Aquatic Resources Delineation Report

Live Oak Springs Water System Improvements Project

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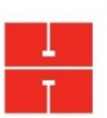

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Acronyms and Abbreviations

County	County of San Diego
Harris	Harris & Associates
NRCS	National Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
project	Live Oak Springs Water System Improvements Project
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
water system	potable water distribution system

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Section A Site Description, Landscape Setting

A.1 Project Location

The County of San Diego (County), Department of Public Works, is proposing improvements and upgrades to the potable water distribution system (water system) on approximately 75.6 acres in the subcommunity of Live Oak Springs, in the Boulevard Community Planning Area of unincorporated southeastern San Diego County, California (Attachment A, Figures; Figure 1, Regional Location, and Figure 2, Project Site). The project site is in Live Oak Springs, at 37820 Old Highway 80, Boulevard, California 91905. The Live Oak Springs Water System Improvements Project (project) site is located northeast of Old Highway 80, south of Interstate 8, and west of Live Oak Trail, and depicted on the U.S. Geological Survey (USGS), the site is in the 7.5-minute Live Oak Springs quadrangle in Township 17 South Range 6 East (Figure 3, USGS Topographic Map). The project site is composed of two areas, the eastern and western areas, which differ in vegetation community composition (Figure 2). The eastern area is mostly developed with the rural residential subcommunity of Live Oak Springs, which contains fragmented patches of both disturbed and high-quality native vegetation. The western area is mostly undeveloped with contiguous areas of both disturbed and high-quality native vegetation, including the Campo Creek riparian corridor, along with some areas of disturbed habitat and developed land. The project site is surrounded by mostly undeveloped, natural open space. The Campo Band of Diegueño Mission Indians Reservation is located to the north and west of the project site. The site is relatively flat with slight undulations in some northern portions of the project site. The project site currently consists of open space and developed land (Figure 2).

A.2 Project Description

The project includes potable water distribution system upgrades and improvements in a phased approach. The goals of the project are to bring the existing water system up to the State Water Resources Control Board's current standards and to upgrade the system to provide a reliable source of water for the community. The project components include construction of a new well, upgrade and replacement of existing water system components, installation of a backup generator for the water system, and an increase in water distribution capacity by 25 percent. These improvements would provide a reliable source of fire suppression and redundant infrastructure to ensure the continued availability of water to the community and to accommodate the additional forecasted demand for water.

Phase I of the project is currently designed and funded and would consist of improvements to convert a pilot well to a secondary well and associated infrastructure to ensure a reliable source of water for the community. The conversion of an existing pilot well to a secondary well would create a backup for the existing primary well. This would involve additional drilling to widen the existing

well hole from 6 to 8 inches in diameter to make the secondary well operational. No additional depth drilling would occur. Phase I would also include installation of up to 50 feet of underground piping to connect the secondary well to the existing water system, installation of electrical and control upgrades and connections, installation of a diesel emergency generator within the existing water system's footprint as backup power to the water system, and placement of gravel, fencing, and a gate around the new well site. Phase I improvements would occur within the existing County-owned parcel and construction is anticipated to last approximately 4 months.

A number of potential future phases of the project have been identified at the concept level but have not yet been designed or funded. They may include construction of two new aboveground 100,000-gallon water storage tanks and associated new water piping, undergrounding or structural support of an existing aerial water line, replacement of an existing underground potable water distribution system piping within the project site and throughout the residential Live Oak Springs, paving of an existing driveway, culvert replacement, and buildout of an additional well. These proposed components are described in subsequent paragraphs, and potential impacts from these later phases will be considered throughout this environmental document.

Water Tanks and Booster Pump Station

Construction of two aboveground 100,000-gallon water storage tanks and a booster pump station is anticipated. The new vertical water tanks would replace two existing horizontal 20,000-gallon water tanks on the western end of the site. The new tanks would either replace the current tanks within the same footprint or be built nearby and at similar elevation. To transition from the existing tanks to new ones, temporary aboveground water tanks may be used, if needed. Construction of the water tanks and the pump station would also require installation of an underground pipeline system to connect various water system components. Sensitive vegetation would be avoided.

Water Distribution Piping

- Other potential future improvements to meet the anticipated demand for potable water and fire suppression include installation of 1,200 linear feet of new piping and realignment or replacement of 400 linear feet of existing underground potable water piping throughout the County-owned parcel. The existing 4-inch water system piping would be replaced with 6-inch lines. The water distribution piping improvements within the County parcel may also include installation of a new water line that would extend south to create a loop within the water system. This would allow distribution of potable water to the adjacent residential community from either the north or the south and would reduce the number of water service interruptions when repairs are needed. These improvements would require excavation to install the new water lines.
- Additional improvements may involve replacement of 50 linear feet of an existing aerial water line that crosses Campo Creek through a suspended support system. Current pipeline may be replaced in the same location with a more stable and secure

utility bridge supported by concrete pier structure, or the waterline may be undergrounded. The undergrounding could potentially result in temporary impacts to Campo Creek if an open-trench method is used. This could result in temporary loss of vegetation and possible dewatering of Campo Creek for the duration of construction.

- Other long-term proposed work includes replacement of existing underground potable water distribution system piping throughout the Live Oak Springs residential subcommunity to increase capacity for fire suppression and potable water distribution flows. This work would consist of excavation and replacement of up to 10,000 linear feet of underground water lines.

Driveway Entrance Off Old Highway 80

To formalize a portion of the existing dirt driveway and access road from the main, northern entrance from Old Highway 80 to the current well site, a concrete driveway is proposed within the existing footprint.

Culvert Crossing Royal Drive

Other associated improvements include replacement of an existing culvert under Royal Drive, located in the southeastern corner of the County-owned parcel. The Campo Creek crossing in this area currently functions as an Arizona crossing because the culvert is almost completely blocked with sediment and the pipe is undersized and, thus, unable to handle an expected 100-year storm event. Therefore, the culvert would be replaced within approximately 20 feet of its current location and designed to convey low flows from Campo Creek with a stabilized road surface to ensure that the road does not wash out during larger rain events. Culvert replacement work could result in temporary impacts to Campo Creek due to excavation and temporary loss of vegetation; however, it is anticipated that no net increase of fill would occur in the creek; therefore, no permanent impacts are expected to occur.

Additional Water Well

Finally, other improvements may include buildout of an additional well to replace the current secondary well, at which time the secondary redundant well would become primary and the present primary well may be decommissioned.

General Construction

Standard construction BMPs, including dust suppression measures, erosion and sediment control measures (sand and gravel bags, fiber rolls, and silt fencing), use of weed-free erosion control products, noise suppression measures, trash containment methods, and preparation and implementation of a Stormwater Pollution Prevention Plan, would be implemented during construction of project components. Upon completion of each project phase, excavated areas

would be backfilled with native soil, restored to the original contours, and hydroseeded using an appropriate native plant seed mix as approved by the County.

Construction duration of future phases would vary; however, collectively, they are anticipated to last approximately 12 to 18 months. Construction of the project phases would largely occur either on the County-owned parcel or within the existing County water line easements. If needed, temporary construction access would be coordinated with the surrounding property owners.

A.3 Landscape Setting

The project site is in a rural subcommunity in the County, primarily surrounded by open space (Figure 2). The project site consists of sensitive and non-sensitive upland and wetland vegetation communities, Campo Creek, and 6 unnamed channels (Channels 1 through 6), and developed areas (rural residential and water infrastructure yards). The project site is composed of two areas, the eastern and western areas, which differ in vegetation community and land use composition (Figure 2). The eastern area is mostly developed with rural residential buildings and roads, as well as some fragmented patches of both disturbed and high-quality native vegetation. The western area of the project site is mostly undeveloped with contiguous areas of both disturbed and high-quality native vegetation, including the Campo Creek riparian corridor, along with some areas of disturbed habitat and developed land.

The project site is primarily flat, with moderately sloping hills on the northern portions of the project site. The on-site elevation ranges from approximately 3,815 feet to 3,953 feet above mean sea level. The topographical lines presented on Figure 3, represent the project elevations.

Subsection B describes the site conditions in more detail.

A.4 Project Site Access

The property owner, the County, granted the U.S. Army Corps of Engineers (USACE) personnel access to the project site, as documented in Attachment B, Statement of Access.

Section B Site Alterations, Current, and Past Land Use

The project site is relatively flat with slight undulations on the northwestern portion of the project site. Campo Creek and its associated drainages have historically been present across the site, but there is evidence that activities associated with the previous owners of the project site and the rural residential development on the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site. This includes a water pipe spanning Campo Creek and a dirt access road crossing Campo Creek, both on the northern portion of the project site.

B.1 Soils

The project site is underlain by Mottsville loamy coarse sand, loamy alluvial, La Posta loamy coarse sand soils, and Tollhouse rocky coarse sandy loam. The soil units on the project site are presented on Figure 4, Soils. Mottsville loamy coarse sand (2 to 9 percent slopes) occurs along the edge of the western portion of the project site and the majority of the eastern portion of the project site. Loamy alluvial soils (0 to 5 percent slopes) occurs on the central and northwestern portion of the project site. La Posta loamy coarse sand (5 to 30 percent slopes) occurs on the central and northern area of the western portion of the project site. A small area of Tollhouse rocky coarse sandy loam (30 to 65 percent slopes) occurs on the southeastern portion of the project site. All four of these soils are defined as well-drained (USDA 2019).

B.2 Hydrology

The project site is in the Tijuana River Watershed, specifically the Campo Hydrologic Area (Hydrologic Unit 911.8) (Project Clean Water 2022). The Tijuana River Watershed encompasses a region of approximately 1,750 square miles on both sides of the US-Mexico border and is the southernmost watershed in the San Diego region. It lies on the southeastern portion of the County and neighbors San Diego Bay, Otay River, and Sweetwater River watersheds to the north and Mexico to the south.

The National Wetlands Inventory (NWI) mapping results show Campo Creek, one tributary connecting to Campo Creek from the northeast, and one freshwater pond connected to Campo Creek as aquatic resources on the project site (Figure 5, National Wetlands Inventory Results). Campo Creek and one freshwater pond connected to Campo Creek identified on the NWI mapping results were observed on the project site. The tributary connecting to Campo Creek from the northeast shown on the NWI mapping results was not observed during the aquatic resources delineation investigation on the project site. This tributary could have occurred historically on the project site prior to the development of the rural residential community on the eastern portion of the project site. The non-wetland Channels 1 through 6 and Ponds 2 and 3 observed on the project site were not identified on the NWI map.

The Tijuana River Estuary is defined by the USACE as a traditionally navigable water (TNW) (USACE 2022a). Campo Creek, a portion of which crosses the project site, is an intermittent tributary of the Tijuana River Estuary and is discussed in detail in Section E, Aquatic Resources Descriptions.

Drainage patterns on and adjacent to the project site show evidence of drainage conveyance alteration due to recent and historical on-site activities. The historical disturbances include changes to the limits of Campo Creek and its tributary channels that likely resulted during the construction of the rural residential development in the eastern portion of the project site. The recent mechanical disturbances include evidence of vehicles driving through Campo Creek and the use of heavy equipment along the bank of portions of Campo Creek to remove trash that had been previously dumped in the creek. While historical and recent disturbance is evident, the drainage patterns appear to continue to be natural. Campo Creek is on the 2018 CWA Section 303(d) List of Impaired Water Bodies (Approved June 2021) because it does not meet federal and state water quality standards (California Water Boards 2021).

B.3 Vegetation

Thirteen vegetation communities and land use types were observed on the project site. These include coastal and valley freshwater marsh, non-vegetated channel, fresh water, non-native grassland, scrub oak chaparral, southern arroyo willow riparian forest, montane manzanita chaparral, coast live oak woodland (disturbed), big sagebrush scrub (disturbed), buck brush chaparral, chamise chaparral, disturbed habitat, and urban/developed land (Baldwin et al. 2012; Oberbauer et al. 2008; Holland 1986). Table 1 presents the acreages of the vegetation communities that occur on the project site. Figure 6, Vegetation Communities and Land Cover Types, presents the vegetation community boundaries.

Vegetation mapping conducted on the project site in 2010 by RBF Consulting for Live Oak Springs Solar documented montane meadow, a County sensitive and potentially federal and state jurisdictional resource, in the central portion of the project site surrounding the riparian and Campo Creek corridor (RBF Consulting 2010). The areas mapped as montane meadow in 2010 by RBF Consulting were not observed during the vegetation mapping or the rare plant surveys conducted for the project in 2021. These areas were determined to instead be characteristic of the non-native grassland vegetation community. The non-native grassland mapped on the project site is described in Section B.3.11, Non-Native Grassland (42200). The transition from montane meadow to non-native grassland and/or the expansion of the non-native grassland surrounding the montane meadow likely occurred as a result of the increasing drought conditions that have been documented in the 11 years since the 2010 RBF Consulting survey (NOAA 2022) and the aggressive nature of the species of non-native grasses and forbs. The waning of El Niño conditions over the Pacific (warm, wet climatic conditions) from 2009 into 2010 and the strengthening of La Niña conditions (cool, dry climatic conditions) in the end of 2010 through 2013 is thought to be what brought on

severe and extreme drought conditions that occurred from 2013 through 2016 (NASA 2022; NOAA 2022). Abnormally dry and severe drought conditions were documented from 2016 to July 2021 when the vegetation mapping was conducted for the project (NOAA 2022). Further, historical and recent disturbance observed throughout the project site, especially surrounding the Campo Creek corridor (described further in Section E) likely altered the drainage patterns on the project site and introduced non-native grasses, causing a transition from montane meadow to non-native grassland in the central portion of the project site.

Table 1. Vegetation Communities and Land Cover Types on the Project Site

Vegetation Community and Land Cover Type	Project Site (acres)[1]
Riparian	
Coastal and valley freshwater marsh (52410)	0.04
Non-vegetated channel (64200)	0.75
Fresh water (64140)	1.26
Southern arroyo willow riparian forest (61320)	1.70
Subtotal	*3.75*
Scrub and Chaparral	
Big sagebrush scrub (and disturbed) (35210)	0.56
Buck brush chaparral (37810)	0.16
Chamise chaparral (37200)	0.50
Montane manzanita chaparral (37520)	1.95
Scrub oak chaparral (37900)	0.10
Subtotal	*3.27*
Woodland	
Coast live oak woodland (and disturbed) (71160)	10.70
Subtotal	*10.70*
Upland	
Non-native grassland (42200)	18.40
Subtotal	*18.40*
Disturbed/Developed	
Disturbed habitat (11300)	2.30
Urban/Developed land (12000)	34.40
Subtotal	*36.70*
Total	**72.82**

Sources: County of San Diego 1998, 2010; Holland 1986; Oberbauer et al. 2008.

Notes: MSCP = Multiple Species Conservation Program; NA = not applicable

[1] Acreages rounded up to one-hundredth

The vegetation communities observed on the project site are described in the following subsections.

B.3.1 Coastal and Valley Freshwater Marsh (52410)

Coastal and valley freshwater marsh is dominated by perennial, emergent monocots that often form completely closed canopies (Oberbauer et al. 2008). Sedges (*Scirpus* sp.) and broadleaf cattail (*Typha* sp.) often dominate coastal and valley freshwater marsh vegetation communities.

Approximately 0.04 acre of coastal and valley freshwater marsh occurs on the southernmost portion of the project site directly south of the fresh water pond created by the concrete dam and spillway within Campo Creek (Figure 6). On the project site, coastal and valley freshwater marsh is dominated by broadleaf cattail and cluster field sedge (*Carex praegracilis*).

B.3.2 Non-Vegetated Channel (64200)

Non-vegetated channel consists of predominantly sandy, gravelly, or rocky channels lacking or with reduced vegetation. Variable water lines inhibit the growth of vegetation, although some weedy species of grasses may grow along the outer edges of the channel. Vegetation may exist here but is usually less than 10 percent of the total cover (Oberbauer et al. 2008).

Approximately 0.75 acre of non-vegetated channel occurs on the project site. The 0.75 acre of non-vegetated channel occurs within Campo Creek and six non-vegetated earthen bottom channels (Channels 1 through 6). Campo Creek and Channels 1 through 6 occur on the northwestern, central-western, and southwestern portions of the project site (Figure 6).

B.3.3 Fresh Water (64140)

Fresh water includes year-round bodies of fresh water in the form of lakes, streams, ponds, or rivers. This includes those portions of water bodies that are usually covered by water and contain less than 10 percent of vegetated cover (Oberbauer et al. 2008).

Approximately 1.26 acres of fresh water occurs on the project site. Three fresh water ponds are present on the central-western and southern portions of the project site (Figure 6). A concrete dam and spillway occurs within Campo Creek on the southern portion of the project site. This concrete dam and spillway have formed one of the three fresh water ponds on the southern portion of the project site.

B.3.4 Southern Arroyo Willow Riparian Forest (61320)

Southern arroyo willow riparian forest is a winter-deciduous riparian forest dominated by broad-leafed trees and arroyo willow (*Salix lasiolepis*). Typically it consists of a moderately tall, closed, or nearly closed canopy, with an understory of shrubby willows. Southern arroyo willow riparian forest is characterized by the presence of several species besides arroyo willow, including San Diego sagewort (*Artemisia palmeri*), mulefat (*Baccharis salicifolia*), manroot (*Marah macrocarpus*), California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*),

Goodding's willow (*Salix gooddingii*), narrowleaf willow (*Salix exigua*), and yellow willow (*Salix lasiandra*). Southern arroyo willow riparian forest occurs in sub-irrigated and frequently overflowed areas along rivers and streams that are perennially wet (Oberbauer et al. 2008).

Approximately 1.70 acres of southern arroyo willow riparian occurs on the central and western portions of the project site (Figure 6). The southern arroyo willow riparian forest on the project site is dominated by arroyo willow with non-native weeds and grass species in the understory.

B.3.5 Big Sagebrush Scrub (disturbed) (35210)

Big sagebrush scrub contains primarily soft-woody shrubs, usually with bare ground underneath and between shrubs (Oberbauer et al. 2008). Big sagebrush (*Artemisia tridentata*) is dominant. Growth of big sagebrush scrub occurs mostly in late spring and early summer, with some species flowering in late spring (blackbrush [*Coleogyne*], bitterbrush [*Purshia* sp.]) and some in early fall (sagebrushes and wormwoods [*Artemisia* sp.], rabbitbrush [*Chrysothamnus* sp.]).

Approximately 0.56 acre of big sagebrush scrub (and disturbed) occurs in the western and central portions of the project site (Figure 6).

Approximately 0.43 acre of high-quality big sagebrush scrub occurs in the northwestern and western portions of the project site (Figure 6). On the project site, high-quality big sagebrush scrub is dominated by dense big sagebrush.

Approximately 0.13 acre of disturbed big sagebrush scrub occurs on the central portion of the project site (Figure 6). On the project site, disturbed big sagebrush scrub is dominated by big sagebrush with non-native weeds and grass species in the understory.

B.3.6 Buck Brush Chaparral

Buck brush chaparral is a dense chaparral that is clearly dominated by buck brush (*Ceanothus cuneatus*) with some mixture of chamise (*Adenostoma fasciculatum*) (Oberbauer et al. 2008). Cover in buck brush chaparral is higher than in Chamise Chaparral but is not so dense because the branches are not so interwoven.

Approximately 0.16 acre of buck brush occurs on the northwestern and southeastern portions of the project site (Figure 6). On the project site, buck brush is dominated by buck brush with chamise and a sparse understory of non-native weeds and grass species.

B.3.7 Chamise Chaparral (37200)

Chamise chaparral is a tall chaparral overwhelmingly dominated by chamise with associated species contributing little cover in this vegetation community (Oberbauer et al. 2008). Mature stands of chamise chaparral are densely interwoven with very little herbaceous understory or litter. Chamise chaparral is adapted to repeated fires by stump sprouting.

Approximately 0.50 acre of chamise chaparral occurs on the northwestern portion of the project site (Figure 6). On the project site, chamise chaparral is dominated by chamise with a primarily open understory.

B.3.8 Montane Manzanita Chaparral (37520)

Montane manzanita chaparral is a dense 2- to 5-meter tall chaparral dominated by any species of manzanita (Oberbauer et al. 2008). This vegetation community may occur as a post-fire successional stage.

Approximately 1.95 acre of montane manzanita chaparral occurs on the northeastern portion of the project site (Figure 6). On the project site, montane manzanita chaparral is dominated by eastwood manzanita (*Arctostaphylos glandulosa*).

B.3.9 Scrub Oak Chaparral (37900)

Scrub oak chaparral is a dense, evergreen chaparral dominated by inland scrub oak (*Quercus berberidifolia*), Nuttal's scrub oak (*Quercus dumosa*) and mountain mahogany (*Cercocarpus betuloides*). Scrub oak chaparral usually occurs in small patches with a variety of other vegetation communities (Oberbauer et al. 2008). Approximately 0.10 acre of scrub oak chaparral occurs on the western edge of the project site (Figure 6). Scrub oak chaparral on the project site is dominated by inland scrub oak.

B.3.10 Coast Live Oak Woodland (disturbed) (71160)

Coast live oak woodland is dominated by coast live oak (*Quercus agrifolia*), an evergreen, with a poorly developed shrub layer that often includes toyon (*Heteromeles arbutifolia*), currents and gooseberries (*Ribes* sp.), laurel sumac (*Malosma laurina*), or dominated by Mexican elderberry (*Sambucus mexicana*) (Oberbauer et al. 2008). The herb component of coast live oak woodland is continuous and dominated by ripgut brome and other non-native grass species.

Approximately 10.70 acres of coast live oak woodland (and disturbed) occurs across the project site (Figure 6).

Approximately 3 acres of coast live oak woodland occurs primarily in the southwestern portion of the project site, with smaller patches in the northwestern, north-central, and southeastern portions of the project site (Figure 6). On the project site, the coast live oak woodland is dominated by dense interior coast live oak.

Approximately 7.70 acres of disturbed coast live oak woodland occurs on the southwestern and south-central portions of the project site. On the project site, the disturbed coast live oak woodland is dominated by interior coast live oak with ripgut brome and other non-native weeds and grass species in the understory.

B.3.11 Non-Native Grassland (42200)

Non-native grassland consists of a dense to sparse cover of flowering annual grasses measuring approximately 3 feet high. It may occur where disturbance by maintenance (e.g., mowing, scraping, disking, spraying), grazing, repetitive fire, agriculture, or other mechanical disruption has altered soils and removed native seed sources from areas formerly supporting native vegetation. Non-native grassland typically occurs adjacent to roads or other developed areas where there has been some historical disturbance. Native wildflowers are often associated with this community, especially in years of favorable rainfall. Common plant species observed in non-native grasslands within the County include smooth barley (*Hordeum murinum*), ripgut grass (*Bromus diandrus*), slender wild oat (*Avena barbata*), and foxtail chess (*Bromus madritensis*) (Oberbauer et al. 2008).

Non-native grassland is the most dominant vegetation community on the project site and occurs on approximately 18.40 acres (Figure 6). It contains over 10 species of non-native grasses and also contains three native species of grasses. Non-native grasses in the grassland area of the project site consists mainly of ripgut grass, slender wild oat, soft chess (*Bromus hordeaceus*), foxtail chess (*Bromus rubens*), cheat grass (*Bromus tectorum*), smooth barley (*Hordeum murinum* ssp. g*laucus*), rat-tail fescue (*Festuca myuros),* and tall fescue (*Festuca arundinacea*). The native species of grass observed were California brome (*Bomus carinatus* var. *carinatus*), blue wild-rye (*Elymus glaucus* ssp. *glaucus*), and coast range melic (*Melica imperfecta*). California Native Plant Society Rank 1B.2 Jacumba milkvetch (*Astragalus douglasii* var. *perstrictus*) occurs in the non-native grassland vegetation community on the western portions of the project site along the dirt entrance/access road (Figure 6).

B.3.12 Disturbed Habitat (11300)

Disturbed habitat consists of previously disturbed areas that either are devoid of vegetation (dirt roads/trails) or support scattered non-native plant species such as ornamentals or ruderal exotic species that take advantage of disturbance such as black mustard (*Brassica nigra*), short-pod mustard (*Hirschfeldia incana*), and *Erodium* species. These species are non-native and are typically found in disturbed habitats, particularly in areas that have been graded, repeatedly cleared for fuel management purposes, and/or experienced repeated use that prevents natural revegetation (Oberbauer et al. 2008).

Disturbed habitat comprises approximately 2.30 acres on the project site (Figure 6). Disturbed habitat on the project site is dominated by bare ground and species of mustard and other non-native plant species. There are innumerable dirt roads that provide residential access to the community of Live Oak Springs, as not all roads are paved leading into and throughout the urban developed areas. There are also dirt access roads to wells maintained by the County Department of Public Works.

B.3.13 Urban/Developed Land (12000)

Urban/developed represents areas that have been constructed on or otherwise physically altered to an extent that native vegetation communities are not supported (Oberbauer et al. 2008). This land cover type generally consists of semi-permanent structures, homes, parking lots, pavement or hardscape, and landscaped areas that require maintenance and irrigation (e.g., ornamental greenbelts). Typically, this land cover type is unvegetated or supports a variety of ornamental plants and landscaping.

Urban/developed land on the project site comprises approximately 34.40 acres and consists of the rural residential community in the eastern portion of the project site and maintenance storage yards on the southwestern portion of the project site (Figure 6). The urban developed areas also contain pockets of leftover native habitats and tree species that exist among the homes and other structures in the community.

Section C Precipitation Data and Analysis

C.1 Climate and Growing Season

On a regional level, San Diego County has a Mediterranean climate, which is characterized by wet winters and dry summers. This is largely because of a semi-permanent high-pressure zone that sits over the Pacific Ocean during much of the year and forms a fog belt (marine layer). The survey area is generally located within the Peninsular Range of Southern California. Generalized climate in the region is regarded as dry, subhumid mesothermal, with warm dry summers and cold moist winters, which pushes the growing season to the wet months of the year (late winter to early spring). Vegetation often goes dormant (senescent) during the later summer months until initial rains start in the fall. The rainy season typically lasts from October through March.

The closest weather station to the project site is in Campo approximately 9.5 miles southwest of the project site (NRCS 2022). Between 2019 and 2021, the average maximum temperature was 77 degrees Fahrenheit, and the minimum temperature was 41 degrees Fahrenheit. The average annual precipitation between 2010 and 2020 was approximately 17.15 inches. In 2020, the total rainfall was 10.30 inches, approximately 15.15 inches less than the previous year (NRCS 2022). As of April 2021, when the delineation fieldwork was conducted, the total precipitation in the area was 7.23 inches, approximately 0.75 inch less than April 2020.

C.2 Antecedent Precipitation Tool and NRCS WETS Table Results Summary

A typical rainfall year in San Diego has historically been expressed by 11 inches of annual precipitation. In order to calculate whether the 2021 aquatic resources delineation was conducted during a wet, dry and typical rainfall year, the Harris & Associates (Harris) aquatic resources specialists used the Antecedent Precipitation Tool Version 1.0.19 (USACE 2022b). The Antecedent Precipitation Tool results determined the 2021 aquatic resources delineation was conducted in normal conditions for precipitation in the dry season (see Attachment C, Antecedent Precipitation Tool and NRCS WETS Table Results).

The National Resources Conservation Service (NRCS) Wetland Climate Table for 1971–2021 at Campo, California, is in Attachment C. The average annual precipitation in the area surrounding the project site over the past 10 years was 17.15 inches, with precipitation occurring primarily between October and March.

C.3 Wetland Hydrology and Analysis

The Harris aquatic resources specialists reviewed historical and current aerial imagery, topographic maps, and NWI maps. The NWI results are presented on Figure 5. The NWI maps show Campo Creek, one tributary to the creek, and one freshwater pond as aquatic resources on the project site. Historical and current aerial imagery depict Campo Creek and associated

drainages, and several freshwater ponds as historically occurring on the project site. The USGS topographic map of the project site is provided on Figure 3. The hydrologic conditions on the project site are described in Section B.2.

Section D Methods

D.1 Pre-Field Review

Prior to conducting fieldwork, aquatic resources specialists referenced the following materials:

- Topographic maps
- Aerial imagery (Google Earth from 1994–2020)
- U.S. Fish and Wildlife Service NWI Online Wetland Mapper (USFWS 2021)
- U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey for the project site, which lists hydric soils found in San Diego County (USDA 2019)

D.2 On-Site Aquatic Resources Delineation

The aquatic resources delineation was conducted using the routine on-site determination method described in the USACE Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region (USACE 2008a). Emily Mastrelli, Katie Laybourn, and Lizzie DeLuca, Harris aquatic resources specialists, conducted the aquatic resources delineation fieldwork on April 28, 2021, and May 7, 2021, to identify aquatic resources on the project site. The aquatic resources specialists completed Arid West Region Ordinary High Water Mark (OHWM) and wetland determination data sheets for each unique aquatic resources feature on the project site (Attachment D, Arid West Ordinary High Water Mark and Wetland Determination Datasheets).

Sampling points were taken in each of the unique aquatic resources features, including the excavation of a wetland soil pit in Campo Creek where soil saturation and wetland vegetation was observed in the channel to investigate the presence of a three-parameter wetland. Figure 7, Aquatic Resources Ordinary High Water Mark for the Live Oak Springs Project, shows the sampling points associated with the on-site aquatic resources. Figure 7 was created in adherence with the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program and can be referenced in Attachment A (USACE 2016). Representative photographs of the aquatic resources on the project site are provided in Attachment E, Photographic Log. The delineation methods conducted at each of the sampling points are described in detail below.

Sampling point NW-1 was taken in the center of Campo Creek on the northern portion of the project site where an OHWM was observed to determine the extent of the non-wetland feature (Figure 7; Photograph 1). Because an OHWM was observed at sampling point NW-1, an Arid West Region OHWM data sheet was completed. The delineation results for sampling point 1 are presented in Section E.

Sampling point NW-2 was taken in the center of Campo Creek on the northern portion of the project site where the OHWM was observed narrow compared to sampling point NW-1 to determine the

extent of the non-wetland feature (Figure 7; Photograph 2). The delineation results for sampling point NW-2 are presented in Section E.

Sampling point NW-3 was taken in the center of Campo Creek on the northern portion of the project site where the OHWM was observed to widen compared to sampling point NW-2 to determine the extent of the non-wetland feature (Figure 7; Photograph 3). The delineation results for sampling point NW-3 are presented in Section E.

Sampling point NW-4 was taken in the center of Campo Creek on the central portion of the project site where the OHWM was observed to widen compared to sampling point NW-3 to determine the extent of the non-wetland feature (Figure 7; Photograph 4). The delineation results for sampling point NW-4 are presented in Section E.

Sampling point NW-5 was taken in the center of Campo Creek on the central portion of the project site where wetland sampling point W-1 was taken and where an OHWM was observed to determine the extent of the non-wetland feature (Figure 7; Photograph 5). The delineation results for sampling point NW-5 are presented in Section E.

Because surface water and soil saturation were observed in the reach of Campo Creek on the central portion of the project site, a USACE three-parameter wetland determination data form, Arid West Region (wetland determination data form) was completed at wetland sampling point W-1 to determine the presence of an emergent wetland in the center of this reach of Campo Creek (Figure 7; Photograph 6). The three-parameters included hydrophytic vegetation, hydric soil, and hydrology. In order to meet the USACE definition of a wetland, the sampling area needs to have hydrophytic vegetation, hydric soils, and wetland hydrology as defined in the 1987 USACE Wetland Delineation Manual and the 2008 Arid West Regional Supplement. The Regional Water Quality Control Board uses the same wetlands parameters as the USACE. However, unlike the USACE, the Regional Water Quality Control Board also includes in their wetland definition any area of hydric indicators void of hydrophytic vegetation (SWRCB 2021). The delineation results for sampling point W-1 are presented in Section E.

Sampling point NW-6 was taken in the center of Campo Creek on the central portion of the project site where the OHWM was observed to narrow compared to sampling point NW-5 to determine the extent of the non-wetland feature (Figure 7; Photograph 7). The delineation results for sampling point NW-6 are presented in Section E.

Sampling point NW-7 was taken in the center of Campo Creek on the central portion of the project site where the OHWM was observed to narrow compared to sampling point NW-6 to determine the extent of the non-wetland feature (Figure 7; Photograph 8). The delineation results for sampling point NW-7 are presented in Section E.

Sampling point NW-8 was taken in the center of a tributary (Channel 1) branching west of Campo Creek on the central portion of the project site where an OHWM was observed to determine the extent of the non-wetland feature Channel 1 (Figure 7; Photograph 11). A freshwater detention pond (Pond 2) was observed and measured approximately 50 feet west of sampling point NW-8. The delineation results for sampling point NW-8 are presented in Section E.

Sampling point NW-9 was taken in the center of Campo Creek on the central portion of the project site where the OHWM was observed to widen compared to sampling point NW-7 to determine the extent of the non-wetland feature (Figure 7; Photograph 9). The delineation results for sampling point NW-9 are presented in Section E.

Sampling point NW-10 was taken in the center of a tributary (Channel 2) branching west of Campo Creek on the central portion of the project site where an OHWM was observed to determine the extent of the non-wetland feature Channel 2 (Figure 7; Photograph 12). The delineation results for sampling point NW-10 are presented in Section E.

Sampling point NW-11 was taken in the center of a tributary (Channel 3) branching east of Campo Creek on the central portion of the project site where an OHWM was observed to determine the extent of the non-wetland feature Channel 3 (Figure 7; Photograph 13). A freshwater detention pond (Pond 3) was observed and measured approximately 20 feet east of sampling point NW-11. The delineation results for sampling point NW-11 are presented in Section E.

Sampling point NW-12 was taken in the center of a tributary (Channel 4) branching east of Campo Creek on the central portion of the project site where an OHWM was observed to determine the extent of the non-wetland feature Channel 4 (Figure 7; Photograph 14). The delineation results for sampling point NW-12 are presented in Section E.

Sampling point NW-13 was taken in the center of a tributary (Channel 5) of Campo Creek that runs parallel to and east of the creek on the central portion of the project site where an OHWM was observed to determine the extent of the non-wetland feature Channel 5 (Figure 7; Photograph 15). The delineation results for sampling point NW-13 are presented in Section E.

Sampling point NW-14 was taken in the center of an eastern branch (Channel 6) of the tributary of Campo Creek that runs parallel to and east of the creek where sampling point NW-13 was taken on the central portion of the project site where an OHWM was observed to determine the extent of the non-wetland feature Channel 6 (Figure 7; Photograph 16). The delineation results for sampling point NW-14 are presented in Section E.

Sampling point NW-15 was taken in the center of Campo Creek south of a freshwater pond (Pond 1) created by a concrete dam on the southern portion of the project site where the OHWM was observed to determine the extent of the non-wetland feature (Figure 7; Photograph 10). The delineation results for sampling point NW-15 are presented in Section E.

Sampling point W-2 was taken at the edge of the freshwater Pond 1 (Figure 7; Photograph 17). Pond 1 appears to have been formed after the construction of a concrete dam within Campo Creek in the southern portion of the project site. The delineation results for sampling point W-2 are presented in Section E.

Sampling point W-3 was taken at the edge of the freshwater Pond 2 (Figure 7; Photograph 18). Pond 2 may have formed as a result of the rural residential development to the east as well as the construction and maintenance of water infrastructure to the west. These activities may have disturbed and altered the flows in and surrounding Campo Creek. The delineation results for sampling point W-3 are presented in Section E.

Sampling point W-4 was taken at the edge of the freshwater Pond 3 (Figure 7; Photograph 19). Pond 3 may have formed as a result of flooding and erosion from Channels 5 and 6 flows converging through Channel 3 to Campo Creek. Stormwater runoff from the nearby rural residential community may also contribute water to Pond 3 which then flows into Channel 3 and Campo Creek. The delineation results for sampling point W-3 are presented in Section E.

D.3 On-Site Ordinary High Water Mark Investigation

The aquatic resources delineation was conducted using the routine on-site determination method described in A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States: A Delineation Manual (USACE 2008b). As described in the previous subsection, the majority of the project site consists of open space and developed land in a rural area.

Following the guidance in A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States: A Delineation Manual (USACE 2008b), the aquatic resources specialists collected and recorded data on vegetation, soil, and hydrologic characteristics used as the basis for OHWM determinations. The aquatic resources specialists completed an Arid West Region OHWM data sheet for Campo Creek and the other non-wetland Channels 1 through 6 on the project site (Attachment D). The aquatic resources specialists identified the OHWM in Campo Creek (sampling points NW-1 through NW-7, NW-9, and NW-15) and the non-wetland tributary Channels 1 through 6 (sampling points NW-8 and NW-10 through NW-14) based on field observations of presence of OHWM or defined non-wetland water indicators, including changes in sediment texture, vegetation species or cover, break in bank slope, and floodplain contours in each of the non-wetland aquatic resources features (USACE 2008b). Results of the OHWM identifications conducted for sampling points NW-1 through NW-15 are presented in Section E.

D.4 Streamflow Duration Assessment

The Streamflow Duration Assessment Method (SDAM) for the Arid West was completed for each of the unique aquatic resources on the project site, including Campo Creek, Channels 1 through 6, and Ponds 1 through 3 (USEPA 2021) (Attachment F, SDAM Forms). SDAMs are rapid field assessment methods that use hydrological, geomorphological, and/or biological indicators, observable in a single site visit, to classify streamflow duration as perennial, intermittent, or ephemeral at the reach scale. The SDAM results for Campo Creek, Channels 1 through 6, and Ponds 1 through 3 are presented in Section E.

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Section E Aquatic Resources Descriptions

E.1 Non-Wetland Waters

Campo Creek and Channels 1 through 6 observed on the project site were determined to be non-wetland waters. The non-wetland waters observed on the project site are summarized in Table 2 and described in the following subsections.

Table 2. Non-Wetland Waters on the Project Site

Feature	Non-Wetland Waters (acres)	Linear Feet
Campo Creek	0.600	1,949
Channel 1	0.006	93
Channel 2	0.003	47
Channel 3	0.004	35
Channel 4	0.040	233
Channel 5	0.080	720
Channel 6	0.020	84
Total[1]	**0.75**	**3,161**

Notes:

[1] Total rounded to one-hundredth of an acre.

The completed Arid West Region OHWM data sheets and one wetland determination data sheet for Campo Creek (sampling points NW-1 through NW-7, NW-9, and NW-15) and the non-wetland tributary Channels 1 through 6 (sampling points NW-8 and NW-10 through NW-14) are in Attachment D. Representative photographs of Campo Creek and the non-wetland tributary Channels 1 through 6 are provided in Attachment E. Electronic Geographic Information Spatial (GIS) data of the aquatic resources on the project site is included in Attachment G, GIS Data. The USACE Aquatic Resources Table for the aquatic resources observed on the project site is provided in Attachment H, ORM Bulk Upload Aquatic Resources Spreadsheet.

E.1.1 Campo Creek

The extent of Campo Creek that runs through the project site begins on the northwestern portion of the project site and runs approximately 1,949 linear feet southeast to the southern edge of the project site. The entire Campo Creek channel on the project site is defined by an OHWM that varies in width between 1 foot at its narrowest and 28 feet at its widest (Figure 7). As discussed in Section D.4, Streamflow Duration Assessment, the SDAM conducted for Campo Creek determined it is an intermittent stream (Attachment F).

E.1.1.1 Ordinary High Water Mark Analysis

Campo Creek is an approximately 0.60 acre (1,949 linear feet) non-wetland water that runs through the western portion of the project site (Table 2; Figure 7). Figure 7 shows all sampling points (NW-

1 through NW-7, NW-9, and NW-15) collected in Campo Creek, which were located within the OHWM of the creek. Attachment E, Photographs 1 through 10, provides representative views of the extent of Campo Creek on the project site. The OHWM indicators were investigated at sampling points NW-1 through NW-7, NW-9, and NW-15. The OHWMs documented at sampling points NW-1 through NW-7, NW-9, and NW-15 are described below.

Sampling Point NW-1: The OHWM is approximately 13 feet wide and 0.5 foot deep (Photograph 1). The other OHWM indicators observed at sampling point NW-1 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. The Campo Creek channel at sampling point NW-1 has upland scrub and grasses growing in the channel and on the banks. At sampling point NW-1, Campo Creek is surrounded by non-native grassland. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-1 are a mix of medium sandy particles and pebbles.

Sampling Point NW-2: The OHWM is approximately 6.5 feet wide and 0.5 foot deep (Photograph 2). The other OHWM indicators observed at sampling point NW-2 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. The Campo Creek channel at sampling point NW-2 has upland scrub and grasses growing in the channel and on the banks. At sampling point NW-2, Campo Creek is surrounded by non-native grassland. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-2 are a mix of medium sandy particles and pebbles.

Sampling Point NW-3: The OHWM is approximately 25.5 feet wide and 0.5 foot deep (Photograph 3). The other OHWM indicators observed at sampling point NW-3 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. The Campo Creek channel at sampling point NW-3 has upland scrub and grasses growing at the edges of the channel and on the banks. At sampling point NW-3, Campo Creek is surrounded by non-native grassland. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-3 are a mix of medium sandy particles and pebbles.

Sampling Point NW-4: The OHWM is approximately 28 feet wide and 0.5 foot deep (Photograph 4). The other OHWM indicators observed at sampling point NW-4 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. The Campo Creek channel at sampling point NW-4 has upland scrub and grasses growing in the channel and on the banks with mature trees growing along the edges of the channel. At sampling point NW-4, Campo Creek is surrounded by non-native grassland. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-4 are a mix of medium sandy particles and pebbles.

Sampling Point NW-5: The OHWM is approximately 17 feet wide and 0.5 foot deep (Photograph 5). The other OHWM indicators observed at sampling point NW-5 include a change in vegetation

species and cover, a break in bank slope, and the presence of a defined bed and bank. Standing water was observed in the center of the Campo Creek channel at sampling point NW-5. This portion of the channel has herbaceous plants and upland scrub and grasses growing in the channel and on the banks. Evidence of mechanical disturbance was observed on the western bank of the channel at sampling point NW-5. At sampling point NW-5, Campo Creek is surrounded by non-native grassland. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-5 are a sandy loam.

Sampling Point NW-6: The OHWM is approximately 9 feet wide and 1 foot deep (Photograph 7). The other OHWM indicators observed at sampling point NW-6 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. Flowing water and soil saturation was observed in the center of the Campo Creek channel at sampling point NW-6. This portion of the channel has algae, herbaceous plants, upland grasses, and mature willow trees growing in the channel and on the banks. At sampling point NW-6, Campo Creek is surrounded by non-native grassland. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-6 are a sandy loam.

Sampling Point NW-7: The OHWM is approximately 1 foot wide and 0.5 foot deep (Photograph 8). The other OHWM indicators observed at sampling point NW-7 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. Flowing water and soil saturation was observed in the center of the Campo Creek channel at sampling point NW-7. This portion of the channel has herbaceous plants and upland grasses growing in the channel and on the banks. At sampling point NW-7, Campo Creek is surrounded by non-native grassland. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-7 are a sandy loam.

Sampling Point NW-9: The OHWM is approximately 7 feet wide and 0.5 foot deep (Photograph 9). The other OHWM indicators observed at sampling point NW-9 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. Flowing water and soil saturation was observed in the center of the Campo Creek channel at sampling point NW-9. This portion of the channel is primarily unvegetated, but has some hydrophytic plants and upland grasses growing in the channel and on the banks. At sampling point NW-9, Campo Creek is surrounded by willow riparian forest. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-9 are a silt loam.

Sampling Point NW-15: The OHWM is approximately 24 feet wide and 1 foot deep (Photograph 10). The other OHWM indicators observed at sampling point NW-15 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. A concrete dam and spillway occur approximately 75 feet north of sampling point NW-15, upstream of which a water detention pond (Pond 1) has formed. Standing water and soil saturation

was observed in the center of the Campo Creek channel at sampling point NW-15. This portion of the channel includes an in-channel wetland with hydrophytic plants in the channel, wetland hydrology and soils observed from the apparent ponding and soil saturation. At sampling point NW-15, Campo Creek is surrounded by willow riparian forest and developed land. Campo Creek is significantly lower in elevation than the surrounding project site and the soils at sampling point NW-15 are a silt loam.

E.1.1.2 Aquatic Resources Delineation Results

The aquatic resources delineation point W-1 described below is located within the OHWM of Campo Creek. Figure 7 shows the results at sampling point W-1 taken in Campo Creek during the aquatic resources delineation. The completed wetland determination data form for sampling point W-1 is in Attachment D.

Sampling Point W-1: The data collected at sampling point W-1 determined that wetland hydrology and hydrophytic vegetation were present and hydric soils were not present (Figure 7; Photograph 6). Standing water and soil saturation was observed in the central portion of Campo Creek adjacent to sampling point W-1. The soil pit dug at sampling point W-1 immediately filled with water, indicative of soil saturation. However, no hydric soil indicators were observed in the soils. This lack of soil indicators could be due to the soils being a mix of small and large sand grains that do not exhibit typical hydric soil indicators. There is also evidence of a high water table under this portion of Campo Creek because surface water and soil saturation did not occur in the upstream of sampling point W-1 (between sampling points NW-4 and NW-5, described previously). Obligate wetland plant species, including San Diego sedge (*Carex spissa*) and bulrush (*Cyperus papyrus*) were observed in the channel and were determined to be the most prevalent at the sampling point. This portion of Campo Creek shows signs of disturbance, potentially from construction or maintenance activities associated with the nearby water infrastructure. Specifically, evidence of mechanical disturbance was observed on the western bank of the channel adjacent to sampling point N-1.

E.1.2 Channel 1

Channel 1 is a tributary of Campo Creek that runs approximately 93 linear feet west where it connects to a shallow freshwater detention pond (Pond 2). The entire Channel 1 between Campo Creek and the water detention Pond 2 is defined by an OHWM. As discussed in Section D.4, the SDAM conducted for Channel 1 determined it is an ephemeral stream (Attachment F).

E.1.2.1 Ordinary High Water Mark Analysis

Channel 1 is an approximately 0.006 acre (93 linear feet) non-wetland water that is a tributary to Campo Creek on the western portion of the project site (Table 2; Figure 7). Figure 7 shows the sampling point NW-8 collected in Channel 1, which is located within the OHWM of the channel.

Photograph 11 provides a representative view of the extent of Channel 1. The OHWM indicators were investigated at sampling point NW-8. The OHWM documented at sampling point NW-8 is described below.

Sampling Point NW-8: The OHWM is approximately 3 feet wide and 0.5 foot deep. The other OHWM indicators observed at sampling point NW-8 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. Channel 1 has thick upland grasses growing in the channel and on the banks. At sampling point NW-8, Channel 1 is surrounded by non-native grassland. Channel 1 is slightly lower in elevation than the surrounding project site and the soils at sampling point NW-8 are a silt loam.

E.1.3 Channel 2

Channel 2 is a tributary of Campo Creek that runs approximately 47 linear feet west where the channel becomes undefined because of a topographic rise. The entire length of Channel 2 is defined by an OHWM. As discussed in Section D.4, the SDAM conducted for Channel 2 determined it is an ephemeral stream (Attachment F).

E.1.3.1 Ordinary High Water Mark Analysis

Channel 2 is an approximately 0.003 acre (47 linear feet) non-wetland water that is a tributary to Campo Creek on the western portion of the project site (Table 2; Figure 7). Figure 7 shows the sampling point NW-10 collected in Channel 2, which is located within the OHWM of the channel. Photograph 12 provides a representative view of the extent of Channel 2. The OHWM indicators were investigated at sampling point NW-10. The OHWM documented at sampling point NW-10 is described below.

Sampling Point NW-10: The OHWM is approximately 3 feet wide and 0.5 foot deep. The other OHWM indicators observed at sampling point NW-10 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. Channel 2 has upland grasses growing in the channel and on the banks. Standing water was observed in the center of Channel 2. At sampling point NW-10, Channel 2 is surrounded by willow riparian forest. Channel 2 is slightly lower in elevation than the surrounding project site and the soils at sampling point NW-10 are a silt loam.

E.1.4 Channel 3

Channel 3 is a tributary of Campo Creek that runs approximately 35 linear feet east where it connects to a freshwater detention pond (Pond 3). The entire Channel 3 between Campo Creek and the water detention Pond 3 is defined by an OHWM. As discussed in Section D.4, the SDAM conducted for Channel 3 determined it is an ephemeral stream (Attachment F).

E.1.4.1 Ordinary High Water Mark Analysis

Channel 3 is an approximately 0.004 acre (35 linear feet) non-wetland water that is a tributary to Campo Creek on the western portion of the project site (Table 2; Figure 7). Figure 7 shows the sampling point NW-11 collected in Channel 3, which is located within the OHWM of the channel. Photograph 13 provides a representative view of the extent of Channel 3. The OHWM indicators were investigated at sampling point NW-11. The OHWM documented at sampling point NW-11 is described below.

Sampling Point NW-11: The OHWM is approximately 4 feet wide and 0.5 foot deep. The other OHWM indicators observed at sampling point NW-11 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. Channel 3 is unvegetated with upland grasses growing on the banks. Standing water was observed in the center of Channel 3, likely overflow from the water detention Pond 3 connected to the eastern extent of Channel 3. At sampling point NW-11, Channel 3 is surrounded by non-native grassland. Channel 3 is lower in elevation than the surrounding project site and the soils at sampling point NW-11 are a silt loam.

E.1.5 Channel 4

Channel 4 is a tributary of Campo Creek that runs approximately 233 linear feet east where the channel bends and reconnects to Campo Creek. The entire length of Channel 4 is defined by an OHWM. As discussed in Section D.4, the SDAM conducted for Channel 4 determined it is an ephemeral stream (Attachment F).

E.1.5.1 Ordinary High Water Mark Analysis

Channel 4 is an approximately 0.04 acre (233 linear feet) non-wetland water that is a tributary to Campo Creek on the western portion of the project site (Table 2; Figure 7). Figure 7 shows the sampling point NW-12 collected in Channel 4, which is located within the OHWM of the channel. Photograph 14 provides a representative view of the extent of Channel 4. The OHWM indicators were investigated at sampling point NW-12. The OHWM documented at sampling point NW-12 is described below.

Sampling Point NW-12: The OHWM is approximately 8 feet wide and 1 foot deep. The other OHWM indicators observed at sampling point NW-12 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. Channel 4 has thick, dead upland grasses growing in the channel and on the banks. At sampling point NW-12, Channel 4 is surrounded by non-native grassland. Channel 4 is slightly lower in elevation than the surrounding project site and the soils at sampling point NW-12 are a silt loam.

E.1.6 Channel 5

Channel 5 is a tributary of Campo Creek, connected to the creek through the freshwater detention Pond 3. Channel 5 runs approximately 720 linear feet north, parallel to Campo Creek, where the channel becomes undefined because of a topographic rise on the project site. The entire length of Channel 5 is defined by an OHWM. As discussed in Section D.4, the SDAM conducted for Channel 5 determined it is an ephemeral stream (Attachment F).

E.1.6.1 Ordinary High Water Mark Analysis

Channel 5 is an approximately 0.08 acre (720 linear feet) non-wetland water that is a tributary to Campo Creek on the western portion of the project site (Table 2; Figure 7). Figure 7 shows the sampling point NW-13 collected in Channel 5, which is located within the OHWM of the channel. Photograph 15 provides a representative view of the extent of Channel 5. The OHWM indicators were investigated at sampling point NW-13. The OHWM documented at sampling point NW-13 is described below.

Sampling Point NW-13: The OHWM is approximately 5 feet wide and 1 foot deep. The other OHWM indicators observed at sampling point NW-13 include a change in vegetation species and cover, a break in bank slope, and the presence of a defined bed and bank. Channel 5 has thick, dead upland grasses growing in the channel and on the banks. At sampling point NW-13, Channel 5 is surrounded by non-native grassland. Channel 5 is slightly lower in elevation than the surrounding project site and the soils at sampling point NW-13 are a silt loam.

E.1.7 Channel 6

Channel 6 is a tributary of Campo Creek, connected to the creek through the freshwater detention Pond 3. Channel 6 runs approximately 84 linear feet north, parallel to Campo Creek and Channel 5, where the channel becomes undefined because of a topographic rise on the project site. The entire length of Channel 6 is defined by an OHWM. As discussed in Section D.4, the SDAM conducted for Channel 6 determined it is an ephemeral stream (Attachment F).

E.1.7.1 Ordinary High Water Mark Analysis

Channel 6 is an approximately 0.02 acre (84 linear feet) non-wetland water that is a tributary to Campo Creek on the western portion of the project site (Table 2; Figure 7). Figure 7 shows the sampling point NW-14 collected in Channel 6, which is located within the OHWM of the channel. Photograph 16 provides a representative view of the extent of Channel 6. The OHWM indicators were investigated at sampling point NW-14. The OHWM documented at sampling point NW-14 is described below.

Sampling Point NW-14: The OHWM is approximately 5 feet wide and 1 foot deep. The other OHWM indicators observed at sampling point NW-14 include a change in vegetation species and

cover, a break in bank slope, and the presence of a defined bed and bank. Channel 6 has thick stands of bulrush growing in the channel and upland grasses growing on the banks. At sampling point NW-14, Channel 6 is surrounded by non-native grassland. Channel 6 is slightly lower in elevation than the surrounding project site and the soils at sampling point NW-14 are a silt loam.

E.2 Wetland Waters

Ponds 1 through 3 observed on the project site were determined to be wetland waters. The wetland waters observed on the project site are summarized in Table 3 and described in the following subsections.

Table 3. Wetlands on the Project Site

Feature	Wetlands (acres)	Cubic Yards
Pond 1	1.10	7,113
Pond 2	0.03	68
Pond 3	0.13	638
Total	**1.26**	**7,819**

The completed wetland determination data sheet for Ponds 1 through 3 (sampling points W-2 through W-4) are in Attachment D. Representative photographs of Ponds 1 through 3 are provided in Attachment D. Electronic GIS data of the aquatic resources on the project site is included in Attachment G. The ORM Bulk Upload Aquatic Resources Spreadsheet for the aquatic resources observed on the project site is provided in Attachment H.

E.2.1 Pond 1

Pond 1 occurs in the southeastern portion of the project site and is connected to Campo Creek on the northern and southern edges of the pond (Figure 7). Pond 1 appears to have been formed after the construction of a concrete dam within Campo Creek in the southern portion of the project site. Pond 1 is connected to Campo Creek, which was determined to be an intermittent stream (Attachment F).

E.2.1.1 Aquatic Resources Delineation Results

Pond 1 is an approximately 1.10-acre (7,113 cubic yards) wetland water that is within Campo Creek in the southern portion of the project site (Table 3; Figure 7). The aquatic resources delineation point W-2 described below is at the edge of Pond 1. Figure 7 shows the results at sampling point W-2 taken at the edge of Pond 1 during the aquatic resources delineation. The completed wetland determination data form for sampling point W-2 is in Attachment D.

Sampling Point W-2: The data collected at sampling point W-2 determined that wetland hydrology, hydrophytic vegetation, and hydric soils were present (Figure 7; Photograph 17). Ponded water and soil saturation were observed in Pond 1. No soil pit was dug at sampling point W-2 because ponded

surface water was observed, indicating soil saturation. Obligate wetland plants (California bulrush [*Schoenoplectus californicus]*), broadleaf cattail [*Typha latifolia*] and filamentous green algae [*Chlorophyta* and *Charophyta*]) were observed in and at the edges of Pond 1. Pond 1 shows signs of disturbance, particularly from construction of the concrete dam that creates the southern boundary of the pond, and potentially from ongoing maintenance activities associated with the nearby water infrastructure and rural residential community.

E.2.2 Pond 2

Pond 2 occurs in the western portion of the project site and is connected to Channel 1 and Campo Creek to the east (Figure 7). Pond 2 may have formed as a result of the rural residential development to the east as well as the construction and maintenance of water infrastructure to the west. These activities may have disturbed and altered the flows in and surrounding Campo Creek. Pond 2 is connected to Channel 1, which was determined to be an ephemeral stream (Attachment F).

E.2.2.1 Aquatic Resources Delineation Results

Pond 2 is an approximately 0.03-acre (68 cubic yards) wetland water that is connected to Channel 1 and Campo Creek in the eastern portion of the project site (Table 3; Figure 7). The aquatic resources delineation point W-3 described below is at the edge of Pond 2. Figure 7 shows the results at sampling point W-3 taken at the edge of Pond 2 during the aquatic resources delineation. The completed wetland determination data form for sampling point W-3 is in Attachment D.

Sampling Point W-3: The data collected at sampling point W-3 determined that wetland hydrology, hydrophytic vegetation, and hydric soils were present (Figure 7; Photograph 18). Standing water and soil saturation were observed in Pond 2. No soil pit was dug at sampling point W-3 because ponded surface water was observed, indicating soil saturation. Obligate wetland plants (California bulrush) and filamentous green algae [*Chlorophyta* and *Charophyta*]) were observed in and at the edges of Pond 2. Pond 2 shows signs of disturbance, potentially from ongoing construction and maintenance activities associated with the nearby water infrastructure to the west and rural residential community to the east.

E.2.3 Pond 3

Pond 3 occurs in the central portion of the project site and is connected to Channels 5 and 6 on the northeast edge of the pond and Channel 3 and Campo Creek on the western edge of the pond (Figure 7). Pond 3 may have formed as a result of flooding and erosion from Channels 5 and 6 flows converging through Channel 3 to Campo Creek. Stormwater runoff from the nearby rural residential community may also contribute water to Pond 3 which then flows into Channel 3 and Campo Creek. Pond 3 is connected to Channels 3, 5 and 6, which were determined to be ephemeral streams (Attachment F).

E.2.3.1 Aquatic Resources Delineation Results

Pond 3 is an approximately 0.13-acre (638 cubic yards) wetland water that is connected to Channels 3, 5 and 6 in the central portion of the project site (Table 3; Figure 7). The aquatic resources delineation point W-4 described below is at the edge of Pond 3. Figure 7 shows the results at sampling point W-4 taken at the edge of Pond 2 during the aquatic resources delineation. The completed wetland determination data form for sampling point W-4 is in Attachment D.

Sampling Point W-4: The data collected at sampling point W-4 determined that wetland hydrology, hydrophytic vegetation, and hydric soils were present (Figure 7; Photograph 19). Standing water and soil saturation were observed in Pond 3. No soil pit was dug at sampling point W-4 because ponded surface water was observed, indicating soil saturation. Obligate wetland plants (San Diego sedge, California bulrush), and filamentous green algae [*Chlorophyta* and *Charophyta*]) were observed in and at the edges of Pond 3. Pond 3 shows signs of disturbance, potentially from ongoing construction and maintenance activities associated with the nearby rural residential community to the east and water infrastructure to the west.

Section F Deviation from Local Wetlands Inventory or National Wetlands Inventory

The NWI map shows Campo Creek, one tributary connecting to Campo Creek from the northeast, and one freshwater pond connected to Campo Creek as aquatic resources on the project site (Figure 5). Campo Creek and one freshwater pond connected to Campo Creek identified on the NWI mapping results were observed on the project site. The tributary connecting to Campo Creek from the northeast shown on the NWI mapping results was not observed during the aquatic resources delineation investigation on the project site. This tributary could have occurred historically on the project site prior to the development of the rural residential community in the eastern portion of the project site. The non-wetland Channels 1 through 6 and Ponds 2 and 3 observed on the project site were not identified on the NWI map.

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Section G Mapping Method

The wetland specialists digitally mapped the limits of non-wetland, non-tidal waters at the OHWM using an ISXBlue II sub-meter Global Positioning System unit. Electronic spatial data collected in the field are in Attachment G.

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Section H Additional Information

Supplemental information regarding regulatory context, potential jurisdiction, and project impacts are provided in Attachment I, Supplemental Information. Additional information can be provided upon request.

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Section I Conclusions

Based on the investigation of wetland and non-wetland waters indicators, the following 10 aquatic resource areas occur on the project site, seven non-wetland waters, and three wetlands:

1. One non-wetland water (Campo Creek) was observed on the western portion of the project site. Campo Creek accounts for approximately 0.60 acre (1,949 linear feet). In-channel wetlands occur within the OHWM in the majority of Campo Creek. A concrete dam and spillway are on the southern extent of Campo Creek on the project site, resulting in a freshwater detention pond, Pond 1, located on the southern portion of the project site. Campo Creek was determined to be an intermittent stream.
2. One non-wetland water (Channel 1) was observed on the western portion of the project site. Channel 1 accounts for approximately 0.006 acre (93 linear feet). Channel 1 is a tributary of Campo Creek and is connected to a shallow freshwater detention pond, Pond 2, west of Channel 1 and Campo Creek. Channel 1 was determined to be an ephemeral stream.
3. One non-wetland water (Channel 2) was observed on the western portion of the project site. Channel 2 accounts for approximately 0.003 acre (47 linear feet). Channel 2 is a tributary of Campo Creek. Channel 2 was determined to be an ephemeral stream.
4. One non-wetland water (Channel 3) was observed on the western portion of the project site. Channel 3 accounts for approximately 0.004 acre (35 linear feet). Channel 3 is a tributary of Campo Creek and is connected to a shallow freshwater detention pond, Pond 3, east of Channel 3 and Campo Creek. Channel 3 was determined to be an ephemeral stream.
5. One non-wetland water (Channel 4) was observed on the western portion of the project site. Channel 4 accounts for approximately 0.04 acre (233 linear feet). Channel 4 is a tributary of Campo Creek. Channel 4 was determined to be an ephemeral stream.
6. One non-wetland water (Channel 5) was observed on the western portion of the project site. Channel 5 accounts for approximately 0.08 acre (720 linear feet). Channel 5 is a tributary of Campo Creek connected to the creek through the freshwater detention Pond 3. Channel 5 was determined to be an ephemeral stream.
7. One non-wetland water (Channel 6) was observed on the western portion of the project site. Channel 6 accounts for approximately 0.02 acre (84 linear feet). Channel 6 is a tributary of Campo Creek connected to the creek through the freshwater detention Pond 3. Channel 6 was determined to be an ephemeral stream.
8. One wetland (Pond 1) was observed in the southern portion of the project site. Pond 1 accounts for approximately 1.10 acres (7,113 cubic yards). Pond 1 is within Campo Creek. Pond 1 is connected to Campo Creek, which was determined to be an intermittent stream.

9. One wetland (Pond 2) was observed in the eastern portion of the project site. Pond 2 accounts for approximately 0.03 acre (68 cubic yards). Pond 1 is connected to and west of Channel 1. Pond 2 is connected to Channel 1, which was determined to be an ephemeral stream.
10. One wetland (Pond 3) was observed in the central portion of the project site. Pond 3 accounts for approximately 0.13 acre (638 cubic yards). Pond 3 is connected to and east of Channel 3 and connected to and south of Channels 5 and 6. Pond 3 is connected to Channels 3, 5 and 6, which were determined to be ephemeral streams.

The extents and summaries of the jurisdictional aquatic resources delineated on the project site are provided in Tables 4 and 5.

Table 4. Summary of Non-Wetland Waters on the Project Site

Feature	Cowardin Type[1]	Acres	Linear Feet	Coordinates	Vegetation/Land Cover Type	Summary
Campo Creek	R4SB	0.600	1,949	32.691758000, −116.33972800 through 32.411459000, −116.20943000	Non-vegetated channel/emergent wetland	Non-wetland channel with OHWM indicators present. The OHWM varies in width between 1 foot at its narrowest and 28 feet at its widest, with depths between 0.5 foot and 1 foot deep. In-channel wetlands occur within the OHWM in the majority of Campo Creek. In-channel emergent wetlands occur within the OHWM in the majority of Campo Creek.
Channel 1	R4SB	0.006	93	32.42251500, −116.20160400	Non-vegetated channel	Non-wetland channel with OHWM indicators present. The OHWM is approximately 3 feet wide and 0.5 foot in depth.
Channel 2	R4SB	0.003	47	32.41242300, −116.20150300	Non-vegetated channel	Non-wetland channel with OHWM indicators present. The OHWM is approximately 3 feet wide and 0.5 foot in depth.
Channel 3	R4SB	0.004	35	32.41248600, −116.20143500	Non-vegetated channel	Non-wetland channel with OHWM indicators present. The OHWM is approximately 4 feet wide and 0.5 foot in depth.
Channel 4	R4SB	0.040	233	32.41230400, −116.20136600	Non-vegetated channel	Non-wetland channel with OHWM indicators present. The OHWM is approximately 8 feet wide and 1 foot in depth.
Channel 5	R4SB	0.080	720	32.41250700, −116.20136700	Non-vegetated channel	Non-wetland channel with OHWM indicators present. The OHWM is approximately 5 feet wide and 1 foot in depth.

Table 4. Summary of Non-Wetland Waters on the Project Site

Feature	Cowardin Type[1]	Acres	Linear Feet	Coordinates	Vegetation/Land Cover Type	Summary
Channel 6	R4SB	0.020	84	32.41249100, −116.20130300	Non-vegetated channel	Non-wetland channel with OHWM indicators present. The OHWM is approximately 5 feet wide and 1 foot in depth.
Non-Wetland Total		**0.753**	**3,161**	**--**		

Notes:

[1] Cowardin Type: R4SB = Riverine Intermittent Streambed.

Table 5. Summary of Wetlands on the Project Site

Feature	Cowardin Type[1]	Acres	Cubic Yards	Coordinates	Vegetation/Land Cover Type	Summary
Pond 1	PUB	1.10	7,113	32.41160600, −116.20101500	Fresh water	Wetland water with three-parameter wetland indicators present. The average depth of Pond 1 is approximately 4 feet.
Pond 2	R6	0.03	68	32.4124700, −116.20166200	Fresh water	Wetland water with three-parameter wetland indicators present. The average depth of Pond 2 is approximately 0.5 foot.
Pond 3	R6	0.13	638	32.41232100, −116.20130900	Fresh water	Wetland water with three-parameter wetland indicators present. The average depth of Pond 3 is approximately 1 foot.
Wetland Total		**1.26**	**7,819**	**—**		

Notes:

[1] Cowardin Type: PUB = Palustrine Unconsolidated Bottom; R6 = A wetland, spring, stream, river pond, or lake that only exists for a short period.

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Section J Disclaimer Statement

This aquatic resources delineation is subject to verification by the USACE, Regional Water Quality Control Board, and California Department of Fish and Wildlife. Harris advises all parties to treat the information in this Aquatic Resources Delineation Report as preliminary until the agencies provide written verification of their jurisdictional boundaries.

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Attachment A. Figures

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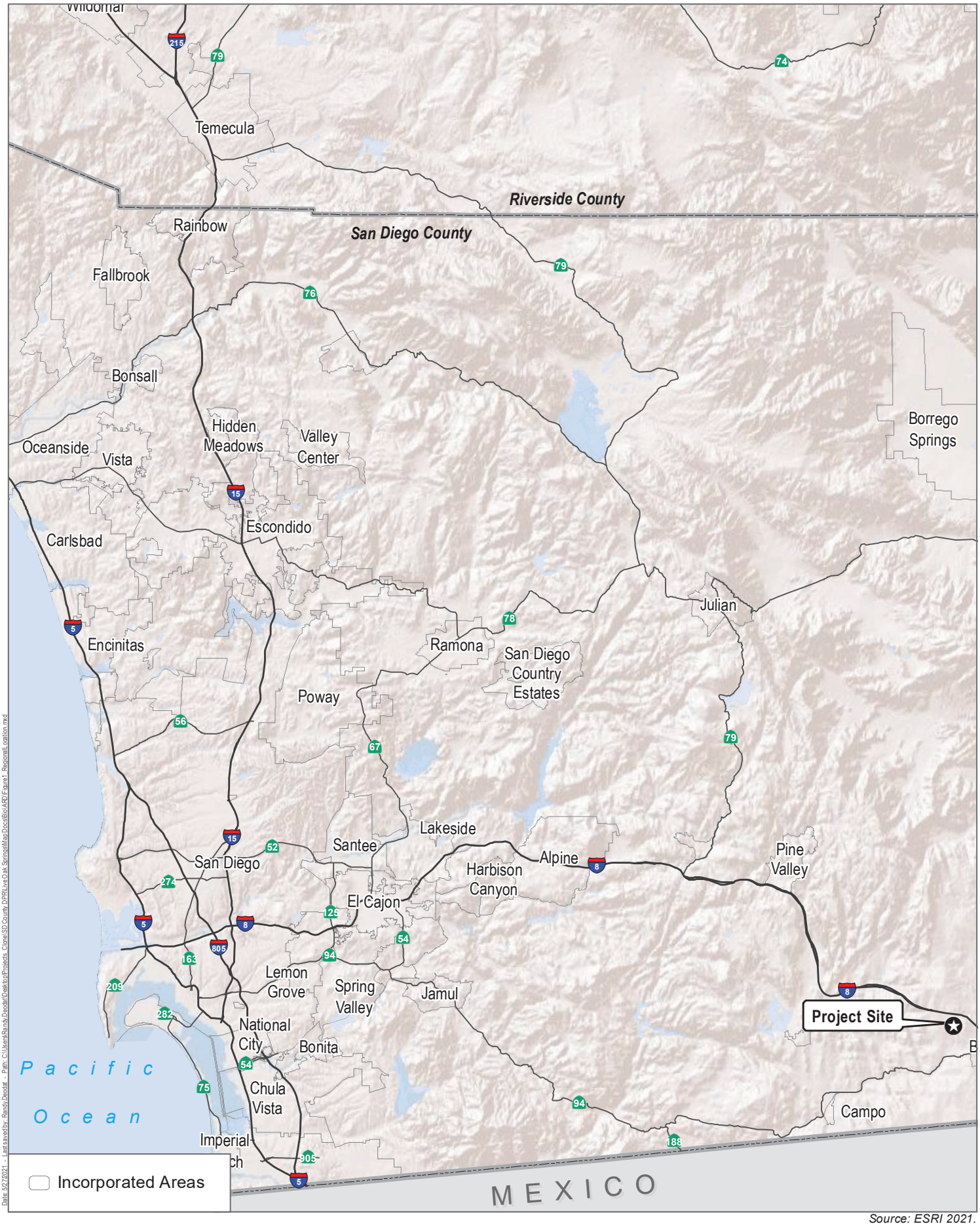


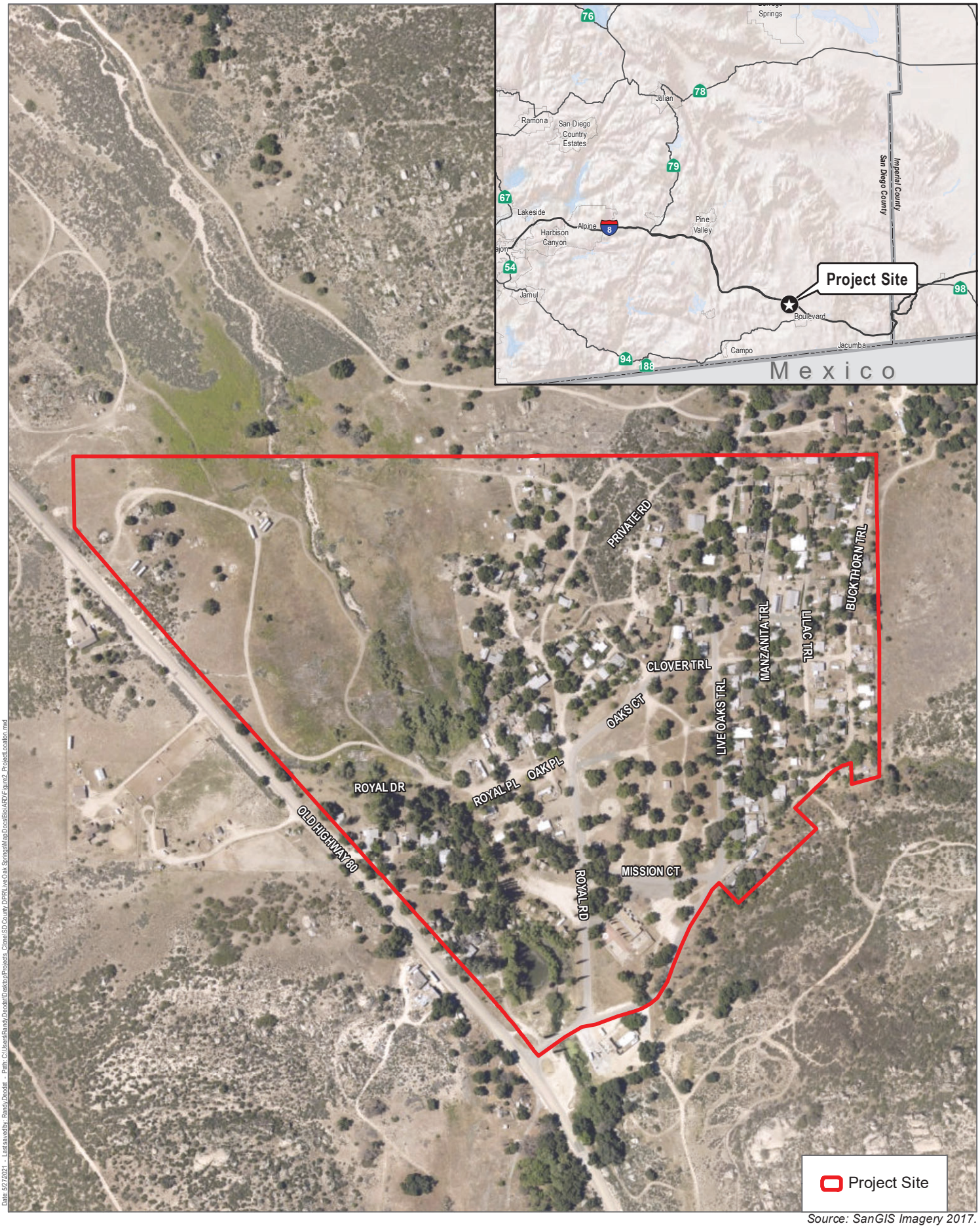
Source: ESRI 2021.

Figure 1

Regional Location

Live Oak Springs Water System Improvements Project

Harris & Associates



Source: SanGIS Imagery 2017.

Harris & Associates

N

0 200 400

Feet

Figure 2

Project Location

Live Oak Springs Water System Improvements Project

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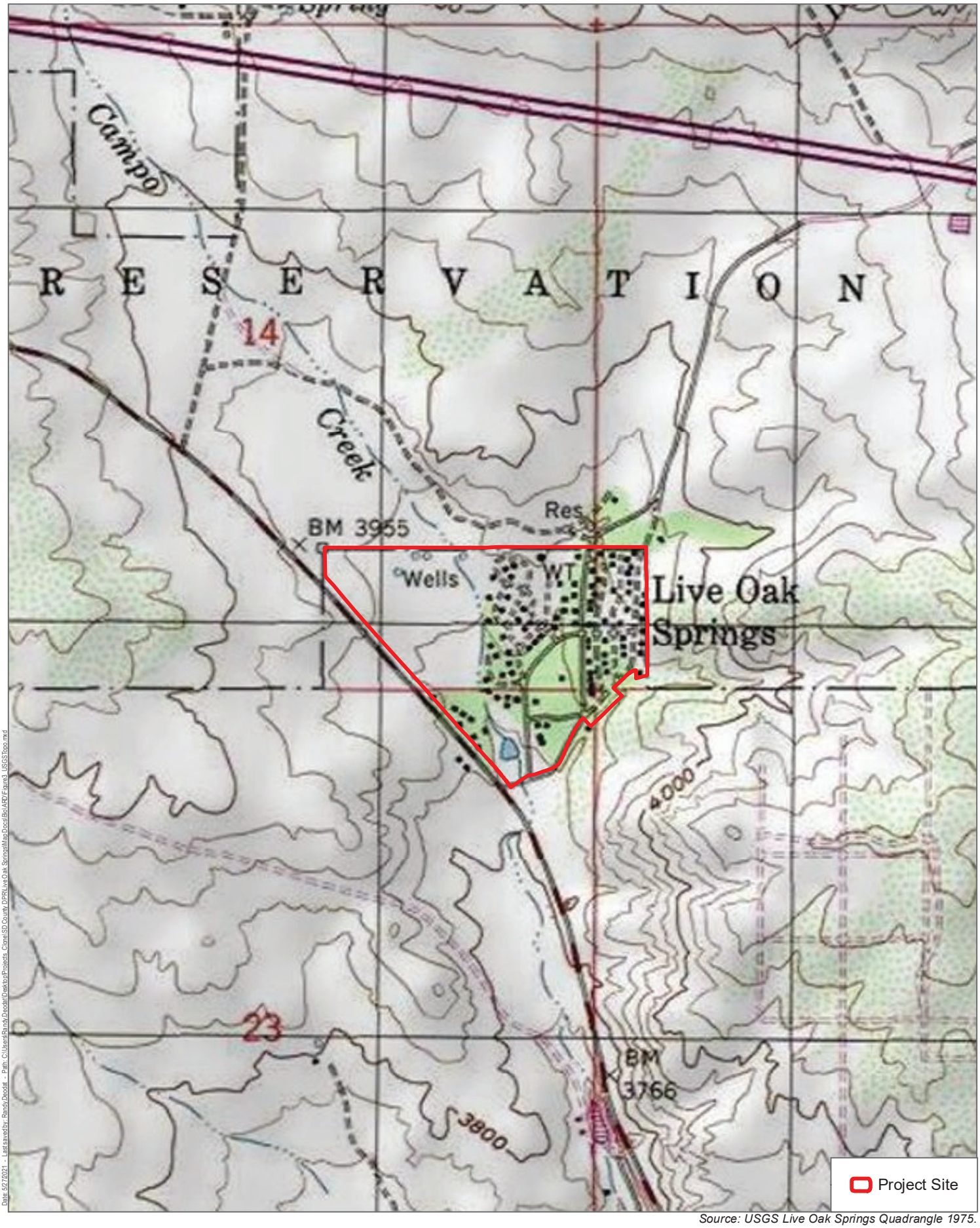

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Source: USGS Live Oak Springs Quadrangle 1975.

Harris & Associates

N

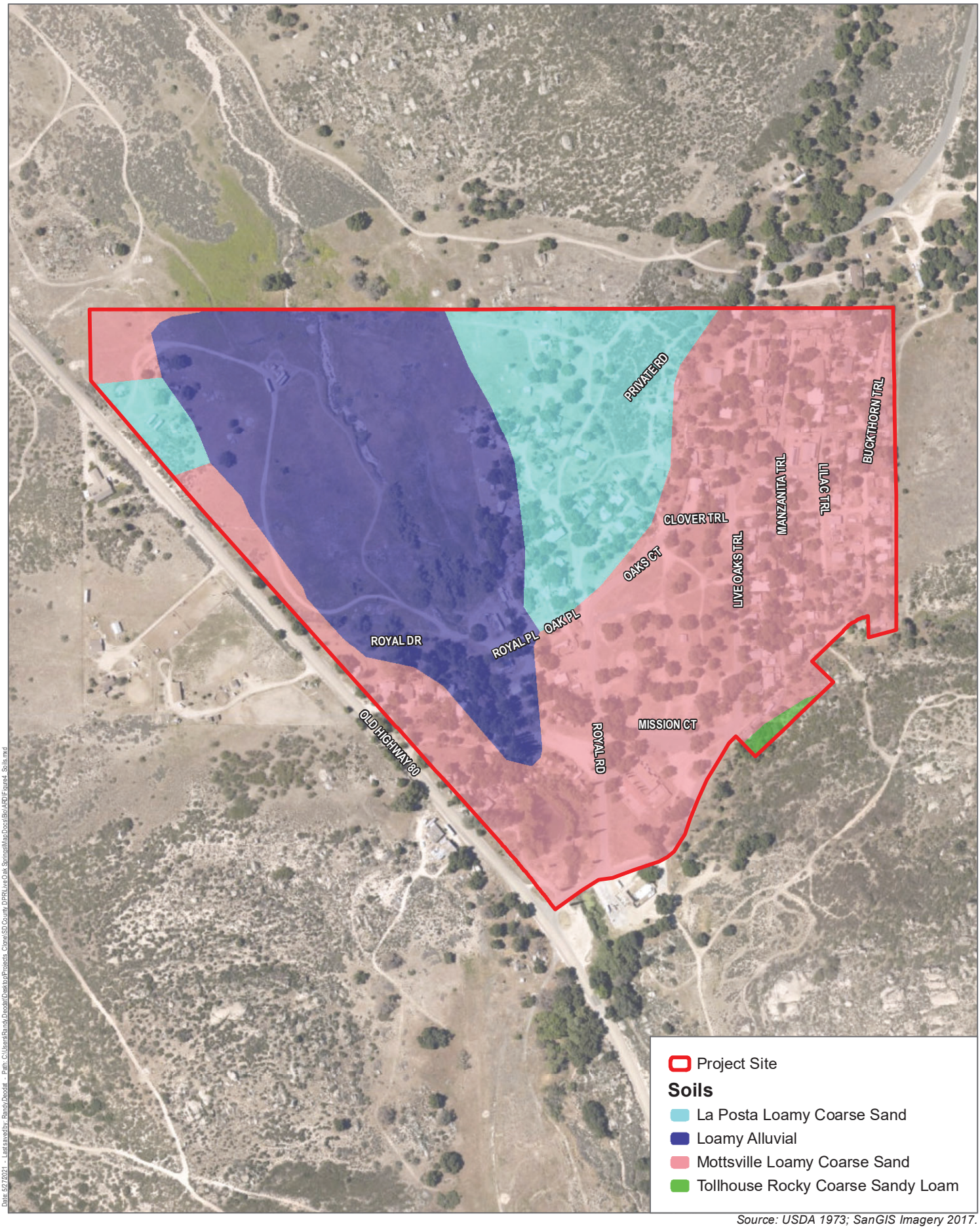
0 500 1,000

Feet

Figure 3

USGS Topographic Map

Live Oak Springs Water System Improvements Project



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Source: USDA 1973; SanGIS Imagery 2017.

Harris & Associates

N

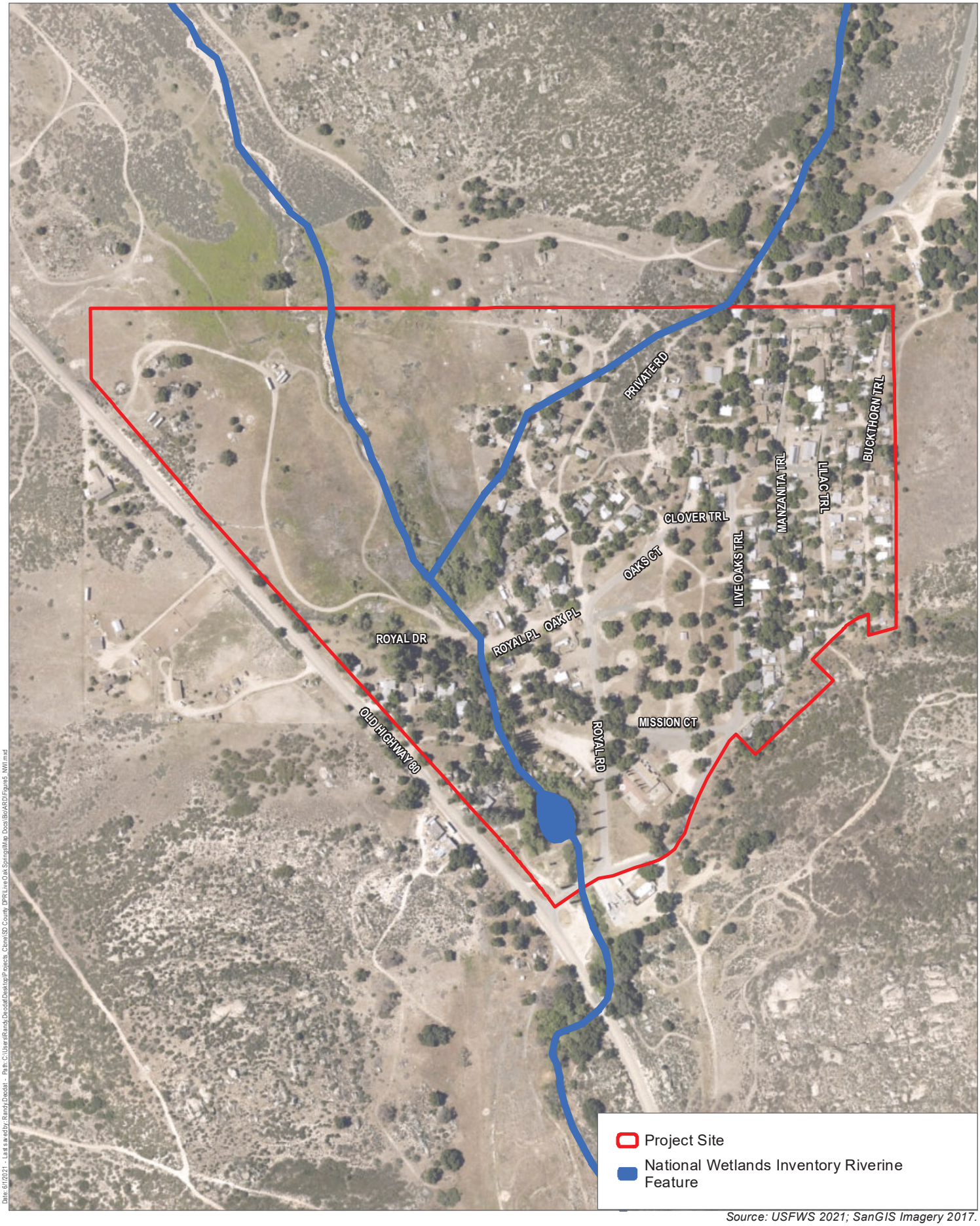
0 200 400

Feet

Figure 4

Soils

Live Oak Springs Water System Improvements Project



Source: USFWS 2021; SanGIS Imagery 2017.

Harris & Associates

N

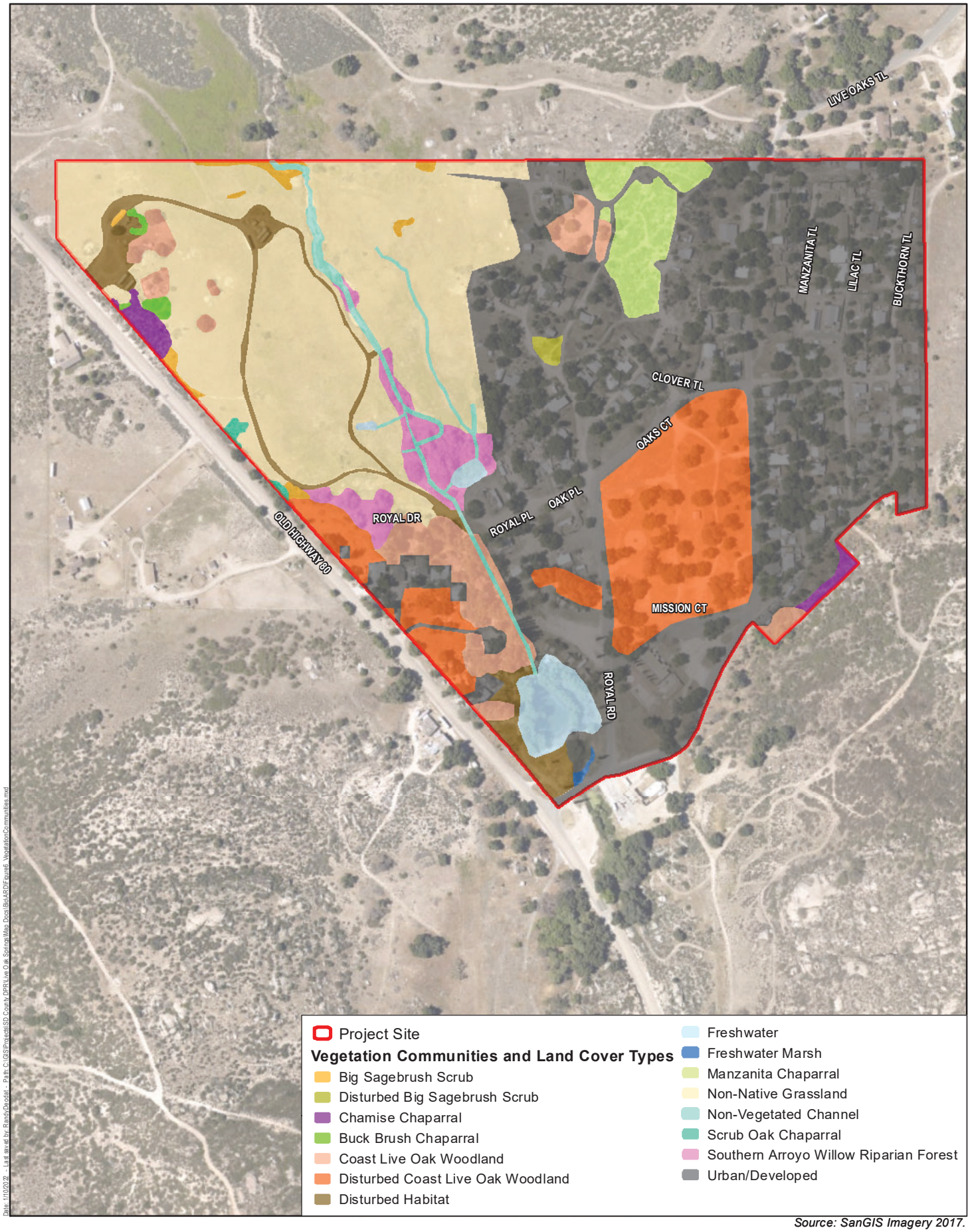
0 200 400

Feet

Figure 5

National Wetlands Inventory Results

Live Oak Springs Water System Improvements Project



Source: SanGIS Imagery 2017.

Harris & Associates

N

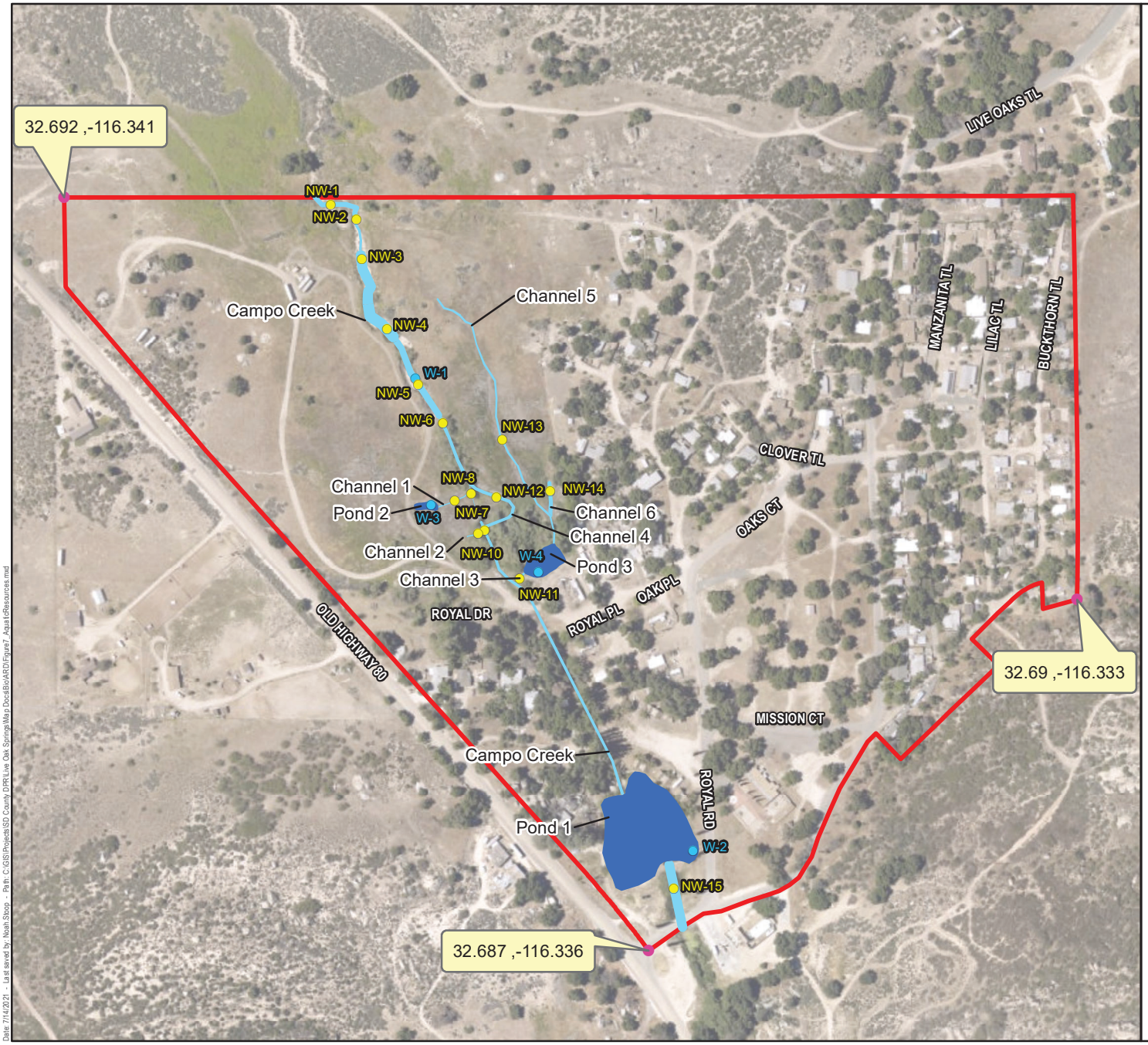
0 200 400

Feet

Figure 6

Vegetation Communities and Land Cover Types

Live Oak Springs Water System Improvements Project



Harris & Associates

Figure 7

Aquatic Resources Ordinary High Water Mark for the Live Oak Springs Water System Improvements Project

Legend

- Project Site
- Reference Points
- Non-Wetland Sampling Points
- Wetland Sampling Points

Wetland and Non-Wetland Waters

- Non-Wetland Waters (0.75 acres) (3,161 ft)
- Wetlands (1.26 acres) (7,819 cu yd)

N

0 200 400

Feet

Coordinate System: NAD 1983 California State Plane Zone 6
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: No Coordinate System
1 inch = 400 feet

Created on May 8th, 2021
Revised on July 12th, 2021

Made in accordance with the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program, as amended on February 10, 2016, by: Jason Deters, Project Manager Enforcement and Special Projects Unit U.S. Army Corps of Engineers South Pacific Division Sacramento District, Regulatory Division
1325 J Street, Room 1350
Sacramento, California 95814-2922

Date: 7/14/2021 - Last saved by: Noah Stoop - Path: C:\GIS\Projects\SD County DPR\Live Oak Springs\Map Docs\BioARD\Figure7_Aqua1cResources.mxd

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Attachment B. Statement of Access

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Statement of Access

The County of San Diego (property owner), allows U.S. Army Corps of Engineers (USACE) personnel to access the project site. The project site address is 37820 Old Highway 80, Boulevard, CA 91905 and APN #609-050-0600. The project site is accessible from Interstate 8 by taking Exit 61 and turning right onto Old Highway 80. Travel 1.5 miles south, then turn left into a maintenance access driveway. The project site is located northeast of Old Highway 80, south of Interstate 8 (I-8), and west of Live Oak Trail (see Attachment A, Figures; Figure 1, Regional Location, and Figure 2, Project Site).

Gail Getz, Planning Manager
County of San Diego
Department of Public Works

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Attachment C. Antecedent Precipitation Tool and NRCS WETS Table Results

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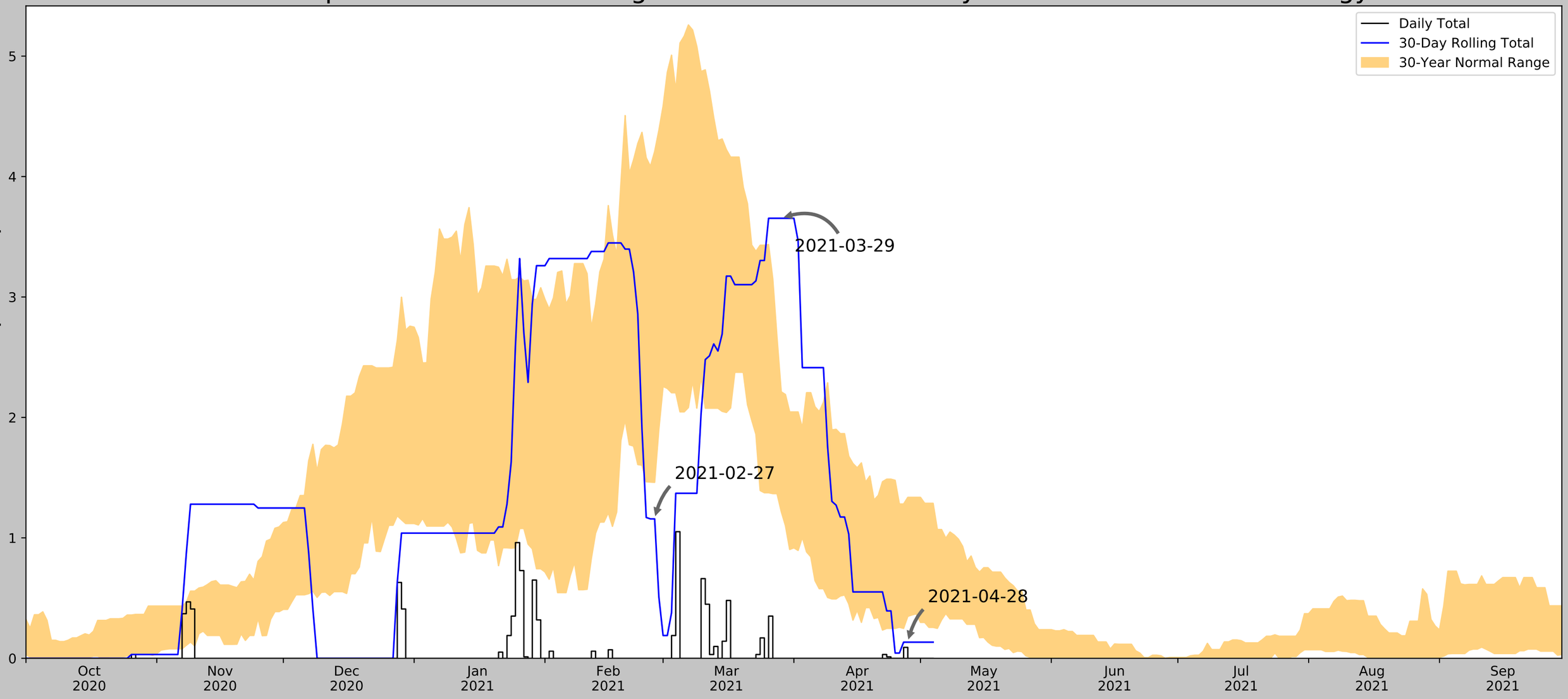
Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	32.691758, -116.339728
Observation Date	2021-04-28
Elevation (ft)	3913.68
Drought Index (PDSI)	Severe drought (2021-03)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-04-28	0.348425	1.336614	0.133858	Dry	1	3	3
2021-03-29	1.218504	2.212598	3.653543	Wet	3	2	6
2021-02-27	1.461024	4.208268	1.15748	Dry	1	1	1
Result							Normal Conditions - 10

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days (Normal)	Days (Antecedent)
CAMPO	32.6264, -116.47	2629.921	8.821	1283.759	15.294	11163	89
BOULEVARD 2	32.6667, -116.3	3600.066	2.887	313.614	2.205	3	0
BOULEVARD 4.4 WSW	32.6447, -116.3478	3520.997	3.285	392.683	2.768	0	1
AGUA HECHICERA	32.5333, -116.6167	3821.851	19.486	91.829	10.558	63	0
CAMPO ASOS	32.6261, -116.4681	2641.076	8.737	1272.604	15.051	62	0
EL HONGO	32.5, -116.3	3148.95	13.45	764.73	16.338	59	0
DESCANSO RS	32.85, -116.6167	3500.0	19.454	413.68	16.802	3	0

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

WETS Table

WETS Station: CAMPO, CA

Requested years: 1971 - 2021

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	63.1	34.2	48.6	2.97	0.93	3.46	5	0.1
Feb	64.3	34.2	49.3	3.01	1.35	3.63	5	0.0
Mar	67.2	35.7	51.5	2.50	0.94	2.97	5	0.0
Apr	72.5	37.3	54.9	0.96	0.35	1.10	2	0.0
May	78.7	41.5	60.1	0.32	0.07	0.28	1	0.0
Jun	88.1	45.0	66.6	0.07	0.00	0.00	0	0.0
Jul	94.2	52.4	73.3	0.31	0.00	0.28	1	0.0
Aug	94.3	52.9	73.6	0.50	0.00	0.35	1	0.0
Sep	89.7	49.1	69.4	0.42	0.13	0.41	1	0.0
Oct	79.8	42.1	61.0	0.72	0.13	0.65	1	0.0
Nov	70.1	36.2	53.1	1.23	0.47	1.44	3	0.0
Dec	63.0	32.9	47.9	2.18	0.83	2.59	4	0.1
Annual:					11.69	18.29		
Average	77.1	41.1	59.1	-	-	-	-	-
Total	-	-	-	15.18			29	0.3

GROWING SEASON DATES

Years with missing data:	24 deg = 6	28 deg = 4	32 deg = 3
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0
Data years used:	24 deg = 45	28 deg = 47	32 deg = 48
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	2/19 to 12/6: 290 days	4/2 to 11/10: 222 days	5/16 to 10/13: 150 days
70 percent *	2/7 to 12/19: 315 days	3/24 to 11/19: 240 days	5/7 to 10/22: 168 days
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1948							T	0.00	0.22	1.10	T	2.56	3.88
1949	4.33	2.24	1.39	0.11	0.41	0.00	0.00	0.00	0.00	0.77	1.09	2.42	12.76
1950	2.74	1.19	1.68	0.48	0.01	0.00	0.10	0.00	0.22	M0.00	0.41	0.34	7.17
1951	4.00	1.39	1.12	3.57	0.27	0.00	0.44	1.34	0.01	1.09	0.82	7.19	21.24
1952	5.05	0.95	8.40	1.62	0.00	T	1.24	0.00	T	0.00	2.85	3.13	23.24
1953	1.04	1.05	2.28	1.24	0.49	0.01	0.04	0.01	0.00	0.00	1.14	0.18	7.48
1954	4.89	2.49	6.45	0.16	0.18	0.05	1.42	0.03	0.13	0.00	0.68	0.75	17.23
1955	3.85	1.23	0.68	0.52	1.95	0.00	0.82	1.90	0.00	0.00	1.14	1.77	13.86
1956	1.70	1.75	T	2.36	0.45	0.00	0.65	0.00	0.00	0.07	0.00	0.40	7.38

1957	7.05	0.78	1.57	1.09	2.60	0.28	0.01	0.65	0.44	2.17	0.84	1.34	18.82
1958													
1959	1.12	5.61	T	0.17	0.14	T	0.03	0.16	0.34	0.50	0.13	2.93	11.13
1960	2.97	4.10	0.45	1.95	0.49	0.00	0.17	0.03	1.59	0.16	1.67	0.07	13.65
1961	1.09	0.16	2.28	T	0.02	0.00	T	0.62	T	0.37	0.77	2.08	7.39
1962	3.61	4.53	2.12	0.00	0.90	0.11	0.00	T	0.00	0.07	T	0.65	11.99
1963	M0.18	3.03	1.72	1.86	T	0.13	T	0.63	2.45	1.35	1.77	0.31	13.43
1964	2.12	1.34	3.22	0.95	0.67	T	T	0.03	0.07	0.39	1.88	1.83	12.50
1965	0.80		1.20	6.03	0.05	0.00	0.36	0.13		T	9.03	4.31	21.91
1966	1.35	1.40	1.16	0.05	0.07	0.22	0.39	0.19	0.20	0.46	0.83		6.32
1967	1.42	T	1.03	3.54	0.48	0.06	0.34	0.49	0.82	0.00	3.65	4.23	16.06
1968	0.58	0.73	2.19	0.85	0.28	0.03	1.88	0.06	0.00	0.05	0.72	1.66	9.03
1969	8.30	5.67	1.96	0.10	0.43	0.12	0.01	T	0.20	0.02	1.85	0.26	18.92
1970	0.85	0.96	3.95	1.18	0.00	0.03	0.03	2.66	0.08	0.12	1.28	2.66	13.80
1971	1.12	1.22	0.40	1.46	0.67	0.00	0.07	1.00	0.25	1.18	0.05	3.60	11.02
1972	0.00	0.18	0.00	0.24	0.14	0.31	0.00	0.04	0.14	1.87	2.60	2.55	8.07
1973	1.70	3.13	5.24	0.29	0.09	0.00	0.00	0.09	0.00	0.05	1.69	0.11	12.39
1974	4.29	0.07	1.24	0.24	0.16	0.00	1.28	0.13	0.31	2.32	0.39	1.24	11.67
1975	0.40	1.02	3.40	1.58	0.11	0.12	0.09	T	0.18	0.07	2.15	0.63	9.75
1976	0.07	5.47	1.81	1.85	0.06	0.00	0.61	0.00	2.85	0.24	1.02	0.76	14.74
1977	3.10	0.35	0.85	0.19	1.15	0.00	T	1.18	T	0.88	0.25		7.95
1978	7.79	5.38	5.45	1.48	0.53	0.00	T	0.01	0.16	0.06	3.05	4.45	28.36
1979	3.99	1.95	4.88	0.03	0.19	0.00	T	0.16	0.04	0.82	0.26	0.69	13.01
1980	11.82	8.82	3.72	1.87	0.80	T	0.55	0.00	0.00	0.28	0.00	0.54	28.40
1981	0.91	2.64	4.22	0.80	0.10	0.00	0.05	0.03	0.31	0.19	1.35	0.03	10.63
1982	5.14	2.15	4.30	0.82	0.12	T	0.33	0.56	0.37	0.13	4.42	3.44	21.78
1983	2.23	4.82	9.92	2.23	0.19	0.00	0.01	4.05	0.68	1.16	2.45	3.20	30.94
1984	0.12	0.00	0.04	0.24	0.00	0.55	1.51	2.29	0.67	0.18	1.43	4.25	11.28
1985		1.59	1.46	0.27	0.04	0.09	1.74	T	0.33	0.69	4.53	1.76	12.50
1986	0.75	3.53	3.47	0.28	0.01	0.00	0.35	0.06	1.32	2.12	0.57	0.72	13.18
1987	1.66	2.55	2.58	0.20	0.08	0.01	0.00	0.65	0.48	3.13	2.48	1.82	15.64
1988	3.49	1.94	0.72	2.48	0.36	T	0.02	1.65	0.00	0.00	1.08	2.12	13.86
1989	1.05	1.18	1.65	0.21	0.13	0.00	0.00	0.00	0.17	0.36	0.03	0.29	5.07
1990	3.06	1.78	0.70	0.99	0.23	0.22	0.11	0.18	0.62	0.04	0.56	1.30	9.79
1991	1.35	2.23	12.18	0.05	0.00	0.00	0.62	0.00	0.	0.	0.	2.	20.

									35	58	30	83	49
1992	3.24	5.05	4.94	0.68	0.23	T	0.75	2.05	T	0.24	0.06	4.04	21.28
1993	18.61	6.51	1.53	0.00	0.12	M0.16	0.00	0.00	0.00	0.30	1.49	1.16	29.88
1994	1.70	4.14	3.14	1.35	0.00	0.00	0.00	1.22	0.00	0.19	0.68	0.97	13.39
1995	10.12	3.28	6.63	1.26	1.10	0.48	0.06	0.64	0.28	0.00	0.08	0.57	24.50
1996	1.54	3.20	2.76	0.53	0.07	0.00	0.00	0.07	0.03	1.56	0.92	1.98	12.66
1997	4.33	1.53	0.02	0.22	0.00			0.07	1.93	0.16	1.75	4.21	14.22
1998	1.60	10.37	4.40	2.35	1.17	0.02	0.10	0.20	0.20	0.03	1.17	1.42	23.03
1999	1.66	0.83	0.62	3.31	T	0.46	0.36	T	0.14	0.00	T	0.21	7.59
2000	0.75	4.20	1.47	0.46	T	0.21	0.00	0.13	0.30	0.65	0.39	0.04	8.60
2001	2.92	4.12	1.76	1.45	0.03	0.00	0.12	0.00	0.24	T	1.11	1.02	12.77
2002	0.40	0.12	1.12	0.39	0.00	0.00	0.19	0.00	1.16	0.03	1.04	1.86	6.31
2003	0.18	4.09	2.20	1.55	0.91	0.00	1.93	1.49	0.38	0.00	0.55	1.26	14.54
2004	0.68	4.45	0.66	1.33	0.00	0.00	0.14	0.01	0.00	8.59	1.08	4.74	21.68
2005	5.17	4.89	1.60	0.58	0.04	0.00	0.47	2.53	0.01	0.62	0.11	T	16.02
2006	0.99	1.30		2.25	0.22	0.16	0.52	0.03	0.07	0.36	0.17	1.19	7.26
2007	0.75	3.08	0.22	0.77	0.04	0.00	0.18			0.17	0.32	2.68	8.21
2008	7.29	M2.45	0.51	T	0.26	0.00	T	1.35	T	T	1.80	6.20	19.86
2009	0.20	3.70	0.09	0.24	0.00	0.03	T	T	0.03	0.03	0.70	4.86	9.88
2010	6.60	5.13	1.37	2.35	0.00	0.00	0.07	T	0.08	3.22	1.19	8.22	28.23
2011	0.48	6.05	2.19	0.59	0.72	0.00	0.22	1.28	0.22	0.64	3.39	1.62	17.40
2012	0.73	2.01	M2.88	2.85	M0.00	0.00	0.39	0.67	0.59	0.37	0.59	2.74	13.82
2013	2.29	1.52	1.78	0.02	0.52	0.00	0.27	0.15	2.34	1.16	0.87	0.78	11.70
2014	0.12	1.52	1.27	1.08	0.01	0.00	0.18	0.56	0.57	0.00	0.38	4.15	9.84
2015	0.48	1.07	1.74	0.44	2.61	0.69	0.46	0.02	0.76	1.09	1.04	2.03	12.43
2016	4.30	0.82	1.05	1.90	0.19	0.00	T	0.00	1.13	0.10	1.20	4.87	15.56
2017	8.87	5.09	0.13	0.00	1.11	0.00	0.18	0.00	0.23	0.01	0.41	0.02	16.05
2018	2.89	0.69	1.48	0.04	0.06	0.00	1.31	0.04	0.00	0.08	1.93	2.15	10.67
2019	2.27	9.29	1.48	0.32	1.98	0.00	0.07	0.00	0.78	0.00	5.01	4.25	25.45
2020	0.10	0.98	4.23	2.67	0.00	0.00	0.00	0.00	0.00	0.03	1.25	1.04	10.30
2021	3.26	0.19	3.65	0.13	0.02	0.00	0.00	0.33	0.12	M0.71			8.41

Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.

Data missing for all days in a month or year is blank.

Creation date: 2021-10-27

Attachment D. Arid West Wetland Determination and Ordinary High Water Mark Datasheets

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Live Oak Springs Water System Improvements City/County: Live Oak Springs Sampling Date: 4/28/2021

Applicant/Owner: County of San Diego DPW State: CA Sampling Point: Wetland 1

Investigator(s): Emily Mastrelli, Katie Laybourn Section, Township, Range:

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): Mediterranean California (LRR C) Lat: 32.691758 N Long: -116.339728 W Datum: NAD83

Soil Map Unit Name: NWI classification: Riverine

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

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

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

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

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

Remarks:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows in the channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 1 m)			
1. San Diego sedge (Carex spissa)	80	Yes	OBL
2. California bulrush (Schoenoplectus californicus)	5	No	OBL
3. Black mustard (Brassica nigra)	10	No	UPL
4. Big sagebrush (Artemisia tridentata)	5	No	UPL
5.			
	100 = Total Cover		
Herb Stratum (Plot size: 1 m)			
1. Short pod mustard (Hirschfeldia incana)	5	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1/2 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 85	x 1 =	85
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species 20	x 5 =	100
Column Totals: 105 (A)		185 (B)

Prevalence Index = B/A = 1.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Sandy soils completely saturated

SOIL

Sampling Point: Wetland 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5 YR 4/2	100%					Sandy loam	Soil pit filled with water - completely saturated, small and large sand grains

[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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ 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 Soil Present? **Yes** _____ **No** X

Remarks:

Soil pit filled to top with water - completely saturated, small and large sand grains

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 2 in

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

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 2 in

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

Surface water and soil saturation observed - potentially a shallow water table; water is not present in the channel approximately 30 feet upstream

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Live Oak Springs Water System Improvements City/County: Live Oak Springs Sampling Date: 4/28/2021

Applicant/Owner: County of San Diego DPW State: CA Sampling Point: Wetland 2

Investigator(s): Emily Mastrelli, Katie Laybourn Section, Township, Range:

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): Mediterranean California (LRR C) Lat: 32.691758 N Long: -116.339728 W Datum: NAD83

Soil Map Unit Name: NWI classification: Riverine

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

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

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

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

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

Remarks:
Pond 1 appears to have been formed after the construction of a concrete dam within Campo Creek, south of sampling point W-2. Evidence that the rural residential development east of sampling point W-2, including the construction and maintenance of water infrastructure, has disturbed and altered the flows in Campo Creek and the formation of Pond 1.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red willow (Salix laevigata)	5	Yes	FACW
2.			
3.			
4.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 1 m)			
1. Broadleaf cattail (Typha latifolia)	40	Yes	OBL
2. California bulrush (Schoenoplectus californicus)	10	No	OBL
3.			
4.			
5.			
	50 = Total Cover		
Herb Stratum (Plot size: 1 m)			
1. Filamentous green algae species (Spirogyra sp.)	80	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	80 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks:
Sandy loam soils completely inundated and saturated

SOIL

Sampling Point: Wetland 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
								No soil pit dug due to complete inundation and saturation at sampling point

[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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ 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 Soil Present? **Yes** X **No** _____

Remarks:

No soil pit dug due to complete inundation and saturation at sampling point - hydric soils assumed

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 4 ft

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

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 4 ft

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

Surface water ponding (inundation) and soil saturation observed - ponding likely a result of construction of the concrete dam located south of the sampling point W-2

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Live Oak Springs Water System Improvements City/County: Live Oak Springs Sampling Date: 4/28/2021

Applicant/Owner: County of San Diego DPW State: CA Sampling Point: Wetland 3

Investigator(s): Emily Mastrelli, Katie Laybourn Section, Township, Range:

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): Mediterranean California (LRR C) Lat: 32.691758 N Long: -116.339728 W Datum: NAD83

Soil Map Unit Name: NWI classification: None

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

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

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

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

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

Remarks: Evidence Pond 2 may have formed as a result of the rural residential development east of sampling point W-3 as well as the construction and maintenance of water infrastructure west of sampling point W-3. These activities may have disturbed and altered the flows in and surrounding Campo Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 1 m)			
1. Russian thistle (Salsola tragus)	40	Yes	UPL
2. California bulrush (Schoenoplectus californicus)	20	No	OBL
3. Black mustard (Brassica nigra)	10	No	UPL
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 1 m)			
1. Filamentous green algae species (Spirogyra sp.)	80	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	80 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1/2 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 100	x 1 = 100
FACW species	x 2 = 10
FAC species	x 3 =
FACU species	x 4 =
UPL species 50	x 5 = 250
Column Totals: 150 (A)	360 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks:

Sandy loam soils completely inundated and saturated

SOIL

Sampling Point: Wetland 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
								No soil pit dug due to complete inundation and saturation at sampling point

[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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ 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 Soil Present? **Yes** X **No** _____

Remarks:

No soil pit dug due to complete inundation and saturation at sampling point - hydric soils assumed

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0.5 ft

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

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0.5 ft

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

Surface water ponding (inundation) and soil saturation observed - ponding likely a result of mechanical disturbance associated with water utility infrastructure to the west and residential development to the east

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Live Oak Springs Water System Improvements City/County: Live Oak Springs Sampling Date: 4/28/2021

Applicant/Owner: County of San Diego DPW State: CA Sampling Point: Wetland 4

Investigator(s): Emily Mastrelli, Katie Laybourn Section, Township, Range:

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): Mediterranean California (LRR C) Lat: 32.691758 N Long: -116.339728 W Datum: NAD83

Soil Map Unit Name: NWI classification: None

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

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

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

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

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

Remarks: Evidence Pond 3 may have formed as a result of flooding and erosion from Channels 5 and 6 flows converging through Channel 3 to Campo Creek. Stormwater runoff from the nearby rural residential community may also contribute water to Pond 3 which then flows into Channel 3 and Campo Creek.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 1 m)			
1. San Diego sedge (Carex spissa)	60	Yes	OBL
2. California bulrush (Schoenoplectus californicus)	10	No	OBL
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 1 m)			
1. Filamentous green algae species (Spirogyra sp.)	75	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Sandy loam soils completely inundated and saturated

SOIL

Sampling Point: Wetland 4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
								No soil pit dug due to complete inundation and saturation at sampling point

[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)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ 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 Soil Present? **Yes** X **No** _____

Remarks:

No soil pit dug due to complete inundation and saturation at sampling point - hydric soils assumed

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 1 ft

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

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 1 ft

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

Surface water ponding (inundation) and soil saturation observed - ponding likely a result of mechanical disturbance associated with water utility infrastructure to the west and stormwater runoff from residential development to the east

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 9:30am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

Brief site description:

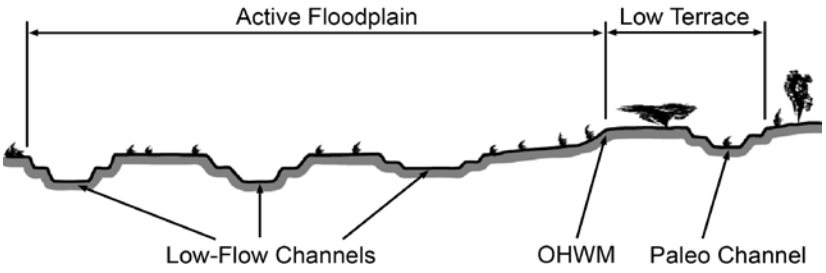
The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

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

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

Hydrogeomorphic Floodplain Units

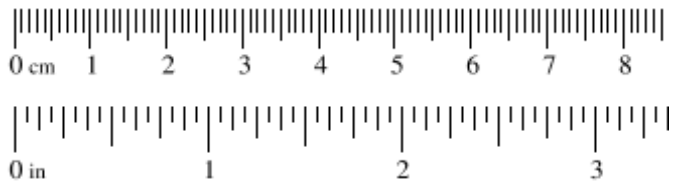


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

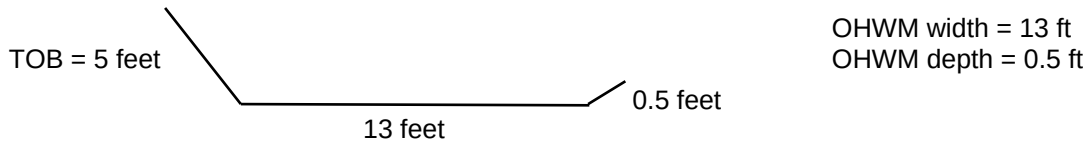
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 1 **Date:** 4/28/2021 **Time:** 9:30am

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 1

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Channel has upland scrub vegetation growing in channel and on banks; sandy soils throughout channel

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

GPS point: Non-Wetland Point 1

Characteristics of the floodplain unit:

Average sediment texture: Sandy

Total veg cover: 30 % Tree: 0 % Shrub: 25 % Herb: 5 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 10:00am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

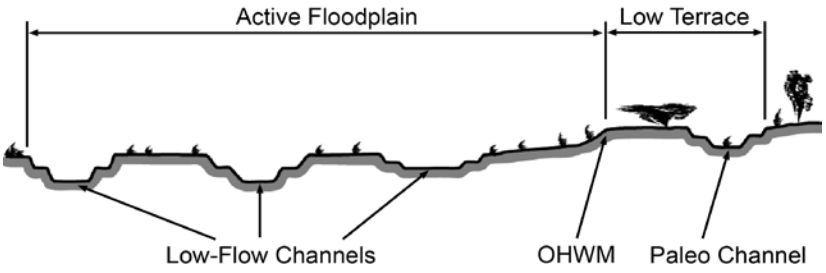
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

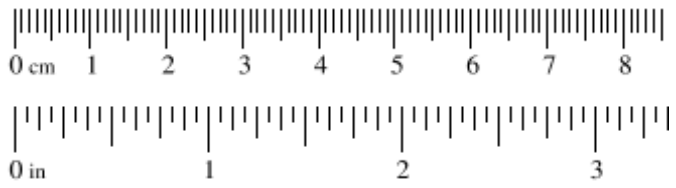


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

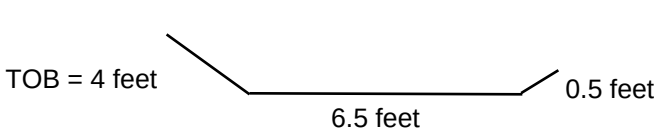
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 2 **Date:** 4/28/2021 **Time:** 10:00am

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 2

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Channel has upland scrub vegetation growing on banks; sandy soils throughout channel

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

GPS point: Non-Wetland Point 2

Characteristics of the floodplain unit:

Average sediment texture: Sandy

Total veg cover: 30 % Tree: 0 % Shrub: 5 % Herb: 25 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 10:15am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

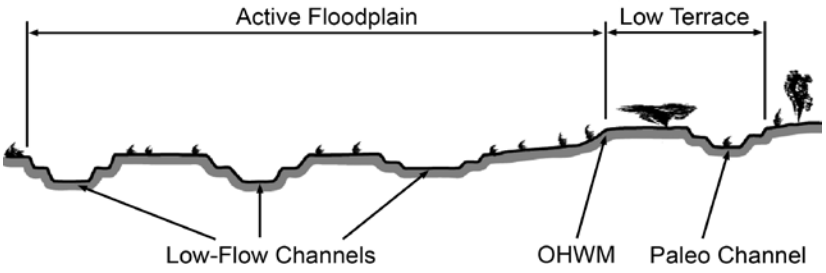
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

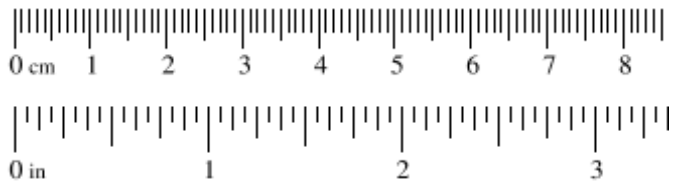


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

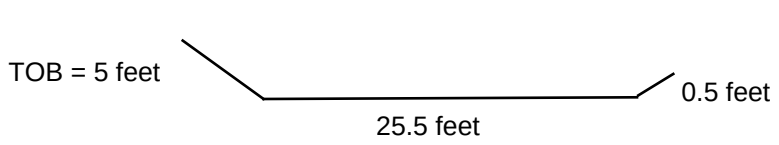
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 3 **Date:** 4/28/2021 **Time:** 10:15am

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 3

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Channel has upland scrub vegetation growing at edges of channel and on banks; sandy soils throughout channel

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

GPS point: Non-Wetland Point 3

Characteristics of the floodplain unit:

Average sediment texture: Sandy

Total veg cover: 20 % Tree: 0 % Shrub: 15 % Herb: 5 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 10:30am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

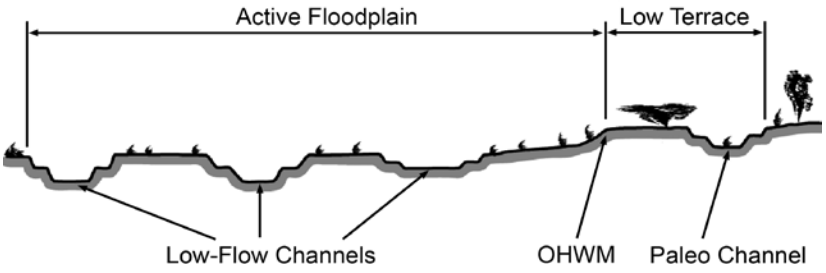
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

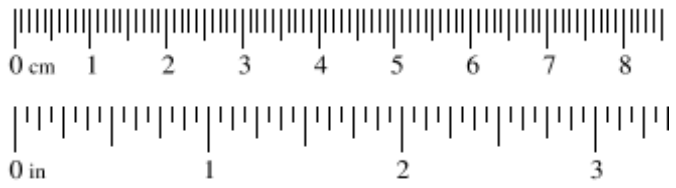


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 4 **Date:** 4/28/2021 **Time:** 10:30am

Cross section drawing:

OHWM

GPS point: Non-Wetland Point 4

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Channel has upland scrub vegetation growing in channel and on banks and trees along the edges of channel; sandy soils throughout channel

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

GPS point: Non-Wetland Point 4

Characteristics of the floodplain unit:

Average sediment texture: Sandy

Total veg cover: 75 % Tree: 30 % Shrub: 40 % Herb: 5 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 10:45am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

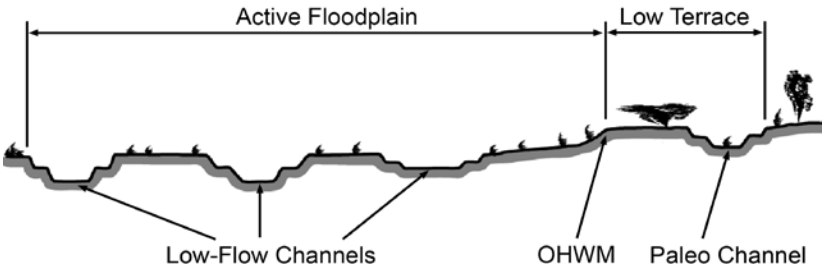
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

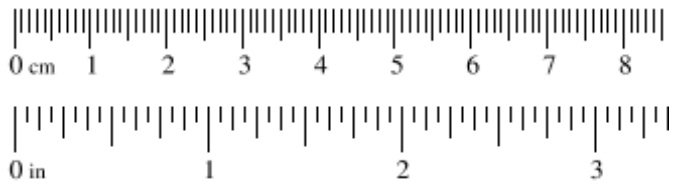


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

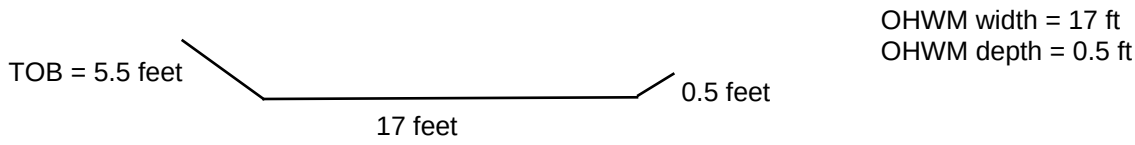
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 5 **Date:** 4/28/2021 **Time:** 10:45am

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 5

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Water observed in center of channel; evidence of mechanical disturbance on west side of channel; channel has herbaceous and upland scrub vegetation growing in channel and on banks; sandy loam soils in channel

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

GPS point: Non-Wetland Point 5

Characteristics of the floodplain unit:

Average sediment texture: Sandy loam

Total veg cover: 80 % Tree: 0 % Shrub: 5 % Herb: 80 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 11:00am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

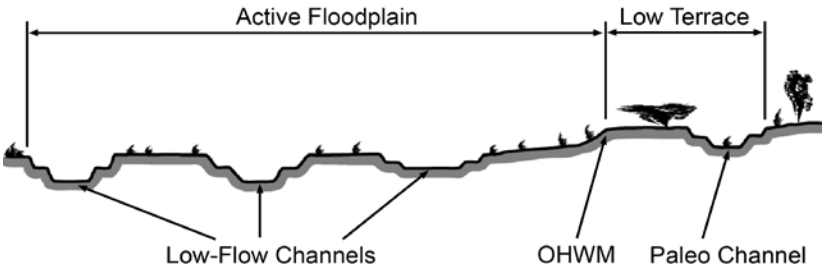
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

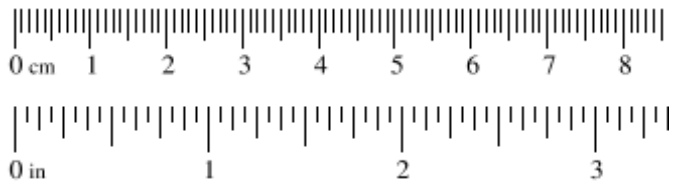


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

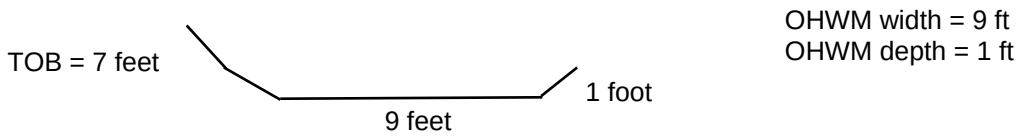
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 6 **Date:** 4/28/2021 **Time:** 11:00am

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 6

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Water observed in center of channel; channel has algae, herbaceous and upland grass vegetation growing in channel and on banks; sandy loam soils in channel

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

GPS point: Non-Wetland Point 6

Characteristics of the floodplain unit:

Average sediment texture: Sandy loam

Total veg cover: 115 % Tree: 100 % Shrub: 10 % Herb: 5 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 11:15am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

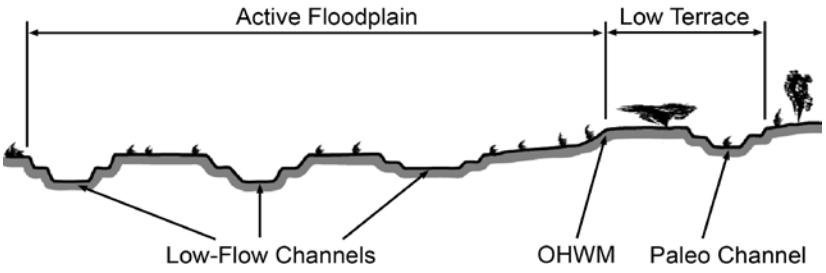
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

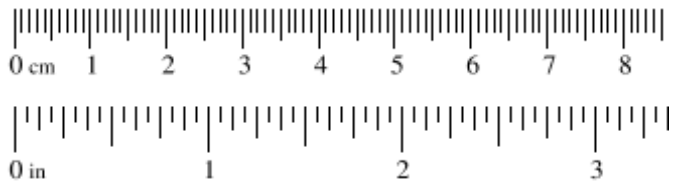


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

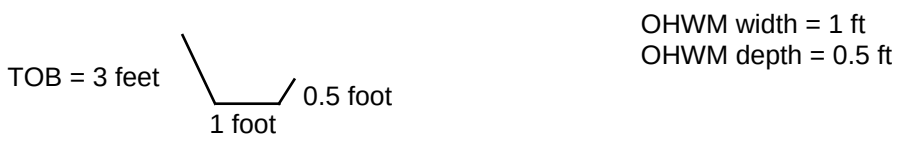
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 7 **Date:** 4/28/2021 **Time:** 11:15am

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 7

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Water observed in center of channel; narrow channel; channel has herbaceous and upland grass vegetation growing in channel and on banks; sandy loam soils in channel

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

GPS point: Non-Wetland Point 7

Characteristics of the floodplain unit:

Average sediment texture: Sandy loam

Total veg cover: 85 % Tree: 15 % Shrub: 60 % Herb: 10 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek tributary
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 11:30am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

Brief site description:

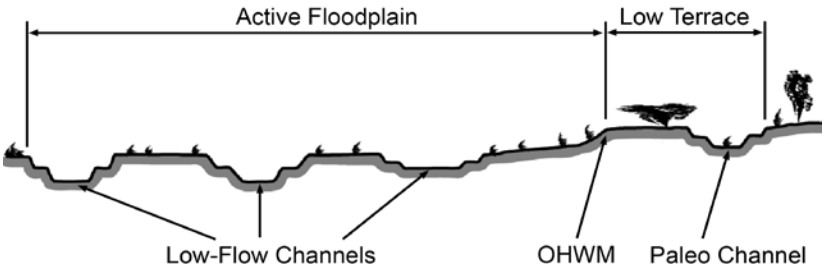
The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

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

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

Hydrogeomorphic Floodplain Units

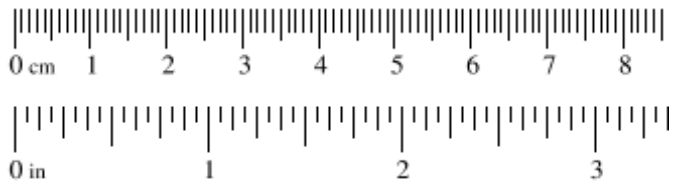


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

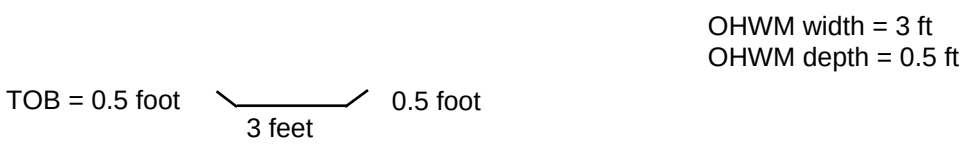
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 8 **Date:** 4/28/2021 **Time:** 11:30am

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 8

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Tributary of Campo Creek; channel connects shallow water detention pond to creek; narrow channel; channel has upland grass vegetation growing in channel and on banks; silt loam soils in channel

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

GPS point: Non-Wetland Point 8

Characteristics of the floodplain unit:

Average sediment texture: Silt loam

Total veg cover: 155 % Tree: 0 % Shrub: 60 % Herb: 95 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 11:45am
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

Brief site description:

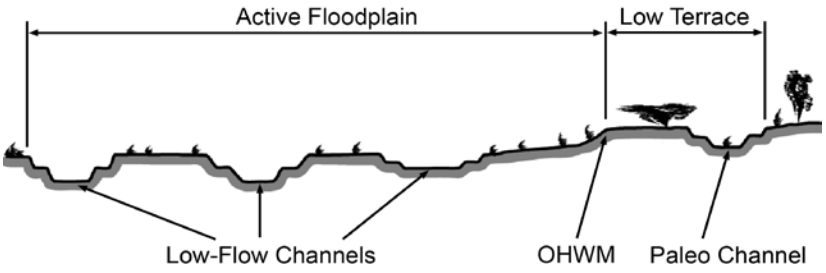
The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

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

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

Hydrogeomorphic Floodplain Units

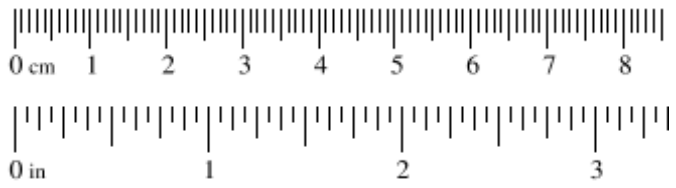


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

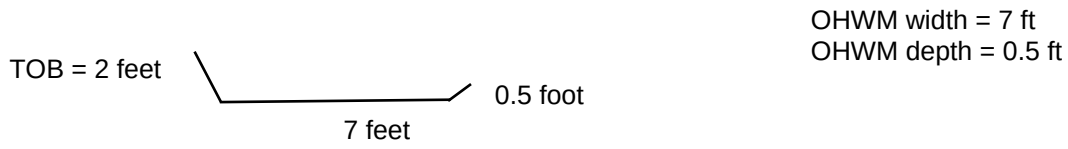
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 9 **Date:** 4/28/2021 **Time:** 11:45am

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 9

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Campo Creek channel; narrow channel with water flowing downstream; channel has wetland and upland grass vegetation growing in channel and on banks and is surrounded by willow riparian forest; silt loam soils in channel

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

GPS point: Non-Wetland Point 9

Characteristics of the floodplain unit:

Average sediment texture: Silt loam

Total veg cover: 110 % Tree: 60 % Shrub: 40 % Herb: 10 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek Tributary
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 12:00pm
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

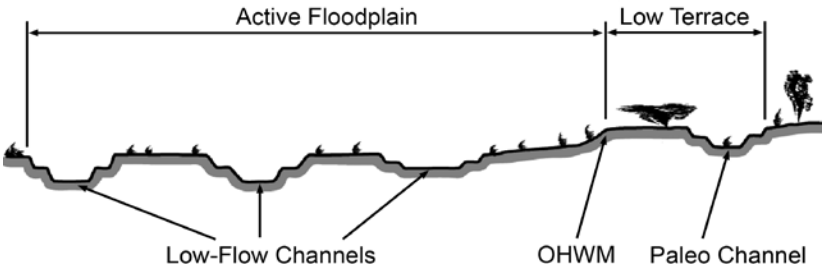
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

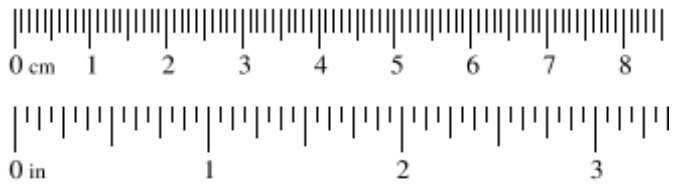


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

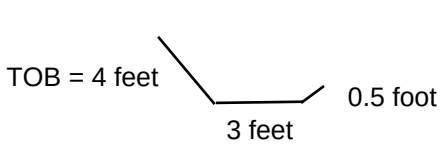
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 10 **Date:** 4/28/2021 **Time:** 12:00pm

Cross section drawing:



OHWM width = 3 ft
OHWM depth = 0.5 ft

OHWM

GPS point: Non-Wetland Point 10

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Campo Creek tributary; narrow channel with water sitting in bottom of channel; channel has upland grass vegetation growing in channel and on banks appears to be a ponding area adjacent to Campo Creek; silt loam soils in channel

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

GPS point: Non-Wetland Point 10

Characteristics of the floodplain unit:

Average sediment texture: Silt loam

Total veg cover: 110 % Tree: 95 % Shrub: 0 % Herb: 15 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek Tributary
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 12:15pm
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

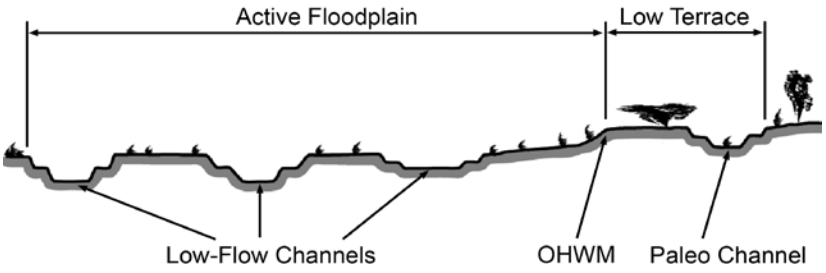
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

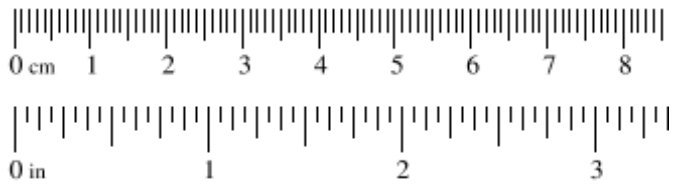


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

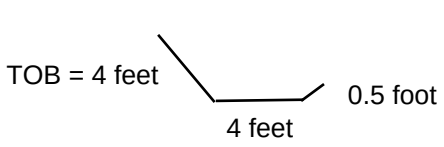
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 11 **Date:** 4/28/2021 **Time:** 12:15pm

Cross section drawing:



OHWM width = 4 ft
OHWM depth = 0.5 ft

OHWM

GPS point: Non-Wetland Point 11

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Campo Creek tributary; connects a ponded area to Campo Creek; narrow channel with water sitting in bottom of channel; channel has upland grass vegetation growing in channel and on banks; silt loam soils in channel

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

GPS point: Non-Wetland Point 11

Characteristics of the floodplain unit:

Average sediment texture: Silt loam

Total veg cover: 65 % Tree: 10 % Shrub: 15 % Herb: 40 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek Tributary
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 12:30pm
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

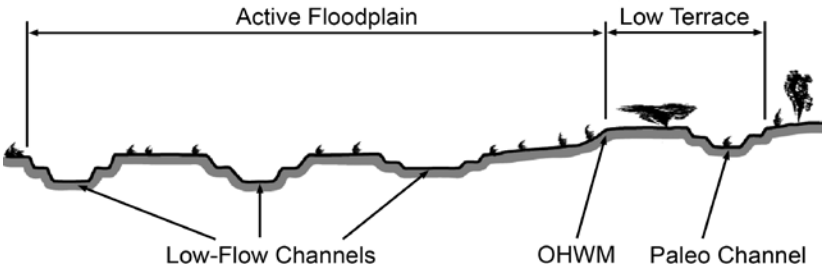
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

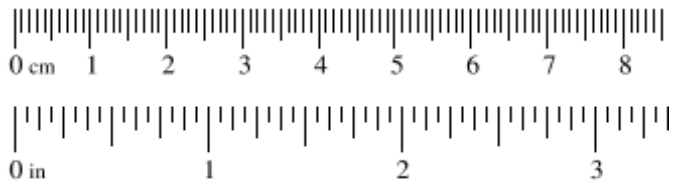


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

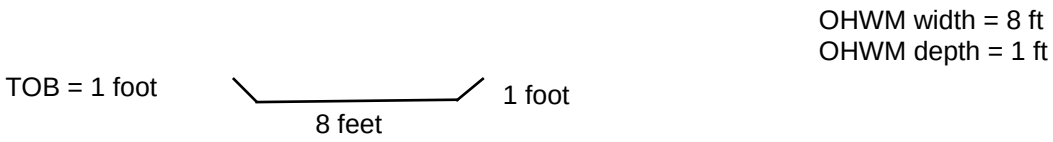
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 12 **Date:** 4/28/2021 **Time:** 12:30pm

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 12

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Campo Creek tributary; appears to be a historic tributary connecting to Campo Creek; wide channel with dead cattails and upland grass vegetation growing in channel and on banks; silt loam soils in channel

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

GPS point: Non-Wetland Point 12

Characteristics of the floodplain unit:

Average sediment texture: Silt loam

Total veg cover: 140 % Tree: 0 % Shrub: 80 % Herb: 60 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek Tributary
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 12:45pm
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

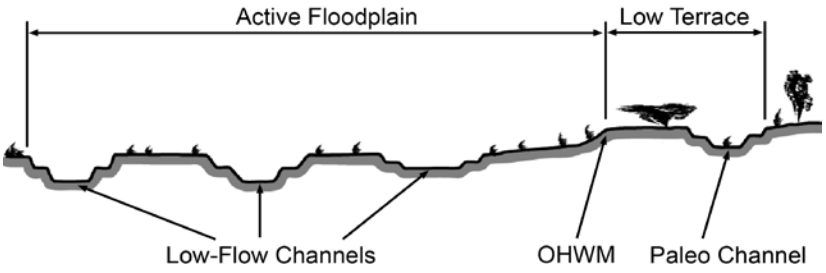
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

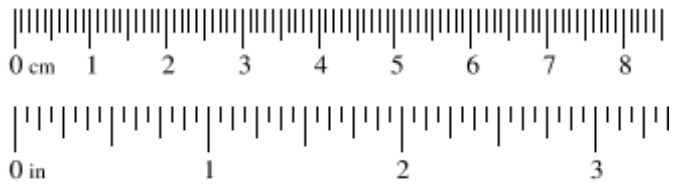


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

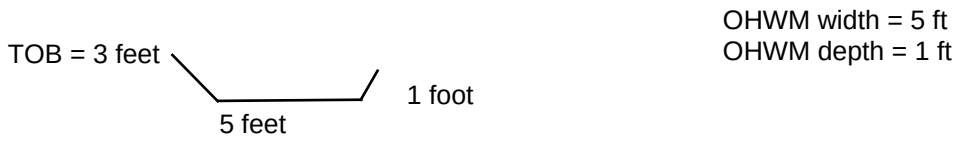
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 13 **Date:** 4/28/2021 **Time:** 12:45pm

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 13

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Campo Creek tributary; appears to be a historic tributary connecting to Campo Creek; erosional channel with dead weeds and upland grass vegetation growing in channel and on banks; silt loam soils in channel

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

GPS point: Non-Wetland Point 13

Characteristics of the floodplain unit:

Average sediment texture: Silt loam

Total veg cover: 90 % Tree: 0 % Shrub: 10 % Herb: 80 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek Tributary
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 1:00pm
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

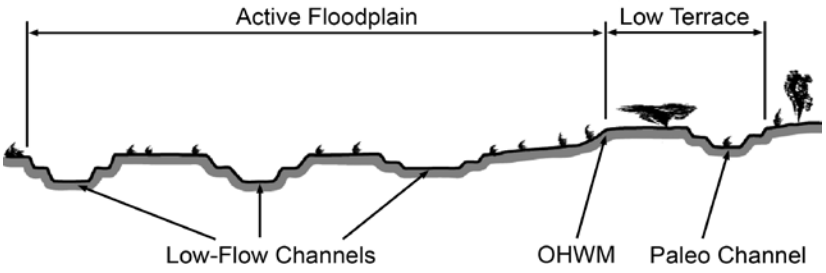
Brief site description:

The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

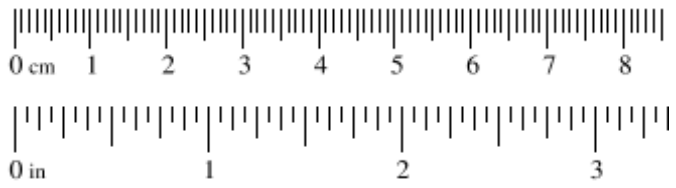


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

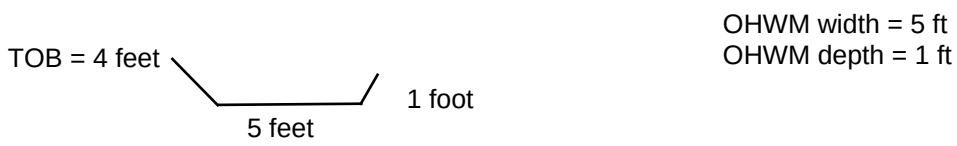
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 14 **Date:** 4/28/2021 **Time:** 1:00pm

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 14

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Campo Creek tributary; appears to be a tributary connecting to Campo Creek; erosional channel with cattails and upland grass vegetation growing in channel and on banks; silt loam soils in channel

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

GPS point: Non-Wetland Point 14

Characteristics of the floodplain unit:

Average sediment texture: Silt loam

Total veg cover: 100 % Tree: 0 % Shrub: 90 % Herb: 10 %

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Live Oak Springs Water System Improvements
Project Number:
Stream: Campo Creek
Investigator(s): Emily Mastrelli, Katie Laybourn

Date: 4/28/2021 **Time:** 1:15pm
Town: Live Oak Springs **State:** CA
Photo begin file#: **Photo end file#:**

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

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

Location Details: Open space/rural residential site, northeast of Old Highway 80 and south of Interstate 8 (I-8)

Projection: **Datum:** NAD83
Coordinates: 32.691758 N -116.339728 W

Potential anthropogenic influences on the channel system:

Evidence that the rural residential development in the eastern portion of the project site, including the construction and maintenance of water infrastructure, has disturbed and altered the flows across the site.

Brief site description:

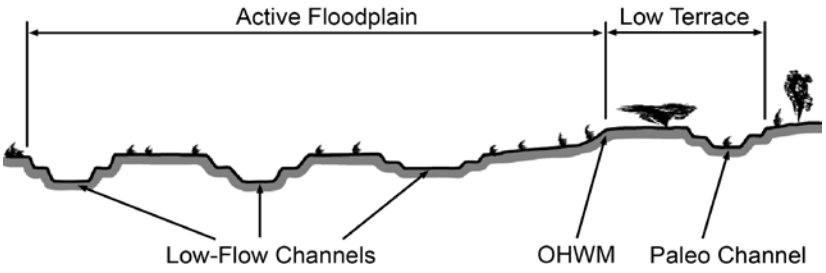
The project site includes the rural residential community of Live Oak springs and is surrounded by open space. Dirt access roads and potable water infrastructure (tanks and pipes) running throughout site.

Checklist of resources (if available):

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

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

Hydrogeomorphic Floodplain Units

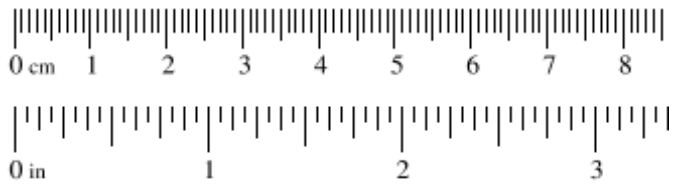


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

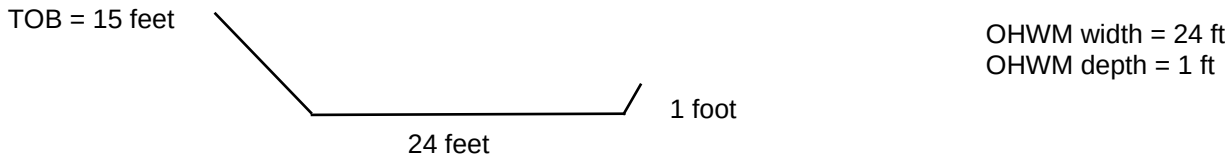
Wentworth Size Classes

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



Project ID: Live Oak Springs **Cross section ID:** Non-Wetland Point 15 **Date:** 4/28/2021 **Time:** 1:15pm

Cross section drawing:



OHWM

GPS point: Non-Wetland Point 15

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Campo Creek downstream from a concrete dam and spillway; wide channel with cattails and upland grass vegetation growing in channel and on banks; silt loam soils in channel

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

GPS point: Non-Wetland Point 15

Characteristics of the floodplain unit:

Average sediment texture: Silt loam

Total veg cover: 100 % Tree: 0 % Shrub: 90 % Herb: 10 %

Community successional stage:

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

Indicators:

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

Comments:

Attachment E. Photographic Log

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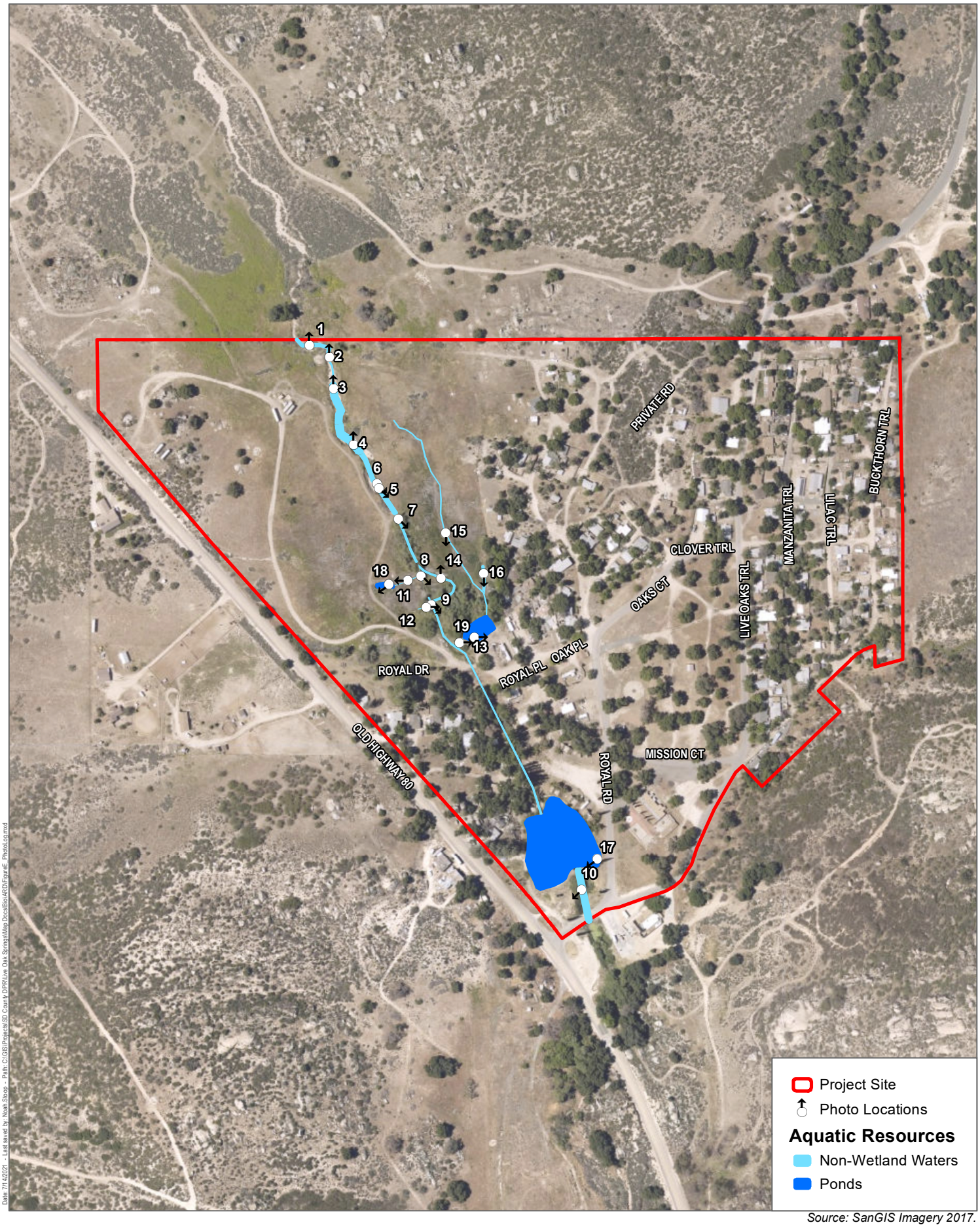

Source: SanGIS Imagery 2017.

Harris & Associates

N

0 200 400

Feet

Figure E

Photographic Log

Live Oak Springs Water System Improvements Project

Date: 7/14/2021 - Last saved by: Noah Shoop - Path: C:\GIS\Projects\SD County\LOR\Live Oak Springs\Map Docs\Bio\ARD\Figure E - PhotoLog.mxd

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Campo Creek

Photograph 1: (32.691758, 116.339728) North-facing view of the northern reach of the 13-foot wide earthen bottom channel on the northern portion of the project site. This photo shows where sampling point NW-1 was taken to determine the presence of OHWM indicators.

Photograph 2: (32.691758, 116.339728) North-facing view of the northern reach of the 6.5-foot wide earthen bottom channel on the northern portion of the project site. This photo shows where sampling point NW-2 was taken to determine the presence of OHWM indicators.

Photograph 3: (32.691758, 116.339728) North-facing view of the northern reach of the 25.5-foot wide earthen bottom channel on the northern portion of the project site. This photo shows where sampling point NW-3 was taken to determine the presence of OHWM indicators.

Photograph 4: (32.691758, 116.339728) North-facing view of the 28-foot wide earthen bottom channel on the northern portion of the project site. This photo shows where sampling point NW-4 was taken to determine the presence of OHWM indicators.

Photograph 5: (32.691758, 116.339728) Southeast-facing view of the 17-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-5 was taken to determine the presence of OHWM indicators.

Photograph 6: (32.691758, 116.339728) Southeast-facing view of where sampling point W-1 was taken to determine the presence of wetland indicators. This photo shows the soil pit that was dug at sampling point W-1, which immediately filled with water, indicative of soil saturation.

Photograph 7: (32.691758, 116.339728) Southeast-facing view of the 9-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-6 was taken to determine the presence of OHWM indicators.

Photograph 8: (32.691758, 116.339728) Southeast-facing view of the 1 foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-7 was taken to determine the presence of OHWM indicators.

Photograph 9: (32.691758, 116.339728) Southeast-facing view of the 7-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-9 was taken to determine the presence of OHWM indicators.

Photograph 10: (32.691758, 116.339728) Southwest-facing view of the 24-foot wide earthen bottom channel on the southern portion of the project site. This photo shows where sampling point NW-15 was taken to determine the presence of OHWM indicators.

Channel 1

Photograph 11: (32.691758, 116.339728) West-facing view of the 3-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-8 was taken to determine the presence of OHWM indicators.

Channel 2

Photograph 12: (32.691758, 116.339728) East-facing view of the 3-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-10 was taken to determine the presence of OHWM indicators.

Channel 3

Photograph 13: (32.691758, 116.339728) East-facing view of the 4-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-11 was taken to determine the presence of OHWM indicators.

Channel 4

Photograph 14: (32.691758, 116.339728) North-facing view of the 8-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-12 was taken to determine the presence of OHWM indicators.

Channel 5

Photograph 15: (32.691758, 116.339728) South-facing view of the 5-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-13 was taken to determine the presence of OHWM indicators.

Channel 6

Photograph 16: (32.691758, 116.339728) South-facing view of the 5-foot wide earthen bottom channel on the central portion of the project site. This photo shows where sampling point NW-14 was taken to determine the presence of OHWM indicators.

Pond 1

Photograph 17: (32.691758, 116.339728) Southwest-facing view of Pond 1 in the southern portion of the project site. This photo shows where sampling point W-2 was taken to determine the presence of wetland indicators.

Pond 2

Photograph 18: (32.691758, 116.339728) Southwest-facing view of Pond 2 in the eastern portion of the project site. This photo shows where sampling point W-3 was taken to determine the presence of wetland indicators.

Pond 3

Photograph 19: (32.691758, 116.339728) East-facing view of Pond 3 in the central portion of the project site. This photo shows where sampling point W-4 was taken to determine the presence of wetland indicators.

Attachment F. SDAM for the Arid West Forms

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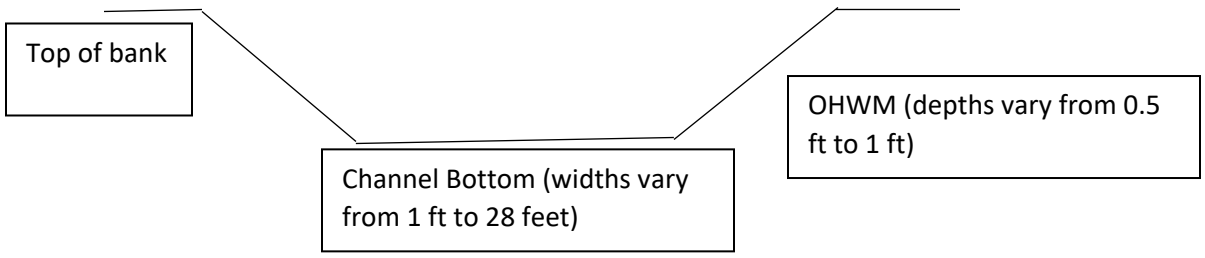
Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: Live Oak Springs Water System Improvements Project		
Site code or identifier: Sampling Points W-1, NW-1 through NW-7, NW-9, and NW-15	Assessor(s): Katie Laybourn, Emily Mastrelli	
Waterway name: Campo Creek		Visit date: April 28, 2021 and May 7, 2021
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ■ Cloudy (_0_ % cover) ■ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Currently dry, sunny weather with no precipitation. No recent precipitation documented.	Coordinates at downstream end (decimal degrees): Lat (N): 32.691758 N Long (W): -116.339728 W Datum: NAD83
Surrounding land-use within 100 m (check one or two): ■ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ■ Other natural ■ Other: _Rural residential and open space	Describe reach boundaries: The extent of Campo Creek that runs through the project site begins on the northwestern portion of the project site and runs approximately 1,949 linear feet southeast to the southern edge of the project site.	
Mean channel width (m) OHWM varies in width between 1 foot at its narrowest and 28 feet at its widest	Reach length (m): 40x width; min 40 m; max 200 m. Approximately 1,949 linear feet	Enter photo ID, or check if completed **ARD Report Attachment E, Photographic Log, Photos 1 through 10 and 17.**
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ■ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ■ Drought ☐ Vegetation removal/limitations ■ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: Campo Creek shows signs of disturbance, potentially from construction or maintenance activities associated with the nearby water infrastructure. Specifically, evidence of mechanical disturbance was observed on the western bank of the channel adjacent to sampling point N-1. Additionally, a concrete dam occurs in Campo Creek in the southern portion of the project site which has likely resulted in the formation of Pond 1.	
Observed hydrology: __75__ % of reach with surface flow _____ % of reach with sub-surface or surface flow __0____ # of isolated pools	Comments on observed hydrology: Surface water hydrology was observed to originate from a high water table/groundwater seepage area in the center of the channel in the northern portion of the project site (Sampling Point W-1). Surface water flows continued south within the remaining reach of Campo Creek that occurs in the project site.	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ☐ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID
San Diego sedge (*Carex spissa*)	80%	Soil saturation up to the surface was observed.	Photos 5 and 6
California bulrush (*Schoenoplectus californicus*)	5%	Soil saturation up to the surface was observed.	Photos 5 and 6
Broadleaf cattail (*Typha latifolia*)	40%	Observed around Pond 1 within Campo Creek	Photo 17

Notes on hydrophytic vegetation:

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
- ■ None
- ☐ 1 to 19
- ☐ 20 +

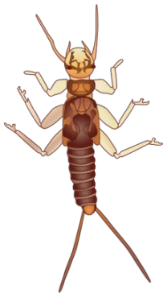
(Do not count mosquitos)

Photo ID:__None_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No

Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby

Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates: Thick algae cover present in ponded areas.

4. Algal Cover

Are algae found on the streambed?		Notes	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	☐ Not detected ☐ Yes, < 10% cover ■ Yes, ≥ 10% (check Yes in single indicator below)	Notes on algae cover: The majority of algal cover occurs in the southern reach of Campo Creek where Pond 1 has formed due to a concrete dam spanning the creek.	

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ■ No, no fish ☐ No, only non-native mosquitofish	Thick algae cover present in ponded areas.	Photo 17
Algae cover ≥ 10%	■ Yes ☐ No		

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
Photos 1 – 10, 17	ARD Report Attachment E, Photographic Log

Additional notes about the assessment:

Classification: _____Intermittent_____

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
	Few (1-19)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
Few (1-2)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present	Absent		**At least intermittent**
			Present		**Intermittent**
Many (3+)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent			**At least intermittent**
		Present			**Perennial**
	Many (20+)	Absent			**At least intermittent**
		Present			**Perennial**

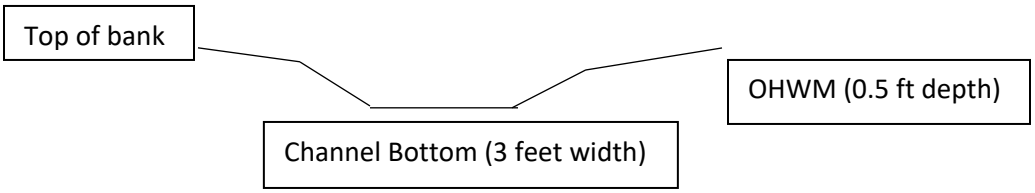
Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: Live Oak Springs Water System Improvements Project		
Site code or identifier: Sampling Point NW-8	Assessor(s): Katie Laybourn, Emily Mastrelli	
Waterway name: Channel 1		Visit date: April 28, 2021 and May 7, 2021
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ■ Cloudy (_0_ % cover) ■ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Currently dry, sunny weather with no precipitation. No recent precipitation documented.	Coordinates at downstream end (decimal degrees): Lat (N): 32.691758 N Long (W): -116.339728 W Datum: NAD83
Surrounding land-use within 100 m (check one or two): ■ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ■ Other natural ■ Other: _Rural residential and open space	Describe reach boundaries: Channel 1 is a tributary of Campo Creek that runs approximately 93 linear feet west where it connects to a shallow freshwater detention pond (Pond 2).	
Mean channel width (m) OHWM is approximately 3 feet wide	Reach length (m): 40x width; min 40 m; max 200 m. Approximately 93 linear feet	Enter photo ID, or check if completed **ARD Report Attachment E, Photographic Log, Photo 11.** Top down: __X_____ Mid down: ____X_____ Mid up: ___X_____ Bottom up: ___X_____
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ■ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ■ Drought ☐ Vegetation removal/limitations ■ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: Channel 1 shows signs of disturbance, potentially from construction or maintenance activities associated with the nearby water infrastructure. Specifically, the formation of Pond 2 appears to be artificial and used as a detention basin for waters related to the nearby water infrastructure.	
Observed hydrology: __0__ % of reach with surface flow _____ % of reach with sub-surface or surface flow __0____ # of isolated pools	Comments on observed hydrology: No surface water hydrology was observed in Channel 1. Surface flows from Pond 2 were not observed during the delineation.	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ■ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation: Channel overgrown with upland grasses and weeds.

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
■ None
☐ 1 to 19
☐ 20 +

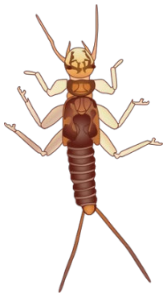
(Do not count mosquitos)

Photo ID:__None_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No

Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby

Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed?		Notes	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	■ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)	Notes on algae cover: Channel overgrown with upland grasses and weeds.	

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ■ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ■ No		

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
Photo 11	ARD Report Attachment E, Photographic Log

Additional notes about the assessment:

Classification: _____Ephemeral_____

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
	Few (1-19)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
Few (1-2)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present	Absent		**At least intermittent**
			Present		**Intermittent**
Many (3+)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent			**At least intermittent**
		Present			**Perennial**
	Many (20+)	Absent			**At least intermittent**
		Present			**Perennial**

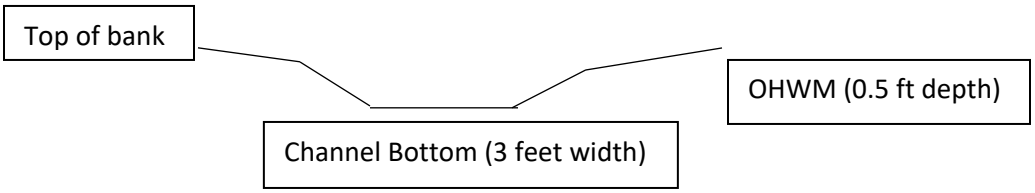
Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: Live Oak Springs Water System Improvements Project		
Site code or identifier: Sampling Point NW-10	Assessor(s): Katie Laybourn, Emily Mastrelli	
Waterway name: Channel 2		Visit date: April 28, 2021 and May 7, 2021
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ■ Cloudy (_0_ % cover) ■ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Currently dry, sunny weather with no precipitation. No recent precipitation documented.	Coordinates at downstream end (decimal degrees): Lat (N): 32.691758 N Long (W): -116.339728 W Datum: NAD83
Surrounding land-use within 100 m (check one or two): ■ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ■ Other natural ■ Other: _Rural residential and open space	Describe reach boundaries: Channel 2 is a tributary of Campo Creek that runs approximately 47 linear feet west where the channel becomes undefined because of a topographic rise.	
Mean channel width (m) OHWM is approximately 3 feet wide	Reach length (m): 40x width; min 40 m; max 200 m. Approximately 47 linear feet	Enter photo ID, or check if completed **ARD Report Attachment E, Photographic Log, Photo 12.** Top down: __X_____ Mid down: ____X_____ Mid up: ___X_____ Bottom up: ___X_____
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ■ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ■ Drought ☐ Vegetation removal/limitations ■ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: Channel 2 shows signs of disturbance, potentially from construction or maintenance activities associated with the nearby water infrastructure.	
Observed hydrology: __25__ % of reach with surface flow _____ % of reach with sub-surface or surface flow __0____ # of isolated pools	Comments on observed hydrology: Surface water hydrology was observed in the easternmost reach of Channel 2 where it connects to Campo Creek.	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ■ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation: Channel 2 has upland grasses and weeds growing in the center and on the banks of the channel.

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
■ None
☐ 1 to 19
☐ 20 +

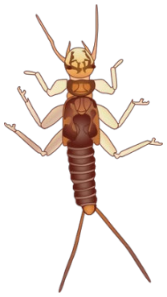
(Do not count mosquitos)

Photo ID:__None_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No

Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby

Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed? ☐ Check if *all* observed algae appear to be deposited from an upstream source.	■ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)	Notes on algae cover:	Photo ID: Photo 12

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ■ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ■ No		Photo 12

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
Photo 12	ARD Report Attachment E, Photographic Log

Additional notes about the assessment:

Classification: _____Ephemeral_____

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
	Few (1-19)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
Few (1-2)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present	Absent		**At least intermittent**
			Present		**Intermittent**
Many (3+)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent			**At least intermittent**
		Present			**Perennial**
	Many (20+)	Absent			**At least intermittent**
		Present			**Perennial**

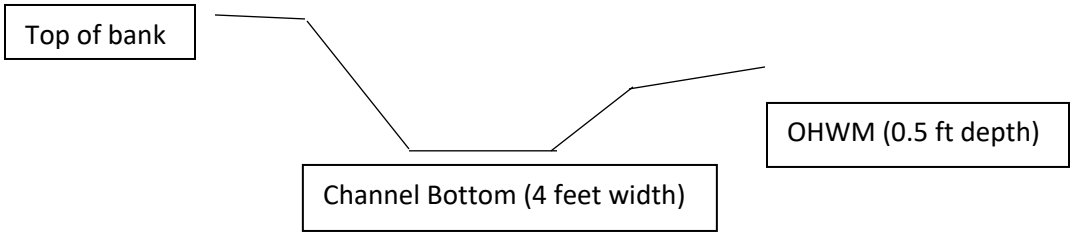
Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: Live Oak Springs Water System Improvements Project		
Site code or identifier: Sampling Point NW-11	Assessor(s): Katie Laybourn, Emily Mastrelli	
Waterway name: Channel 3		Visit date: April 28, 2021 and May 7, 2021
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ■ Cloudy (_0_ % cover) ■ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Currently dry, sunny weather with no precipitation. No recent precipitation documented.	Coordinates at downstream end (decimal degrees): Lat (N): 32.691758 N Long (W): -116.339728 W Datum: NAD83
Surrounding land-use within 100 m (check one or two): ■ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ■ Other natural ■ Other: _Rural residential and open space	Describe reach boundaries: Channel 3 is a tributary of Campo Creek that runs approximately 35 linear feet east where it connects to a freshwater detention pond (Pond 3).	
Mean channel width (m) OHWM is approximately 4 feet wide	Reach length (m): 40x width; min 40 m; max 200 m. Approximately 35 linear feet	Enter photo ID, or check if completed **ARD Report Attachment E, Photographic Log, Photo 13.** Top down: __X_____ Mid down: ____X_____ Mid up: ___X_____ Bottom up: ___X_____
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ☐ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ■ Drought ☐ Vegetation removal/limitations ■ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: Channel 3 shows signs of disturbance, potentially from construction or maintenance activities associated with the nearby water infrastructure and rural residential development.	
Observed hydrology: __100_ % of reach with surface flow _____ % of reach with sub-surface or surface flow __0____ # of isolated pools	Comments on observed hydrology: Surface water hydrology was observed in Channel 3 between where it connects Pond 3 to Campo Creek.	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ■ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation: Channel 3 has upland grasses and weeds growing on the banks of the channel.

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
■ None
☐ 1 to 19
☐ 20 +

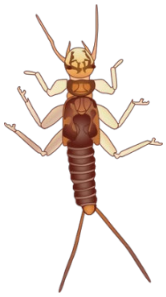
(Do not count mosquitos)

Photo ID:__None_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No

Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby

Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed?		Notes on algae cover:	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	■ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)		Photo 12

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ■ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ■ No		Photo 12

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
Photo 13	ARD Report Attachment E, Photographic Log

Additional notes about the assessment:

Classification: _____Ephemeral_____

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
	Few (1-19)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
Few (1-2)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present	Absent		**At least intermittent**
			Present		**Intermittent**
Many (3+)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent			**At least intermittent**
		Present			**Perennial**
	Many (20+)	Absent			**At least intermittent**
		Present			**Perennial**

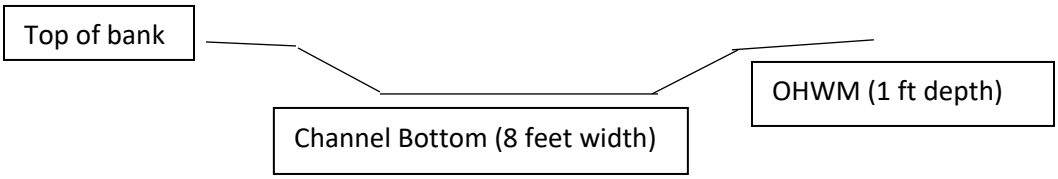
Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: Live Oak Springs Water System Improvements Project		
Site code or identifier: Sampling Point NW-12	Assessor(s): Katie Laybourn, Emily Mastrelli	
Waterway name: Channel 4		Visit date: April 28, 2021 and May 7, 2021
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ■ Cloudy (_0_ % cover) ■ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Currently dry, sunny weather with no precipitation. No recent precipitation documented.	Coordinates at downstream end (decimal degrees): Lat (N): 32.691758 N Long (W): -116.339728 W Datum: NAD83
Surrounding land-use within 100 m (check one or two): ■ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ■ Other natural ■ Other: _Rural residential and open space	Describe reach boundaries: Channel 4 is a tributary of Campo Creek that runs approximately 233 linear feet east where the channel bends and reconnects to Campo Creek.	
Mean channel width (m) OHWM is approximately 8 feet wide	Reach length (m): 40x width; min 40 m; max 200 m. Approximately 233 linear feet	Enter photo ID, or check if completed **ARD Report Attachment E, Photographic Log, Photo 14.** Top down: __X_____ Mid down: ____X_____ Mid up: ___X_____ Bottom up: ___X_____
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ☐ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ■ Drought ☐ Vegetation removal/limitations ■ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: Channel 4 shows signs of disturbance, potentially from construction or maintenance activities associated with the nearby water infrastructure and rural residential development.	
Observed hydrology: __0_ % of reach with surface flow _____ % of reach with sub-surface or surface flow __0____ # of isolated pools	Comments on observed hydrology: No surface water observed. The channel is overgrown with dry upland grasses and weeds.	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ■ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation: Channel 4 has upland grasses and weeds growing on the banks of the channel.

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
■ None
☐ 1 to 19
☐ 20 +

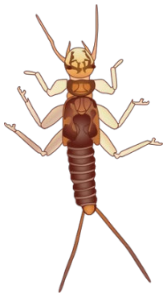
(Do not count mosquitos)

Photo ID:__None_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No

Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby

Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed?		Notes on algae cover:	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	■ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)		Photo 14

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ■ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ■ No		Photo 14

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
Photo 14	ARD Report Attachment E, Photographic Log

Additional notes about the assessment:

Classification: _____Ephemeral_____

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
	Few (1-19)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
Few (1-2)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present	Absent		**At least intermittent**
			Present		**Intermittent**
Many (3+)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent			**At least intermittent**
		Present			**Perennial**
	Many (20+)	Absent			**At least intermittent**
		Present			**Perennial**

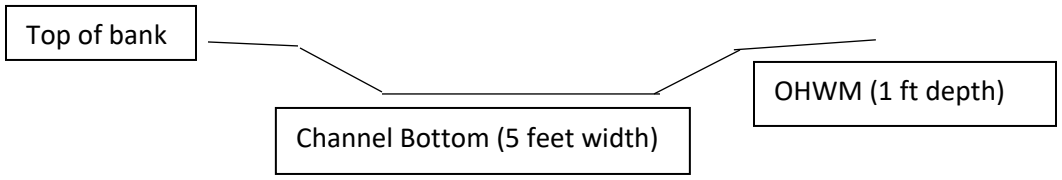
Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: Live Oak Springs Water System Improvements Project		
Site code or identifier: Sampling Point NW-13	Assessor(s): Katie Laybourn, Emily Mastrelli	
Waterway name: Channel 5		Visit date: April 28, 2021 and May 7, 2021
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ■ Cloudy (_0_ % cover) ■ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Currently dry, sunny weather with no precipitation. No recent precipitation documented.	Coordinates at downstream end (decimal degrees): Lat (N): 32.691758 N Long (W): -116.339728 W Datum: NAD83
Surrounding land-use within 100 m (check one or two): ■ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ■ Other natural ■ Other: _Rural residential and open space	Describe reach boundaries: Channel 5 is a tributary of Campo Creek, connected to the creek through the freshwater detention Pond 3. Channel 5 runs approximately 720 linear feet north, parallel to Campo Creek, where the channel becomes undefined because of a topographic rise on the project site.	
Mean channel width (m) OHWM is approximately 5 feet wide	Reach length (m): 40x width; min 40 m; max 200 m. Approximately 720 linear feet	Enter photo ID, or check if completed **ARD Report Attachment E, Photographic Log, Photo 15.** Top down: __X_____ Mid down: ____X_____ Mid up: ___X_____ Bottom up: ___X_____
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ☐ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ■ Drought ☐ Vegetation removal/limitations ■ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: Channel 5 shows signs of disturbance, potentially from construction or maintenance activities associated with the nearby water infrastructure and rural residential development.	
Observed hydrology: __0_ % of reach with surface flow _____ % of reach with sub-surface or surface flow __0____ # of isolated pools	Comments on observed hydrology: No surface water observed. The channel is overgrown with dry upland grasses and weeds.	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ■ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation: Channel 5 has upland grasses and weeds growing on the banks of the channel.

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
■ None
☐ 1 to 19
☐ 20 +

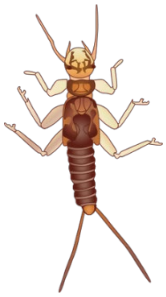
(Do not count mosquitos)

Photo ID:__None_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No

Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby

Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed?		Notes on algae cover:	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	■ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)		Photo 15

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ■ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ■ No		Photo 14

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
Photo 15	ARD Report Attachment E, Photographic Log

Additional notes about the assessment:

Classification: _____Ephemeral_____

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
	Few (1-19)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
Few (1-2)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present	Absent		**At least intermittent**
			Present		**Intermittent**
Many (3+)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent			**At least intermittent**
		Present			**Perennial**
	Many (20+)	Absent			**At least intermittent**
		Present			**Perennial**

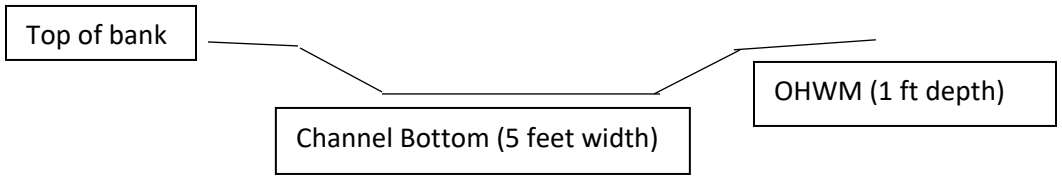
Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: Live Oak Springs Water System Improvements Project		
Site code or identifier: Sampling Point NW-14	Assessor(s): Katie Laybourn, Emily Mastrelli	
Waterway name: Channel 6		Visit date: April 28, 2021 and May 7, 2021
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ■ Cloudy (_0_ % cover) ■ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week): Currently dry, sunny weather with no precipitation. No recent precipitation documented.	Coordinates at downstream end (decimal degrees): Lat (N): 32.691758 N Long (W): -116.339728 W Datum: NAD83
Surrounding land-use within 100 m (check one or two): ■ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ■ Other natural ■ Other: _Rural residential and open space	Describe reach boundaries: Channel 6 is a tributary of Campo Creek, connected to the creek through the freshwater detention Pond 3. Channel 6 runs approximately 84 linear feet north, parallel to Campo Creek and Channel 5, where the channel becomes undefined because of a topographic rise on the project site.	
Mean channel width (m) OHWM is approximately 5 feet wide	Reach length (m): 40x width; min 40 m; max 200 m. Approximately 84 linear feet	Enter photo ID, or check if completed **ARD Report Attachment E, Photographic Log, Photo 16.** Top down: __X_____ Mid down: ____X_____ Mid up: ___X_____ Bottom up: ___X_____
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ☐ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ■ Drought ☐ Vegetation removal/limitations ■ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: Channel 6 shows signs of disturbance, potentially from construction or maintenance activities associated with the nearby water infrastructure and rural residential development.	
Observed hydrology: __0_ % of reach with surface flow _____ % of reach with sub-surface or surface flow __0____ # of isolated pools	Comments on observed hydrology: No surface water observed. The channel is overgrown with dry upland grasses and weeds.	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ■ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation: Channel 6 has upland grasses and weeds growing on the banks of the channel.

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
■ None
☐ 1 to 19
☐ 20 +

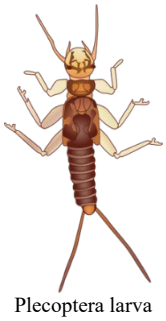
(Do not count mosquitos)

Photo ID:__None_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No

Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby

Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed?		Notes on algae cover:	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	■ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)		Photo 16

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ■ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ■ No		Photo 14

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
Photo 16	ARD Report Attachment E, Photographic Log

Additional notes about the assessment:

Classification: _____Ephemeral_____

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
	Few (1-19)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present	Absent	**Need more information**
				Present	**At least intermittent**
		Present			**At least intermittent**
Few (1-2)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present			**At least intermittent**
	Many (20+)	Absent	Absent		**Intermittent**
			Present		**At least intermittent**
		Present	Absent		**At least intermittent**
			Present		**Intermittent**
Many (3+)	None	Absent	Absent	Absent	**Need more information**
				Present	**At least intermittent**
			Present		**At least intermittent**
	Few (1-19)	Absent			**At least intermittent**
		Present			**Perennial**
	Many (20+)	Absent			**At least intermittent**
		Present			**Perennial**

Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

Attachment G. Geographic Information Systems Data

Can be provided upon request.

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Attachment H. ORM Bulk Upload Aquatic Resources Spreadsheet

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Waters_Name	State_	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway	Similarity_Situated	Sim_Situated_Aggregated_SPOE	Adjcent_Waters_Sbjct_33USC1344	OHWM_Chg_In_Plant_Community	OHWM_Bed_And_Banks	OHWM_Break_In_Slope	OHWM_Chg_In_Character_Of_Soil	OHWM_Chg_In_Veg_Density_Maturity	OHWM_Chg_In_Sediment_Texture	OHWM_Line_Impressed_On_Bank	OHWM_Destr_Of_Terrestrial_Veg	OHWM_Leaf_Litter_Disturbed	OHWM_Multiple_Flow_Events	OHWM_Scour	OHWM_Sediment_Deposition	OHWM_Sediment_Sorting	OHWM_Shelving	OHWM_Litter_and_Debris_Present	OHWM_Wrack_Line_Present	OHWM_Veg_Matted_Bent_Or_Absent	OHWM_Water_Staining	OHWM_Other	OHWM_Other_Text	Func_I_Sediment_Trapping	Func_II_Nutrient_Recycling	Func_III_Pollutant_Management	Func_IV_Retntn_Attenu_Fld_Wtrs	Func_V_Runoff_Storage	Func_VI_Contribution_of_Flow	Func_VII_Export_Organic_Matter	Func_VIII_Export_Fo	Func_IX
Campo Creek	CALIFORNIA	R4SB	RIVERINE	Linear	1949	FOOT	A5	32.69175800	-116.33972800	Tributary to Tijuana River (TNW)	NO	no	no	yes	yes	yes	no	no	NO	no	yes	no	no	NO	no	NO	no	yes	no	yes	no	no		no	no	no	yes	no	yes	yes	no	no
Channel 1	CALIFORNIA	R4SB	RIVERINE	Linear	93	FOOT	A6BOHWM	32.42251500	-116.20160400	Tributary to Campo Creek	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO
Channel 2	CALIFORNIA	R4SB	RIVERINE	Linear	47	FOOT	A6BOHWM	32.41242300	-116.20150300	Tributary to Campo Creek	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO
Channel 3	CALIFORNIA	R4SB	RIVERINE	Linear	35	FOOT	A6BOHWM	32.41248600	-116.20143500	Tributary to Campo Creek	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO
Channel 4	CALIFORNIA	R4SB	RIVERINE	Linear	233	FOOT	A6BOHWM	32.41230400	-116.20136600	Tributary to Campo Creek	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO
Channel 5	CALIFORNIA	R4SB	RIVERINE	Linear	720	FOOT	A6BOHWM	32.41250700	-116.20136700	Tributary to Campo Creek	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO
Channel 6	CALIFORNIA	R4SB	RIVERINE	Linear	84	FOOT	A6BOHWM	32.41249100	-116.20130300	Tributary to Campo Creek	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO	NO
Pond 1	CALIFORNIA	PUB	RIVERINE	Area	1.1	ACRE	EXCLDB4II	32.41160600	-116.20101500	Tributary to Campo Creek	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		YES	YES	NO	YES	YES	NO	NO	NO	NO
Pond 2	CALIFORNIA	R6	RIVERINE	Area	0.03	ACRE	A6N1WB	32.41247700	-116.20166200	Tributary to Campo Creek	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		YES	YES	NO	YES	YES	NO	NO	NO	NO
Pond 3	CALIFORNIA	R6	RIVERINE	Area	0.13	ACRE	A6N1WB	32.41232100	-116.20130900	Tributary to Campo Creek	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		YES	YES	NO	YES	YES	NO	NO	NO	NO

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Attachment I. Supplemental Information

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Attachment I. Supplemental Information

An Aquatic Resources Delineation Report (ARDR) (Harris & Associates, November 2021) was prepared for the Live Oak Springs Water System Improvements Project (project) following the aquatic resources delineation fieldwork conducted on the project site by Harris & Associates aquatic resources specialists on April 28, 2021 and May 7, 2021. The results of the aquatic resources delineation on the project site is presented in the ARDR (Harris & Associates, November 2021), to which this document is Attachment I. This document provides supplemental information for the ARDR, including the regulatory context for the time the aquatic resources delineation was conducted, potential federal and state jurisdictional aquatic resources on the project site, and project construction impacts to the potentially jurisdictional aquatic resources.

1.1 Regulatory Context

Federal and State Jurisdictional Aquatic Resources

Clean Water Act (CWA), Section 401 (40 CFR 121). Section 401 of the CWA gives the state authority to grant, deny, or waive certification of proposed federally licensed or permitted activities resulting in discharge to waters of the United States (waters of the U.S.). Aquatic resources that are under state jurisdiction occur on the project site and would be subject to Section 401 of the CWA.

The State Water Resources Control Board (State Water Board) directly regulates multi-regional projects and supports the Section 401 certification and wetlands program statewide. The Regional Water Quality Control Board (RWQCB) regulates activities pursuant to Section 401(a)(1) of the federal CWA, which specifies that certification from the state is required for any applicant requesting a federal license or permit to conduct any activity including, but not limited to the construction or operation of facilities that may result in any discharge into navigable waters. The certification shall originate from the state or appropriate interstate water pollution control agency in/where the discharge originates or will originate. Any such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the CWA.

CWA, Section 404 (33 CFR 328.3[a]). These provisions regulate the discharge of dredged or fill material in waters of the U.S., including wetlands. Activities that discharge dredge or fill material into waters of the U.S. can be authorized by the U.S. Army Corps of Engineers (USACE). Aquatic resources that are under federal jurisdiction occur on the project site and would be subject to Section 404 of the CWA.

The USACE and the U.S. Environmental Protection Agency (USEPA) have issued a set of guidance documents detailing the process for determining CWA jurisdiction over waters of the U.S. following the 2008 Rapanos decision. The USEPA and USACE issued a summary memorandum of the guidance for implementing the Supreme Court's decision in Rapanos that

addresses the jurisdiction over waters of the U.S. under the CWA. The complete set of guidance documents, summarized as key points below, were used to collect relevant data for evaluation by the USEPA and the USACE to determine CWA jurisdiction over the project and to complete the "significant nexus test" as detailed in the guidelines.

The significant nexus test includes consideration of hydrologic and ecologic factors. For circumstances such as those described in point B below, the significant nexus test would take into account physical indicators of flow (evidence of an Ordinary High Water Mark [OHWM]), if a hydrologic connection to a Traditionally Navigable Water (TNW) exists, and if the aquatic functions of the water body have a significant effect (more than speculative or insubstantial) on the chemical, physical, and biological integrity of a TNW. The USACE and USEPA will apply the significant nexus standard to assess the flow characteristics and functions of the tributary drainage to determine if it significantly affects the chemical, physical, and biological integrity of the downstream TNW.

Wetlands (including swamps, bogs, seasonal wetlands, seeps, marshes, and similar areas) are also considered waters of the U.S. and are defined by USACE as "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[b]; 40 CFR 230.3[t]). Indicators of three wetland parameters (i.e., hydric soils, hydrophytic vegetation, and wetlands hydrology), as determined by field investigation, must be present for a site to be classified as a wetland by USACE (USACE 1987).

Rapanos Guidance Key Points Summary

A. The USACE and USEPA will assert jurisdiction over the following waters:
    - TNWs
    - Wetlands adjacent to TNWs
    - Non-navigable tributaries of TNWs that are relatively permanent (flows 3 months or longer)
        - Wetlands that abut such tributaries
B. The USACE and USEPA will decide jurisdiction over the following waters based on whether they have a significant nexus with a TNW:
    - Non-navigable tributaries that are not relatively permanent
    - Wetlands adjacent to non-navigable tributaries that are not relatively permanent
    - Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary

C. The USACE and USEPA will not assert jurisdiction over the following waters:

- Swales or erosional features (gullies, small washes characterized by low volume, infrequent, or short-duration flow)
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water

The Navigable Waters Protection Rule, published by the USACE and USEPA on April 21, 2020, was vacated during a federal court ruling in Arizona (Pascua Yaqui Tribe v. U.S. Environmental Protection Agency) on August 30, 2021. With this ruling, the regulatory agencies have halted implementation of the Navigable Waters Protection Rule and are interpreting "waters of the U.S." consistent with the pre-2015 regulatory regime (Rapanos Guidance).

Porter-Cologne Water Quality Control Act. Regulated by the RWQCB for impacts to waters of the state. The RWQCB is the regional agency responsible for protecting water quality in California. The jurisdiction of this agency includes all waters of the state and all waters of the U.S., as mandated by Section 401 in the CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne). Although water quality issues related to impacts to waterways are normally addressed during 401 Water Quality Certification, should a water of the State of California be determined by the USACE not to have CWA jurisdiction, Porter-Cologne would be addressed under a Construction General Permit, State General Waste Discharge Order, or Waste Discharge Requirements, depending on the level of impact and the properties of the waterway.

Lake and Streambed Alteration Agreement (California Fish and Game Code, Section 1600). The California Fish and Game Code (CFGC) requires any person who proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or their tributaries, or use materials from a streambed, to submit a notification for a Lake and Streambed Alteration Agreement (LSAA) to the California Department of Fish and Wildlife (CDFW). The aquatic resources and riparian habitats that occur on the project site are subject to CFGC Section 1600.

1.2 Potential Jurisdictional Aquatic Resources

The potentially federal and state jurisdictional aquatic resources mapped on the project site include Campo Creek, tributary Channels 1 through 6, and Ponds 1 through 3 (Figure 1, Aquatic Resources). The riparian vegetation communities that occur within the potentially federal and state jurisdictional aquatic resources areas on the project site include the approximately 0.04-acre coastal and valley freshwater marsh within the southern extent of Campo Creek, approximately 0.75 acre of non-vegetated channels in Campo Creek and Channels 1 through 6, approximately 1.26 acre of fresh water within Ponds 1 through 3, and approximately 1.69 acre of southern arroyo willow riparian forest (Figure 2, Vegetation Communities).

1.2.1 Non-Wetland Waters and Wetlands of the U.S.

The aquatic resources on the project site that are potentially under the jurisdiction of USACE are summarized in Table 1, Potential Non-Wetland and Wetland Waters of the United States on the Project Site, and shown on Figure 3, Potential Waters of the U.S.

Table 1. Potential Non-Wetland and Wetland Waters of the United States on the Project Site

Non-Wetland Waters							
Feature	**Cowardin Type[1]**	**Acres**	**Length (ft)**	**Width (ft)**	**Cubic Yards**	**Coordinates**	**Vegetation/Land Cover Type**
Campo Creek	R4SB	0.600	1,949	1 - 28	—	32.691758000, -116.33972800 through 32.411459000, -116.20943000	Non-vegetated channel/emergent wetland
Channel 1	R4SB	0.006	93	3	—	32.42251500, -116.20160400	Non-vegetated channel
Channel 2	R4SB	0.003	47	3	—	32.41242300, -116.20150300	Non-vegetated channel
Channel 3	R4SB	0.004	35	4	—	32.41248600, -116.20143500	Non-vegetated channel
Channel 4	R4SB	0.040	233	8	—	32.41230400, -116.20136600	Non-vegetated channel
Channel 5	R4SB	0.080	720	5	—	32.41250700, -116.20136700	Non-vegetated channel
Channel 6	R4SB	0.020	84	5	—	32.41249100, -116.20130300	Non-vegetated channel
Non-Wetland Waters Subtotal[2]		*0.75*	*3,161*	—			
Wetlands							
Pond 1	PUB	—	--	—	7,113	32.41160600, -116.20101500	Fresh water
Pond 2	R6	—	--	—	68	32.4124700, -116.20166200	Fresh water
Pond 3	R6	—	--	—	638	32.41232100, -116.20130900	Fresh water
Wetlands Subtotal		*1.26*	—	--	—	—	
Total[2]		**2.01**	**3,161**	--	—	—	

Notes:

[1] Cowardin Type: R4SB = Riverine Intermittent Streambed; PUB = Palustrine Unconsolidated Bottom; R6 = A wetland, spring, stream, river pond, or lake that only exists for a short period.

[2] Totals may not sum exactly due to rounding.

1.2.2 Non-Wetland Waters and Wetlands of the State

The aquatic resources on the project site that are potentially under the jurisdiction of RWQCB and CDFW are summarized in Table 2, Potential Non-Wetland and Wetland Waters of the state on the Project Site, and shown on Figure 4, Potential Waters of the state.

Table 2. Potential Non-Wetland and Wetland Waters of the State on the Project Site

Feature	Acres	Linear Feet	Cubic Yards
Non-Wetland Waters/Streambed	0.75	3,161	—
Wetlands	1.26	—	7,819
In-Channel Emergent Wetland	0.04	—	0.001
Riparian Zone	1.70	—	—
Total	**3.74**	**3,161**	**7,819.001**

1.3 Project Construction Impacts

Tables 1 and 2 and Figures 3 and 4 show the aquatic resources mapped on the project site potentially under the jurisdiction of USACE, RWQCB, and CDFW. The potentially federal and state jurisdictional aquatic resources mapped on the project site include Campo Creek, tributary Channels 1 through 6, and Ponds 1 through 3 (Figures 3 and 4). The riparian vegetation communities that occur within the potentially federal and state jurisdictional aquatic resources areas on the project site include the approximately 0.04-acre coastal and valley freshwater marsh within the southern extent of Campo Creek, approximately 0.75 acre of non-vegetated channels in Campo Creek and Channels 1 through 6, approximately 1.26 acre of fresh water within Ponds 1 through 3, and approximately 1.70 acre of southern arroyo willow riparian forest (Figures 3 and 4).

Direct Impacts

The project has been designed to avoid direct impacts to potentially jurisdictional aquatic resources on the project site to the greatest extent feasible, which include coastal and valley freshwater marsh, fresh water Ponds 1 through 3, and the majority of the southern arroyo willow riparian forest (Figures 5a and 5b, Biological Resources Impacts). No direct impacts to potentially jurisdictional aquatic resources would result from implementation of Phase I. No direct permanent or temporary impacts would occur to the potentially jurisdictional coastal and valley freshwater marsh and fresh water Ponds 1 through 3 and no mitigation would be required. The majority of the 0.75 acre of potentially jurisdictional non-vegetated channel and 1.70 acre southern arroyo willow riparian forest are being avoided by project construction. However, direct temporary impacts to 0.009 acre of the Campo Creek potentially jurisdictional non-vegetated channel and 0.001 acre of southern arroyo willow riparian forest in the western portion of the project site would result from construction of potential future phase components, including the replacement of an existing culvert under Royal Drive (southwestern area) and the replacement of 50 linear feet of an existing aerial water line that crosses

Campo Creek (northwestern area) through either a suspended support system or undergrounding using an open-trench method (Figures 5a and 5b). The Campo Creek non-vegetated channel and the southern arroyo willow riparian forest are potentially under the jurisdiction of the USACE, RWQCB, and CDFW, pursuant to Sections 404 and 401 of the CWA and the LSAA. The temporary impacts to the aquatic resources potentially under federal and state jurisdiction are summarized in Table 3, Impacts to Potential Non-Wetland Waters of the United States and State on the Project Site.

Table 3. Impacts to Potential Non-Wetland Waters of the United States and State on the Project Site

Feature	Temporary Impacts (acres)	Jurisdiction	
		Federal (USACE)	State (RWQCB and CDFW)
Non-vegetated channel/streambed	0.009	✓	✓
Riparian zone (southern arroyo willow riparian forest)	0.001	NA	✓
Total	**0.01**	—	—

Temporary direct impacts that occur during project construction will require federal permitting and compensatory mitigation by the USACE through the Section 404 Permit Program, and state permitting and compensatory mitigation by the RWQCB through a 401 State Water Quality Certification and by the CDFW through a 1602 Streambed Alteration Agreement. Approved temporary impacts to the potentially federal and state jurisdictional non-vegetated channel and southern arroyo willow riparian forest require compensatory mitigation through habitat creation, enhancement, and/or credits in a mitigation bank to achieve a no-net loss of federal and state jurisdictional non-wetland waters and wetlands.

Indirect Impacts

Temporary indirect impacts to the potentially jurisdictional aquatic resource on the project site, including coastal and valley freshwater marsh, non-vegetated channel, fresh water (Ponds 1 through 3), and southern arroyo willow riparian forest can result from generation of fugitive dust, changes in hydrology resulting from construction (including sedimentation and erosion), and exposure to construction-related pollutant discharges. Implementation of standard construction BMPs, including dust suppression measures, erosion and sediment control measures (sand and gravel bags, fiber rolls, and silt fencing), use of weed-free erosion control products, and preparation and implementation of a Stormwater Pollution Prevention Plan, would be required of the construction contractor during Phase I and potential future phases. With the implementation of construction BMPs, indirect impacts to the potentially jurisdictional aquatic resources on the project site would be less than significant, and no mitigation would be required.