on the east bank and no bank protection on the west.

Checklist of resources (if available):

- [XX] Aerial photography
  Dates:
- [XX] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [ ] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [XX] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

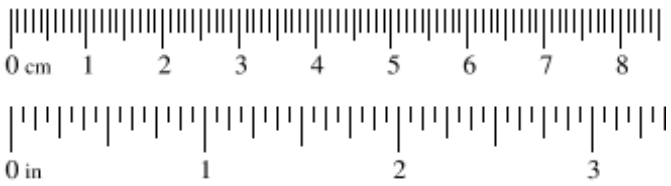


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [ ] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [XX] GPS
   - [ ] Other:

Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
	10.08	256	Boulder	Gravel
	2.56	64	Cobble	
	0.157	4	Pebble	
	0.079	2.00	Granule	
	0.039	1.00	Very coarse sand	Sand
	0.020	0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	Silt
1/32	0.00061	0.0156	Medium silt	
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:

OHWM

GPS point: _____

Indicators:

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [ ] Break in bank slope
- [ ] Other: _____
- [ ] Other: _____

Comments:

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: 700

Characteristics of the floodplain unit:

Average sediment texture: Cobbles and sand

Total veg cover: 55 % Tree: 00 % Shrub: 00 % Herb: 55 %

Community successional stage:

- [x] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

There is herbaceous cover including invasive such as short pod mustard.

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: Loamy Sand

Total veg cover: 85 % Tree: 15 % Shrub: 00 % Herb: 80 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☒ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

The channel is broad and approximately 1-2 ft. deep at the concrete matting. The low flow channel has a sandy bottom with cobbles and herbaceous cover, willow vegetation is adjacent on the broad active channel.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

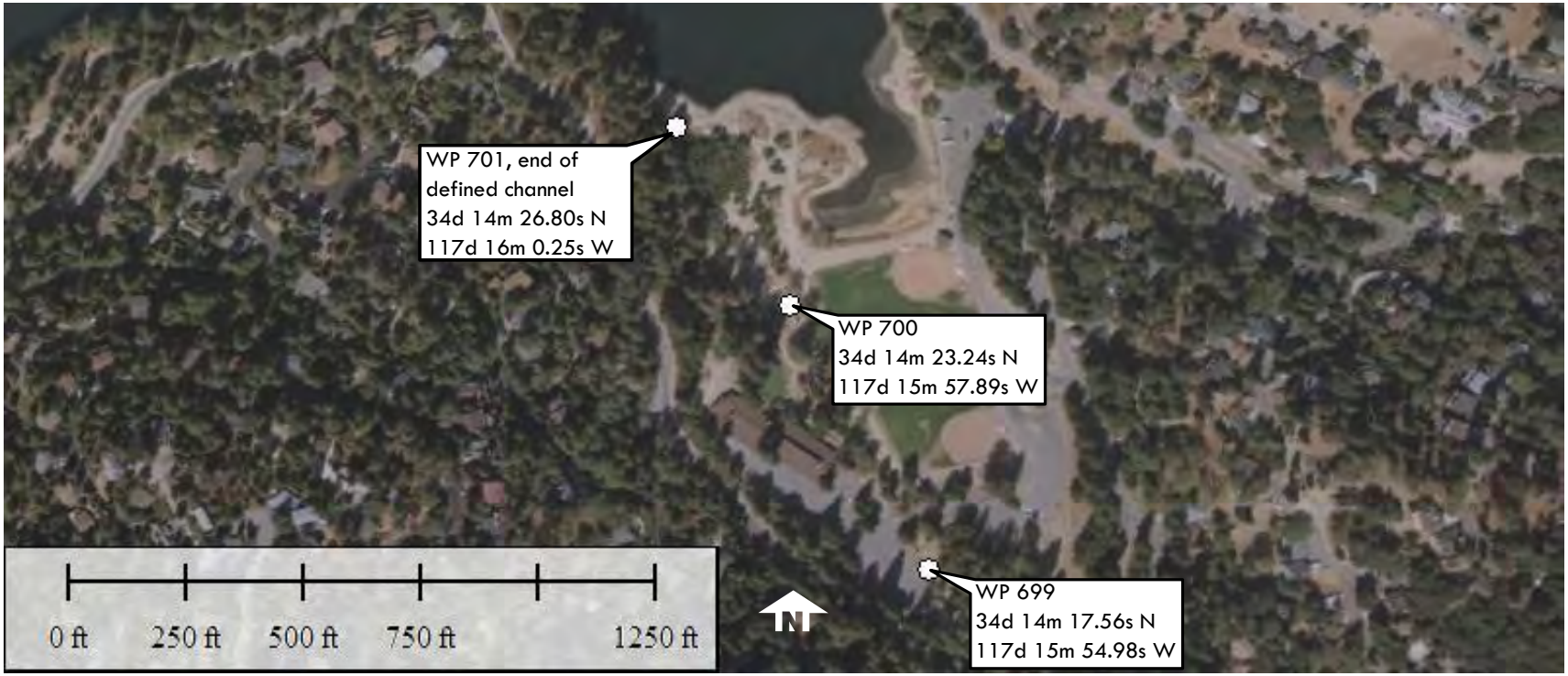
Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:



OHWM Waypoints

Lake Gregory Sediment Management
and Bioretention Program
San Bernardino County, California

LILBURN
CORPORATION

APPENDIX C
WETLAND DETERMINATION DATA FORM – ARID WEST REGION

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lake Gregory (west basin by library) City/County: Crestline, San Bernardino County Sampling Date: 9-14-2012

Applicant/Owner: San Bernardino County Regional Parks Department State: CA Sampling Point: WP 399

Investigator(s): Juan Hernandez Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): concave Slope (%): _____

Subregion (LRR): Arid West Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Oak Glen Family-Riverwash Association (partially hydric) NWI classification: No Data

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No _____	**Is the Sampled Area within a Wetland?** **Yes x** **No _____**
Hydric Soil Present?	Yes x	No _____	
Wetland Hydrology Present?	Yes x	No _____	

Remarks: Culvert channels water to the wetland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix Laevigata	80%	Yes	FACW
2. Alnus sp.	20%	Yes	FACW
3.			
4.			
	100% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10m2)			
1. Salix Laevigata	30%	Yes	FACW
2. Typha angustafolia	10%	Yes	OBL
3.			
4.			
5.			
	40% = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. Rubus parviflorus	10%	No	FAC
2.			
	10% = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

x Dominance Test is >50%

___ Prevalence Index is ≤3.0[11]

___ Morphological Adaptations[11] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[11] (Explain)

[11] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes x** **No _____**

Remarks:

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[11]	Loc[22]	Texture	Remarks
4	10YR2/1	100%					sandy	
>4	10YR2/1	50%						hard to tell red parent material

[11]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [22]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- x Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- x Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[33]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- x Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[33]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- x Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- x Water Marks (B1) (**Nonriverine**)
- x Sediment Deposits (B2) (**Nonriverine**)
- x Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- x Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- x Biotic Crust (B12)
- x Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes x No ___ Depth (inches): 6”

Water Table Present? Yes ___ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): _____

Wetland Hydrology Present? **Yes** x **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lake Gregory (west basin by library) City/County: Crestline, San Bernardino County Sampling Date: 9-14-2012

Applicant/Owner: San Bernardino County Regional Parks Department State: CA Sampling Point: WP 400

Investigator(s): Juan Hernandez Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): flat Slope (%): _____

Subregion (LRR): Arid West Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Morical-Wind River Families Complex (not hydric) NWI classification: No Data

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No x	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** x
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	Yes x	No _____	

Remarks: The area where the drainage enters the lake by the softball fields is a sand bar which contains riparian vegetation. This point was selected Because it was the location with the greatest potential for being a wetland. The pit was dug and at 20" dark sand of <2 was found. According to the Arid West manual dark chroma soils should occur within the top 6". It was concluded that no hydric soils occur.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix Laevigata	90%	Yes	FACW
2.			
3.			
4.			
	90%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10m2)			
1. Urtica sp.	40%	Yes	FAC
2. Juncus sp.	20%	Yes	FACW
3.			
4.			
5.			
	40%	= Total Cover	
Herb Stratum (Plot size: 10m2)			
1. Urtica sp.	20%	Yes	FAC
2. Mentha arvensis	5%	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	25%	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

x Dominance Test is >50%

___ Prevalence Index is ≤3.0[11]

___ Morphological Adaptations[11] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[11] (Explain)

[11] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** x **No** _____

Remarks:

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[11]	Loc[22]	Texture	Remarks
12	2.5Y3/3	100%					sandy	
20	2.5Y3/21	90%	7.5YR4/4	10%	RM	M	sandy	

[11]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [22]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- x Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[33]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[33]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** x

Remarks: One point was sampled where the drainage meets the lake. Low chroma soils were found at 20" deep. The sand showed some redox features. However, based on the guidelines in the Arid West manual, low chroma soils should occur within the first 6" of the surface. A hydrology Study of the sample site shows that the location is the inlet of a 853 acre watershed, the site undergoes severe silt accumulation that may prevent the Formation of hydric soils. The soils are not hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- x Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- x Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): _____

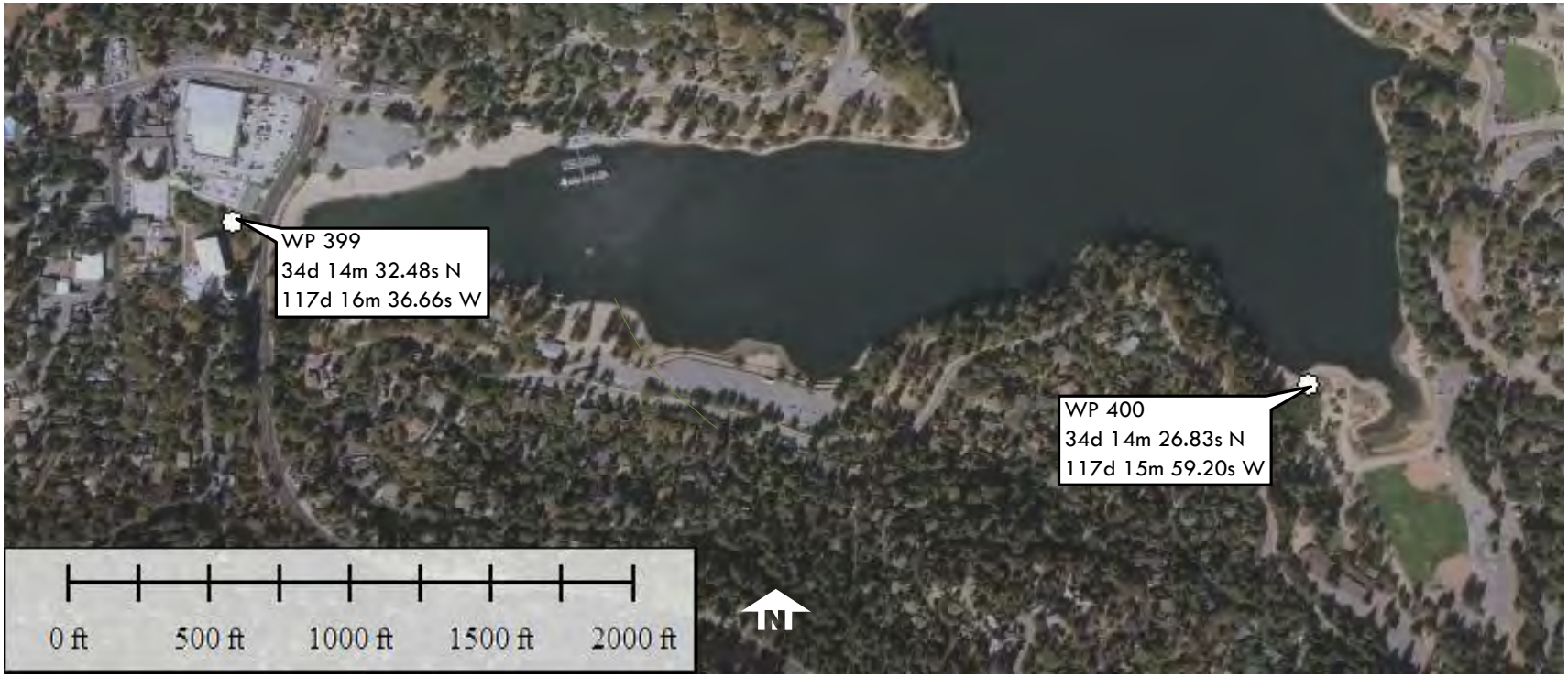
Water Table Present? Yes ___ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): _____

Wetland Hydrology Present? **Yes** x **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



Wetland Delineation Waypoints

Lake Gregory Sediment Management
and Bioretention Program
San Bernardino County, California

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