PRELIMINARY JURISDICTIONAL DELINEATION FOR THE NEWELL CREEK DAM INLET/OUTLET REPLACEMENT PROJECT

Santa Cruz County, California

PREPARED FOR:

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TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ACOE	U.S. Army Corps of Engineers
AMSL	above mean sea level
APN	Assessor's Parcel Number
CDFW	California Department of Fish and Wildlife
City	City of Santa Cruz
CWA	Clean Water Act
ED	ephemeral drainage
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
FR	*Federal Register*
ID	intermittent drainage
L1RB	lacustrine, limnetic, rock bottom
L1UB	lacustrine, limnetic, unconsolidated bottom
LLRA	Loch Lomond Recreation Area
N/A	not applicable
NCD	Newell Creek Dam
NCP	Newell Creek Pipeline
NL	not listed
OBL	obligate
OHWM	ordinary high water mark
PEM1	palustrine, emergent, persistent
PEM2	palustrine, emergent, nonpersistent
Project	Newell Creek Dam Inlet/Outlet Replacement Project
R3RB	riverine, upper perennial rock bottom
R3RB1	riverine, upper perennial rock bottom, bedrock
R4SB1	riverine, intermittent, streamed bedrock
R6	riverine, ephemeral
Reservoir	Loch Lomond Reservoir
RS	roadside swale
RWQCB	Regional Water Quality Control Board
SW	seasonal wetland
TNW	traditional navigable water
UPL	upland
USGS	U.S. Geological Survey

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1 INTRODUCTION

At the request of the City of Santa Cruz (City) Water Department, Dudek has prepared this report to document the results of a preliminary jurisdictional delineation of waters of the United States, including wetlands, conducted for the Newell Creek Dam (NCD) Inlet/Outlet Replacement Project (Project). NCD, which impounds Loch Lomond Reservoir (Reservoir), is located in unincorporated Santa Cruz County. The results of this delineation are preliminary until verified by the San Francisco District of the U.S. Army Corps of Engineers (ACOE).

1.1 Project Location

NCD is located approximately 10 miles north of the City of Santa Cruz and 2 miles east of the unincorporated community of Ben Lomond (see Figure 1). The dam and Reservoir are located on an approximately 518-acre site owned by the City of Santa Cruz (Assessor's Parcel Number [APN] 076-251-24). The Study Area consists of two separate areas, referred to herein as the North Site and the South Site (Figure 1) that total approximately 85 acres. The North Site is located at the Loch Lomond Recreation Area (LLRA) boat launch on the eastern side of Loch Lomond Reservoir. The South Site encompasses the southern portion of Loch Lomond Reservoir and an area located below the dam, where Loch Lomond Reservoir drains into Newell Creek via a spillway and outlet. The Project site is located in Section 33 of Township 9 South, Range 2 West of the Felton, California, U.S. Geological Survey (USGS) 7.5-minute quadrangle map. The central point of the Study Area corresponds to the following decimal degree coordinates: 37.1021 degrees north latitude and 122.0733 degrees west longitude (Figure 1).

The Study Area consists of all the areas where Project activities could occur and includes the NCD, the southern portion of the Reservoir where the existing and proposed intakes are located, the spillway plunge pool and plunge pool crossing, the existing outlet and seepage channel at the toe of the of the dam, the control house on the crest of the dam, Newell Creek Road and access roads to the toe and crest of the dam, a portion of the Newell Creek Pipeline (NCP), and a portion of an emergency access (Haul) road along the right bank of the reservoir. In addition, the Study Area includes the LLRA launch, and areas surrounding the dam and reservoir that would be used for construction staging and/or storage of excavated spoils (see Figure 2).

1.2 Directions to the Study Area

Access to the North Site of the Study Area is via Loch Lomond Way. From the City of Santa Cruz, head north on Ocean Street. Continue onto Graham Hill Road. In 5.3 miles, turn right onto East Zayante

Road. Turn left onto Lompico Road. Turn left onto West Drive, and travel for 0.6 miles. Take a slight right turn onto Sequoia Avenue, and then continue on Loch Lomond Way to the North Site.

Access to the South Site is via Newell Creek Road. From Santa Cruz, travel north on Ocean Street. Continue onto Graham Hill Road for 5.7 miles. Turn right onto CA-9/Highway 9 and travel 1.7 miles. Turn right on Glen Arbor Road and travel 1.1 miles, then turn right onto Newell Creek Road. Follow Newell Creek Road to the South Site. There are several locked gates along Newell Creek Road restricting vehicular traffic to the South Site.

2 PROJECT DESCRIPTION SUMMARY

The proposed Project would entirely replace the existing aging inlet/outlet works in a new location at the Reservoir and include other associated improvements. The Project is comprised of the following primary components:

- Three new inlets located within the Reservoir that function as both inlet and outlet and an operational structure and valves at the toe of the dam;
- A 14-foot-diameter tunnel containing 48-inch and 10-inch inlet/outlet pipelines through the right (west) abutment and under the dam;
- A new control house on the dam crest to house controls for the inlets;
- Replacement of an approximately 2,000-linear-foot segment of NCP between the outlet structure and the first isolation valve;
- Improvements along the dam's access roads to improve access for construction, including a new culvert crossing at the spillway plunge pool; and
- Decommissioning of the existing inlet/outlet works once the replacement inlet/outlet system is operational.

Figure 3 illustrates the location of the primary new facilities in relation to existing facilities.

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3 REGULATORY BACKGROUND

3.1 Federal Statutes and Regulations – U.S. Army Corps of Engineers

Any person or public agency proposing to discharge dredged or fill material into waters of the United States, including jurisdictional wetlands, must obtain a permit from the ACOE.

As defined in Title 33 of the Code of Federal Regulations, Section 328.3, waters of the United States include all waters subject to interstate or foreign commerce, including tidal waters, interstate waters and wetlands, many intrastate waters, impoundments, tributaries, the territorial seas, and adjacent wetlands. Specifically, Section 328.3 of Title 33 of the Code of Federal Regulations defines waters of the United States as follows:

a. For purposes of the Clean Water Act, 33 U.S.C. 1251 et seq. and its implementing regulations, subject to the exclusions in paragraph (b) of this section, the term "waters of the United States" means:

    1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

    2. All interstate waters, including interstate wetlands;

    3. The territorial seas;

    4. All impoundments of waters otherwise identified as waters of the United States under this section;

    5. All tributaries, as defined in paragraph (c)(3) of this section, of waters identified in paragraphs (a)(1) through (3) of this section;

    6. All waters adjacent to a water identified in paragraphs (a)(1) through (5) of this section, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.

b. The following are not "waters of the United States" even where they otherwise meet the terms of paragraphs (a)(4) through (8) of this section.

    1. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act.

    2. Prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

For non-tidal waters of the United States, the lateral limits of ACOE jurisdiction extend to the ordinary high water mark (OHWM) when no adjacent wetlands are present. Defined in the Code of Federal Regulations, Title 33, Section 328.3(e), the OHWM is

> that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

If adjacent wetlands are present, the jurisdiction extends to the limit of wetlands.

Wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3). Wetlands are jurisdictional if they meet this definition and the definition of waters of the United States. ACOE predominantly uses the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (ACOE 2010) methodology to determine the presence of wetlands. According to the manual (ACOE 2010), the following three criteria must be satisfied to classify an area as a wetland: (1) a predominance of plant life that is adapted to life in wet conditions (hydrophytic vegetation); (2) soils that saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part (hydric soils); and (3) permanent or periodic inundation or soils saturation, at least seasonally (wetland hydrology). Further guidance for determining jurisdictional limits in ephemeral riverine systems in the western mountains, valleys, and coast region is detailed in *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (ACOE 2014).

In the last two decades, two major court cases have affected the jurisdictional reach of Section 404 of the Clean Water Act (CWA): (1) *Solid Waste Agency of Northern Cook County v. United States Corps of Engineers* and (2) *Rapanos v. United States* (2006) and *Carabell v. United States Army Corps of Engineers.*

Solid Waste Agency of Northern Cook County v. United States Corps of Engineers

In 1986, in an attempt to clarify the reach of its jurisdiction, ACOE stated that Section 404(a) of the CWA extends to intrastate waters (51 *Federal Register* [FR] 41217):

> a. Which are or would be used as habitat by birds protected by Migratory Bird Treaties; or

b. Which are or would be used as habitat by other migratory birds which cross state lines; or

c. Which are or would be used as habitat for endangered species; or

d. Used to irrigate crops sold in interstate commerce.

In 2001, the U.S. Supreme Court—in its judgment on the *Solid Waste Agency of Northern Cook County* case, held that Code of Federal Regulations, Title 33, Section 328.3(a)(3), as clarified and applied to the *Solid Waste Agency of Northern Cook County* site pursuant to the Migratory Bird Rule (51 FR 41217)—superseded the authority granted to ACOE under Section 404(a) of the CWA. Therefore, ACOE may not rely on the Migratory Bird Rule to establish a "significant nexus" to interstate or foreign commerce. In additional language, the U.S. Supreme Court majority opinion reasoned that these types of waters required some nexus to navigable waters. Although no formal guidance was issued by ACOE interpreting the extent to which the *Solid Waste Agency of Northern Cook County* decision would limit jurisdictional determinations, in practice, ACOE considers intrastate waters as waters of the United States where there is an appropriate connection to navigable water or other clear interstate commerce connection (*Solid Waste Agency of Northern Cook County v. United States Corps of Engineers* 2001).

Rapanos v. United States and Carabell v. United States Army Corps of Engineers

In 2006, the U.S. Supreme Court again issued an opinion on the extent ACOE had jurisdiction over certain waters under Section 404 of the CWA. The *Rapanos-Carabell* consolidated decisions addressed the question of jurisdiction over attenuated tributaries to waters of the United States, as well as wetlands adjacent to those tributaries (*Rapanos v. United States* 2006).

ACOE and the U.S. Environmental Protection Agency issued guidance related to the *Rapanos* decision on June 5, 2007. The guidance identifies the waters the agencies (i.e., ACOE and the U.S. Environmental Protection Agency) will assert jurisdiction over categorically and on a case-by-case basis based on the reasoning of the *Rapanos* opinions. In summary, ACOE will continue to assert jurisdiction over the following:

- Traditional navigable waters (TNWs) and their adjacent wetlands.
- Non-navigable tributaries of TNWs that are relatively permanent (e.g., tributaries that typically flow year-round or have a continuous flow at least seasonally) and wetlands that directly abut such tributaries (e.g., not separated by uplands, berm, dike, or similar feature).

  Note: Relatively permanent waters do not include ephemeral tributaries, which flow only in response to precipitation, and intermittent streams, which do not typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months).

- Non-relatively permanent waters, if determined (on a fact-specific analysis) to have a significant nexus with a TNW, including non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally, wetlands adjacent to such tributaries, and wetlands adjacent to but that do not directly abut a relatively permanent, are non-navigable tributary. Absent a significant nexus, jurisdiction is lacking.

A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological integrity of a TNW. Principal considerations when evaluating significant nexus include volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, including hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands. Certain ephemeral waters in the Western Mountains, Valleys, and Coast Region are distinguishable from the geographic features described previously, where such ephemeral waters are tributaries and have a significant nexus to downstream TNWs. For example, these ephemeral tributaries may serve as a transitional area between the upland environment and the TNW. These ephemeral tributaries may provide habitat for wildlife and aquatic organisms in downstream TNWs and support nutrient cycling, sediment retention and transport, pollutant trapping and filtration, and improvement of water quality.

Swales or erosional features (e.g., gullies and small washes characterized by low-volume, infrequent, or short-duration flow) are generally not considered waters of the United States, because they are not tributaries, or they do not have a significant nexus to downstream TNWs. In addition, ditches (including roadside ditches) excavated wholly in and draining only uplands, and that do not carry a relatively permanent flow of water, are generally not considered waters of the United States, because they are not tributaries, or they do not have a significant nexus to downstream TNWs. Even when not jurisdictional under Section 404 of the CWA, these features may still be jurisdictional at the state or local level such as under the California Porter-Cologne Water Quality Control Act, and/or Section 1602 of the California Fish and Game Code.

Prior to the *Rapanos* guidance, ACOE required its regional districts to request concurrence for only those jurisdictional determinations where the district was planning to assert jurisdiction over a non-navigable, intrastate, and isolated water and/or wetland. The agencies now require that all determinations for non-navigable, intrastate, and isolated waters be submitted for ACOE and U.S. Environmental Protection Agency review prior to the district making a final decision on the jurisdictional determination.

U.S. Army Corps of Engineers-Regulated Activities

Under Section 404 of the CWA, ACOE regulates activities that involve a discharge of dredged or fill material, including but not limited to grading, placing riprap for erosion control, pouring concrete,

laying sod, and stockpiling excavated material into waters of the United States. Activities that generally do not involve a regulated discharge (if performed specifically in a manner to avoid discharges) include driving pilings, providing some drainage channel maintenance activities, and excavating without stockpiling.

3.2 State of California

California Department of Fish and Wildlife

Pursuant to Section 1602 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife.

In Title 14 of the California Code of Regulations, Section 1.72, the CDFW defines a "stream" (including creeks and rivers) 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 watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

In Title 14 of the California Code of Regulations, Section 1.56, the CDFW's definition of "lake" includes "natural lakes or man-made reservoirs." Diversion, obstruction, or change to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife requires authorization from the CDFW by entering into an agreement pursuant to Section 1602 of the Fish and Game Code.

California Regional Water Quality Control Board

Pursuant to Section 401 of the federal CWA, the Regional Water Quality Control Board (RWQCB) regulates discharging waste, or proposing to discharge waste, within any region that could affect a water of the state (California Water Code, Section 13260(a)), pursuant to provisions of the Porter-Cologne Water Quality Control Act. Waters of the state are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, Section 13050(e)). Before ACOE will issue a CWA Section 404 permit, applicants must receive a CWA Section 401 Water Quality Certification from the RWQCB. If a CWA Section 404 permit is not required for the Project, the RWQCB may still require a permit (i.e., Waste Discharge Requirement) for impacts to waters of the state under the Porter-Cologne Water Quality Control Act.

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4 METHODOLOGY

4.1 Literature Review

Prior to conducting fieldwork, Dudek reviewed the following available public resources and prior studies to assess the potential for jurisdictional features:

- 1:200-scale aerial photograph (Bing Maps 2016; Google Earth 2017)
- USGS "Felton, California" 7.5-minute topographic quadrangle (USGS 2018)
- U.S. Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey (USDA 2018)
- Local and regional climate data (WRCC 2018)
- National Wetland Inventory (USFWS 2018)
- Marine Geophysical Survey – Loch Lomond Reservoir, California (Sea Engineering Inc. 2009)
- Newell Creek Dam Hydro-electric Project, Santa Cruz County, California – Delineation of State and Federal Jurisdictional Waters (Biotic Resources Group 2013)
- Watershed Resource Management Plan – Existing Conditions Report (Swanson Hydrology & Geomorphology 2001)

4.2 Jurisdictional Delineation

Potential wetlands were delineated based on methodology described in the 1987 *Corps of Engineers Wetlands Delineation Manual* (ACOE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (ACOE 2010). Non-wetland waters of the United States were delineated based on the presence of an OHWM determined using the methodology in *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (ACOE 2014).

Dudek biologists collected photographic records that represent the on-site habitats and wetlands (Appendix A).

4.3 Flora

All plant species encountered during the field surveys were identified and recorded. Those species that could not be identified immediately were brought into the laboratory for further investigation. Latin names follow the *Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California* (Jepson Flora Project 2018), and common names follow the U.S. Department of Agriculture, Natural Resources

Conservation Service, Plants Database (USDA 2017). Wetland plant indicator status for each observed species was determined using the 2016 National Wetland Plant List regional plant list for the Mountains, Valley, and Coast Region (Lichvar et al. 2016). Wetland plant indicator status is ranked as follows:

- Obligate (OBL): plants that always occur in standing water or in saturated soils
- Facultative Wetland (FACW): plants that nearly always occur in areas of prolonged flooding or require standing water or saturated soils but may, on rare occasions, occur in non-wetlands
- Facultative (FAC): plants that occur in a variety of habitats, including wetland and mesic to xeric non-wetland habitats but commonly occur in standing water or saturated soils
- Facultative Upland (FACU): plants that typically occur in xeric or mesic non-wetland habitats but may frequently occur in standing water or saturated soils
- Upland (UPL): plants that rarely occur in water or saturated soils

A rating of Not Listed (NL) indicates the plant has no wetland plant indicator status and is not considered a wetland plant in any region. Appendix B contains a complete list of plant species observed during the surveys and their wetland plant indicator status.

4.4 Field Visit

Dudek biologists, Laura Burris and Lisa Achter, surveyed the Study Area on April 11 and 12, 2018, to document current site conditions and to assess potential wetlands and non-wetland waters of the United States. Dudek biologists conducted the wetland delineation fieldwork in conjunction with biological surveys performed for the same Project. A supplemental field survey was conducted by Dudek on September 6, 2018 to assess several additional staging areas proposed for inclusion in the Study Area.

Dudek biologists collected additional data at a total of six data stations where necessary to collect site-specific data on the presence of hydric soils, hydrophytic vegetation, and wetland hydrology. The data stations were established based on topography and evidence of potential wetland indicators, such as hydrophytic vegetation or evidence of wetland hydrology. The data stations generally consist of paired locations that are placed to transect the wetland boundary. The results of the survey are presented in Chapter 6, Results, and data sheets for each data station are included as Appendix C. In addition to information gathered at the data stations to assess potential wetland resources, data were collected from four stream transects to assess stream hydrology. Evidence of an OHWM was present in the form of shelving, undercut banks, wracking, and changes in sediment and vegetation. Data sheets for stream transects are included as Appendix C. All data stations, wetland boundaries, and OHWM data were collected using a hand-held GPS unit capable of sub-meter accuracy (Trimble Geo XT). These data were then downloaded and overlain on aerial imagery by Dudek GIS staff using ArcMaps software.

The vegetation communities and land cover types within the Study Area were documented in the field and have been adapted from *A Manual of California Vegetation, Second Edition* (Sawyer et.al 2009), and the California Wildlife Habitat Relationship System (CDFW 2014).

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5 ENVIRONMENTAL SETTING

5.1 Land Uses

The Study Area is generally rural and surrounded by forested watershed lands and open space. Structures that presently exist in the southern portion of the Study Area include a control house on the southeastern side of the dam, and, in the northern portion of the property, a boat launch and a small store in the LLRA. Several parking lots exist along the access road to the boat launch.

5.2 Topography and Soils

The Study Area consists of forested hills with a central valley created by Newell Creek and the Reservoir. Elevations in the vicinity of the North Site range from approximately 580 feet above mean sea level (AMSL) at the boat launch to approximately 760 feet AMSL on the slopes above the Reservoir. Elevations in the vicinity of the South Site range from approximately 780 feet AMSL above the dam to 390 feet AMSL at the bottom of the dam. The Reservoir sits at an elevation of approximately 580 feet AMSL.

According to the Natural Resources Conservation Service (USDA 2018), four native soil types and one anthropogenic soil types are mapped within the Study Area (Figure 4). The native soils include Maymen-Rock outcrop complex, 50%–75% slopes; Nisene-Aptos complex, 30%–50% slopes; Nisene-Aptos complex, 50%–75% slopes; and Lompico-Felton complex, 50%–75% slopes. The anthropogenic soil type is classified as "Dam" and corresponds to NCD. The Maymen-Rock outcrop complex is characterized by residuum weathered from sandstone and shale, or granite. This complex is a somewhat excessively drained soil consisting of approximately 75% Maymen soils and 25% rock outcrops (USDA 2018). Nisene-Aptos complex soils are derived from approximately 30% Nisene soils and 30% Aptos soils, with the inclusion of other minor soil components. This complex is well drained and is derived from residuum weathered from sandstone and shale or from siltstone (USDA 2018). The Lompico-Felton complex contains approximately 45% Lompico soils and 40% Felton soils, with minor components included. This complex is well drained and is derived from residuum weathered from siltstone and/or mica schist, sandstone, and shale (USDA 2018).

The U.S. Department of Agriculture, Natural Resources Conservation Service does not consider any of these soil types to be hydric soils (USDA 2016).

During the site survey, soils in the Study Area conformed to survey mapping, and were generally loamy with a layer of leaf litter at the surface. Soils on the dam face and at the base of the dam consisted of mixed fill with a loose, rocky texture at the surface composed of various sized materials, presumably due to dam construction activities and placement of fill in the past.

5.3 Watershed and Hydrology

The Study Area is located in the Zayante Creek – San Lorenzo River Watershed (Hydrologic Unit Code 180600150202). Newell Creek drains water from Loch Lomond Reservoir and the watershed upstream of the Reservoir, south to the San Lorenzo River, approximately 3 miles south of the Study Area. The San Lorenzo River conveys water south, where it empties into the northern portion of Monterey Bay approximately 10 miles south of the Study Area.

The water levels of the Reservoir are variable depending on the time of year, rainfall, and available flows from upstream tributaries. Four large streams flow into the Reservoir from the west and the north, including the main channel of Newell Creek (Swanson Hydrology & Geomorphology 2001). The Reservoir overtops the main spillway at its southern end and drains water to the lower reach of Newell Creek.

Newell Creek is depicted as a perennial blue-line stream on the Felton, California, USGS 7.5-minute quadrangle map. It originates northeast of the Study Area near the Bear Creek ridge area, then enters the Reservoir at its northeastern end. The Reservoir was constructed in 1960 and retains water from the Newell Creek Watershed as well as water from the San Lorenzo River (Felton Diversion) (Swanson Hydrology & Geomorphology 2001). The City Water Department maintains a minimum release of 1 cubic foot per second from the Reservoir when water is not actively spilling down the main spillway, per existing regulatory permits (Berry, pers. comm. 2018). The water is discharged into a seepage channel before entering the spillway plunge pool that discharges into Newell Creek channel to the south.

Chapter 6 includes further discussion of features within the Study Area.

5.4 Regional and Local Climate

The Study Area is located within the San Francisco Bay Area subregion of the Central Western California region in the greater California Floristic Province (Baldwin ed. 2012). This subregion characterizes lands east of the truly coastal habitat along the Pacific Ocean coastline and contains variable vegetation (Baldwin ed. 2012). Average annual temperatures in the Ben Lomond, California, area range from approximately 43.5 degrees Fahrenheit to 73.8 degrees Fahrenheit, and the average annual precipitation is 49.25 inches (WRCC 2018). On average, the months with the highest rainfall are January and February, and July has the least precipitation.

Rainfall for the survey year (2018) was average following above-normal rains in 2016/2017 after a number of years of drought. Site conditions during survey appeared typical for the time of year and region in which they occurred.

5.5 Natural Vegetation Communities and Land Cover Types

Land cover types within the Study Area consist of a combination of terrestrial non-vegetative land covers and natural vegetation communities, as well as aquatic land cover types discussed further in the results section of this report. The following vegetation communities and land cover types were observed and mapped during the field visit using the classifications described in *A Manual of California Vegetation* by Sawyer and Keeler-Wolf (2009): California annual grassland, coyote brush scrub, French broom, mixed chaparral, redwood forest, big leaf maple forest, arroyo willow-bigleaf maple groves, red alder/bigleaf maple groves, redwood-Douglas fir forest, redwood-madrone woodland, Douglas fir forest, Douglas fir/knobcone pine forest, live oak/madrone woodland, and ruderal/developed.

Herbaceous

California Annual Grassland. California annual grassland in the Study Area is generally confined to the south-facing slope of the dam face but occurs in small patches throughout the Study Area. This vegetation community is dominated by non-native annual grasses such as wild oat (*Avena fatua*), soft chess (*Bromus hordeaceus*), and rip-gut brome (*Bromus diandrus*). In addition to the non-native grasses, red fescue (*Festuca rubra*), a native grass, was also present. Annual forbs such as bicolor lupine (*Lupinus bicolor*), English plantain (*Plantago lanceolata*), and spring vetch (*Vicia sativa*) are also interspersed in the grasses of this land cover type. The annual grassland community on the dam face is maintained by periodic goat grazing.

Scrubs/Shrub

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance). Coyote brush (*Baccharis pilularis*) is the dominant shrub in this vegetation community. Coyote brush scrub occurs on a northwest-facing slope along the access road to the NCD. Other shrub species observed in this vegetation community include pink honeysuckle (*Lonicera hispidula*), bush monkeyflower (*Diplacus aurantiacus*), and wedge leaf ceanothus (*Ceanothus cuneatus*). Scattered coastal live oak trees (*Quercus agrifolia*) are interspersed in this shrubland. The herbaceous understory of this vegetation community contains grass and herb species consistent with those found in the California annual grassland previously described.

French Broom (*Genista monspessulana* and Others Shrubland Semi-Natural Alliance). Broom patches occur sporadically throughout the Study Area, with highest concentrations along the ecotone of woodland and grassland adjacent to the NCD face and along the margins of the reservoir. This shrubland is dominated by French broom (*Genista monspessulana*), a non-native, invasive species introduced from Europe. French broom creates a dense shrub canopy and herbaceous vegetation is sparse to absent in the understory.

Mixed Chaparral. Mixed chaparral occurs on a bluff in the northern portion of the Study Area. This habitat type is dominated by manzanitas (*Arctostaphylos* spp.), wedge leaf ceanothus, and wart leaf ceanothus (*Ceanothus papillosus*). The shrub canopy is dense, and herbaceous vegetation is largely absent from the understory.

Woodlands and Forests

Redwood Forest (*Sequoia sempervirens* Forest Alliance). A small grove of redwood (*Sequoia sempervirens*) trees occurs adjacent to a proposed staging area within the Study Area. This stand contained 100% cover of mature redwood trees. The thick layer of redwood leaf duff under the canopy likely precludes the growth of herbaceous vegetation in the understory.

Bigleaf Maple Forest (*Acer macrophyllum* Forest Alliance). Bigleaf maple (*Acer macrophyllum*) forest occurs throughout the southern portion of the Study Area, primarily along the margins of the NCD face and on north-facing slopes adjacent to Newell Creek. Bigleaf maple is the dominant species in the tree canopy of this vegetation community. Other trees observed in this community include California bay (*Umbellularia californica*), redwood, and madrone (*Arbutus menziesii*). The shrub layer in this vegetation community is sparse and consists of snowberry (*Symphoricarpos mollis*), toyon (*Heteromeles arbutifolia*), and poison oak (*Toxicodendron diversilobum*). Grassland similar to California annual grassland also occurs in the understory.

Arroyo Willow-Bigleaf Maple Groves (*Salix lasiolepis – Acer macrophyllum* Shrubland Alliance). This vegetation community is a tall shrub/low tree canopy composed of codominant arroyo willow (*Salix lasiolepis*) and bigleaf maple trees. This vegetation community occurs along the margins of Loch Lomond Reservoir to the northwest of NCD. Arroyo willow is a riparian tree or arborescent shrub that easily colonizes along stream banks and benches, slope seeps, and along drainages. It is valuable species for bank and slope stabilization. The herbaceous layer is variable and dependent on the coverage and density of the canopy and lower shrubs.

Red Alder–Bigleaf Maple Groves (*Alnus rubra – Acer macrophyllum* Forest Alliance). Big leaf maple forest within the Study Area intergrades with red alder (*Alnus rubra*) groves along the channel of Newell Creek and along the margins of the spillway plunge pool.

Redwood-Douglas Fir Forest (*Sequoia sempervirens – Pseudotsuga menzieseii* Forest Alliance). Redwood trees are intermixed with Douglas fir (*Pseudotsuga menziesii*) in the western portion of the study area. The canopy is relatively continuous and dense, with some areas of two-tiered canopy. Mixtures of redwood and Douglas fir usually occurs in protected upland slopes up to approximately 3,200 feet (976 meters) elevation. The longitudinal extent of the Redwood – Douglas fir forest type is associated with a constant temperature and moisture regime that defines the Redwood fog belt.

Redwood–Madrone Woodland (*Sequoia sempervirens* – *Arbutus menziesii* woodland Alliance). This community extends in a north-south band on the west side of Loch Lomond Reservoir. The vegetation community is characterized by redwood trees and a nearly continuous lower canopy composed of madrone. Understory shrub and herbaceous species are sparse to intermittent.

Douglas Fir Forest (*Pseudotsuga menzieseii* Forest Alliance). Douglas fir dominates much of the eastern slopes of the Study Area, particularly in the northern portion. Additional tree species present in lower cover include madrone, redwood, and knobcone pine (*Pinus attenuata*).

Douglas Fir–Knobcone Pine Forest (*Pseudotsuga menzieseii* – *Pinus attenuata* Forest Alliance). The Douglas fir in the northwestern portion of the southern Study Area becomes codominant in the tree canopy with knobcone pine.

Coast Live Oak – Madrone Woodland (*Quercus agrifolia* – *Arbutus menziesii* woodland Alliance). Portions of the southern Study Area, especially north-facing slopes adjacent to the NCD are contain a co-dominance of coast live oak and madrone in the tree canopy. The understory of this vegetation alliance consists primarily of poison oak and annual grasses similar to those described in California Annual Grasslands.

Other Land Cover Types

Ruderal Roadways/Developed. This land cover type includes the developed dirt and gravel access roads, and the buildings at the top of the dam. Vegetation is generally absent from this land cover type in the Study Area.

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6 RESULTS

The following section describes the results of the literature review and field assessment. These data represent Dudek's best effort to determine limits of potential jurisdiction. All findings are considered preliminary until verified by the San Francisco District of the ACOE.

6.1 Wetlands

Two types of wetlands occur within the Study Area: seasonal wetland and seep. Each of these wetland types is described in more detail below.

Seasonal Wetland. Two seasonal wetlands (SWs) were observed in the southern portion of the Study Area during the site survey. SW-01 is located at the base of a rock wall adjacent to the spillway plunge pool where water appears to pond in a natural depression as the levels of the plunge pool recede during dry months. This area is characterized by Harford's sedge (*Carex harfordii*) and miner's lettuce (*Claytonia perfoliata*). A dense cover of leaf litter blankets this area from the mature woodland canopy and the leaves were saturated at the time of the site survey. Due to its adjacency to a potentially jurisdictional water feature, SW-01 is likely jurisdictional.

SW-02 is located in the upland areas in the northwestern portion of the Southern part of the Study Area. This wetland is located in a natural depression above a logging road cut where rainwater runoff from the surrounding hills appears to pond for sufficient time to create hydric soils and support hydrophytic vegetation. Dominant vegetation in this wetland includes Baltic rush (*Juncus balticus*) and clustered sedge (*Carex densa*). Due to its proximity to the Reservoir, SW-02 is likely considered an adjacent wetland and is likely jurisdictional.

Seeps. Several small seep areas were noted adjacent to the outlet pipe at the base of the NCD and at the base of a hillslope adjacent to Newell Creek. Seep-01 is located just north of the low water crossing at the confluence of the tributary to Newell Creek (ED-01) and Newell Creek (PD-01). This area contains a layer of bedrock below the soil that likely aids in retention of water in the surface soils and the creation of wetland soils. Hydrophytic vegetation such as field sedge (*Juncus effusus*), horsetail (*Equisetum hyemale*), and redroot flatsedge (*Cyperus eragrostis*). Due to its adjacency to Newell Creek and ED-01, this seep is likely jurisdictional.

Seep-02 is located at the base of NCD, directly adjacent to the outlet structure. This seep appears to contain standing water for much of the year and support a high cover of hydrophytic species such as watercress (*Nasturtium officinale*), stinging nettle (*Urtica dioica*), and redroot flatsedge. Because Seep-02 is associated with the outlet of Reservoir, and is adjacent to PD-02, it is likely jurisdictional.

6.1.1 Results of Data Stations

Results from the eight representative data stations document potentially jurisdictional wetlands within the Study Area based on observable field indicators. Table 1, below, provides a summary of each data station and whether the required wetland parameters (hydrophytic vegetation, hydric soils, and wetland hydrology) were met at each location, whether the data station was associated with a stream, as well as a determination of jurisdictional status and potential agency jurisdiction. As described in Section 4.4, the data stations were established in key locations for the purposes of assessing if wetland indicators were present. Each of the data stations is show on Figure 5 and the data collected at each data station are included in Appendix C, on the ACOE's Wetland Determination Data Forms for the Western Mountains, Valleys and Coast Region.

Table 1
Data Station Summary

Data Station	Wetland Determination Field Indicators			Stream Association	Jurisdictional Status Determination	Jurisdiction
	Vegetation	*Hydric Soils*	*Hydrology*			
1a	✓	✓	✓	No	Jurisdictional; Seasonal Wetland	ACOE, RWQCB
1b	None	None	None	No	Non-jurisdictional; Upland	None
2a	✓	✓	✓	Yes	Jurisdictional; Seep	ACOE, RWQCB
2b	None	None	None	No	Non-jurisdictional; Upland	None
3	✓	✓	None	Yes	Non-jurisdictional; Upland	None
4a	✓	✓	✓	No	Jurisdictional; Seasonal Wetland	ACOE, RWQCB
4b	None	None	None	No	Non-jurisdictional; Upland	None
5	✓	None	None	No	Non-jurisdictional, Upland	None

Notes: ACOE = U.S. Army Corps of Engineers; RWQCB = Regional Water Quality Control Board.

6.2 Non-Wetland Waters of the United States

There are five types of non-wetland waters within the Study Area: perennial drainage, ephemeral drainage, roadside swale, spillway plunge pool, and reservoir.

Perennial Drainages. Newell Creek (PD-01) holds water on a year-round basis. At least 1 cubic foot per second of water is released from the Reservoir on a continuous basis (Berry, pers. comm. 2018),

maintaining water flow into the seepage channel, spillway plunge pool, and the channel of Newell Creek. The bed of Newell Creek is comprised of large boulders and cobbles, and evidence of an OHWM includes debris wracking, undercut banks, and changes in vegetation and sediment texture. The channel near the man-made low-water crossing is approximately 20 feet wide.

The seepage channel (PD-02) conveying water from the outlet to Newell Creek also maintains water on an annual basis due to the discharge from the Reservoir. This channel has an average width of 5 feet and is relatively shallow. The substrates in the channel are a mixture of cobbles and gravel and the OHWM is evidenced by the change in vegetation and sediment texture in the channel. Based on perennial flows, clear evidence of an OHWM, and connectivity to downstream TNWs, Newell Creek and the seepage channel are both considered likely jurisdictional.

Ephemeral Drainages. Four ephemeral drainages (ED) occur within the southern portion of the Study Area. ED-01 is tributary to Newell Creek, draining water from the hills northwest of spillway plunge pool and into the creek. This stream had flowing water at the time of the survey but appears not to maintain water on an annual basis. This channel cuts a deeply incised pathway through the surrounding landscape, with the top of the slopes approximately 15 feet above the level of the stream. The bed consists of a rocky channel that ranged in width from approximately 2 feet to 3.5 feet. An OHWM is evidenced by shelving, watermarks on boulders, and debris wracking.

ED-02 occurs along the access road, where it appears to drain rainwater runoff from the hills to the east of the roadway. This stream channel travels under the road via a corrugated metal culvert, then drains to Newell Creek. This channel had steep banks and cobbles, and changes in sediment and vegetation cover provide evidence of an OHWM.

ED-03 is a small cobble-lined drainage in the southern portion of the Study Area that appears to drain rainwater runoff from the hillslopes west to the roadside swale (described below). Evidence of an OHWM through a change in vegetation cover and sediment texture was observed in the channel. There was some evidence of flow in some cut banks. There is a high density of shrub cover over this channel, including poison oak, coyote brush, and wart leaf ceanothus. This channel did not contain water in it at the time of the site survey.

ED-04 originates on a terrace above and north of Newell Creek and drains south into Newell Creek. Water appears to sheetflow overland from a culvert under Newell Creek Road and south into the two channels of ED-04 (ED-04a and ED-04b) before draining into Newell Creek. ED-04 contains an OHWM as evidenced by break in slope and change in vegetation. The channels are incised into the terrace above Newell Creek and appear to convey water on an ephemeral basis. Neither channel contained water at the time of the survey.

The ephemeral drainages described above all exhibit clear evidence of an OHWM and have connectivity to downstream TNWs. Consequently, these ephemeral drainages are considered likely jurisdictional.

Roadside Swale. One roadside swale (RS-01) occurs parallel to the NCD access roadway. It is located downstream of ED-03 and is an extension of this feature (presumably ED-03 was re-directed into this roadside swale at the time the dam and access roadway was constructed). This swale also appears to drain water from the hillslopes northeast of the NCD access roadway and conveys flows southward to where the swale crosses under the access roadway via a culvert. This swale is largely vegetated and does not contain evidence of an OHWM. Nevertheless, this roadside swale is considered likely jurisdictional because it connects to, and conveys flows from, ED-03 (located upstream) to downstream jurisdiction waters (i.e., Newell Creek) and ultimately TNWs.

Spillway Plunge Pool. The NCD spillway plunge pool (SPP-01) at the base of the NCD spillway contains water on a year-round basis and is directly tributary to Newell Creek. This feature has a defined bed and bank, as well as an associated riparian fringe comprised of red alder and bigleaf maple. The spillway plunge pool is considered likely jurisdictional based on the presence of a clear OHWM and direct connectivity to Newell Creek.

Reservoir. Loch Lomond Reservoir (R) was created by the installation of the NCD on Newell Creek. The concrete spillway at the southern end of the Reservoir where water drains into the plunge pool and then Newell Creek during times of high flow. The Reservoir has a defined bed and bank and contains a mature, if sporadic, riparian fringe comprised of bigleaf maple and arroyo willow. For this evaluation, normal operating levels of the Reservoir were determined based on bathymetric surveys of the Reservoir and communications with the City of Santa Cruz (Sea Engineering Inc. 2009). Based on the presence of an OHWM around the periphery of the reservoir and connectivity to Newell Creek and downstream TNWs, Loch Lomond Reservoir is considered likely jurisdictional.

7 CONCLUSIONS

The Study Area supports 0.07 acre of wetlands and 2,633 linear feet (20.81 acres) of non-wetland waters that are anticipated to meet the criteria to be jurisdictional waters of the United States, including wetlands, based on an analysis of the three parameters for wetlands (soils, hydrology, and vegetation) and connectivity/proximity to known waters of the United States.

The Study Area does not support TNWs, interstate waters, or waters that support interstate commerce (33 CFR 328.3(a)(1–4)); therefore, potential ACOE jurisdiction was determined based on connectivity or adjacency to off-site waters of the United States (33 CFR 328.3(a)(5)).

Figure 5 depicts the geographic extent of potentially jurisdictional wetlands and non-wetland waters within the Study Area, and Table 2, below, summarizes the acreage and, where applicable, linear footage for each feature, as well as potential agency jurisdiction An aquatic resources spreadsheet is provided in accordance with the ACOE requirements is included as Appendix D.

Table 2
Wetlands and Non-Wetland Waters in the Study Area

Feature	Cowardin Code	Potential Agency Jurisdiction	Acres	Linear Feet
Wetlands				
SW-01	PEM2	ACOE, RWQCB	0.01	N/A
SW-02	PEM2	ACOE, RWQCB	0.01	N/A
Seep-01	PEM1	ACOE, RWQCB	0.03	N/A
Seep-02	PEM1	ACOE, RWQCB	0.02	N/A
		Total	0.07	N/A
Non-wetland Waters				
PD-01	R3RB1	ACOE/RWQCB/CDFW	0.28	648
PD-02	R3RB	ACOE/RWQCB/CDFW	0.02	153
ED-01	R4SB1	ACOE/RWQCB/CDFW	0.03	414
ED-02	R4SB1	ACOE/RWQCB/CDFW	0.01	140
ED-03	R6	ACOE/RWQCB/CDFW	0.02	319
ED-04a	R6	ACOE/RWQCB/CDFW	0.01	202
ED-04b	R6	ACOE/RWQCB/CDFW	0.01	217
RS-01	R6	ACOE/RWQCB	0.01	540
SPP-01	L1RB	ACOE/RWQCB/CDFW	0.21	N/A
Reservoir-01	L1UB	ACOE/RWQCB/CDFW	20.21	N/A
		Total	20.81	2,633

Table 2
Wetlands and Non-Wetland Waters in the Study Area

Feature	Cowardin Code	Potential Agency Jurisdiction	Acres	Linear Feet
Wetlands				

Notes: SW = Seasonal Wetland; ACOE = U.S. Army Corps of Engineers; RWQCB; Regional Water Quality Control Board; N/A = not applicable; L1RB = Lacustrine, limnetic, rock bottom; L1UB = Lacustrine, limnetic, unconsolidated bottom; PEM1 = Palustrine, emergent, persistent; PEM2 = Palustrine, emergent, nonpersistent; ID = Intermittent Drainage; R3RB = Riverine, upper perennial, rock bottom; R3RB1 = Riverine, upper perennial, rock bottom, bedrock; R4SB1 = Riverine, intermittent, streambed, bedrock; RS = Roadside Swale; R6 = Riverine, ephemeral; ED = Ephemeral Drainage.

All features identified as potential ACOE jurisdiction are potentially jurisdictional wetlands or non-wetlands waters of the United States. These findings are considered preliminary until verified by the San Francisco District of the ACOE.

7.1 Discussion of Potential Jurisdiction

7.1.1 U.S. Army Corps of Engineers

As previously described in Section 3.1 of this report, ACOE has jurisdiction over waters of the United States, including wetlands, as outlined in Section 404 of the CWA. This includes up to the OHWM of drainages and adjacent wetlands. Because Newell Creek is tributary to the San Lorenzo River, which in turn is tributary to Monterey Bay and the Pacific Ocean, it is considered a non-wetland water of the United States. All tributaries to Newell Creek and adjacent wetlands and the Reservoir are also potentially jurisdictional. Project-related fill or dredge within these features would require prior authorization from the ACOE.

7.1.2 Regional Water Quality Control Board

RWQCB's jurisdiction corresponds with the wetland and non-wetland waters of the United States as described in Section 3.1, with the addition of isolated waters covered under the Porter-Cologne Water Quality Act discussed in Section 3.2. The wetlands and perennial and ephemeral drainages would all fall within the jurisdiction of RWQCB under Section 401 of the CWA, as would the Reservoir. Placement of fill within or modification to wetlands or work below the top of bank of any linear feature on site would require authorization from RWQCB in the form of a Water Quality Certification.

7.1.3 California Department of Fish and Wildlife

CDFW jurisdiction includes ephemeral, intermittent, and perennial watercourses and lakes characterized by the presence of defined bed and banks and existing fish or wildlife resources. CDFW also takes

jurisdiction along watercourses to the outer limits of associated riparian vegetation. With the exception of the roadside swale, which lacks a defined bed and bank, all non-wetland waters in the Study Area, including the perennial and ephemeral drainages, Loch Lomond Reservoir, and associated riparian areas, are likely under CDFW jurisdiction. Any work within the bed or bank of these features, or within associated riparian corridors, would require authorization from CDFW via a Lake and Streambed Alteration Agreement pursuant to Section 1602 of the California Fish and Game Code. Any work in CDFW-jurisdictional features or trimming/removal of riparian vegetation may require compensatory mitigation.

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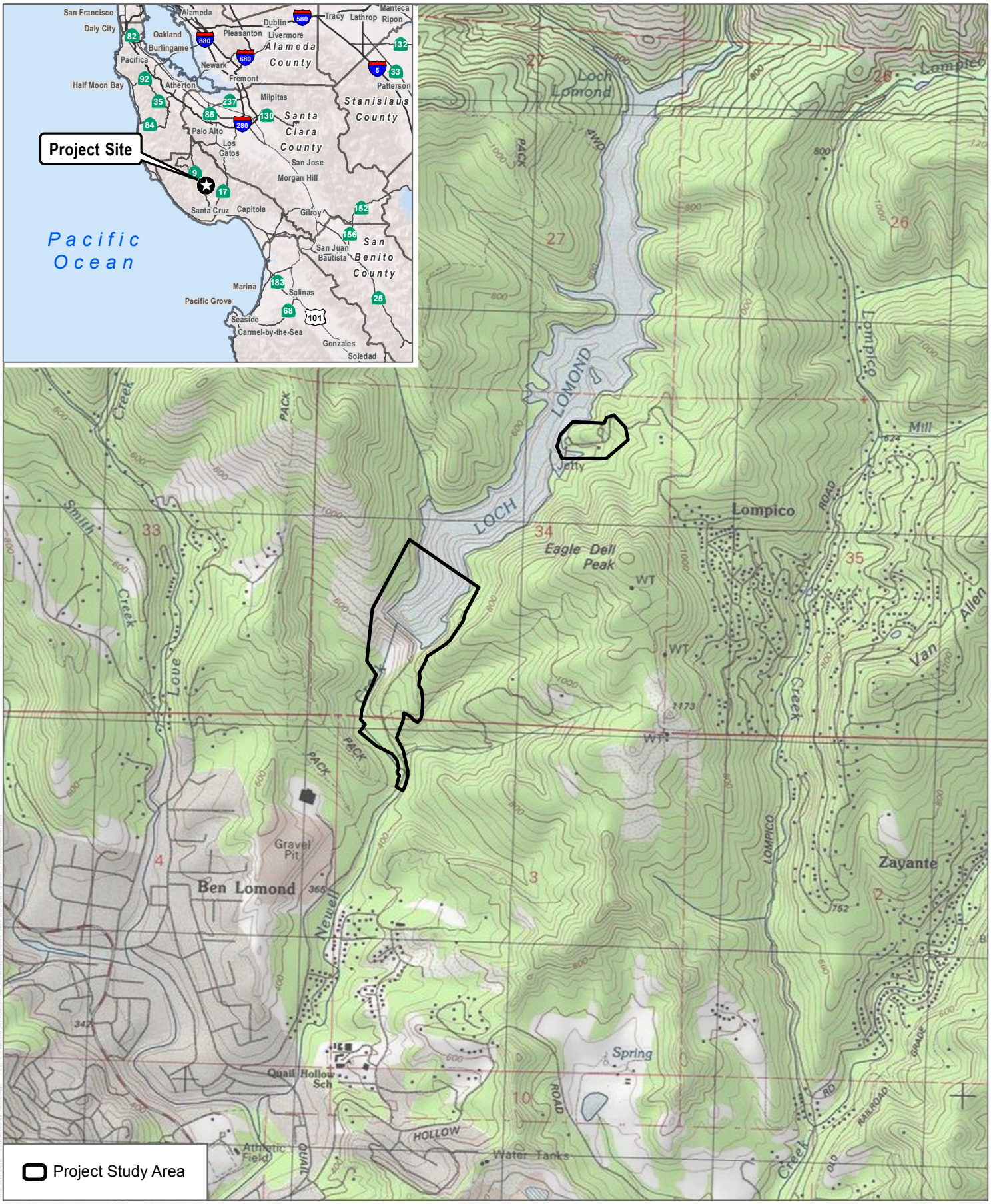

SOURCE: USGS 7.5-Minute Series Felton Quadrangle

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Newell Creek Dam Inlet/Outlet Replacement Project

SOURCE: Bing Maps 2018

DUDEK

0 500 1,000 Feet

FIGURE 2

Project Site

Newell Creek Dam Inlet/Outlet Replacement Project

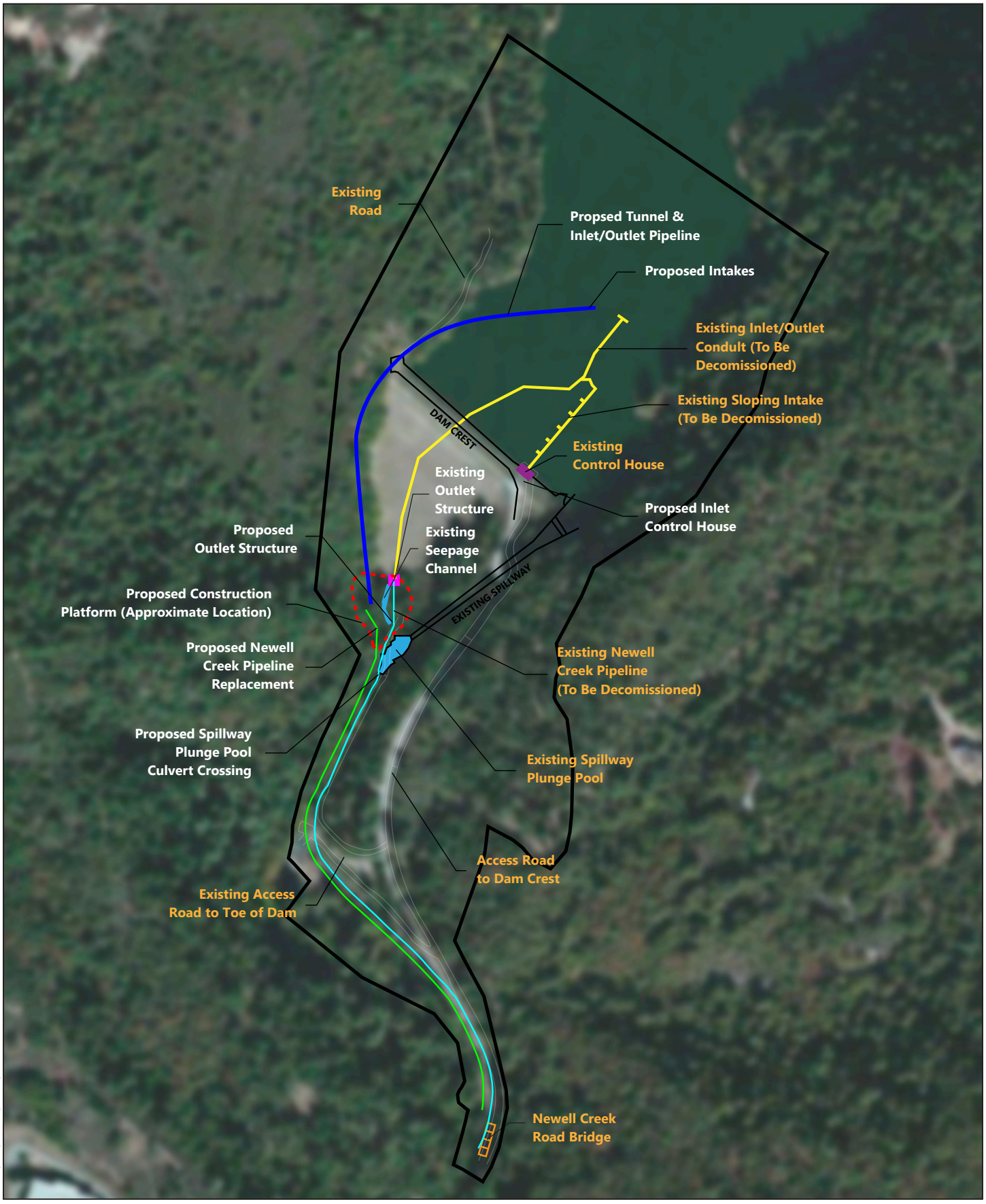

FIGURE 3

Project Overview

Newell Creek Dam Inlet/Outlet Replacement Project

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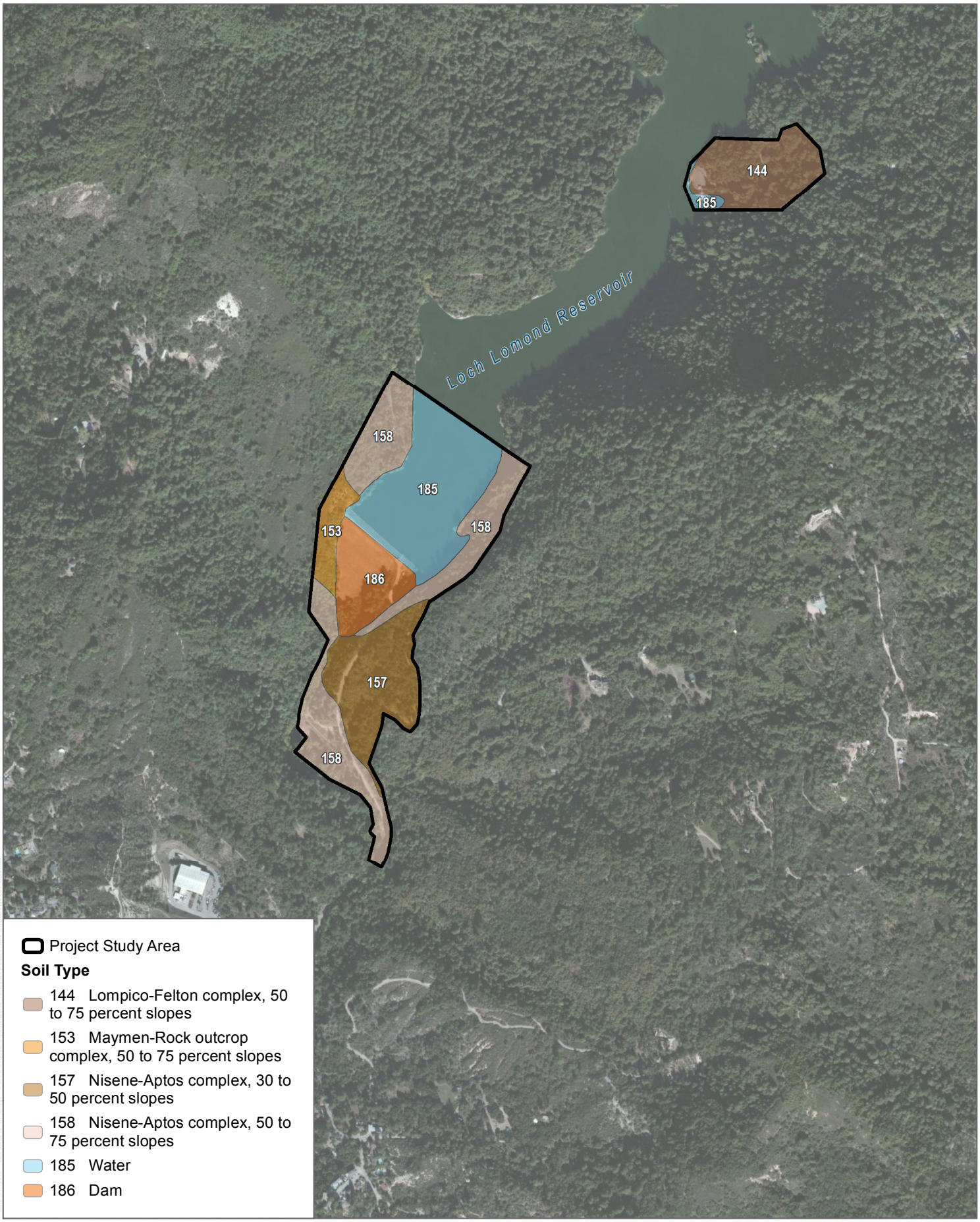


SOURCE: Bing Maps 2018; USDA 2017

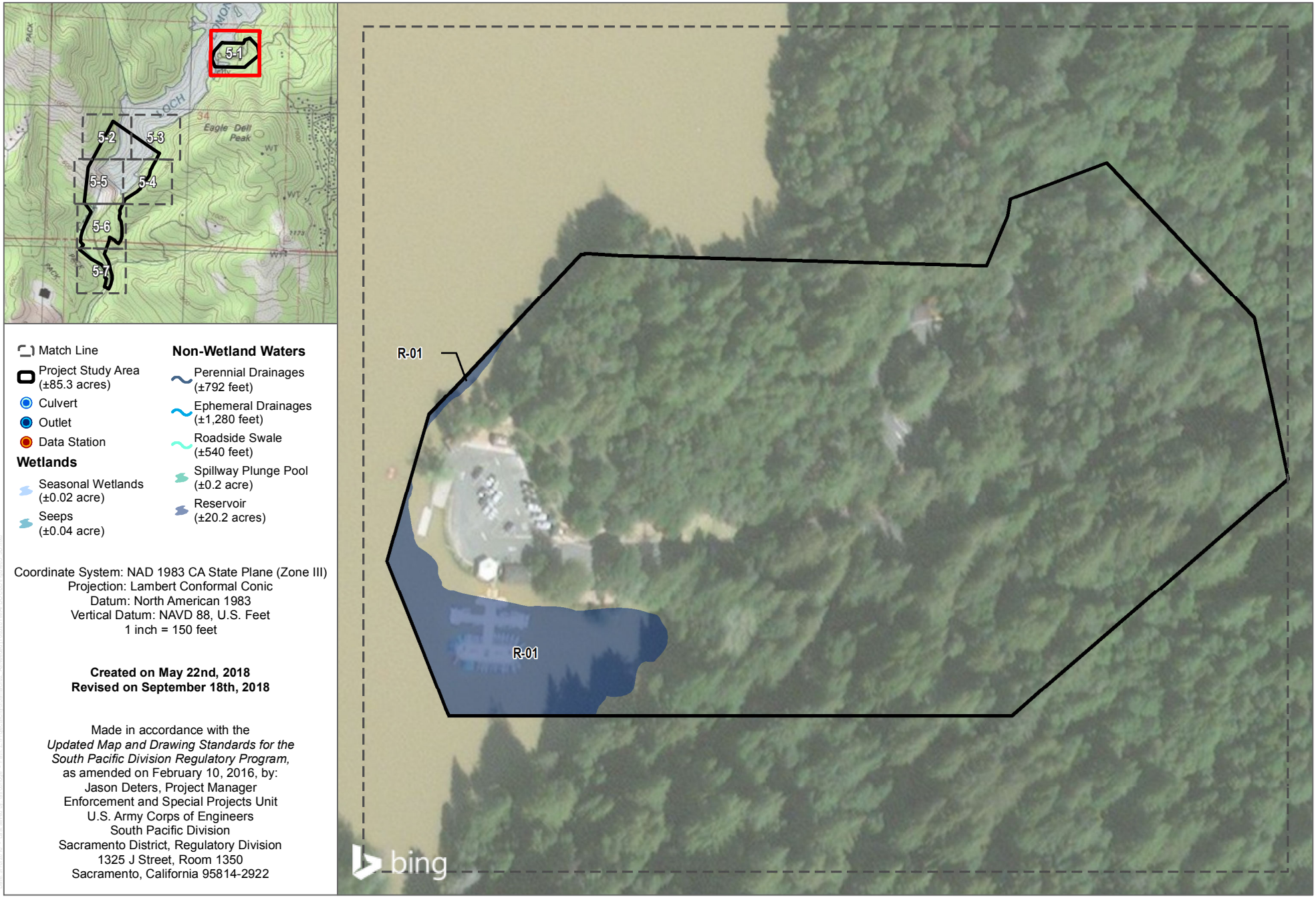
DUDEK

0 500 1,000 Feet

FIGURE 4

Soils

Newell Creek Dam Inlet/Outlet Replacement Project



SOURCE: Bing Maps 2018

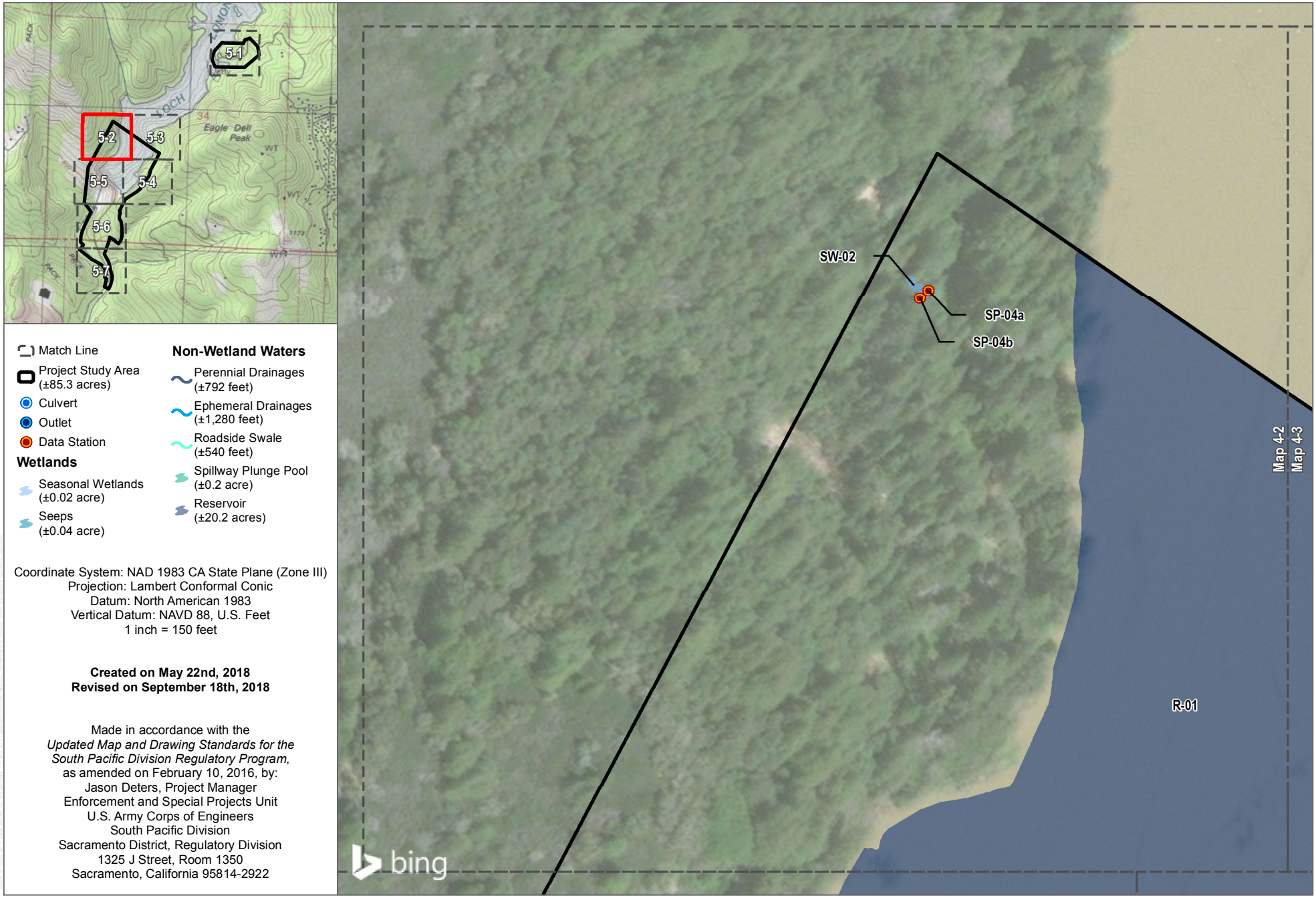
DUDEK

0 75 150 Feet

FIGURE 5-1

Delineation of Wetland and Non-Wetland Waters of the U.S.

Newell Creek Dam Inlet/Outlet Replacement Project



SOURCE: Bing Maps 2018

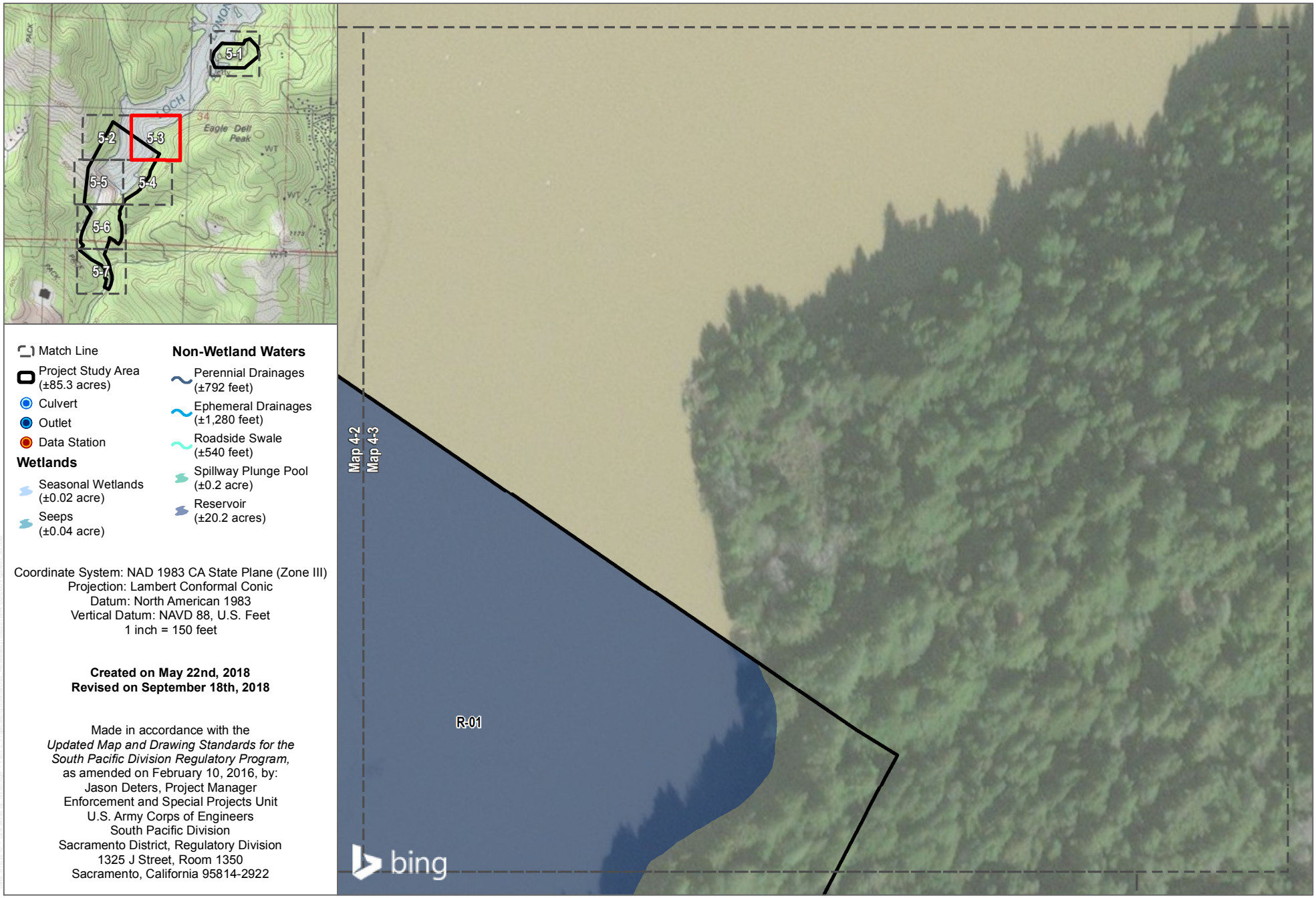
DUDEK

0 75 150 Feet

FIGURE 5-2

Delineation of Wetland and Non-Wetland Waters of the U.S.

Newell Creek Dam Inlet/Outlet Replacement Project



SOURCE: Bing Maps 2018

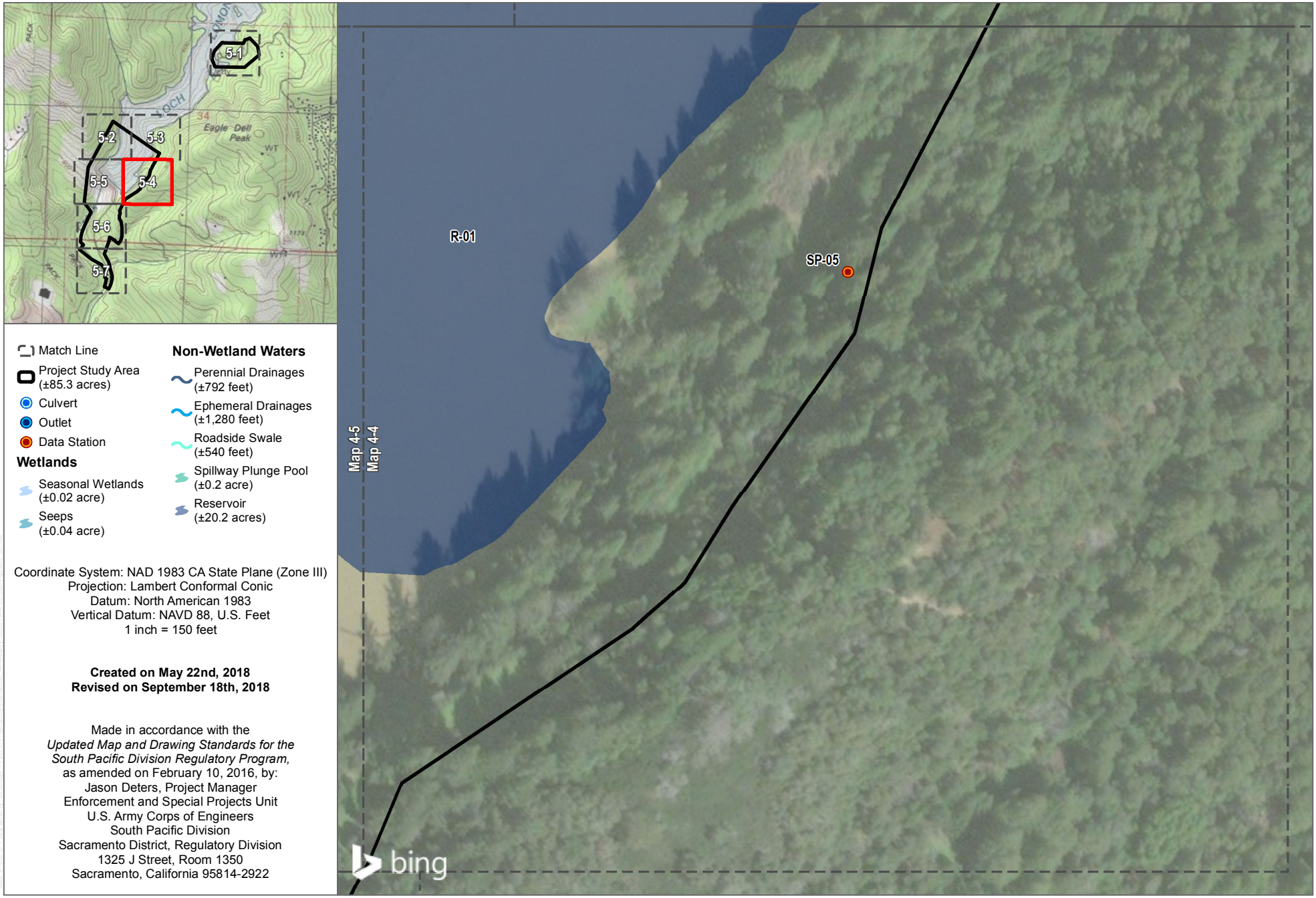
DUDEK

0 75 150 Feet

FIGURE 5-3

Delineation of Wetland and Non-Wetland Waters of the U.S.

Newell Creek Dam Inlet/Outlet Replacement Project



SOURCE: Bing Maps 2018

DUDEK

0 75 150 Feet

FIGURE 5-4

Delineation of Wetland and Non-Wetland Waters of the U.S.

Newell Creek Dam Inlet/Outlet Replacement Project

SOURCE: Bing Maps 2018

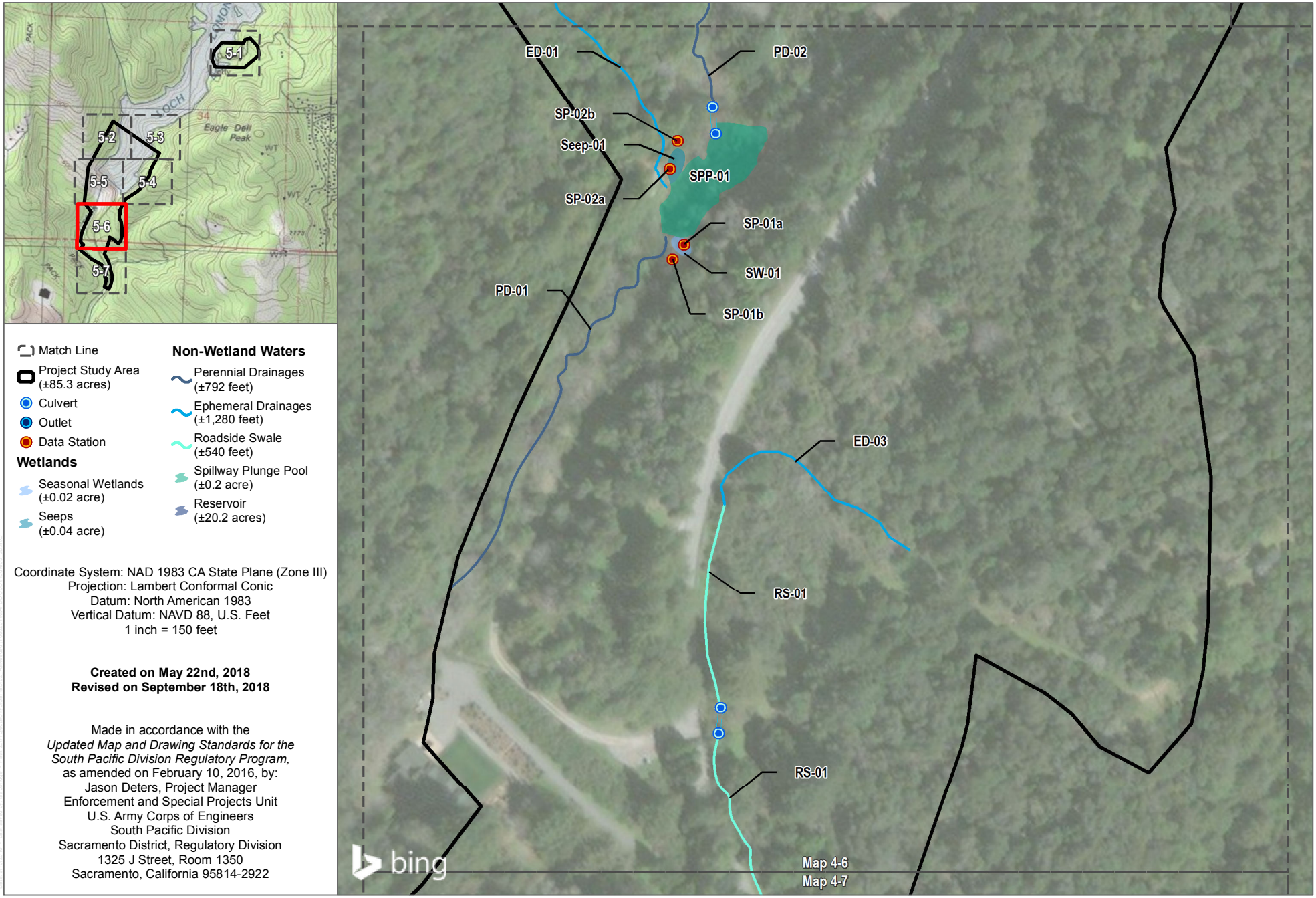
DUDEK

0 75 150 Feet

FIGURE 5-5

Delineation of Wetland and Non-Wetland Waters of the U.S.

Newell Creek Dam Inlet/Outlet Replacement Project



SOURCE: Bing Maps 2018

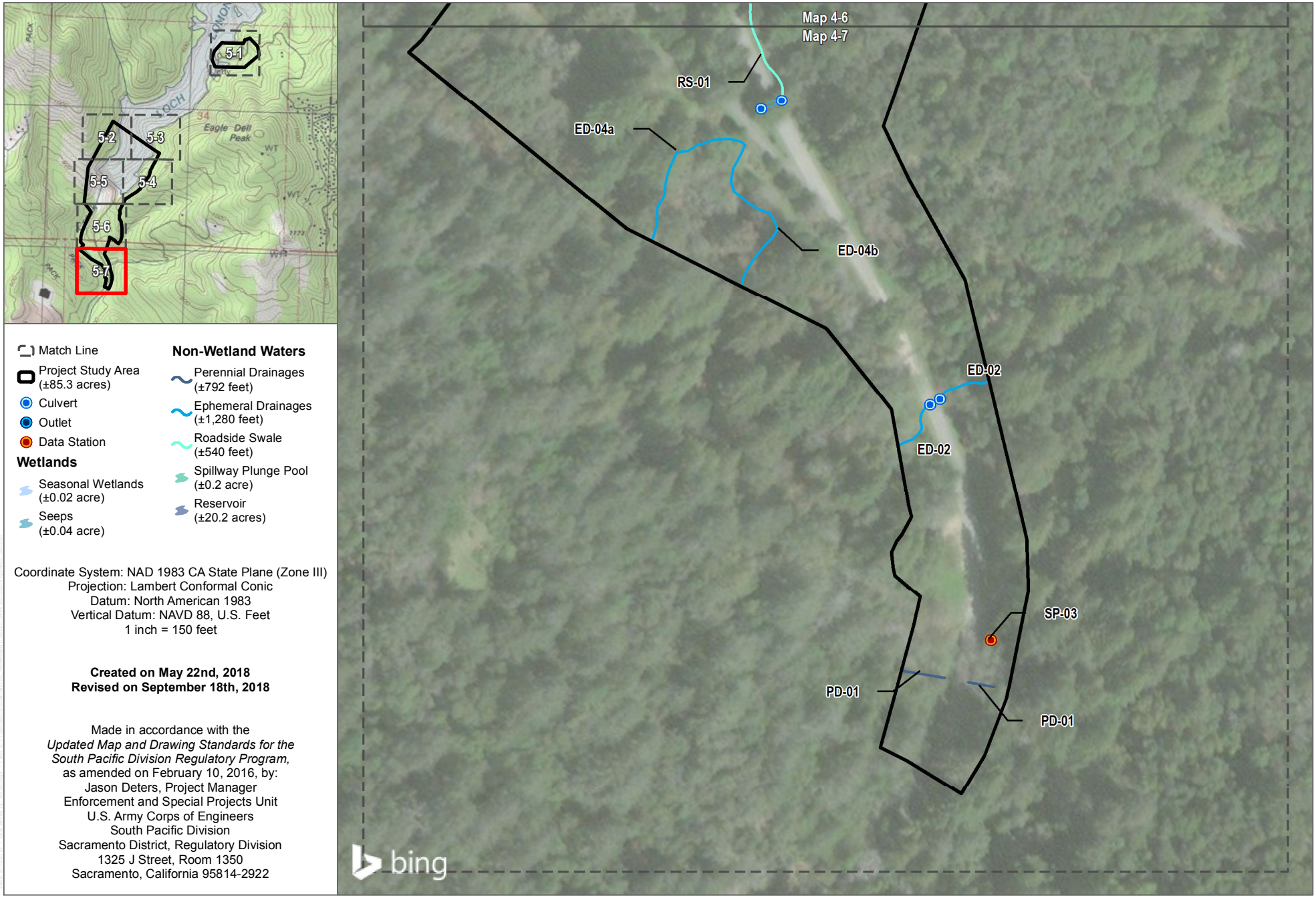
DUDEK

0 75 150 Feet

FIGURE 5-6

Delineation of Wetland and Non-Wetland Waters of the U.S.

Newell Creek Dam Inlet/Outlet Replacement Project



SOURCE: Bing Maps 2018

DUDEK

0 75 150 Feet

FIGURE 5-7

Delineation of Wetland and Non-Wetland Waters of the U.S.

Newell Creek Dam Inlet/Outlet Replacement Project

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APPENDIX A

Representative Photos

Photo 1: View of SP01. April 11, 2018.

Photo 2: View of plunge pool with spillway in background, facing northeast. April 11, 2018.

Photo 3: View of Newell Creek (PD-01), facing west and downstream of the low water crossing. April 11, 2018.

Photo 4: View of the tributary to Newell Creek (ED-01), facing north and upstream. April 11, 2018.

Photo 5: View of Seep-01 at the base of Newell Creek Dam, facing north. April 11, 2018.

Photo 6: View of ED-02 where it crosses under Newell Creek Dam Road, facing east. April 11, 2018.

Photo 7: View of SP04 in SW-02, facing north. April 11, 2018.

Photo 8: View of roadside swale (RS-01), facing southwest. April 12, 2018.

APPENDIX B

Plant Species Observed

EUDICOTS

VASCULAR SPECIES

ADOXACEAE—MUSKROOT FAMILY

Sambucus nigra—blue elderberry
FAC

ANACARDIACEAE—SUMAC OR CASHEW FAMILY

Toxicodendron diversilobum—poison oak
FAC

APIACEAE—CARROT FAMILY

* *Foeniculum vulgare*—fennel
Not Listed

* *Torilis arvensis*—spreading hedgeparsley
Not Listed

ARALIACEAE—GINSENG FAMILY

* *Hedera helix*—English ivy
FACU

ASTERACEAE—SUNFLOWER FAMILY

Artemisia douglasiana—Douglas' sagewort
FACW

Baccharis pilularis—coyote brush
Not Listed

* *Cirsium vulgare*—bull thistle
FACU

Hieracium albiflorum—white hawkweed
Not Listed

* *Sonchus asper*—spiny sowthistle
FACU

BETULACEAE—BIRCH FAMILY

Alnus rhombifolia—white alder
FACW

Corylus cornuta—beaked hazelnut
FACU

BORAGINACEAE—BORAGE FAMILY

Amsinckia menziesii—Menzies' fiddleneck
Not Listed
Cynoglossum grande—Pacific hound's tongue
Not Listed
* *Myosotis latifolia*—broadleaf forget-me-not
Not Listed
Phacelia ramosissima—branching phacelia
FACU

BRASSICACEAE—MUSTARD FAMILY

* *Brassica nigra*—black mustard
Not Listed
Cardamine californica—milkmaids
Not Listed
Nasturtium officinale—watercress
OBL

CAPRIFOLIACEAE—HONEYSUCKLE FAMILY

Lonicera hispidula—pink honeysuckle
FACU
Symphoricarpos albus—common snowberry
FACU

CARYOPHYLLACEAE—PINK FAMILY

* *Stellaria media*—common chickweed
FACU

ERICACEAE—HEATH FAMILY

Arbutus menziesii—madrone
Not Listed

FABACEAE—LEGUME FAMILY

Acmispon glaber—deer weed
Not Listed
* *Genista monspessulana*—French broom
Not Listed
Lathyrus jepsonii—Delta tule pea
OBL

Lathyrus torreyi—Torrey's pea
Not Listed
Lupinus bicolor—miniature lupine
Not Listed
* *Melilotus indicus*—annual yellow sweetclover
FACU
* *Trifolium campestre*—field clover
Not Listed
* *Vicia sativa*—garden vetch
UPL
* *Vicia villosa*—winter vetch
Not Listed

FAGACEAE—OAK FAMILY

Notholithocarpus densiflorus—tanoak
Not Listed
Quercus agrifolia—coast live oak
Not Listed

GERANIACEAE—GERANIUM FAMILY

* *Geranium dissectum*—cutleaf geranium
Not Listed
* *Geranium molle*—dovefoot geranium
Not Listed

LAMIACEAE—MINT FAMILY

Clinopodium douglasii—yerba buena
FACU
* *Marrubium vulgare*—horehound
FACU

LAURACEAE—LAUREL FAMILY

Umbellularia californica—California bay
FAC

MONTIACEAE—MONTIA FAMILY

Claytonia perfoliata—miner's lettuce
FAC

PHRYMACEAE—LOPSEED FAMILY

Diplacus aurantiacus—bush monkeyflower
FACU
Erythranthe guttata—common monkey flower
OBL

PLANTAGINACEAE—PLANTAIN FAMILY

* *Plantago lanceolata*—narrowleaf plantain
FACU

RHAMNACEAE—BUCKTHORN FAMILY

Ceanothus cuneatus—wedge leaf ceanothus
Not Listed
Ceanothus papillosus—wart leaf ceanothus
Not Listed

ROSACEAE—ROSE FAMILY

Holodiscus discolor—ocean spray brush
FACU
Rosa gymnocarpa—dwarf rose
FACU
* *Rubus armeniacus*—Himalayan black berry
FAC
Rubus ursinus—California blackberry
FACU

RUBIACEAE—MADDER FAMILY

Galium californicum—California bedstraw
Not Listed

SALICACEAE—WILLOW FAMILY

Salix lasiandra—shining willow
FACW

SAPINDACEAE—SOAPBERRY FAMILY

Acer macrophyllum—bigleaf maple
FACU
Aesculus californica—California buckeye
Not Listed

SAXIFRAGACEAE—SAXIFRAGE FAMILY

Lithophragma affine—San Francisco woodland-star

Not Listed

URTICACEAE—NETTLE FAMILY

Urtica dioica—stinging nettle

FAC

FERNS AND FERN ALLIES

VASCULAR SPECIES

BLECHNACEAE—DEER FERN FAMILY

Woodwardia fimbriata—giant chainfern

FACW

DENNSTAEDTIACEAE—BRACKEN FAMILY

Pteridium aquilinum—western brackenfern

FACU

DRYOPTERIDACEAE—WOOD FERN FAMILY

Dryopteris arguta—coastal woodfern

Not Listed

Polystichum munitum—western swordfern

FACU

EQUISETACEAE—HORSETAIL FAMILY

Equisetum hyemale—scouringrush horsetail

FACW

PTERIDACEAE—BRAKE FAMILY

Adiantum capillus-veneris—common maidenhair

FACW

Pentagramma triangularis—goldback fern

Not Listed

GYMNOSPERMS AND GNETOPHYTES

VASCULAR SPECIES

CUPRESSACEAE—CYPRESS FAMILY

Calocedrus decurrens—incense cedar
Not Listed
Sequoia sempervirens—redwood
Not Listed

PINACEAE—PINE FAMILY

Pinus attenuata—knobcone pine
Not Listed
Pseudotsuga menziesii—Douglas fir
FACU

MONOCOTS

VASCULAR SPECIES

CYPERACEAE—SEDGE FAMILY

Cyperus eragrostis—tall flatsedge
FACW

IRIDACEAE—IRIS FAMILY

Iris douglasiana—Douglas iris
Not Listed

LILIACEAE—LILY FAMILY

Calochortus albus—white fairy-lantern
Not Listed

MELANTHIACEAE—FALSE HELLEBORE FAMILY

Toxicoscordion fremontii—Fremont's deathcamas
Not Listed

POACEAE—GRASS FAMILY

* *Avena fatua*—wild oat
Not Listed
* *Bromus diandrus*—ripgut brome
Not Listed

* *Bromus hordeaceus*—soft brome
FACU
* *Festuca myuros*—rat-tail fescue
Not Listed
* *Festuca perennis*—perennial rye grass
FAC
Festuca rubra—red fescue
FAC
* *Hordeum murinum*—mouse barley
FAC
* *Phalaris aquatica*—Harding grass
FACU

RUSCACEAE—LILY-OF-THE-VALLEY FAMILY

Maianthemum racemosum—feathery false lily of the valley
FAC

* signifies introduced (non-native) species

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APPENDIX C

Data Sheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project City/County: Ben Lomond/Santa Cruz Sampling Date: 4/11/2018
Applicant/Owner: City of Santa Cruz State: CA Sampling Point: SP01
Investigator(s): L. Burris Section, Township, Range: _____
Landform (hillslope, terrace, etc.): bottomland Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): Mediterannean Lat: 37.100564 Long: -122.074412 Datum: UTM Zone 10
Soil Map Unit Name: Nisene-Aptos complex, 30 to 50 percent slopes NWI classification: Freshwater Pond
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ 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	☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Hydric Soil Present?	Yes	☒	No	☐	
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: South of access road, west of crossing at plunge pool. Wetland area at base of rock cliff and adjacent to plunge pool.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer macrophyllum*	60	yes	FACU
2. *Umbellularia californica*	10	no	FAC
3. _____	_____	____	____
4. _____	_____	____	____
50% = 35, 20% = 14	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10')			
1. *Salix lasiolepis*	10	yes	FACW
2. *Aesculus californica*	5	yes	NL (UPL)
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = 7.5, 20% = 3	15	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Carex harfordii*	15	yes	OBL
2. *Lathyrus oderatus*	10	yes	NL (UPL)
3. *Claytonia perfoliata*	5	no	FAC
4. *Rubus ursinus*	5	no	FACU
5. *Persicaria lapathifolia*	5	no	FACW
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = 20, 20% = 8	40	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
% Bare Ground in Herb Stratum 60			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	40	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x1 =	15
FACW species	15	x2 =	30
FAC species	15	x3 =	45
FACU species	65	x4 =	260
UPL species	15	x5 =	75
Column Totals:	125 (A)		425 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

☐ 1 – Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0[1]
☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ 5 - Wetland Non-Vascular Plants[1]
☒ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Leaf litter and bare ground/rocks in herb layer Herbaceous layer is hydrophytic - tree canopy primarily from upland hill above cliff..

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project

SOIL

Sampling Point: SP01

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 2.5/1	90	5YR 4/6	10	C	M	sandy loam	Cobble and bedrock present

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Rock

Depth (inches): 6

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project City/County: Ben Lomond/Santa Cruz Sampling Date: 4/11/2018
Applicant/Owner: City of Santa Cruz State: CA Sampling Point: SP01b
Investigator(s): L. Burris Section, Township, Range: _____
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 6
Subregion (LRR): Mediterannean Lat: _____ Long: _____ Datum: UTM Zone 10
Soil Map Unit Name: Nisene-Aptos complex, 30 to 50 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ 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 ☒	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks: Upland point for SP01a. Upslope and west of SP01a. Rocky and dry.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer macrophyllum*	50	yes	FACU
2. *Umbellularia californica*	5	no	FAC
3. _____			
4. _____			
50% = 27, 20% = 11	55	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10')			
1. *Toxicodendron diversilobum*	10	yes	FAC
2. _____			
3. _____			
4. _____			
5. _____			
50% = 5, 20% = 2	10	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Vicia sativa*	10	yes	UPL
2. *Bromus diandrus*	5	no	NL (UPL)
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
50% = 7, 20% = 2	15	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. *Rubus ursinus*	5	yes	FACU
2. _____			
50% = 2, 20% = 1	5	= Total Cover	
% Bare Ground in Herb Stratum 85			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	25	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x1 =	0
FACW species	0	x2 =	0
FAC species	5	x3 =	15
FACU species	55	x4 =	220
UPL species	15	x5 =	75
Column Totals:	75 (A)		310 (B)

Prevalence Index = B/A = 4.1

Hydrophytic Vegetation Indicators:

☐ 1 – Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0[1]
☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ 5 - Wetland Non-Vascular Plants[1]
☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: Dry, rocky ground at base of hillslope.

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project

SOIL

Sampling Point: SP01b

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 3/2	100					gravel	gravel from road base and bedrock

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: gravel and rock

Depth (inches): 4

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project City/County: Ben Lomond/Santa Cruz Sampling Date: 4/11/2018
Applicant/Owner: City of Santa Cruz State: CA Sampling Point: SP02a
Investigator(s): L. Burris Section, Township, Range: _____
Landform (hillslope, terrace, etc.): bottomland Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): Mediterannean Lat: 37.100788 Long: -122.074513 Datum: UTM Zone 10
Soil Map Unit Name: Nisene-Aptos complex, 30 to 50 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ 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	☐	
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: Seep area at the base of road grade, northwest of plungepool, across access road, adjacent to Newell Creek.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer macrophyllum*	10	yes	FACU
2. *Sequoia sempervirons*	10	yes	NL (UPL)
3. *Pseudotsuga menziesii*	10	yes	FACU
4. _____	_____	____	____
50% = 15, 20% = 6	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10')			
1. *Genista monspessulana*	5	yes	NL (UPL)
2. *Toxicodendron diversilobum*	5	yes	FAC
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = 5, 20% = 2	10	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Cyperus eragrostis*	45	yes	FACW
2. *Equisetum hyamale*	15	yes	FACW
3. *Juncus effusus*	5	no	FACW
4. *Polypogon monspeliensis*	5	no	FACW
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = 35, 20% = 14	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	7	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	43	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x1 =	0
FACW species	70	x2 =	140
FAC species	5	x3 =	15
FACU species	20	x4 =	80
UPL species	15	x5 =	75
Column Totals:	110 (A)		310 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project

SOIL

Sampling Point: SP02a

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	5Y 2.5/1	90	10YR 3/6	10	C	M	sandy loam	bedrock/boulder under soil

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 4

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☒	No	☐	Depth (inches):	
Water Table Present?	Yes	☒	No	☐	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Water seeping from base of hill.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project City/County: Ben Lomond/Santa Cruz Sampling Date: 4/11/2018
Applicant/Owner: City of Santa Cruz State: CA Sampling Point: SP02b
Investigator(s): L. Burris Section, Township, Range: _____
Landform (hillslope, terrace, etc.): bottomland Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): Mediterannean Lat: 37.100564 Long: -122.074412 Datum: UTM Zone 10
Soil Map Unit Name: _____ NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ 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 ☒	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks: Upland point for SP02a. Adjacent to gravel access road north of plunge pool.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer macrophyllum*	10	yes	FACU
2. *Sequoia sempervirens*	10	yes	NL (UPL)
3. *Pseudotsuga menzieseii*	10	yes	FACU
4. _____			
50% = 15, 20% = 6	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10')			
1. *Genista monspessulana*	5	yes	NL (UPL)
2. *Toxiicodendron diversilobum*	5	yes	FAC
3. _____			
4. _____			
5. _____			
50% = 5, 20% = 2	10	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Dryopteris arguta*	10	yes	NL (UPL)
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
50% = 5, 20% = 2	10	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 90*			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	6	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	17	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x1 =	0
FACW species	0	x2 =	0
FAC species	5	x3 =	15
FACU species	20	x4 =	80
UPL species	25	x5 =	125
Column Totals:	50 (A)		220 (B)

Prevalence Index = B/A = 4.4

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: *Leaf duff from conifers on ground.

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project

SOIL

Sampling Point: SP02b

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5YR 2.5/1	100					Loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project City/County: Ben Lomond/Santa Cruz Sampling Date: 4/11/2018
Applicant/Owner: City of Santa Cruz State: CA Sampling Point: SP03
Investigator(s): L. Burris Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Mediterannean Lat: _____ Long: _____ Datum: UTM Zone 10
Soil Map Unit Name: Nisene-Aptos complex, 50 to 75 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ 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	☐	
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒	

Remarks: **Juncus-dominated shelf abovve stream, north of Newell Creek Dam Road bridge over Newell Creek.**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pseudotsuga menziesii*	10	yes	FACU
2. *Acer macrophyllum*	10	yes	FACU
3. *Umbellularia californica*	10	yes	FAC
4. _____			
50% = 15, 20% = 6	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10')			
1. *Genista monspessulana*	5	yes	NL (UPL)
2. _____			
3. _____			
4. _____			
5. _____			
50% = 2.5, 20% = 1	5	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Juncus balticus*	90	yes	FACW
2. *Hedera helix*	5	no	FACU
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
50% = 47, 20% = 19	95	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. *Rubus ursinus*	10	yes	FACU
2. _____			
50% = 5, 20% = 2	10	= Total Cover	
% Bare Ground in Herb Stratum 5			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	40	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x1 =	0
FACW species	90	x2 =	180
FAC species	10	x3 =	30
FACU species	35	x4 =	140
UPL species	5	x5 =	25
Column Totals:	140 (A)		375 (B)

Prevalence Index = B/A = 2.68

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project

SOIL

Sampling Point: SP03

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5YR 3/2	94	7.5YR 5/6	6	C	M	Loam	
10-16	7.5YR 3/1	75	10YR 5/8	5	C	M	Clay loam	
	7.5 YR 3/2	20						

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Tree roots

Depth (inches): 16

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: Water seeping from base of hill.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project City/County: Ben Lomond/Santa Cruz Sampling Date: 4/12/2018
Applicant/Owner: City of Santa Cruz State: CA Sampling Point: SP04a
Investigator(s): L. Burris Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): Mediterannean Lat: _____ Long: _____ Datum: UTM Zone 10
Soil Map Unit Name: Nisene-Aptos complex, 50 to 75 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ 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	☐	**Is the Sampled Area within a Wetland?**	**Yes**	☒	**No** ☐
Hydric Soil Present?	Yes	☒	No	☐				
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: Depression at base of slope, adjecent to and north of the access road in the northwester portion of project site.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Sequioia sempervirens*	25	yes	NL (UPL)
2. _____			
3. _____			
4. _____			
50% = 12.5, 20% = 5	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10')			
1. *Genista monspessulana*	10	yes	NL (UPL)
2. _____			
3. _____			
4. _____			
5. _____			
50% = 5, 20% = 2	10	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Juncus balticus*	30	yes	FACW
2. *Carex densa*	10	no	OBL
3. *Trifolium microcephalum*	10	no	FAC
4. *Vicia americana*	5	no	FAC
5. *Geranium molle*	5	no	NL (UPL)
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
50% = 30, 20% = 12	60	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. *Rubus ursinus*	10	yes	FACU
2. _____			
50% = 5, 20% = 2	10	= Total Cover	

% Bare Ground in Herb Stratum 40

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	25	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	10	x1 =	10
FACW species	30	x2 =	60
FAC species	15	x3 =	45
FACU species	10	x4 =	40
UPL species	40	x5 =	200
Column Totals:	105 (A)		355 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☒ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Tree canopy form surrounding uplands and not hydrophytic, but herbaceous veg dominated by hydrophytic plants.

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project

SOIL

Sampling Point: SP04a

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 3/1	90	7.5YR 4/6	10	C	M	Clay loam	Rock present

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Rock

Depth (inches): 12

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project City/County: Ben Lomond/Santa Cruz Sampling Date: 4/12/2018
Applicant/Owner: City of Santa Cruz State: CA Sampling Point: SP04b
Investigator(s): L. Burris Section, Township, Range: _____
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Mediterannean Lat: _____ Long: _____ Datum: UTM Zone 10
Soil Map Unit Name: Nisene-Aptos complex, 50 to 75 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ 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 ☒	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks: Upland point for SP04a, located just south of SP04 along logging access road.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pseudotsuga menziesii*	50	yes	FACU
2. *Sequoia sempervirens*	10	no	NL (UPL)
3. *Pinus attenuata*	10	no	NL (UPL)
4. _____			
50% = 35, 20% = 14	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10')			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Bromus diandrus*	20	yes	NL (UPL)
2. *Carduus pycnocephalus*	10	yes	NL (UPL)
3. *Geranium molle*	5	no	NL (UPL)
4. *Claytonia parviflora*	5	no	FACU
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
50% = 20, 20% = 8	40	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. *Lonicera hispidula*	15	yes	FACU
2. _____			
50% = 7, 20% = 3	15	= Total Cover	

% Bare Ground in Herb Stratum 60

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x1 =	0
FACW species	0	x2 =	0
FAC species	0	x3 =	0
FACU species	70	x4 =	280
UPL species	55	x5 =	275
Column Totals:	125 (A)		555 (B)

Prevalence Index = B/A = 4.4

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: leaf litter in understory.

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project

SOIL

Sampling Point: SP04b

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 3/2	100					loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project City/County: Ben Lomond/Santa Cruz Sampling Date: 9/6/18
Applicant/Owner: City of Santa Cruz State: CA Sampling Point: SP05
Investigator(s): A. Hatch Section, Township, Range: _____
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Mediterannean Lat: 37.10337 Long: -122.07011 Datum: UTM Zone 10
Soil Map Unit Name: Nisene-Aptos complex, 50 to 75 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ 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	☐	
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒	

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = ____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Juncus occidentalis*	55	yes	FAC
2. *Juncs balticus*	10	no	FAC
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
50% = _____, 20% = _____	40	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. *Rubus armeniacusa*	5	yes	FAC
2. _____			
50% = 7, 20% = 3	15	= Total Cover	
% Bare Ground in Herb Stratum 60			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x1 =	0
FACW species	0	x2 =	0
FAC species	0	x3 =	0
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☒ 1 – Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: leaf litter in understory.

Project Site: Newell Creek Dam Inlet - Outlet Replacement Project

SOIL

Sampling Point: SP05

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	7YR 4/2	100					clay loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Hardpan-like surface from compaction, rocks increase with depth.

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ 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)
- ☐ Stunted or Stresses Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

APPENDIX D

Aquatic Resources Spreadsheet

Waters_Name	State	Cowardin _Code	HGM_ Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
SW-01	CALIFORNIA	PEM2		Area	0.01	ACRE	RPWWN	37.10053549	-122.0744253	Newell Creek
SW-02	CALIFORNIA	PEM2		Area	0.01	ACRE	RPWWN	37.10613759	-122.073135	Newell Creek
Seep-01	CALIFORNIA	PEM1		Area	0.03	ACRE	RPWWD	37.10144764	-122.0743066	Newell Creek
Seep-02	CALIFORNIA	PEM1		Area	0.018	ACRE	RPWWD	37.10080427	-122.0744548	Newell Creek
PD-01	CALIFORNIA	R3RB1		Linear	648.03	FOOT	RPW	37.09620509	-122.0730658	Newell Creek
PD-02	CALIFORNIA	R3RB		Linear	153.83	FOOT	RPW	37.1011878	-122.0743859	Newell Creek
ED-01	CALIFORNIA	R4SB1		Linear	413.79	FOOT	NRPW	37.10118421	-122.0747661	Newell Creek
ED-02	CALIFORNIA	R4SB1		Linear	140.36	FOOT	NRPW	37.09721747	-122.0731645	Newell Creek
ED-03	CALIFORNIA	R6		Linear	318.92	FOOT	NRPW	37.09977296	-122.0738636	Newell Creek
ED-04a	CALIFORNIA	R6		Linear	201.55	FOOT	NRPW	37.09798118	-122.0743952	Newell Creek
ED-04b	CALIFORNIA	R6		Linear	217.41	FOOT	NRPW	37.09779319	-122.0740134	Newell Creek
RS-01	CALIFORNIA	R6		Linear	540.36	FOOT	NRPW	37.0993178	-122.0742973	Newell Creek
SPP-01	CALIFORNIA	L1RB		Area	0.21	ACRE	IMPNDMNT	37.10077911	-122.0741834	Newell Creek
Reservoir-01	CALIFORNIA	L1UB		Area	20.21	ACRE	IMPNDMNT	37.1104584	-122.0646835	Loch Lomond