ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT – ZONE 7 WATER AGENCY STANLEY PILOT PROJECT

Biological Resources Report

Prepared for:
Zone 7 Water Agency

July 18, 2012

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SECTION 1.0
INTRODUCTION

This report presents the results of a biological resources assessment performed at the site of the proposed Stanley Pilot Project (project) in the City of Livermore, Alameda County, California. The project site is located within and adjacent to the intermittent Arroyo Mocho creek channel, which is managed as a flood control channel by the Alameda County Zone 7 Water Agency (Zone 7). The purpose of this report is to provide up-to-date, site-specific information relative to existing biological resources in the Arroyo Mocho creek corridor and surrounding upland areas within 250 feet of the corridor between the intersections of Stanley Boulevard/Isabel Avenue and Stanley Boulevard/Murrieta Boulevard (project area) that is needed to complete the environmental review process for the project.

The biological resources in the project area were generally described in the 2006 Zone 7 Stream Management Master Plan (SMMP) Environmental Impact Report (EIR) (ESA, 2006a). This included an account of the vegetation communities and associated wildlife habitats present in the project area and a discussion of sensitive natural communities and special-status plant and animal species that are known to or have the potential to occur in the project area. The Zone 7 SMMP EIR also included an evaluation of potential impacts on biological resources that could occur as a result of implementation of projects proposed under the SMMP, and provided recommendations to avoid or minimize the significance of such impacts. Environmental Science Associates (ESA) staff biologists reviewed the Zone 7 SMMP EIR to verify the adequacy, completeness, and accuracy for its use in this assessment. Where appropriate, information from the Zone 7 SMMP EIR is incorporated into this report.

In addition to the Zone 7 SMMP EIR, ESA staff biologists reviewed species lists and occurrence records maintained by the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and California Native Plant Society (CNPS) (USFWS, 2012; CDFG, 2012; CNPS, 2012) and standard biological literature, and conducted a reconnaissance-level field survey on May 7, 2012. The purpose of the field survey was to verify the existing information on vegetative communities and associated wildlife habitats, and habitat use in and surrounding the project area.

SECTION 2.0
PROJECT SETTING

2.1 REGIONAL SETTING

The project area is located in eastern Alameda County within the City of Livermore (**Figure 1**). The City of Livermore (City) is considered part of the Tri-Valley region, including Amador, Livermore, and San Ramon valleys, and the gateway to the Central Valley. With protection from the Coast Ranges, warm to hot, dry summers and mild to cool, wet winters characterize the overall climate of this region. The City is bisected by Interstate 580, which provides regional access to the San Francisco Bay Area and to Tracy in the Central Valley, and is largely urbanized, although several tributary creeks and arroyos to Alameda Creek flow within the City limits (e.g., Arroyo Seco, Arroyo Mocho, and Arroyo Las Positas) and support natural vegetation along portions of their length. The City is surrounded by open space, agricultural land, and vineyards to the north, south, and east, and by the cities of Dublin and Pleasanton to the west.

2.2 PROJECT AREA SETTING

The project area lies within the southwestern City limits, east of the Chain of Lakes.[1] The project area includes the reach of the Arroyo Mocho creek channel between the intersections of Stanley Boulevard/Isabel Avenue and Stanley Boulevard/Murrieta Boulevard and the surrounding upland areas within 250 feet of the creek corridor (**Figure 2**). Paved maintenance roads and pedestrian pathways parallel the creek corridor with urban development lying beyond this narrow upland buffer. Land uses surrounding the project area generally include residential, commercial, recreational park, agricultural, and sand and mining uses. With the exception of the Arroyo Mocho creek channel, the project site and surrounding area is characterized by nearly level topography and elevations of roughly 400 feet. Native soils are generally in the Yolo-Pleasanton association (USDA, 1966). This association consists of Yolo soils, Pleasanton soils, Sycamore soils, and Livermore soils. In addition to these soils, Riverwash is present (USDA, 1966). This land type occurs throughout the area and is usually very gravelly or stony. Natural vegetation typically supported by this land type, as well as the soils identified above, is annual grasses with scattered oaks.

2.2.1 EXISTING CONDITIONS

In the project area, the Arroyo Mocho is largely an urban creek with areas of rip-rap and concrete slopes constraining the channel (see **Figure 3** and **Figure 4**). Grade stabilization structures are

[1] A series of active and retired gravel-mining pits located between Livermore and Pleasanton.

SOURCE: ESRI, 2012

Stanley Pilot Project . 201459.06

Figure 1

Regional Project Area Location

SOURCE: ESRI, 2012, ESA, 2012

Stanley Pilot Project . 201459.06

Figure 2

Project Area Location

Stanley Pilot Project. 201459.06

Source: ESA

Figure 3

Representative Photographs of Upland and Aquatic Habitat in the Project Area

Stanley Pilot Project. 201459.06

Source: ESA

Figure 4

Representative Photographs of Grade Control Structures Identified for Removal

also present. The channel flows seasonally from east to west and supports discontinuous areas of open water and vegetated and non-vegetated sand and gravel bars (see Figure 3). Low diversity wetland vegetation, including species such as bristly ox-tongue (*Helminthotheca echioides*), cocklebur (*Xanthium strumarium*), and Italian ryegrass (*Festuca perenne* [= *Lolium multiflorum*]), grows along portions of the channel margins and on some of the sand and gravel bars where sediment has accumulated. Narrow strips of annual grassland vegetation dominated by common weedy invasive species, such as black mustard (*Brassica nigra*), poison hemlock (*Conium maculatum*), wild oats (*Avena fatua*), and wild radish (*Raphanus sativus*), grows along the side slopes below the access maintenance roads/pedestrian pathways, as well as below those areas armored with rip-rap (see Figure 3). Planted native trees and shrubs, such as blue elderberry (*Sambucus nigra* ssp. *caerulea*), coast live oak (*Quercus agrifolia*), valley oak (*Q. lobata*), and western redbud (*Cercis occidentalis*), line portions of the access maintenance roads/pedestrian pathways above the channel. Upland areas beyond the creek corridor are largely developed with urban uses and support typical landscaping vegetation, including non-native ornamental grasses, forbs, shrubs, and trees.

Due to the urban development surrounding the project area and the limited availability of aquatic and upland vegetation in the project area, habitat valve for wildlife species is limited. Most of the species that likely use the project area are in transit only, although given the proximity to the agricultural lands to the west, those species more tolerant of human disturbance, such as America crow (*Corvus brachyrhynchos*), song sparrow (*Melospiza melodia*), and western scrub jay (*Aphelocoma californica*), could also nest in the project area. Wildlife species observed in the project area during the reconnaissance-level field survey are listed in **Table 1**.

TABLE 1
WILDLIFE SPECIES OBSERVED DURING RECONNAISSANCE-LEVEL FIELD SURVEY

Scientific Name	Common Name
Amphibians	
Lithobates catesbeianus	Bullfrog
Reptiles	
Sceloporus occidentalis	Western Fence Lizard
Birds	
Anas platyrhynchos	Mallard
Aphelocoma californica	Western Scrub Jay
Ardea alba	Great Egret
Calypte anna	Anna's Hummingbird
Callipepla californica	California Quail
Carpodacus mexicanus	House Finch
Charadrius vociferous	Killdeer[1]
Corvus brachyrhynchos	American Crow
Falco sparverius	American Kestrel
Melospiza melodia	Song Sparrow
Sayornis nigricans	Black Phoebe
Zenaida macroura	Mourning Dove
Mammals	
Canis latrans	Coyote

[1] Observed nesting in the project area

SECTION 3.0
REGULATORY FRAMEWORK

The following discussion identifies federal, state, and local regulations that serve to protect sensitive biological resources relevant to the environmental review process.

3.1 FEDERAL REGULATIONS

3.1.1 FEDERAL ENDANGERED SPECIES ACT

The Secretary of the Interior (represented by the USFWS) and the Secretary of Commerce (represented by the National Marine Fisheries Service [NMFS]) have joint authority to list a species as threatened or endangered under the Federal Endangered Species Act (FESA) (United States Code [USC], Title 16, Section 1533[c]). FESA prohibits the "take" of endangered or threatened fish, wildlife, or plants species in areas under federal jurisdiction or in violation of state law, in addition to adverse modifications to their critical habitat. Under FESA, the definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The USFWS and NMFS also interpret the definition of "harm" to include significant habitat modification that could result in the take of a species.

If an activity would result in the take of a federally listed species, one of the following is required: an incidental take permit under Section 10(a) of FESA, or an incidental take statement issued pursuant to federal interagency consultation under Section 7 of FESA. Such authorization typically requires various measures to avoid and minimize species take, and to protect the species and avoid jeopardy to the species' continued existence.

Pursuant to the requirements of Section 7 of FESA, a federal agency reviewing a proposed project which it may authorize, fund, or carry out must determine whether any federally listed threatened or endangered species, or species proposed for federal listing, may be present on the project site and determine whether implementation of the proposed project is likely to affect the species. In addition, the federal agency is required to determine whether a proposed project is likely to jeopardize the continued existence of a listed species or any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed or designated for such species (16 USC 1536[3], [4]).

Generally, the USFWS implements FESA for terrestrial and freshwater fish species and the NMFS implements FESA for marine and anadromous fish species. USFWS and/or NMFS must authorize projects where a federally listed species is present and likely to be affected by an existing or proposed project. Authorization may involve a letter of concurrence that the project will not result in the potential take of a listed species, or may result in the issuance of a Biological

Opinion that describes measures that must be undertaken to minimize the likelihood of an incidental take of a listed species. A project that is determined by USFWS or NMFS to jeopardize the continued existence of a listed species cannot be approved under a Biological Opinion.

Where a federal agency is not authorizing, funding, or carrying out a project, take that is incidental to the lawful operation of a project may be permitted pursuant to Section 10(a) of FESA through approval of a habitat conservation plan (HCP).

FESA requires the federal government to designate "critical habitat" for any species it lists under the Endangered Species Act. "Critical habitat" is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to the species conservation, and those features that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the regulatory agency determines that the area itself is essential for conservation.

3.1.2 FEDERAL MIGRATORY BIRD TREATY ACT

The federal Migratory Bird Treaty Act (MBTA) (16 USC, Section 703, Supp. I, 1989), as amended by the Migratory Bird Treaty Reform Act, prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. The act addresses whole birds, parts of birds, and bird nests and eggs. For projects that would not cause direct mortality of birds, the MBTA is generally interpreted in CEQA analyses as protecting active nests of all species of birds that are included in the "List of Migratory Birds" published in the Federal Register in 1995 and as amended in 2005. Though the MBTA allows permits to be issued for import and export, banding, scientific collecting, taxidermy, and rehabilitation, among other reasons, there is no provision in the MBTA that allows for species take related to creation or other development (Code of Federal Regulations, Title 50: Wildlife and fisheries Part 21; Migratory Bird Permits).

3.1.3 RIVER AND HARBOR ACT AND CLEAN WATER ACT

The Secretary of the Army (represented by the Corps of Engineers [USACE]) has permitting authority over activities affecting waters of the United States under Section 10 of the River and Harbors Act (33 USC 403) and Section 404 of the Clean Water (33 USC 1344). Waters of the United States are defined in Title 33 CFR Part 328.3(a) and include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. Section 10 of the River and Harbor Act requires a federal license or permit prior to accomplishing any work in, over, or under navigable[2] waters of the United States, or which affects the course, location, condition or capacity of such waters. Section 404 of the Clean Water Act requires a federal license or permit prior to discharging dredged or fill material into waters of the United States, unless the activity is exempt

2 "Navigable waters of the United States" (33 CFR Part 329) are defined as water that have been used in the past, are now used, or are susceptible to use as a means to transport interstate or foreign commerce up to the head of navigation.

(33 CFR 324.4) from Section 404 permit requirements (e.g., certain farming and forestry activities). To obtain a federal license or permit, project proponents must demonstrate that they have attempted to avoid the resource or minimize impacts on the resource; however, if it is not possible to avoid impacts or minimize impacts further, the project proponent is required to mitigate remaining project impacts on all federally-regulated waters of the United States.

Section 401 of the Act (33 USC 1341) requires any project proponents for a federal license or permit to conduct any activity including, but not limited to, the creation or operation of facilities, which may result in any discharge into navigable waters of the United States to obtain a certification from the state in which the discharge originates or would originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or would originate, that the discharge will comply with the applicable effluent limitations and water quality standards. A certification obtained for the creation of any facility must also pertain to the subsequent operation of the facility. The responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and its 9 Regional Water Quality Control Boards (RWQCBs).

3.2 STATE REGULATIONS

3.2.1 CALIFORNIA ENDANGERED SPECIES ACT

Pursuant to the California Endangered Species Act (CESA) and Section 2081 of the California Fish and Game Code, a permit from the CDFG is required for activities that could result in the take of a state-listed threatened or endangered species (i.e., species listed under CESA). The definition of "take" is to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (Fish and Game Code Section 86).

Unlike the federal definition of "take," the state definition does not include "harm" or "harass". As a result, the threshold for take under CESA is typically higher than that under FESA. Section 2080 of the Fish and Game Code prohibits the taking of plants and animals listed under the authority of CESA, except as otherwise permitted under Fish and Game Code Sections 2080.1, 2081, and 2835. Under CESA, the California Fish and Game Commission retains a list of threatened species and endangered species (Fish and Game Code Section 2070). The California Fish and Game Commission also maintains two additional lists:

1. Candidate species (CDFG has issued a formal notice that the species is under review for addition to either the list of endangered species or the list of threatened species)

2. Species of special concern (which serves as a watch list)

A lead agency reviewing a proposed project within its jurisdiction must determine whether any state-listed threatened or endangered species may be present in a project area and determine whether the proposed project may take a listed species, consistent with the requirements of CESA. If a take would occur, an incidental take permit would be required from the CDFG, including a mitigation plan that provides measures to minimize and fully mitigate the impacts of the take. The measures must be roughly proportional in extent to the impact of the taking and

must be capable of successful implementation. Issuance of an incidental take permit may not jeopardize the continued existence of a state-listed species. For species that are also listed as threatened or endangered under the FESA, CDFG may rely on a federal incidental take statement or incidental take permit to authorize an incidental take under CESA.

3.2.2 CALIFORNIA FULLY PROTECTED SPECIES AND SPECIES OF SPECIAL CONCERN

The classification of "fully protected" was the CDFG's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibian and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under CESA and/or FESA. The California Fish and Game Code sections (fish at Section 5515, amphibian and reptiles at Section 5050, birds at Section 3511, and mammals at Section 4700) dealing with "fully protected" species states that these species "…may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species," although take may be authorized for necessary scientific research. This language makes the "fully protected" designation the strongest and most restrictive regarding the "take" of these species. In 2003, the code sections dealing with fully protected species were amended to allow the CDFG to authorize take resulting from recovery activities for state-listed species.

Species of Special Concern are broadly defined as animals not listed under the FESA or CESA, but which are nonetheless of concern to the CDFG because are declining at a rate that could result in listing or historically occurred in low numbers and known threats to their persistence currently exist. This designation is intended to result in special consideration for these animals by the CDFG, land managers, consulting biologists, and others, and is intended to focus attention on the species to help avert the need for costly listing under FESA and CESA and recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them. Although these species generally have no special legal status, they are given special consideration under the CEQA during project review.

3.2.3 CALIFORNIA DEPARTMENT OF FISH AND GAME CODE SECTION 3503

Independent of the MBTA, birds of prey are protected in California under the Fish and Game Code (Section 3503.5, 1992). Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes (diurnal birds of prey) or Strigiformes (owls) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. The CDFG considers any disturbance that causes nest abandonment and/or loss of reproductive effort to be "taking."

3.2.4 CALIFORNIA NATIVE PLANT PROTECTION ACT

The California Native Plant Protection Act (California Fish and Game Code Sections 1900-1913) and the Natural Communities Conservation Planning Act provide guidance on the preservation of plant resources; these two acts underlie the language and intent of Section 15380(d) of the CEQA Guidelines. Vascular plants listed as rare or endangered by the CNPS (2012), but which have no designated status or protection under state or federal endangered species legislation, are defined as follows:

1. List 1A: Plants presumed extinct
2. List 1B: Plants rare, threatened, or endangered in California and elsewhere
3. List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere
4. List 3: Plants about which more information is needed – a review list
5. List 4: Plants of limited distribution – a watch list

In general, plants appearing on CNPS List 1A, 1B, or 2 are considered to meet the criteria for endangered, threatened, or rare as laid out in Section 15380 of the CEQA Guidelines. Additionally, plants listed on CNPS List 1A, 1B, or 2 also meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (CESA) of the California Fish and Game Code.

3.2.5 CALIFORNIA DEPARTMENT OF FISH AND GAME CODE SECTIONS 1600-1616

Streams, lakes, and riparian vegetation as habitat for fish and other wildlife species, are subject to jurisdiction by the CDFG under Sections 1600-1616 of the California Fish and Game Code. Any activity that would do one or more of the following: (1) substantially obstruct or divert the natural flow of a river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake generally require a 1602 Lake and Streambed Alteration Agreement. The term “stream,” which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as follows: “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life”. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term stream can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Riparian is defined as “on, or pertaining to, the banks of a stream;” therefore, riparian vegetation is defined as, “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself”. Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFG.

3.2.6 STATE WATER RESOURCES CONTROL BOARD

The State Board was created by the legislature in 1967. The mission of the State Board is to ensure the highest reasonable quality for waters of the State while at the same time allocating those waters to achieve the optimum balance of beneficial uses. Waters of the state are defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The State Water Board protects all waters in its regulatory scope, but has special responsibility for isolated wetlands and headwaters. These waterbodies have high resource value, are vulnerable to filling, and may not be regulated by other programs, such as Section 404 of the Clean Water Act. Waters of the State are regulated by the Water Boards under the State Water Quality Certification Program, which regulates discharges of dredged and fill material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a USACE permit, or fall under other federal jurisdiction, and have the potential to impact waters of the State are required to comply with the terms of the Water Quality Certification Program. If a proposed project does not require a federal license or permit, but does involve activities that may result in a discharge of harmful substances to waters of the State, the Water Boards have the option to regulate such activities under its State authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

3.3 LOCAL REGULATIONS

3.3.1 CITY OF LIVERMORE GENERAL PLAN 2003-2025

The City of Livermore 2003-2025 General Plan (General Plan) establishes polices to guide decisions on future growth, development, and conservation of resources through 2025 in a manner consistent with the goals and quality of life desired by the City's residents. The following goals, objectives, policies, and actions for protecting biological resources defined within the Open Space and Conservation Element of the General Plan are applicable to the proposed project.

***Goal OSC-1*:** Conserve the value and function of Livermore's open space as a biological resource.

> ***Objective OCS-1.1:*** Maintain biodiversity within the Planning Area with special emphasis on species that are sensitive, rare, declining, unique or represent valuable biological resources.
>
> > ***Policy P4.*** The City shall require all projects that impact a federal or State listed threatened or endangered species, federal or State listed candidate species, State species of special concern, or State designated sensitive habitats, to mitigate for identified impacts in a way consistent with mitigation and avoidance measures published and distributed by the federal and/or State resource agencies at the time of the specific plan or project-level review. Monitoring requirements also shall be consistent with published requirements for each species or habitat. For listed or candidate species, species of special concern, or sensitive habitats for which no mitigation or avoidance measures have been published, the City shall require evidence of coordination with the responsible

agencies prior to acceptance of mitigation or avoidance measures or monitoring requirements.

Action A1. Require all development to comply with State and federal regulations to preserve and protect the habitats of rare and endangered species.

Goal OSC-1.2**:** Minimize impacts to sensitive natural habitats including alkali sinks, riparian vegetation, wetlands and woodland forest.

Policy P.1. Habitats of rare or endangered species shall be preserved.

Policy P.6. The City shall require all development to comply with State and federal regulations to preserve and protect the habitats of rare and endangered species.

Policy P.7. The City shall require project proponents to identify and map sensitive biological and wetland resources on each development parcel and identify the measures necessary to avoid and/or minimize impacts on sensitive biological and wetland resources prior to approving the development. Mitigation for impacts to sensitive biological and wetland resources shall replace the functions and values of the resources as well as gross acreage.

Policy P.8. The City shall require development to avoid take of species listed as threatened, endangered, or candidate under federal and state endangered species acts by implementing measures determined in consultation with the U.S. Fish and Wildlife Service and the California Department of Fish and Game.

Objective OSC-1.3**:** Conserve Livermore's native trees and vegetation, which are important biological resources within the Planning Area.

Objective OSC-1.4. Coordinate with other levels of government and interested agencies to preserve natural resources.

Policy P.4. The City shall monitor, on an on-going basis, open space easements received as part of its regulatory authority or through other acquisitions, and work with other easement holders to maintain the values of the easement.

Action A1. Work with local, regional, and State natural resource agencies and area non-profit organizations to develop programs to fund preservation of sensitive biological resources, including arroyos, wetlands, and grasslands.

Goal OSC-2**:** Conserve Livermore's waterways, tributaries, and associated riparian habitats.

Objective OSC-2.1**:** Continue efforts to ensure that development does not harm the quality or quantity of Livermore's surface or ground water.

Policy P.1. Require the implementation of Best Management Practices (BMPs) to minimize erosion, sedimentation, and water quality degradation resulting from the construction of new impervious surfaces.

SECTION 4.0
SENSITIVE BIOLOGICAL RESOURCES ASSESSMENT

The assessment of sensitive biological resources in the project area involved a review of available background information and a reconnaissance-level field survey. Available information reviewed included (but was not limited to) the Zone 7 SMMP EIR and the California Natural Diversity Database (CNDDB) (CDFG, 2012), the CNPS Electronic Inventory (CNPS, 2012), and the USFWS lists for all or some combination of the following USGS 7.5-minute quadrangles: Livermore, Altamont, Dublin, La Costa Valley, and Mendenhall Springs. The purpose of the background review was to identify sensitive natural communities, including wetlands and other waters, and special-status plant and animal species that are known to or have the potential to occur in the general vicinity of the project area (i.e., within a 5 mile radius of the project area). A field survey was then conducted by ESA staff biologists in May 2012 to evaluate the potential occurrence of these sensitive biological resources in the project area based on the conditions observed during the survey. The results of this assessment are presented below.

4.1 SENSITIVE NATURAL COMMUNITIES

Two sensitive natural communities are recorded in the general vicinity of the project area (CDFG, 2012). This includes Sycamore Alluvial Woodland and Valley Sink Scrub. Neither of these communities is present in the project area. Also, with the exception of wetlands and other waters, the project area does not support the other communities considered sensitive by the resource and regulatory agencies, such as oak woodlands and riparian woodlands and forests (see Regulatory Framework above). The wetlands and other waters in the project area are associated with the Arroyo Mocho creek channel and are subject to the jurisdiction of the USACE, State Board, and CDFG.

4.2 SPECIAL-STATUS SPECIES

A comprehensive list of specials-status plant and animal species that are known to or have the potential to occur in the general vicinity of the project area is presented in **Table 2** below. This includes each species' regulatory status, habitat requirements, and ranking of potential for occurrence in the project area, as well as the time period each species is most likely to be observed.

4.2.1 SPECIAL-STATUS PLANTS

Twenty-five special-status plant species are known to or have the potential to occur in the project vicinity (see Table 2). Although protocol-level plant surveys were not performed as part of this

assessment, none of the special-status plant species are expected to occur in the project area. As described above, the vegetation in the project area is largely dominated by common weedy invasive and ornamental species. These species often out-compete native species and sometimes even preclude their continued survival. Past and present land uses, as well as the dynamic nature of the Arroyo Mocho, also reduces the likelihood for special-status plant species to be present in the project area. Other reasons these species are not expected include the project area not being located within the current range or supporting the habitats necessary for the species.

4.2.2 SPECIAL-STATUS ANIMALS

Forty-two special-status animal species are known to or have the potential to occur in the regional project vicinity (see Table 2). Except for a few of the special-status birds, none of these animal species are expected to occur in the project area. The reasons for this are generally discussed below, as well as those specials-status birds with the greatest potential to occur in the project area.

The project area is not located within the current range of a number of the special-status animal species evaluated for this assessment. This includes species such as Delta smelt (*Hypomesus transpacificus*), San Joaquin whipsnake (*Masticophis flagellum ruddocki*), Alameda whipsnake (*M. lateralis euryxanthus*), and California least tern (*Sternula antillarum browni*). In addition, the aquatic habitats necessary to support species such as Conservancy fairy shrimp (*Branchinecta conservatio*), longhorn fairy shrimp (*B. longiantenna*), vernal pool fairy shrimp (*B. lynchi*), California linderiella (*Linderiella occidentalis*), and western spadefoot toad (*Spea hammondii*) are absent from the project area, as well as those upland habitats needed to support a number nesting and wintering birds, such as Cooper's hawk (*Accipiter cooperii*), tricolored blackbird (*Agelaius tricolor*), and prairie falcon (*Falco peregrines anatum*), and roosting bats, such as pallid bat (*Antrozous pallidus*), Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*), and Yuma myotis bat (*Myotis yumanensis*), among others. While aquatic habitat is present for species such as the Central California Coast steelhead (*Oncorhynchus mykiss irideus*), the reach of the Arroyo Mocho in the project area is inaccessible; downstream barriers (e.g., the BART weir and rubber dam in lower Alameda Creek) prevent the upstream migration of this species. Also, Arroyo Mocho is a seasonal waterway that will be dry during Project implementation, ensuring that steelhead are absent. The majority of the habitat is unsuitable or of very low quality for California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylii*), western pond turtle (*Emys marmorata*), American badger (*Taxidea taxus*) and San Joaquin kit fox (*Vulpes macrotis mutica*); or very distant from known breeding populations. In addition, suitable breeding habitat for California tiger salamander and California red-legged frog is absent within the documented distances of these species' observed mobility. It should also be noted that protocol-level survey for California red-legged frog were previously-performed in the project area with negative findings (ESA, 2001; 2004; 2005; 2006b).

TABLE 2
SPECIAL-STATUS SPECIES EVALUATED FOR THE POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
PLANTS				
Alkali milk vetch *Astragalus tener* var. *tener*	--/--/1B.2	In poor draining low ground of alkali playa, grasslands and vernal pools; usually in dry adobe soil	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and the majority of Bay Area records for this species are thought to be extirpated.	March-June
Heartscale *Atriplex cordulata var. cordulata*	--/--/1B.2	Chenopod scrub and sandy, alkaline grasslands	**Low potential.** Although there are several CNDDB records in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	April-October
Brittlescale *Atriplex depressa*	--/--/1B.2	Alkaline or clay grasslands, chenopod scrub, and playas; occasionally in riparian areas, marshes or vernal pools	**Low potential.** Although there are several CNDDB records in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	April-October
San Joaquin spearscale *Atriplex joaquiniana*	--/--/1B.2	Alkaline seasonal wetlands and sinks in grasslands, chenopod scrub and alkali meadows	**Low potential.** Although there are several CNDDB records in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	April-October
Lesser saltscale *Atriplex minuscula*	--/--/1B.1	Alkaline or sandy grasslands, chenopod scrub, and playas	**Low potential.** Although there are CNDDB records in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	May-October
Big-scale balsamroot *Balsamorhiza macrolepis*	--/--/1B.2	Woodland and grasslands, sometimes on serpentine soils	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and there are no CNDDB records in project vicinity.	March-June
Big tarplant *Blepharizonia plumosa*	--/--/1B.1	In annual grasslands of dry hills and plains; soils are clay to clay-loam; often found in burned areas and usually on slopes	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and there are no CNDDB records in project vicinity.	July-October
Round-leaved filaree *California macrophylla*	--/--/1B.1	On clay soils in woodlands and grasslands.	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and there are no CNDDB records in project vicinity.	March-May

TABLE 2
SPECIAL-STATUS SPECIES EVALUATED FOR THE POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Chaparral harebell *Campanula exigua*	--/--/1B.2	Rocky chaparral, usually on serpentine soils	**Absent.** Suitable habitat for this species does not occur in the project area.	May-June
Congdon's tarplant *Centromadia parryi* ssp. *congdonii*	--/--/1B.2	Alkaline soils in grasslands	**Low potential.** Although there are several CNDDB records in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	June-November
Hispid bird's-beak *Chloropyron molle ssp. hispidum*	--/--/1B.1	Usually on silty, alkaline clays in chenopod scrub and grasslands; tends toward wetter areas (meadows, seeps, seasonal wetlands)	**Low potential.** Although there are CNDDB records in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	June-September
Palmate-bracted bird's beak *Chloropyron palmatum*	FE/CE/1B.1	Usually on silty, alkaline clays in chenopod scrub and grasslands; tends toward wetter areas (meadows, seeps, seasonal wetlands)	**Absent.** Suitable habitat for this species does not occur in the project area.	May-October
Livermore tarplant *Deinandra bacigalupii*	--/--/1B.2	Alkali meadows and seeps	**Low potential.** Although there is a CNDDB record in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	June-October
Hospital Canyon larkspur *Delphinium californicum* ssp. *interius*	--/--/1B.2	Coastal scrub, chaparral and moist areas in cismontane woodlands	**Absent.** Suitable habitat for this species does not occur in the project area.	April-June
Diamond-petaled poppy *Eschscholzia rhombipetala*	--/--/1B.1	On grassland slopes and flats; substrate clay and alkaline	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and there are no CNDDB records in project vicinity.	March-April
Stinkbells *Fritillaria agrestis*	--/--/4.2	Clay chaparral, woodland, and grassland; sometimes on serpentine soils.	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and there are no CNDDB records in project vicinity.	March-June
Diablo helianthella *Helianthella castanea*	--/--/1B.2	Forest, woodland, chaparral, coastal scrub, riparian woodland, and grassland; usually in chaparral/oak woodland ecotone.	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and there are no CNDDB records in project vicinity.	March-June
Legenere *Legenere limosa*	--/--/1B.1	Vernal pools	**Absent.** Suitable habitat for this species does not occur in the project area.	April-June
Mt. Hamilton coreopsis *Leptosyne hamiltonii*	--/--/1B.1	Rocky woodland	**Absent.** Suitable habitat for this species does not occur in the project area.	March-May

TABLE 2
SPECIAL-STATUS SPECIES EVALUATED FOR THE POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Prostrate navarretia *Navarretia prostrata*	--/--/1B.1	In mesic, alkali areas of coastal scrub and grassland, particularly vernal pools	**Low potential.** Although there is a CNDDB record in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	April-July
Hairless popcornflower *Plagiobothrys glaber*	--/--/1A	Alkaline wetlands in valleys; salt marshes	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and species is believed to be extirpated from Alameda County.	March-May
Oregon polemonium *Polemonium carneum*	--/--/2.2	Coastal prairie, coastal scrub, and coniferous forest	**Absent.** Suitable habitat for this species does not occur in the project area.	April-September
Most beautiful jewel-flower *Streptanthus albidus* ssp. *peramoenus*	--/--/1B.2	Ridges and slopes with chaparral, grassland and woodland; on serpentine outcrops	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and there are no CNDDB records in project vicinity.	April-June
Saline clover *Trifolium hydrophilum*	--/--/1B.2	Vernal pools and seasonal wetlands in alkaline grasslands; also in freshwater marsh.	**Low potential.** Although there are CNDDB records in the project vicinity, the project area is generally dominated by non-native species, which often precludes many native species. Also, the project area does not support the micro-habitat this species typically occupies.	April-June
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	--/--/1B.1	Alkaline clay grasslands	**Low potential.** Project area is generally dominated by non-native species, which often precludes many native species. Also, project area does not support the micro-habitat this species typically occupies, and species is believed to be extirpated from Alameda County.	March-April
ANIMALS				
Invertebrates				
Conservancy fairy shrimp *Branchinecta conservatio*	FE/*	Vernal pools or other areas capable of ponding water seasonally	**Absent.** Suitable habitat for this species does not occur in the project area.	Year-round (eggs in dry season, adult shrimp in Winter)
Longhorn fairy shrimp *Branchinecta longiantenna*	FE/*	Vernal pools or other areas capable of ponding water seasonally	**Absent.** Suitable habitat for this species does not occur in the project area.	Year-round (eggs in dry season, adult shrimp in Winter)

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Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/* Critical Habitat	Vernal pools or other areas capable of ponding water seasonally	**Absent.** Suitable habitat for this species does not occur in the project area.	Year-round (eggs in dry season, adult shrimp in Winter)
Curved-foot hygrotus diving beetle *Hygrotus curvipes*	--/*	Drainages, seeps, and wet areas; standing water in ponds or ephemeral pools	**Absent.** Suitable habitat for this species does not occur in the project area.	February-March
California linderiella *Linderiella occidentalis*	--/*	Vernal pools or other areas capable of ponding water seasonally	**Absent.** Suitable habitat for this species does not occur in the project area.	Year-round (eggs in dry season, adult shrimp in Winter)
Amphibians				
California tiger salamander *Ambystoma californiense*	FT/CT Critical Habitat	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds and vernal pools	**Low potential.** Several CNDDB records in the regional project vicinity, but no suitable breeding habitat is available within 1.25 miles.	Winter rains and March-April
California red-legged frog *Rana draytonii*	FT/CSC Critical Habitat	Breed in stock ponds, pools, and slow moving streams	**Low potential**. Several CNDDB records in the project vicinity, but this species not found during protocol-level surveys in 2001, 2004, 2005, or 2006. Pool habitat is absent in the project area and supplemental flows are ceased in summer months; making presence unlikely.	May-August
Foothill yellow-legged frog *Rana boylii*	--/CSC	Breeds and overwinters in and near cobbled streams with permanent water	**Absent.** Upstream portions of Arroyo Mocho may support this species; there is a historic CNDDB record in project vicinity. Potential for this species is low downstream from the South Bay Aqueduct intersection.	December-May
Western spadefoot toad *Spea hammondii*	--/CSC	Freshwater seasonal marsh (primarily vernal pools for breeding), grasslands, and oak savanna	**Absent.** Suitable habitat for this species does not occur in the project area.	February-May
Fish				
Delta smelt *Hypomesus transpacificus*	FT/CE	Sloughs and drainages upstream of Suisun Bay through the Delta.	**Absent.** Project area is out of this species' described range.	year-round, migrating March-May
Steelhead- Central California Coast ESU *Oncorhynchus mykiss irideus*	FT/*	Drainages of San Francisco and San Pablo Bays, central Calif. Coastal drainages	**Absent.** Due to the presence of migration barriers in the lower Alameda Creek watershed, this species is currently unable to access the project area.	year-round, migrating October-June
Reptiles				

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Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Western pond turtle *Emys marmorata*	--/CSC	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands	**Low potential.** Upstream portions of Arroyo Mocho may support this species, but suitable habitat for this species does not occur in the project area.	year-round
San Joaquin whipsnake *Masticophis flagellum ruddocki*	--/CSC	Open grassland, pasture, and alkali scrub	**Low potential.** Suitable habitat for this species does not occur in the project area; species is likely absent from the Livermore Valley floor.	March-October
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT/CT	Coastal ranges, in chaparral and riparian habitat and adjacent grasslands	**Absent.** Suitable habitat for this species does not occur in the project area; species is likely absent from the Livermore Valley floor.	March-November
California horned lizard *Phrynosoma blainvillii*	--/CSC	Valley woodland, coniferous forest, riparian, and grassland habitats; most commonly in sandy washes with scattered shrubs	**Low potential.** Suitable habitat for this species occurs in the project area; however, the extent of this habitat is limited. Also, there are no CNDDB records in project vicinity.	year-round
Birds				
Cooper's hawk *Accipiter cooperii*	--/* (nesting)	Nests in dense oak and riparian woodland	**Absent.** Suitable nesting and foraging habitat does not occur in the project area.	year-round
Sharp-shinned hawk *Accipiter striatus*	--/* (nesting)	Nests in dense stands of conifers and riparian habitats	**Absent.** Suitable nesting and foraging habitat does not occur in the project area. Also, there are no CNDDB records in project vicinity.	year-round
Tricolored blackbird *Agelaius tricolor*	--/CSC (nesting colony)	Nests in freshwater marshes with dense stands of cattails or bulrushes, occasionally in willows, thistles, mustard, blackberry brambles, and dense shrubs and grains	**Absent.** Suitable nesting and foraging habitat does not occur in the project area.	year-round
Golden eagle *Aquila chrysaetos*	--/* (nesting and wintering)	Nests in canyons and large trees in open habitats	**Absent.** Suitable habitat for this species does not occur in the project area. Also, there are no CNDDB records in project vicinity.	year-round
Burrowing owl *Athene cunicularia*	--/CSC (burrowing sites)	Nests and forages in low-growing grasslands with burrowing mammals	**Low to Moderate potential.** Burrows along channel side slopes in project area provide suitable nesting and wintering habitat for this species; however, no individuals or evidence of individual owls was observed during field surveys. Also, the number of burrows in the project area is limited. Suitable nesting and wintering habitat, as well as foraging habitat, occurs up- and down-stream of the project area.	year-round
Great egret *Ardea alba*	--/* (nesting colony)	Colonial nester in tall trees near wetland foraging areas	**Present (foraging only).** Suitable foraging habitat for this species occurs in the project area, and species observed during field surveys. Nesting sites are not present in the project area.	year-round

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Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Great blue heron *Ardea herodias*	--/* (nesting colony)	Colonial nester in tall trees near wetland foraging areas	**High potential (foraging only).** Suitable foraging habitat for this species occurs in the project area. Nesting sites are not present in the project area.	year-round
Ferruginous hawk *Buteo regalis*	--/* (wintering)	Open grassland and agricultural areas.	**Low to Moderate potential.** Suitable habitat for this species occurs in the project area; however, the extent of this habitat is limited.	October-March
White-tailed kite *Elanus leucurus*	--/* (nesting)	Nests in shrubs and trees adjacent to grasslands, forages over grasslands and agricultural lands	**Low to Moderate potential.** Suitable foraging habitat for this species occurs in the project area however, the extent of this habitat is limited. Also, suitable nesting habitat occurs in the project vicinity, but not in the project area.	year-round
California horned lark *Eremophila alpestris actia*	--/*	Nests and forages in short-grass prairie, mountain meadow, coastal plain, fallow fields, and alkali flats	**Low potential.** Suitable habitat for this species occurs in the project area; however, the extent of this habitat is limited. Also, there are no CNDDB records in the project vicinity.	March-July
Prairie falcon *Falco mexicanus*	--/* (nesting)	Forages in marshes and grasslands. Nesting habitat includes high, protected cliffs and ledges near water	**Absent.** Suitable habitat for this species does not occur in the project area.	May-August
American peregrine falcon *Falco peregrinus anatum*	FD/CD (nesting)	Forages in marshes and grasslands. Nesting habitat includes high, protected cliffs and ledges near water	**Absent.** Suitable habitat for this species does not occur in the project area.	May-August
Bald eagle *Haliaeetus leucocephalus*	FD/CE (nesting and wintering)	Winter foraging at lakes and along major rivers	**Absent.** Suitable habitat for this species does not occur in the project area.	August-January
Loggerhead shrike *Lanius ludovicianus*	--/CSC (nesting)	Scrub, open woodlands, and grasslands	**Low potential.** Suitable foraging and nesting habitat for this species occurs in the project area; however, the extent of this habitat is limited.	year-round
California least tern *Sternula antillarum browni*	FE/CE (nesting colony)	Bays and lagoons, nesting on adjacent open sandy beaches, dunes, or disturbed sites.	**Absent.** Project area is out of this species' described range.	April-August
Mammals				
Pallid bat *Antrozous pallidus*	--/CSC	Arid deserts and grasslands. Roosts in rock crevices or buildings	**Low potential.** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited and in close proximity to human disturbance. No suitable roosting habitat occurs in the project area.	April-September
Townsend's western big-eared bat *Corynorhinus townsendii townsendii*	--/CSC	Oak and coniferous woodland and arid grasslands. Roosts in caves, buildings, etc.	**Low potential.** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited and in close proximity to human disturbance. No suitable roosting habitat occurs in the project area.	April-September

TABLE 2
SPECIAL-STATUS SPECIES EVALUATED FOR THE POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification
Berkeley kangaroo rat *Dipodomys heermanni berkeleyenis*	--/*	Grassy openings and hilltops in chaparral and blue oak/gray pine woodland.	**Absent.** Suitable habitat for this species does not occur in project area.	year-round
Western mastiff bat *Eumops perotis californicus*	--/CSC	Roosts in rugged, rocky canyons and forages in a variety of habitats	**Absent (roosting).** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited and in close proximity to human disturbance. No suitable roosting habitat occurs in the project area. Also, there are no CNDDB records in the project vicinity.	February-September
Hoary bat *Lasiurus cinereus*	--/*	Open habitats or habitat mosaics with access to trees for cover and open areas or habitat edges for foraging	**Absent (roosting).** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited. No suitable roosting habitat occurs in the project area.	February-September
Western small-footed myotis bat *Myotis ciliolabrum*	--/*	Forages over grasslands and roosts in caves and rock crevices	**Absent (roosting).** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited. No suitable roosting habitat occurs in the project area	February-September
Long-eared myotis bat *Myotis evotis*	--/*	Inhabits woodlands and forests up to approximately 8,200 feet in elevation; generally not in Central Valley.	**Absent (roosting).** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited. No suitable roosting habitat occurs in the project area. Also, there are no CNDDB records in the project vicinity.	February-September
Fringed myotis bat *Myotis thysanodes*	--/*	Inhabits a variety of habitats including pinyon-juniper woodland, valley-foothill hardwood, hardwood-conifer forests, and desert scrub; generally not in Central Valley.	**Absent (roosting).** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited. No suitable roosting habitat occurs in the project area. Also, there are no CNDDB records in the project vicinity.	April-September
Long-legged myotis bat *Myotis volans*	--/*	Inhabits forests and woodland habitats, primarily oak and juniper woodlands	**Absent (roosting).** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited. No suitable roosting habitat occurs in the project area. Also, there are no CNDDB records in the project vicinity.	February-September
Yuma myotis bat *Myotis yumanensis*	--/*	Open forests and woodlands below 8,000 feet in close association with water bodies	**Absent (roosting).** Suitable foraging habitat for this species occurs in the project area; however, the extent of this habitat is limited and in close proximity to human disturbance. No suitable roosting habitat occurs in the project area. Also, there are no CNDDB records in project vicinity.	February-September
American badger *Taxidea taxus*	--/CSC	Open areas with loose-textured soils for burrows.	**Absent.** Suitable habitat for this species does not occur in the project area; burrows along channel side slopes do not support species. Also, there are no CNDDB records in the project vicinity.	year-round
San Joaquin kit fox *Vulpes macrotis mutica*	FE/CT	Annual grasslands or grassy open areas with shrubs, loose-textured soils for burrows and prey base	**Absent.** Suitable habitat for this species does not occur in the project area.	year-round

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service)
FE = Listed as Endangered (in danger of extinction) by the Federal Government.
FT = Listed as Threatened (likely to become endangered within the foreseeable future) by the Federal Government.
FD = Delisted by the Federal Government

STATE: (California Department of Fish and Game)
CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CD = Delisted by the State of California
CSC = California Species of Special Concern
* = Special Animals

California Native Plant Society
List 1A=Plants presumed extinct in California
List 1B=Plants rare, threatened, or endangered in California and elsewhere
List 2= Plants rare, threatened, or endangered in California but more common elsewhere
List 3= Plants about which more information is needed
List 4= Plants of limited distribution

SOURCE: ESA, 2006a; CDFG, 2012; USFWS, 2012; CNPS, 2012; ESA File Data

The special-status animals species with the greatest potential to occur in the project area include burrowing owl (*Athene cunicularia*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), ferruginous hawk (*Buteo regalis*), and white-tailed kite (*Elanus leucurus*). However, none of these species are expected to nest in the project area. The project area is not located within the current nesting range of ferruginous hawk and lacks suitable nesting sites for great egret, great blue heron, and white-tailed kite. About 200 feet east of the project area there are few ground squirrel burrows that are potentially suitable for burrowing owl use; however, no evidence of owl use or individual owls was observed during the field survey, and the few burrows that were found were occupied by ground squirrels. In addition, the limited extent of suitable habitat and proximity to human-related disturbance reduces the likelihood for burrowing owls to occur in the project area. Use of the project area by these species would therefore be limited to occasional winter (in the case of ferruginous hawk) or foraging activities, although other bird species not listed in Table 2 above but protected under the federal MBTA and Section 3503.5 of the California Fish and Game Code (see Regulatory Framework section above), such as killdeer (*Charadrius vociferous*) and song sparrow (*Melospiza melodia*), could nest in the project area.

SECTION 5.0
PROJECT IMPACTS AND MITIGATION

5.1 PROJECT DESCRIPTION

The proposed project would generally involve the removal of existing grade stabilization structures in the Arroyo Mocho creek channel between the intersections of Stanley Boulevard/Isabel Avenue and Stanley Boulevard/Murrieta Boulevard. Conventional earth moving equipment would be used to complete the work, and would access the project site from the existing maintenance roads/pedestrian pathways paralleling the creek corridor. Equipment would be staged at pre-designated areas along the maintenance roads/pedestrian pathways, and all materials removed from the project site would be off-hauled and disposed off-site. Standard construction best management practices (BMPs) outlined in the erosion control plan that would be prepared for the project as part of the City/County permitting process and Storm Water Pollution Prevention Plan (SWPPP) prepared for the project as part of the National Pollutant Discharge Elimination System (NPDES) General Construction Activity Storm Water Permit would be implemented to avoid and minimize the potential for erosion and transport of sediment and other pollutants from entering waterways during construction. All in-channel work would be conducted during the dry season (i.e., no dewatering would be necessary) and would be completed in one season. All disturbed areas would be revegetated with a mix of annual grasses and forbs.

5.2 IMPACT ASSESSMENT

The potential impacts of the proposed project on biological resources would be direct and short-term. All of the impacts would be caused by construction activities; there would be no operation-related impacts associated with the proposed project. Direct and short-term potential impacts on biological resources in the project area would generally be limited to the potential for wildlife injury or mortality, disturbance of nesting special-status birds, and temporary disturbance of potential jurisdictional wetlands and other waters. These impacts are discussed in more detail below and mitigation measures are identified to avoid or minimize the impacts.

5.2.1 IMPACTS TO NESTING BIRDS

While the extent of the vegetation present is limited, the project site and surrounding area support potentially suitable nesting habitat for those special-status bird species that are more tolerant of human-related disturbances. During the field survey, killdeer were observed nesting on the gravel bars in the Arroyo Mocho creek channel. Construction activities could adversely affect nesting birds through the direct loss of individuals, injury, or disturbance, if present. The nesting season

is a critical period for protection of bird populations. The physical removal or harm to nests, or site disturbance that cause birds to abandon an active nest would constitute a significant impact.

Restricting construction activities to the non-nesting season (in general, September 1st through January 31st) or conducting preconstruction surveys for nesting birds if construction activities are to take place during the nesting season (in general, February 1st through August 31st) would reduce impacts to nesting birds to a less-than-significant level.

5.2.2 IMPACTS TO JURISDICTIONAL WETLANDS AND OTHER WATERS

The project area supports jurisdictional wetlands and other waters associated with the Arroyo Mocho. Construction activities would result in temporary impacts to these features in association with the removal of drop structures. The precise extent of wetland impacts is not known because design drawings were not available at the time of the field assessment.

Compliance with the BMPs outlined in the approved erosion control plan prepared for the project as part of the City/County permitting process and SWPPP prepared for the project as part of the NPDES General Construction Activity Storm Water Permit, as well as limiting the extent of disturbance to the minimum area necessary to complete the work and developing and implementing a comprehensive Wetland Mitigation and Monitoring Plan in coordination the USACE, State Board, and CDFG as part of the permitting process for impacts to wetlands and other waters subject to their jurisdiction, would reduce potential significant impacts to jurisdictional wetland and other waters. Mitigation measures that were identified in the 2006 SMMP EIR for impacts to wetland and riparian habitat would be sufficient to address potential project impacts to a less than significant level.

SECTION 6.0
REFERENCES

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SECTION 7.0
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ZONE 7 WATER AGENCY: STANLEY PILOT PROJECT

Preliminary Delineation of Waters of the United States, Alameda County, California

Prepared for
Zone 7 Water Agency

December 2012

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ACRONYMS AND ABBREVIATIONS USED IN THIS DOCUMENT

CFR	Code of Federal Regulations
Corps	United States Army Corps of Engineers
CWA	Clean Water Act
EPA	United States Environmental Protection Agency
FAC	Facultative plant species
FACU	Facultative upland plant species
FACW	Facultative wetland plant species
GIS	Geographic Information System
GPS	Global Positioning System
OBL	Obligate wetland plant species
OHWM	Ordinary high water mark
NI	No wetland indicator assigned (for plants)
NRCS	Natural Resource Conservation Service
NRPW	Non-relatively permanent waters
NWI	National Wetlands Inventory
RCP	Reinforced Concrete Pipe
RPW	Relatively permanent waters
SWANCC	Solid Waste Agency of Northern Cook County
TNW	Traditionally navigable waters
UPL	Upland plant species
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service

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CHAPTER 1
Introduction

1.1 Objective

This report documents the extent of potentially jurisdictional waters of the United States, including wetlands and other waters, which occur within the Zone 7 Water Agency: Stanley Pilot Project (Project) boundary, located within the City of Livermore in Alameda County, California (see **Figure 1**).

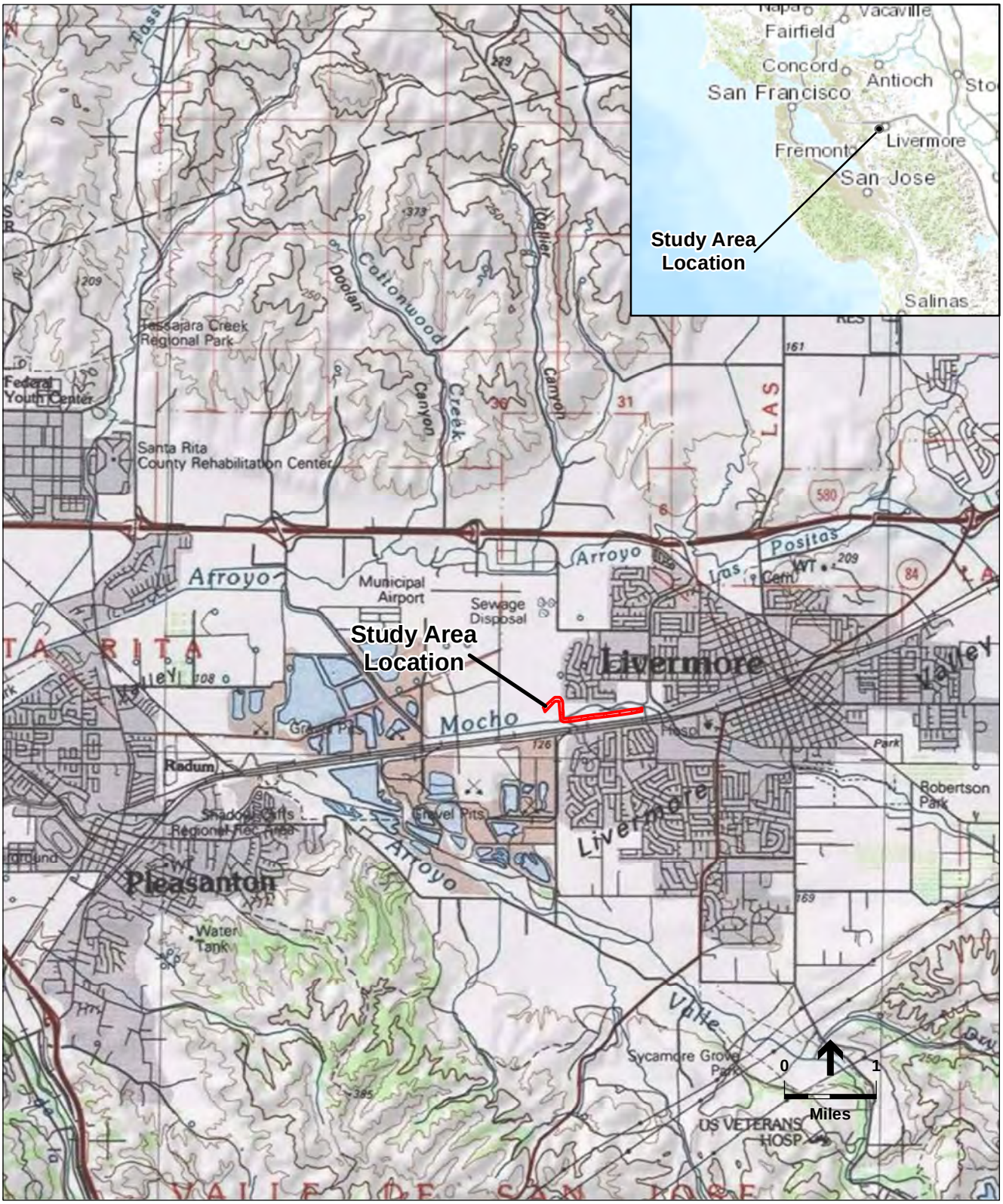
The purpose of this document is to identify features within the Stanley Pilot Project delineation study area under potential jurisdiction of the U.S. Army Corps of Engineers (Corps), and to provide the background information necessary to support future permit applications under Section 404 and Section 401 of the Clean Water Act for the proposed project. The wetland delineation process involves determining the boundaries between wetlands, waters and surrounding uplands through the investigation of the three parameters that define a wetland: vegetation, soils, and hydrology.

1.2 Summary of Results

ESA conducted a formal wetland delineation of the Stanley Pilot Project wetland delineation study area on November 15 and 26, 2012. The field delineation identified and documented all potentially jurisdictional wetlands and other waters of the U.S. within the delineation study area.

A total of 5.3 acres (231,111 square feet) and 5,535 linear feet of potentially jurisdictional Waters of the U.S. occur within the delineation study area. This total can be broken down as follows: 3.2 acres (140,123 square feet) of instream wetlands, 0.02 acre (820 square feet) of seasonal wetlands, and 2.1 acres (90,168 square feet) of other waters (intermittent stream).

A detailed summary of all jurisdictional features documented within the delineation study area is presented in Table 4-1 (see Chapter 4). Delineation maps are presented in **Appendix A**; wetland datasheets are provided in **Appendix B**; a jurisdictional determination analysis map is located in **Appendix C**; soil maps are provided in **Appendix D**; the climate summary (WETS Table) information table is provided in **Appendix E**; and representative photographs are provided in **Appendix F**.



SOURCE: ESRI, 2012; ESA, 2012

Zone 7 Water Agency: Stanley Pilot Project . 201459.11

Figure 1

Location Map

1.3 Responsible Parties

Zone 7 Water Agency
100 North Canyons Parkway
Livermore, CA 94551
Contact: Elke Rank, Water Resources Planner
erank@zone7water.com

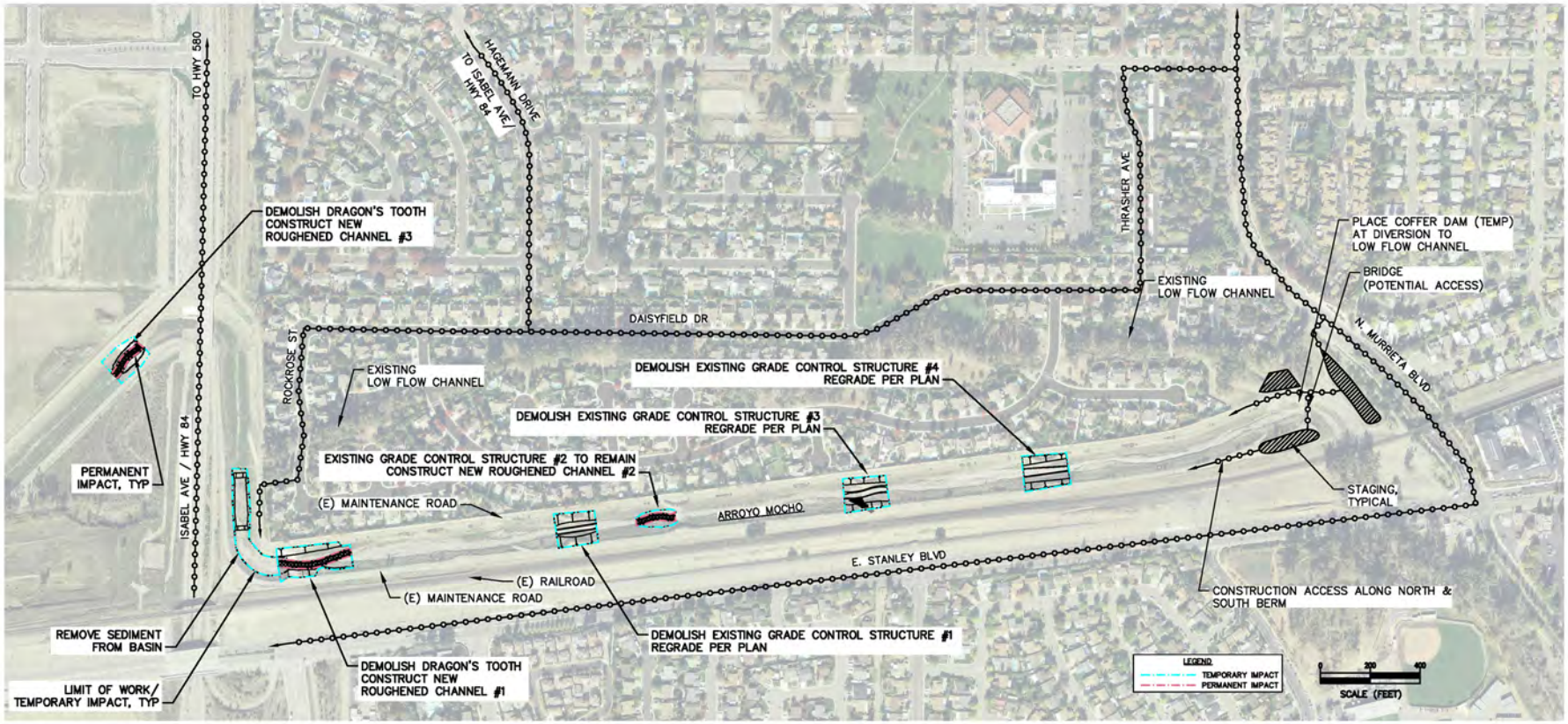
1.4 Project Description

1.4.1 Overview

The restoration goals are to eliminate barriers to fish passage, create a geomorphically stable channel, and improve salmonid habitat conditions while maintaining the existing flood management function of the channel. The primary focus of the Project is to remove five existing, in-stream grade control structures made from concrete and grouted rock. At the grade control structures, the channel narrows and the channel bottom drops sharply. Under the proposed Project conditions, three grade control structures and two "dragon's tooth" structures will be removed, and a fourth grade control structure will be modified to enhance fish passage. Under post-project conditions, the thalweg is expected to undergo various cycles of local sediment deposition and scour until a channel slope in equilibrium with flow and sediment delivery conditions is reached.

Figure 2 shows the overall location of project elements. Three of the existing structures create abrupt 3 to 6 foot drops in the channel profile which are barriers to fish passage: 1) a concrete energy dissipation structure (three foot drop) downstream of Isabel Avenue; (2) a large, concrete energy dissipation structure (six foot drop) at the downstream end of the project reach and 3) a grouted rock grade control structure that also covers a major sanitary sewer line. These structures will be replaced with roughened channel sections constructed from loose boulders and designed to mimic natural bed conditions. The roughened channels are designed to create conditions conducive to fish passage by spreading the drop over approximately 250 feet of channel length and providing a low-flow pathway. The design includes installation of willow baffles to increase hydraulic roughness in overbank areas adjacent to the roughened channels to prevent scour in the immediate post-construction period and introduce topographic variability in the longer term. The remaining three grouted rock grade control structures will be removed and the demolition area re-graded to be consistent with adjacent creek bed and banks and eliminate channel constrictions. Channel disturbance between work areas will be minimized, though natural sediment transport processes are expected to adjust the channel profile in response to the removal of grade control structures.

The proposed Project will also include significant re-vegetation of the channel and banks. The re-vegetation strategy and planting plans were developed by others and are not specifically addressed in this document.



SOURCE: ESRI, 2012; ESA, 2012

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Figure 2

Project Plan

1.4.2 Construction Description

Roughened Channels

Demolition

The downstream dragon's tooth (below Isabel Avenue) will be completely removed except for a water diversion located at the crest on the left bank. The upstream concrete dragon's tooth structure will be almost completely demolished, except for the southwest portion, which contains a 66" RCP pipe outfall. The terrace elevation will be lowered, resulting in a significant volume of offhaul. The rock slope protection will be reused onsite in the new roughened channel construction.

Construction

The roughened channel will have a finished width of about 25 ft, and a depth of approximately 2.5 feet. The site will be rough graded to about finished grade elevation on the terraces and to the subgrade elevations in the roughened channel area. After laying down bedding the contractor will place footer stones and keystones at the appropriate locations and elevations. The contractor will fill in the lattice structure with the crest stones. The voids between the rocks will be filled with bedding using hand labor and water jetting as appropriate. The fine grading will backfill the alluvium over the structure as shown on the plans and terrace finished grades achieved.

Grade Control Structure Demolition and Channel Reconstruction

Demolition

Grade control structures 1, 3, and 4 will be completely removed and the void from rock will be re-contoured with onsite alluvial material (Figure 2). Grouted and un-grouted riprap are present at all locations with a concrete cutoff wall (0.5 foot thick) extending across the channel at the structure's crest. All these materials will be demolished and the salvageable rock will be reused in the roughened channel construction. The constriction at each structure, made of compacted alluvium, will be removed and a straight channel corridor created.

In addition there are a few storm drains that discharge onto the grouted riprap. Most are 12-inch and will be trimmed back easily. Grade control structure #3 has a double 48-inch reinforced concrete pipe (RCP) storm drain that will be saw-cut and repaired.

Construction

Once the concrete and rock materials are removed from each site, the contractor will create a smooth transition between the upstream and downstream grades, including the terrace and channel dimensions. Over time the system will self-adjust the alignment and shape of the channel.

Sediment Removal

The sedimentation basin located upstream of Isabel Avenue will be re-graded to original design elevations.

Construction Schedule and Equipment

This Project contains seven distinct project locations. The number of machines and crew that the contractor chooses to use for this Project will depend on the speed at which they intend to complete the construction. Each location will likely have one to four pieces of equipment working at any given time, and two to five crew members. It is estimated that each of the roughened channels will require approximately four to seven weeks for construction; each grade control structure about two weeks; and sediment removal less than one week. For each project location, there will be common equipment used, as described below.

Demolition of concrete and grouted riprap will require a backhoe or similar equipment fitted with a hammer. Earthmoving equipment such as front end loader will likely be used for the bulk of the grading operations, and an excavator will be used for rock placement. Hand labor will be used for small rock placement and filling the voids with bedding material. Front end loaders and dump trucks will be used to off-haul material.

It is expected that the contractor will be onsite for 8 to 10 hours per day throughout the construction season. There will need to be approximately 100 truck trips (8 cubic yards each) to deliver rock for the construction. To off-haul materials approximately 1,240 trips (8 cubic yards each) will be required. Zone 7 staff has provisionally approved off-haul materials to be delivered to an agency property about 10 miles from the site.

CHAPTER 2
Setting

2.1 Delineation Study Area

The delineation study area is located on the floor of the Livermore-Amador Valley in Alameda County (**Figure 3**). It is north of Stanley Boulevard and west of Murrieta Boulevard in the City of Livermore. Isabel Avenue crosses the project reach near its western end. The study area includes an approximately one-mile stretch of a channelized portion of Arroyo Mocho. In the study area, Arroyo Mocho is largely an urban creek with areas of rip-rap and concrete slopes constraining the channel. Grade stabilization structures are also present. The creek is bordered by access maintenance roads/pedestrian trails along both the northern and southern edges of the channel.

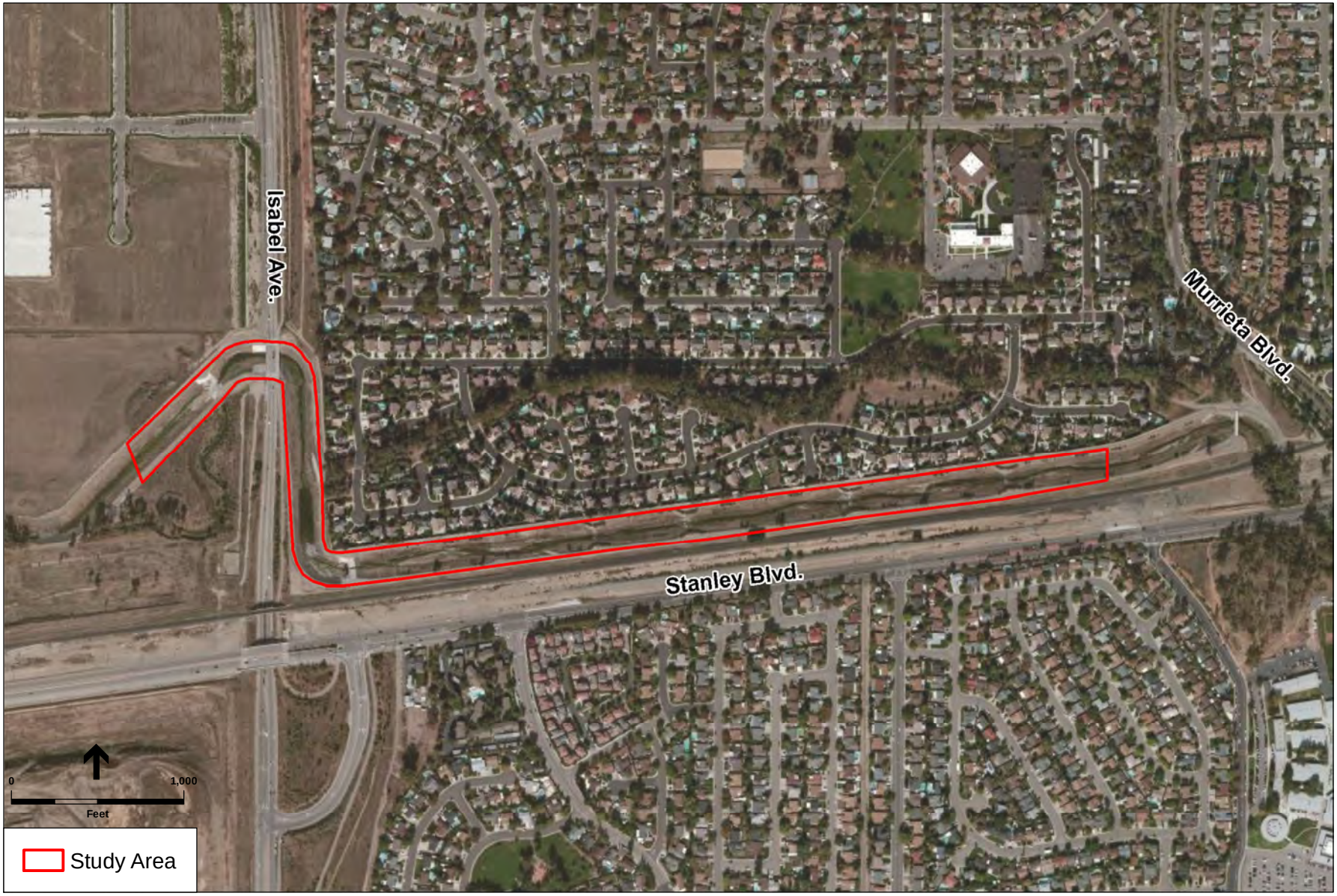
Arroyo Mocho is one of several creeks and flood control channels that traverse the valley floor that ultimately enters the San Francisco Bay via Alameda Creek. Single-family homes border the study area to the north, east, and south. Also to the north is the historical Arroyo Mocho stream channel, which is hydrologically connected to the current channel and during high flows receives water from a point upstream of the delineation study area and discharges water back into the study reach through a culvert located just downstream of the 'dragon's tooth' structure east of Isabel Avenue. The Zone 7 Water Agency Chain of Lakes[1] lies to the west.

2.2 Climate and Topography

The overall Northern California climate is Mediterranean in nature, which is characterized by warm, dry summers and cool, wet winters, with the bulk of precipitation occurring as rain in the winter months. The average annual temperature in Livermore is 59.9 F°, while mean annual rainfall is 14.61 inches (USDA, NRCS, 2002).

The study area slopes east to west from an elevation of approximately 450 feet above sea level to approximately 410 feet at the top of bank. The creek channel is incised approximately 10 to 15 feet below top of bank.

[1] A series of active and retired gravel-mining pits located between Livermore and Pleasanton.



SOURCE: ESRI, 2012; ESA, 2012

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Figure 3
Study Area

2.3 Soils

The United States Department of Agriculture (USDA) Naturals Resource Conservation Service (NRCS) Web Soil Survey (USDA NRCS, 2012) was consulted to determine the soil types occurring within the delineation study area and they are:

- Livermore gravelly loam
- Livermore very gravelly coarse sandy loam
- Yolo loam, 0 to 3 percent slopes
- Riverwash

Riverwash is included on the National Hydric Soil list, while all other soil types mapped within the study area are not included on the list (USDA, 2005). Riverwash is mapped along the historical Arroyo Mocho channel, as shown in Figure D-1, but now also occurs within the current streambed. A map depicting the soils within the wetland delineation study area is presented in Appendix D. Livermore gravelly loam occupies the majority of the study area and occurs along Stanley Boulevard, while the remaining soil types are found along Isabel Avenue. A brief description of each mapped soil series within the delineation study area follows.

The Livermore soils within the study area are found on fluvial terraces and alluvial fans and are derived from sandstone and shale parent material (USDA NRCS, 2012). This series is deep (more than 80 inches to the water table and to a restrictive layer), is somewhat excessively drained, and has a low water capacity.

Yolo loam soils are found on fans and valley floors and are comprised of alluvium derived from sandstone and shale parent material (USDA NRCS, 2012). These soils are also deep (more than 80 inches to the water table and to a restrictive feature) and are well-drained. These soils have a high water capacity.

Riverwash is found within channels and is also comprised of alluvium derived from sandstone and shale parent material. Riverwash is excessively drained and floods frequently. The depth to the water table ranges between 0 and 24 inches below the ground surface.

2.4 Hydrology

Arroyo Mocho, which runs through the entire study area, is located within the Arroyo Mocho Watershed. It is a tributary to Arroyo de la Laguna, which flows to Alameda Creek and eventually into San Francisco Bay. The stream is fed by natural runoff during storm events and regulated releases from the Department of Water Resources (DWR) South Bay Aqueduct. DWR releases water into Arroyo Mocho a few miles upstream of the study area for the purposes of groundwater recharge.

Water was not present within the creek during field survey conducted on November 15, 2012, but was present during the November 26, 2012 field survey.

2.5 Vegetation

Plant communities are assemblages of plant species that occur together in the same area, which are defined by species composition and relative abundance. The study area contains one upland plant community; non-native annual grassland, and two wetland communities; instream wetland and seasonal wetland. The upland community is described briefly below. The wetland communities are described in Section 4.2.

Non-native grassland occurs on the side slopes between the access maintenance roads/pedestrian pathways and the creek channel. The grassland is dominated by common weedy species such as wild oat (*Avena barbata*) and black mustard (*Brassica nigra*). Fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), and wild radish (*Raphanus sativus*) also occur within the grassland. Planted native trees and shrubs, such as blue elderberry (*Sambucus nigra* ssp. *caerulea*), coast live oak (*Quercus agrifolia*), valley oak (*Q. lobata*), and western redbud (*Cercis occidentalis*), line portions of the access maintenance roads/pedestrian pathways above the channel.

CHAPTER 3
Methods

3.1 Definitions

Many of the terms used throughout this report have specific meanings with respect to the delineation of Waters of the U.S. These terms are defined below:

Waters of the United States: The Code of Federal Regulations (33 CFR § 328.3[a]; 40 CFR § 230.3[s]) defines 'waters of the United States' as:

> (1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) All interstate waters including interstate wetlands; (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters which are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce; (4) All impoundments of waters otherwise defined as waters of the United States under the definition; (5) Tributaries of waters identified in paragraphs (1) through (4); (6) Territorial seas; and (7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6).

Wetlands: The Corps and the U.S. Environmental Protection Agency (EPA) define wetlands as, "Those areas that are saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for the life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Corps wetlands must typically exhibit three parameters: 1) wetland hydrology, 2) hydrophytic vegetation, and 3) hydric soils in order to meet the federal definition.

> **Wetland Hydrology:** This term encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. These include both riverine and non-riverine hydrology indicators, such as sediment deposits, drift lines, and oxidized rhizospheres along living roots in the upper 12 inches of the soil. In the Arid West, hydrologic indicators may be absent in any given year due to annual variability in precipitation and in times of drought. The *Arid West Supplement* (Corps, 2008) cites a technical standard that can be used for disturbed or problematic sites that support wetland vegetation and soils but where wetland hydrology is not apparent. 'This standard calls for 14 or more consecutive days of flooding, ponding, or

a water table 12 inches or less below the soil surface during the growing season at a minimum frequency of 5 years in 10'.

Hydrophytic Vegetation: Hydrophytic vegetation is defined as plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. Emphasis is placed on the assemblage of plant species that exert a controlling influence on the character of the plant community, rather than on a single indicator species, i.e., there must be a prevalence of hydrophytic vegetation present in order to satisfy this wetland parameter.

***Wetland Indicator Status*:** Refers to the probability that a plant will occur in a wetland or not. Indicator status categories are as follows:

- *Obligate (OBL)*: almost always occurs in wetlands
- *Facultative wetland (FACW)*: usually occurs in wetlands, sometimes may occur in uplands
- *Facultative (FAC)*: equally likely to occur in wetlands or nonwetlands
- *Facultative upland (FACU)*: usually occurs in uplands but may occasionally occur in wetlands
- *Obligate upland (UPL)*: almost never occurs in wetlands
- *No indicator (NI)*: no indicator assigned due to lack of information

Hydric Soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils are often characterized by redoximorphic features (such as redox concentrations, formerly known as mottles), which form by the reduction, translocation, and/or oxidation of iron and manganese oxides. Hydric soils may lack hydric indicators for a number of reasons. In such cases the same standard used to determine wetland hydrology when indicators are lacking can be used.

Ordinary High Water Mark: Ordinary high water mark (OHWM) is defined in 33 CFR § 328.3[e] as '…that line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter or debris, or other appropriate means that consider the characteristics of the surrounding area'.

Other Waters: The term "other waters of the United States" includes water bodies, such as rivers and streams, that may not meet the full criteria for wetlands designation but that do exhibit evidence of an OHWM and are navigable or hydrologically connected to a navigable water body. Under the latest regulatory guidance, some types of other waters must have a significant nexus to a navigable water body to be considered jurisdictional by the Corps.

Traditionally Navigable Waters: Traditionally navigable waters (TNW) are all waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

Relatively Permanent Waters: Relatively permanent waters (RPW) are non-navigable tributaries of traditional navigable waters that are relatively permanent, meaning they typically flow year-round or have continuous flow at least seasonally (e.g., typically three months).

Non-Relatively Permanent Waters: Non-relatively permanent waters (NRPW) include non-navigable tributaries with ephemeral or seasonal flows lasting less than three months.

Significant Nexus: This term refers to the hydrologic and ecologic connection between a TNW and its tributaries. Under recent guidance from the Corps and EPA certain wetlands and waters must have a significant nexus with a TNW in order to be considered jurisdictional.

Growing Season: The growing season is that part of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5°C/41° F). Growing season dates should be determined through onsite observations whenever possible. Since onsite data gathering is often not possible growing season dates can be approximated by using WETS tables from the nearest appropriate WETS station. The WETS table 70% probability average beginning and ending dates for 28° F temperatures can be used to represent the "normal" growing season for wetland determinations (NRCS, 1995). According to the Livermore WETS Station data (see Appendix E) the normal growing season for the study area would be 365 days (USDA, NRCS, 2002).

3.2 Regulatory Setting

Wetlands and other waters (e.g., rivers, streams, and natural ponds) are a subset of waters of the U.S. and receive protection under Section 404 of the Clean Water Act (CWA). The Corps has primary federal responsibility for administering regulations that concern waters of the U.S. and requires a permit if a project proposes placement of structures within navigable waters and/or alteration of waters of the U.S. The EPA has the ultimate authority under the CWA and can veto the Corps' issuance of a permit to fill jurisdictional waters of the U.S.

In recent years several Supreme Court cases have challenged the scope and extent of the Corps' jurisdiction over waters of the United States and have led to several reinterpretations of that authority. The most recent of these decisions are the case of Solid Waste Agency of Northern Cook County (SWANCC) v. the Army Corps of Engineers (January 9, 2001) and Rapanos v. United States (June, 2006). The SWANCC decision found that jurisdiction over non-navigable, isolated, intrastate waters could not be based solely on the use of such waters by migratory birds. The reasoning behind the SWANCC decision could be extended to suggest that waters need a demonstrable connection with a 'navigable water' to be protected under the CWA. The introduction of the term isolated has led to the consideration of the relative connectivity between waters and wetlands as a jurisdictionally relevant factor. The more recent Rapanos case further questioned the definition of "waters of the United States" and the scope of federal regulatory jurisdiction over such waters but resulted in a split decision which did not provide definitive answers but expanded on the concept that a 'significant nexus' with traditional navigable waters was needed for certain waters to be considered within the jurisdiction of the Corps.

On June 5, 2007 the EPA and the Corps released guidance on CWA jurisdiction in response to the Rapanos Supreme Court decisions, which can be used to support a finding of CWA coverage for a particular water body when either a) there is a significant nexus between the stream or wetland in question and navigable waters in the traditional sense; or b) a relatively permanent water body is hydrologically connected to traditional navigable waters and/or a wetland has a surface connection with that water. According to this guidance the Corps and the EPA will take jurisdiction over the following waters: 1) Traditional navigable waters; 2) Wetlands adjacent to traditional navigable waters, including adjacent wetlands that do not have a continuous surface connection to traditional navigable waters; 3) Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); 4) Wetlands adjacent to non-navigable tributaries, as defined above, that have a continuous surface connection to such tributaries (e.g. they are not separated by uplands, a berm, dike, or similar feature).

The EPA and the Corps will claim jurisdiction over the following waters, based on a fact-specific determination of significant nexus, as defined below, to a traditional navigable water: non-navigable tributaries that are not relatively permanent; wetlands adjacent to non-navigable tributaries that are not relatively permanent; and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

The EPA and the Corps generally do not assert jurisdiction over the following features: swales or erosional features (e.g., 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 EPA and the Corps have defined the significant nexus standard as follows:

> A significant nexus analysis assesses the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters.

Significant nexus analysis includes consideration of hydrologic and ecologic factors including: volume, duration, and frequency of flow; proximity to a traditional navigable water; size of the watershed; average annual rainfall; average annual winter snow pack; potential of tributaries to carry pollutants and flood waters to traditional navigable waters; provision of aquatic habitat that supports a traditional navigable water; potential of wetlands to trap and filter pollutants or store flood waters; and maintenance of water quality in traditional navigable waters.

3.3 Office Preparation

Literature Review

ESA reviewed the following information relevant to this delineation:

- *Jepson eFlora* (Jepson Flora Project, 2012) and *The Jepson Manual: Higher Plants of California* (Hickman, 1993);
- 2012 GIS retrieved aerial photographs;
- USDA NRCS, Web Soil Survey online application
- *National Wetland Plant List* (Lichvar and Kartesz, 2012)
- Standard biological references and field guides.

3.4 Field Survey Methods

Dates

ESA biologists N. Dvorak and M. Giolli conducted a routine delineation of waters of the U.S. within the wetland delineation study area on November 15 and 26, 2012.

Field Delineation Methods

Data Collection

All wetland and drainage signatures on project site aerial photographs were investigated within the delineation study area. The delineation study area was walked such that visual coverage was 100%. All waters of the U.S. within the study area were delineated by comparing the aerial image to the existing site condition and GPS data collection.

Data were collected at 10 data points within the study area. In accordance with the Corp's guidance, sample points were taken at sites representative of the vegetation, hydrology, and physical characteristics across the various wetland types and at adjacent upland areas. Results were extrapolated to nearby wetlands exhibiting similar vegetation and hydrologic conditions. Paired upland data points were established for each wetland data point. Arid West data sheets were used to record information at each data point.

Determination of Hydrophytic Vegetation

At each datapoint vegetation was analyzed within a five-foot radius for herbaceous species, 10-foot radius for shrub species, and a 30-foot radius for trees. Shrubs and trees were only recorded if they appeared to be rooted within the proposed wetland area. All species noted within the study plots were recorded on the data sheets. The indicator status of each species was confirmed in the field, to the extent feasible, with the *National Wetland Plant List* (Lichvar and Kartesz, 2012) for the Arid West Region. Dominance and/or prevalence calculations were generally performed in the field as well. When the vegetation passed either the dominance or prevalence test the point was considered to have hydrophytic vegetation.

Determination of Hydric Soils

Soils were analyzed in accordance with the Corps' *Arid West Manual* (2008). Soil pits were excavated to the maximum depth possible and soil color was matched against a standard color chart (Munsell, 2000). Soils were also inspected for redoximorphic features and soil texture was determined. It was then possible to determine if the soils met any of the hydric soils criteria listed on the Arid West data sheets. Where soils did not exhibit hydric soil criteria consideration was given as to whether the data point in question had the potential to be saturated, ponded or have a water table within 12 inches of the surface for 14 or more consecutive days during the growing season. With the presence of wetland vegetation and hydrology, this technical standard can be used to characterize a soil as hydric (Corps, 2008).

Determination of Wetland Hydrology

Hydrology was assessed using the Corps' 2008 *Arid West Manual's* revised hydrology indicators (e.g., oxidized rhizospheres along living roots, aquatic invertebrates, drift deposits and sediment deposits in a riverine system). Soils in most of the wetland areas encountered were moist to saturated at the time of the delineation field work. Where hydrology indicators were weak, consideration was given as to whether the technical standard quoted above for hydrology and soils might reasonably be applied to a given site.

Mapping and Acreage Calculations

Stream ordinary high water marks and wetland boundaries were recorded in the field by recording waypoints with a Trimble GeoExplorer global positioning unit (GPS). Attribute data was also collected for each waypoint, including wetland type and measurements. Features were also mapped by hand on aerial images and field notes were taken on the characteristics of each feature (vegetation type and quality, disturbance levels, etc.). Field data was overlayed on digital aerial photographs covering the study area and used to map the delineation results. Mapping included correction of original data as well as digitizing using field maps, notes, and aerial photographs. Stream length and area calculations for other waters of the U.S. and wetlands were computed using ArcGIS 10.1.

CHAPTER 4
Results

4.1 Organization

Field delineation results for the delineation study area are presented below. Delineation maps and datasheets for the project, and other supporting information, such as a jurisdictional determination analysis map, a soils map, and representative photographs for the delineation study area are presented in Appendices A through F.

4.2 Results

A total of 5.3 acres (231,111 square feet) and 5,535 linear feet of potentially jurisdictional Waters of the U.S. occur within the delineation study area. **Table 4-1** below presents all delineated features within the delineation study area and summarizes estimated Corps jurisdictional areas for each feature type.

The width of the OHWM for Arroyo Mocho within the study area is highly variable and ranges from 75 feet in the widest locations to 7 feet in the narrowest locations. The majority of wetlands within the study area are instream (emergent) wetlands, while a few seasonal wetlands are located within depressions above, and adjacent to, the OHWM.

Within the delineation study area, instream wetlands occur along the edges of the active channel and on islands within the channel. No water was observed within the stream channel during the survey on November 15, 2012, but flow was observed throughout the active channel during the November 26, 2012 survey. The flow may have been a result of runoff from recent rainfall as well as releases from DWR upstream.

TABLE 4-1
WATERS OF THE U.S. WITHIN THE
STANLEY PILOT PROJECT DELINEATION STUDY AREA

Feature type	Linear ft.	Area (ac)	Area (sq ft)	Sample points
Wetlands				
Instream Wetlands				
ISW-1	NA	0.113	4933.52	--
ISW-2	NA	0.166	7217.11	--
ISW-3	NA	0.051	2201.75	--
ISW-4	NA	0.608	26492.34	7, 9
ISW-5	NA	0.004	165.14	--
ISW-6	NA	0.183	7980.48	--
ISW-7	NA	0.072	3151.76	--
ISW-8	NA	0.375	16325.94	--
ISW-9	NA	0.007	305.41	--
ISW-10	NA	0.015	648.26	--
ISW-11	NA	0.252	10960.29	--
ISW-12	NA	0.004	182.48	--
ISW-13	NA	0.035	1514.67	--
ISW-14	NA	0.078	3388.77	--
ISW-15	NA	0.200	8728.55	--
ISW-16	NA	0.186	8099.30	--
ISW-17	NA	0.053	2302.99	--
ISW-18	NA	0.044	1895.85	--
ISW-19	NA	0.053	2312.10	--
ISW-20	NA	0.301	13105.89	--
ISW-21	NA	0.248	10802.57	--
ISW-22	NA	0.142	6204.31	1
ISW-23	NA	0.028	1203.69	3
Subtotal	***NA***	***3.217***	***140123.17***	
Seasonal Wetland				
SW-1	NA	0.008	351.01	6
SW-2	NA	0.011	469.18	5
Subtotal	***NA***	***0.019***	***820.19***	
Total Wetlands	***NA***	***3.236***	***140943.35***	
Other Waters				
Open Water				
Arroyo Mocho	5,535	***2.070***	***90168.06***	--
Total Other Waters	***5,535***	***2.070***	***90168.06***	
Total Waters of the U.S.	***5,535***	***5.306***	***231111.41***	

SOURCE: ESA, 2012

4.2.1 Wetlands

Instream Wetlands

Within the study area, instream wetlands occur within the OHWM in areas that are saturated for at least 14 consecutive days during the growing season. Sample points 1, 3, 7, and 9 represent instream wetland conditions (see Appendix B for datasheets). Sample points 1, 7, and 9 are located within the outer edges of the OHWM, while sample point 3 is located on an instream island.

Vegetation

Throughout the study reach these areas were commonly dominated by facultative and facultative wetland species. Dominant at the sample points included barnyard grass (*Echinochloa muricata*; FACW), willow herb (*Epilobium ciliatum*; FACW), fiddle dock (*Rumex pulcher*; FAC), Bahia grass (*Paspalum notatum*; FAC), and tall flatsedge (*Cyperus eragrostis*; FACW). Water smartweed (*Persicaria punctata*; OBL), cocklebur (*Xanthium strumarium*; FAC), Italian wildrye (*Festuca perennis*; FAC) and rabbitfoot grass (*Polypogon monspeliensis*; FACW), among others, were also present.

Soils

Soil sampled at sample point 1 had a matrix of dark yellowish brown (10YR 4/6) sandy loam from zero to 8 inches and 15 percent cover of redox concentrations within the matrix. Coarse sand and cobbles/gravels were present below 8 inches. This soil sample met hydric soil indicator S5: Sandy Redox. Soil sampled at sample point 3, located within a vegetated island in the active channel, consisted of large sand particles and cobbles and was classified as riverwash. Riverwash is typically considered a hydric soil when wetland plants and hydrology are also present (Corps, 2008).

Soil sampled at sample point 7 had a matrix with 40 percent yellowish brown (10YR 5/4) and 60 percent very dark grayish brown (10YR 3/2) sandy clay from zero to 8 inches. From 8 to 18 inches, the matrix was 75 percent yellowish brown and 20 percent very dark brown (10YR 2/2) with 5 percent redox concentrations in the matrix. Soil sampled at sample point 7 had a matrix of very dark grayish brown (10YR 3/2) sandy clay from zero to 12 inches and riprap located below 12 inches. Neither of these soil samples met any of the hydric soil indicators, but given the presence of hydrophytic vegetation and wetland hydrology indicators, and location within the OHWM, it is assumed that soils at these locations are saturated for more than 14 consecutive days in the growing season.

Hydrology

All instream wetland sample points were located within the OHWM. Indicators of wetland hydrology at sample point 1 included the presence of oxidized rhizospheres along living roots (C3) and drainage pattern (B10) represented by low vegetation that had been bent over in the direction of flow. Wetland hydrology indicators at sample point 3 included riverine water marks (B1), riverine sediment deposits (B2), riverine drift deposits (B3), drainage pattern (B10), and

vegetation passing the FAC-Neutral Test (D5). Wetland hydrology indicators at sample points 7 and 9 included water-stained leaves (B9) and riverine sediment deposits (B3).

Seasonal Wetlands

Seasonal wetlands within the study area are located within depressions outside of the Arroyo Mocho OHWM. These wetlands likely receive water from ground water seepage and occasional high flows from the creek. Data points 5 and 6 represent seasonal wetland conditions (see Appendix B for datasheets).

Vegetation

The two seasonal wetlands have different vegetation composition. SW-1, represented by sample point 6, was dominated by fennel (FAC) with cover by willow herb and tall flatsedge. SW-2, represented by sample point 5, was dominated by water smartweed, tall flatsedge, and Bermuda grass (*Cynodon dactylon*; FACU).

Soils

Soil sampled at data point 5 met hydric soil indicator S5: Sandy Redox. The matrix from zero to 5 inches was very dark grayish brown (10YR 3/2) with a coarse sand layer from 5 to 6 inches. The matrix from 6 to 18 inches was dark grayish brown (10YR 4/2) with 20 percent cover of redox concentrations in the matrix.

Soil sampled at data point 6 had a matrix of dark grayish brown (2.5Y 4/2) between zero and 3 inches and then coarse sand and cobbles below 3 inches. The soil sample is considered riverwash, which is considered hydric when wetland vegetation and wetland hydrology are present.

Hydrology

Wetland hydrology indicators recorded at sample point 5 consisted of nonriverine drift deposits (B3) and drainage pattern (B10). Wetland hydrology indicators at sample point 6 consisted of surface water (A1), high water table (A2), saturation (A3), and water-stained leaves (B9).

4.2.2 Other Waters

Arroyo Mocho is an intermittent stream within the delineation study area. Areas within the OHWM that were not mapped as containing wetlands consisted of open water and unvegetated gravel bars or sediments. During the November 26, 2012, when water was present within the creek, water depth ranged from several inches to several feet in depth. Within the study reach the OHWM ranged from 7 feet to 75 feet in width, with an average width of 42 feet.

4.3 Clean Water Act Analysis

A Jurisdictional Determination Analysis Map, which summarizes the information presented here, can be found in Appendix C. This section provides a brief summary of the Section III Clean Water Act Analysis (CWA Analysis), Parts A and B for all delineated features, which is supplemental information requested by the Corp's San Francisco District. Information used to

support the CWA Analysis presented herein includes the following: Review of U.S. Geological Survey (USGS) topographic quadrangles and high resolution aerials covering the study area and field studies conducted in November 2012. Proposed classification of waters as traditionally navigable waters (TNWs) and relatively permanent waters (RPWs) are based on results of the literature review and field surveys in connection with the delineation. There are a number of potential biological, chemical, and physical processes being performed by Arroyo Mocho and the wetlands included in this delineation. These include transport of water and nutrients to downstream waters, processing of organic wastes, attenuation of downstream flooding through interception of surface runoff and water storage onsite, reduction of suspended sediment delivered to downstream waters, groundwater replenishment, provision of spawning and rearing habitat for wildlife, and supporting biodiversity at the site and watershed levels through provision of wetland and riparian habitat. No specific studies regarding duration of flow, groundwater measurement, or ecological function and values of streams and wetlands covered in this delineation were conducted. The magnitude at which these functions are being performed is also, for the most part, unknown.

Arroyo Mocho at the project reach is a 4th order stream and is mapped as a USGS blue line intermittent stream, with a direct hydrologic connection to Arroyo de la Laguna, a RPW, and via Alameda Creek, also a RPW, to San Francisco Bay, a TNW. Historically Arroyo Mocho did not flow to the bay but drained into the alluvial deposits of the Livermore Valley in the vicinity of the proposed project site. Arroyo Mocho within the study area appears to have intermittent flow, which is suggested by the fact that the stream was not flowing during the first field visit conducted for this delineation but was flowing during the second. In addition, analysis of daily stream flow data (Zone 7, 2007 and 2011) collected at a gauge located downstream from the project site at the Zone 7 Arroyo Mocho at Hagemann “AMHAG” gauge (former USGS gauge 11176090) also suggests that Arroyo Mocho has continuous flow seasonally for at least three consecutive months in five years out of 10. Therefore, Arroyo Mocho is considered a RPW with seasonal intermittent flow and thus has a significant nexus with a TNW. Arroyo Mocho is therefore likely to be considered jurisdictional by the Corps. All wetlands within the delineation study area either lie within, or directly adjacent to, the OHWM of Arroyo Mocho and are therefore considered abutting wetlands. The Corps takes jurisdiction over wetlands that are abutting an intermittent RPW.

CHAPTER 5
Report Preparation and References

5.1 Report Preparation

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Senior Review:	M. Lowe
Wetland Delineation:	N. Dvorak and M. Giolli
Report Preparation:	M. Giolli
GIS:	M. Giolli and N. Dvorak
Graphics:	M. Giolli and N. Dvorak

5.2 References and Sources Consulted

Environmental Laboratory, 1987. *Corps of Engineers Wetland Delineation Manual*, January 1987, Final Report, Department of the Army Waterways Experiment Station, Vicksburg, Mississippi.

Hickman, J.C., (Ed.) 1993. *The Jepson Manual: Higher Plants of California.* University of California Press, Berkeley, California.

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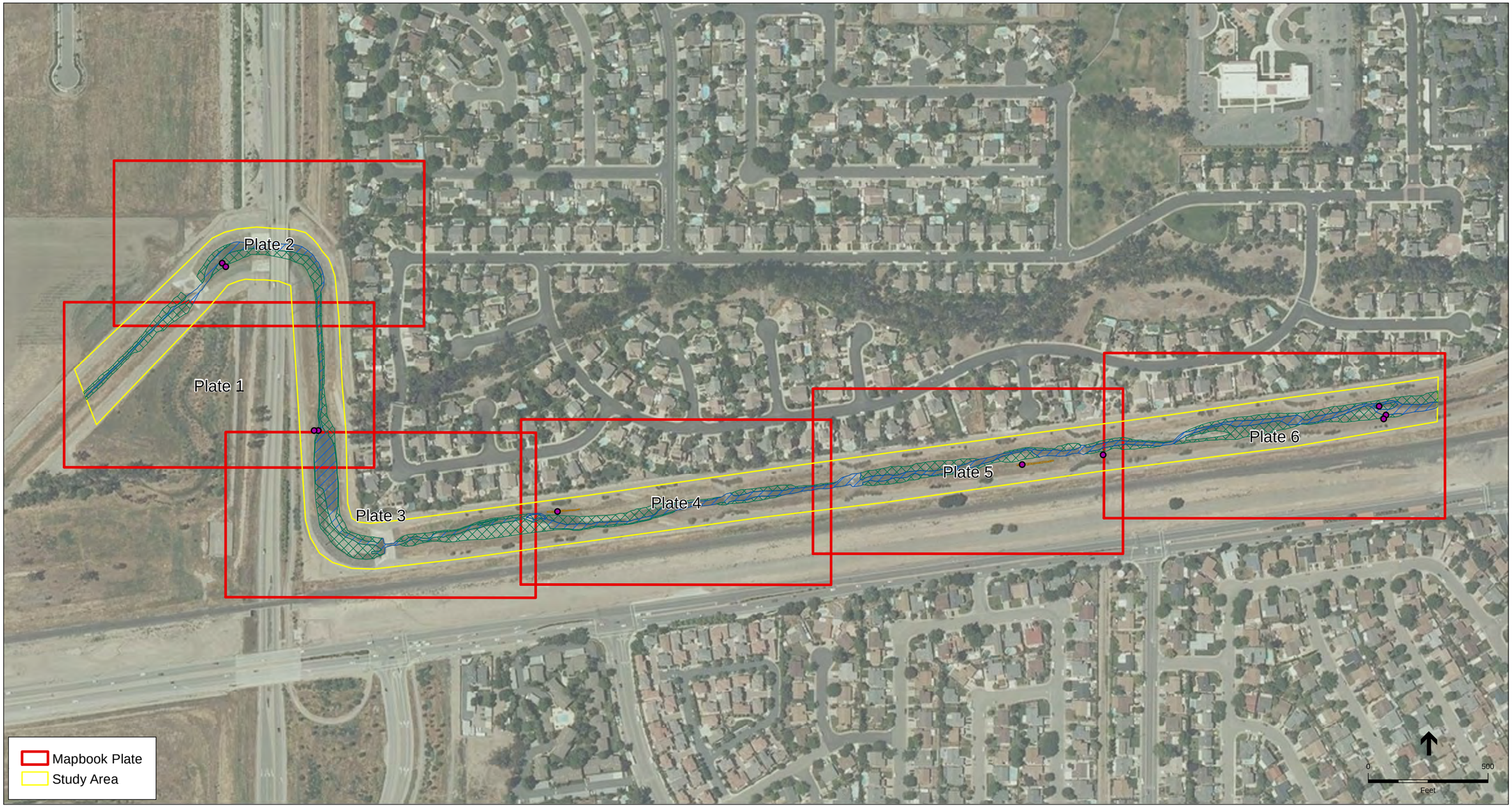
USDA, NRCS, Soil Survey Staff, Web Soil Survey. Data request for Stanley Pilot Project. Available online at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx [Accessed on November 12, 2012].

Zone 7, 2007, daily stream flow data from the Arroyo Mocho at Hagemann "AMHAG" gauge (former USGS gauge 11176090), email correspondence from Gerry Gates to ESA, 8/23/07.

Zone 7, 2011, daily stream flow data from the Arroyo Mocho at Hagemann "AMHAG" gauge (former USGS gauge 11176090), email correspondence from Elke Rank to ESA, 8/23/07.

APPENDIX A
Delineation Maps



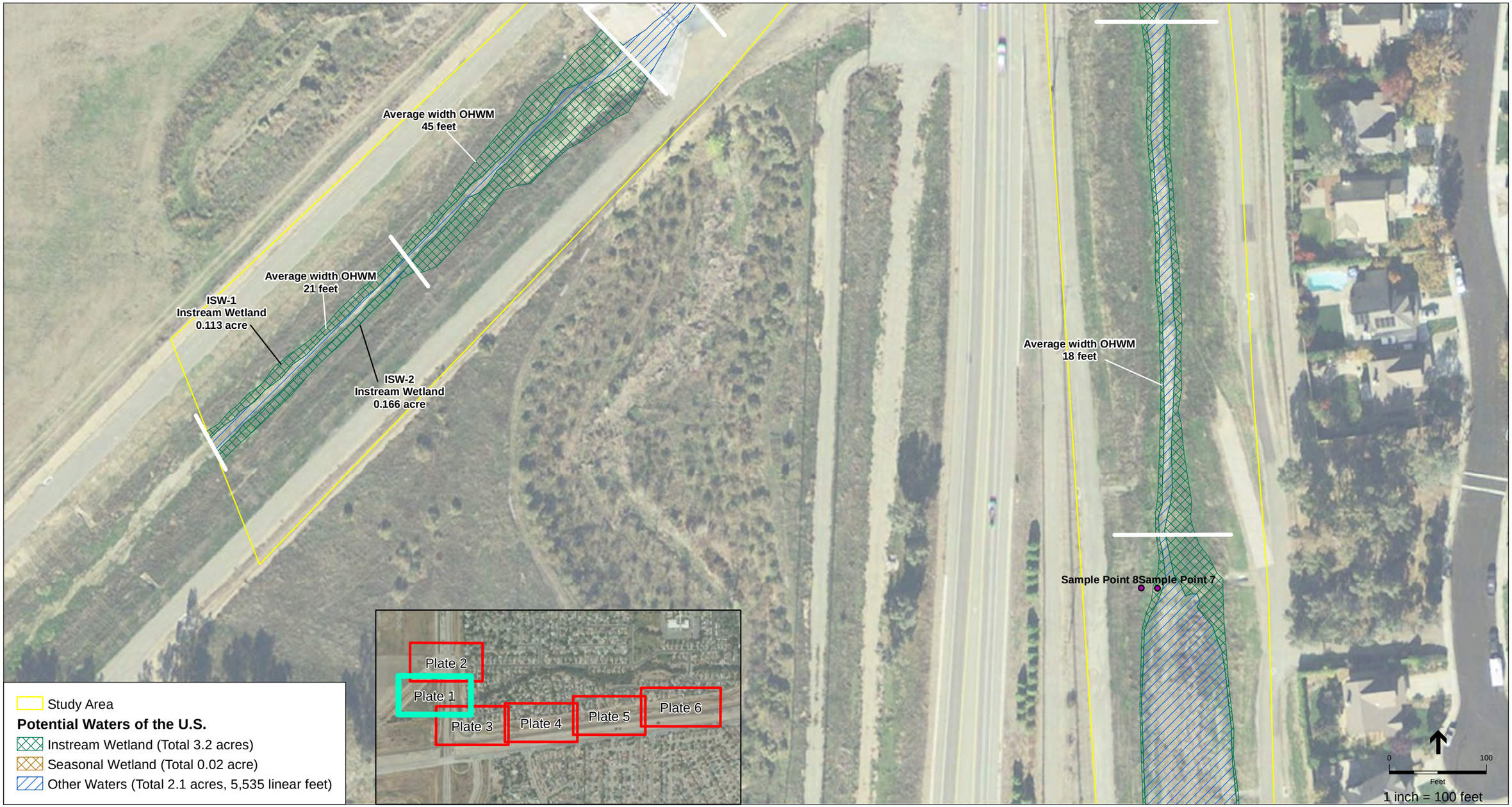
SOURCE: USGS, 2008; ESA, 2012

Prepared by M. Giolli and N. Dvorak, ESA; December 4, 2012

Stanley Pilot Project . 201459.11

Figure A-1

Mapbook Guide for Arroyo Mocho: Preliminary Delineation of Waters of the U.S.



SOURCE: USGS, 2008; ESA, 2012

Prepared by M. Giolli and N. Dvorak, ESA; December 4, 2012

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Figure A-2

Arroyo Mocho: Preliminary Delineation of Waters of the U.S.

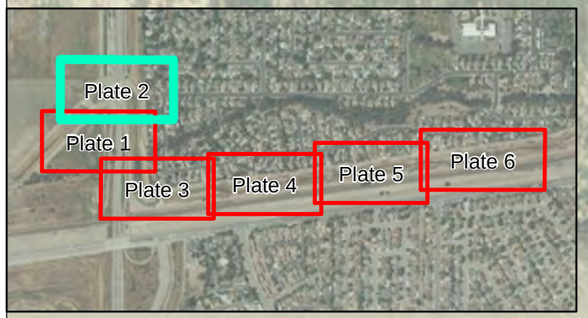
Study Area

Potential Waters of the U.S.

Instream Wetland (Total 3.2 acres)

Seasonal Wetland (Total 0.02 acre)

Other Waters (Total 2.1 acres, 5,535 linear feet)



ISW-5
Instream Wetland
0.004 acre

ISW-3
Instream Wetland
0.051 acre

Average width OHWM
49 feet

Sample Point 9
Sample Point 10

Average width OHWM
18 feet

ISW-4
Instream Wetland
0.608 acre

Average width OHWM
45 feet

0 100
Feet

1 inch = 100 feet

SOURCE: USGS, 2008; ESA, 2012

Prepared by M. Giolli and N. Dvorak, ESA; December 4, 2012

Figure A-3

Arroyo Mocho: Preliminary Delineation of Waters of the U.S.

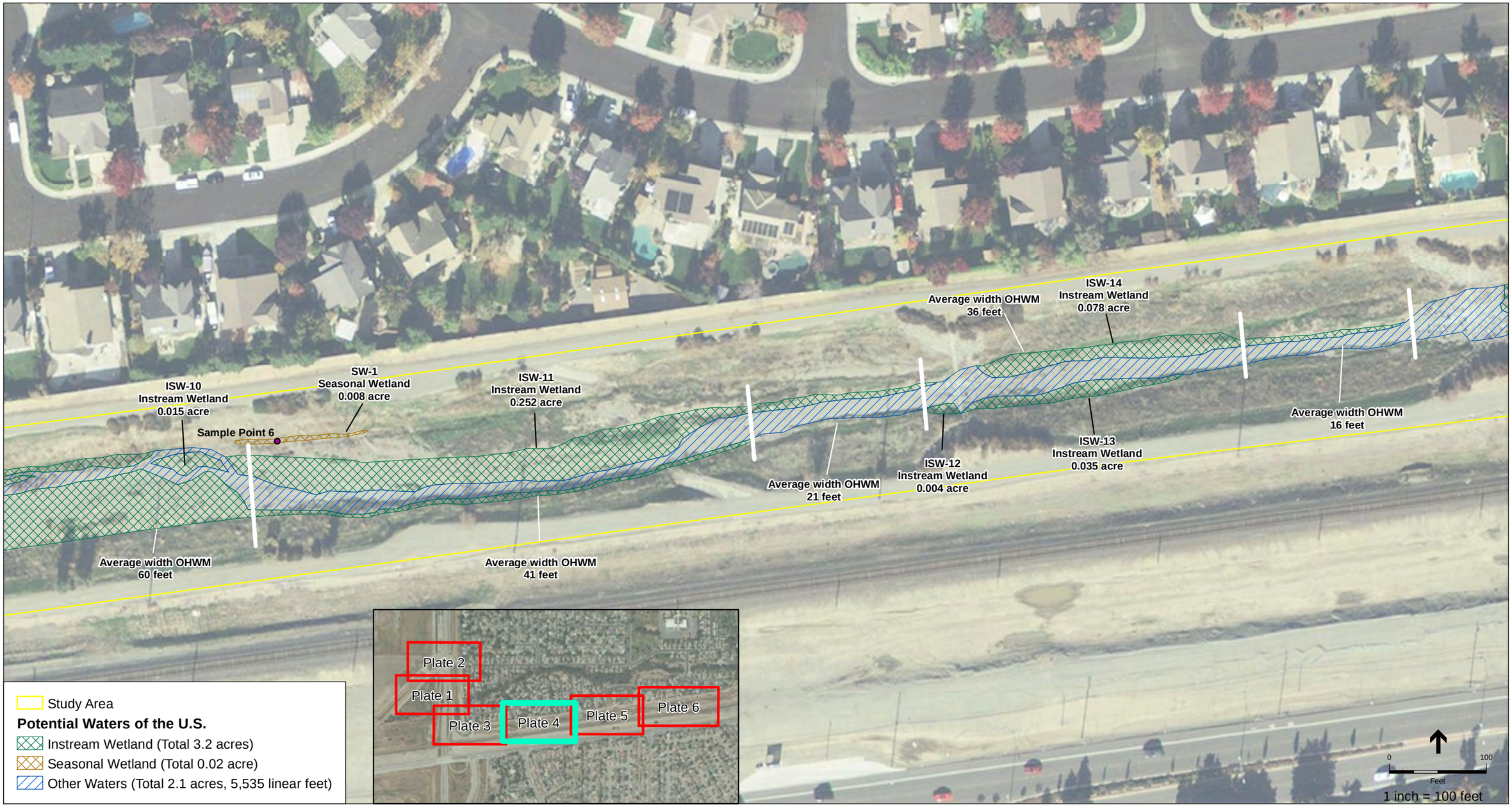
SOURCE: USGS, 2008; ESA, 2012

Prepared by M. Giolli and N. Dvorak, ESA; December 4, 2012

Stanley Pilot Project . 201459.11

Figure A-4

Arroyo Mocho: Preliminary Delineation of Waters of the U.S.



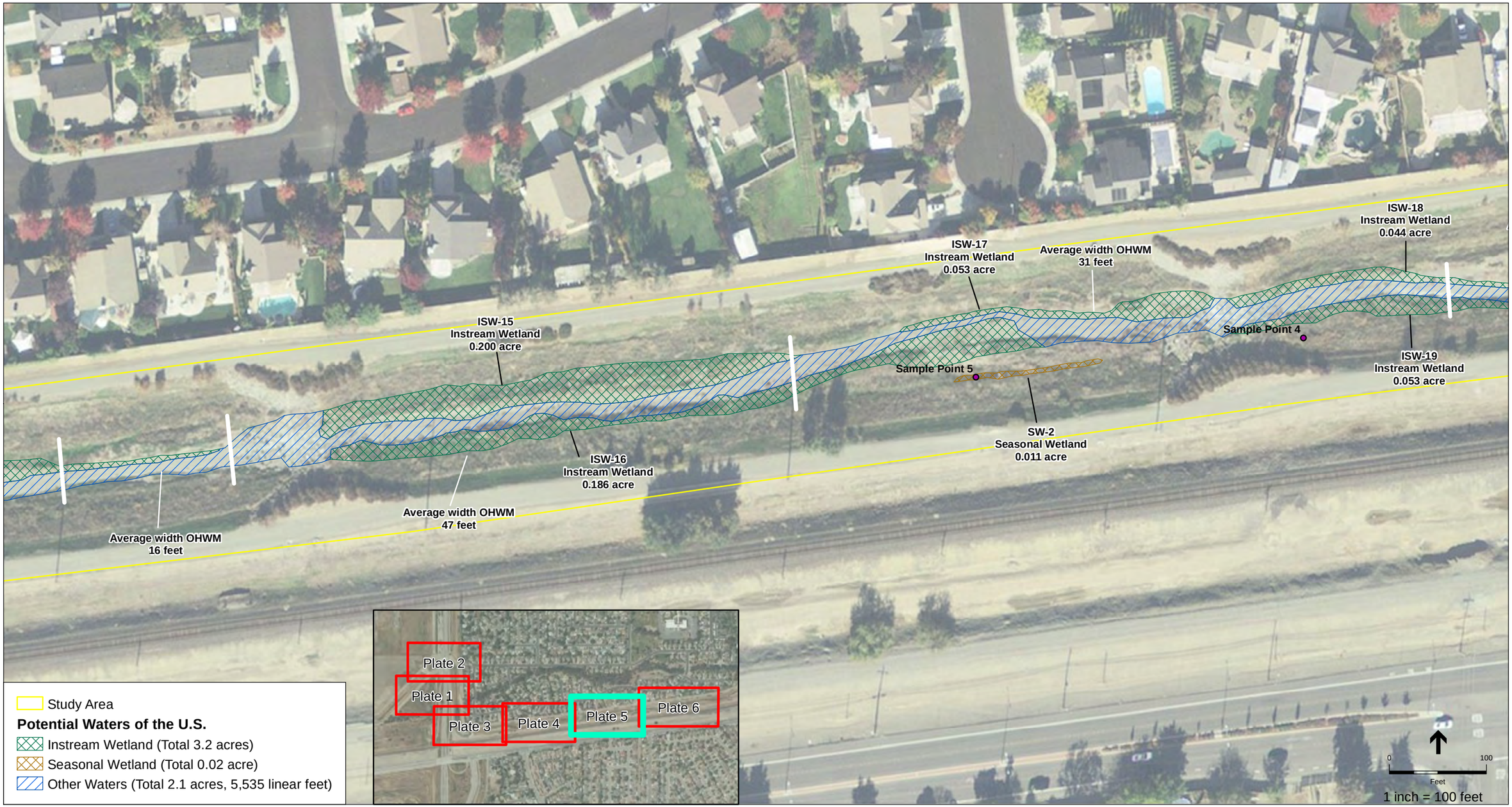
SOURCE: USGS, 2008; ESA, 2012

Prepared by M. Giolli and N. Dvorak, ESA; December 4, 2012

Stanley Pilot Project . 201459.11

Figure A-5

Arroyo Mocho: Preliminary Delineation of Waters of the U.S.



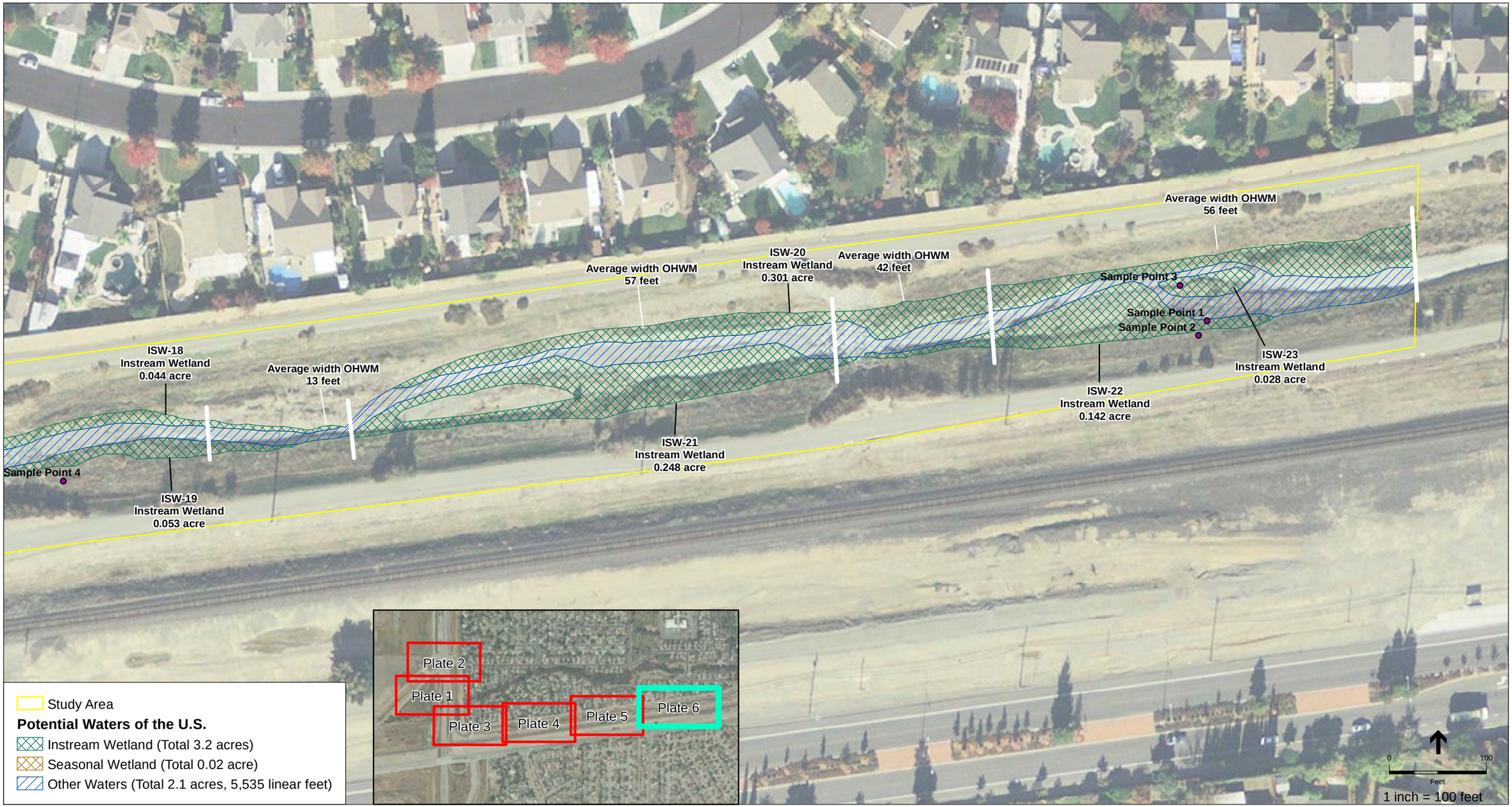
SOURCE: USGS, 2008; ESA, 2012

Prepared by M. Giolli and N. Dvorak, ESA; December 4, 2012

Stanley Pilot Project . 201459.11

Figure A-6

Arroyo Mocho: Preliminary Delineation of Waters of the U.S.



SOURCE: USGS, 2008; ESA, 2012

Prepared by M. Giolli and N. Dvorak, ESA; December 4, 2012

Stanley Pilot Project . 201459.11

Figure A-7

Arroyo Mocho: Preliminary Delineation of Waters of the U.S.

APPENDIX B
Wetland Datasheets

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/15/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 1

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Landgrant

Landform (hillslope, terrace, etc.): stream terrace Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): C - Mediterranean California Lat: 37.678352 N Long: 121.792564 W Datum: NAD 83

Soil Map Unit Name: Livermore gravelly loam NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

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

Remarks: Wetland is within the OHWM

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Festuca perennis*	15	Yes	FAC
2. *Dactylis glomerata*	15	Yes	FACU
3. *Echinocloa muricata*	10	Yes	FACW
4. *Rumex crispus*	5	No	FAC
5. *Cyperus eragrostis*	5	No	FACW
6. *Polypogon monspeliensis*	10	Yes	FACW
7. *Malva parviflora*	5	No	UPL
8. *Helminthotheca echioides*	5	No	FACU
Total Cover:	70 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 3 % % 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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	25	x 2 =	50
FAC species	20	x 3 =	60
FACU species	20	x 4 =	80
UPL species	5	x 5 =	25
Column Totals:	70 (A)		215 (B)

Prevalence Index = B/A = 3.07

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.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Thatch = 20% cover

Additional species at less than 3% cover are Lepidium latifolium (FAC), Xanthium strumarium (FAC), and Epilobium ciliatum (FACW)

SOIL

Sampling Point: 1

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
0-8	2.5Y 4/2	85	10YR 4/6	15	C	M	Sandy loam	
8-12	sandy, not colored							below 8" very sandy, soil not on
								below 12" cobble/gravel

[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.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: rock refusal at 12"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks: Point is within OHWM of an intermittent stream.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/15/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 2

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Land Grant

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 3

Subregion (LRR): C - Mediterranean California Lat: 37.678444 N Long: 121.792625 W Datum: NAD 83

Soil Map Unit Name: Livermore gravelly loam NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

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

Remarks: This is a paired upland data point for data point 1

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Avena barbata*	40	Yes	UPL
2. *Brassica nigra*	25	Yes	UPL
3. *Eschscholzia californica*	3	No	UPL
4. *Foeniculum vulgare*	3	No	UPL
5. *Artemisia douglasiana*	3	No	FAC
6.			
7.			
8.			
Total Cover:	74 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 25 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	3	x 3 =	9
FACU species		x 4 =	0
UPL species	71	x 5 =	355
Column Totals:	74 (A)		364 (B)

Prevalence Index = B/A = 4.92

Hydrophytic Vegetation Indicators:

- (●) 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.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: Remaining cover is thatch.

SOIL

Sampling Point: 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
0-18"	2.5Y 5/3	100					sandy loam	very sandy w/gravel
								no redox

[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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks: No hydric soil indicators observed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks: No indicators of hydrology observed. Point is above OHWM.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/15/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 3

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Land Grant

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

Subregion (LRR): C - Mediterranean California Lat: 37.678452 N Long: 121.792572 W Datum: NAD 83

Soil Map Unit Name: Riverwash, although mapped as Livermore gravelly loam NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

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

Remarks: Located within active channel and below OHWM.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Stipa miliacea*	12	Yes	UPL
2. *Epilobium ciliatum*	10	Yes	FACW
3. *Rumex pulcher*	12	Yes	FAC
4. *Mentha pulegium*	9	No	FACW
5. *Lepidium latifolium*	5	No	FAC
6. *Cyperus eragrostis*	3	No	FACW
7. *Helminthotheca echioides*	5	No	FACU
8. *Polypogon monspeliensis*	2	No	FACW
Total Cover:	58 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 10 % % 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	24	x 2 =	48
FAC species	17	x 3 =	51
FACU species	5	x 4 =	20
UPL species	12	x 5 =	60
Column Totals:	58 (A)		179 (B)

Prevalence Index = B/A = 3.09

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.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Thatch = 30%
Also Xanthium strumarium (FAC) at 2% cover

SOIL

Sampling Point: 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
0-12"	2.5Y 5/3	100					sandy	large sand particles/cobbles

[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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks: Sample point located in riverwash. It is on a vegetated sand and gravel bar within the floodplain (under problematic soils). Likely inundated for 14+ days consecutive days during the growing season due to position relative to OHWM and active channel, therefore assumed to be hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 10

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks: Located on vegetated island within active channel.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/15/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 4

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Land Grant

Landform (hillslope, terrace, etc.): stream terrace Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): C - Mediterranean California Lat: 37.677971 N Long: 121.795761 W Datum: NAD 83

Soil Map Unit Name: Livermore gravelly loam NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

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

Remarks: Located within a patch of Elymus triticoides above OHWM.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Elymus triticoides*	75	Yes	FAC
2. *Festuca perennis*	10	No	FAC
3. *Avena barbata*	5	No	UPL
4. *Foeniculum vulgare*	1	No	UPL
5. *Artemisia douglasiana*	1	No	FAC
6.			
7.			
8.			
Total Cover:	92 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 10 % % 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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	86	x 3 =	258
FACU species		x 4 =	0
UPL species	6	x 5 =	30
Column Totals:	92 (A)		288 (B)

Prevalence Index = B/A = 3.13

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.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: 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
0-12"	10YR 5/3						sandy loam	sandy/cobble

[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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks: Soil moisture increases noticeably at 6" depth and below. No hydric soil indicators. Located above OHWM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks: No hydrology present, located above OHWM

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/15/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 5

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Land Grant

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

Subregion (LRR): C - Mediterranean California Lat: 37.677933 N Long: 121.796738 W Datum: NAD 83

Soil Map Unit Name: Livermore gravelly loam NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

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

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

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

Remarks: Point is outside OHWM but located in an off channel depression that may occasionally have hydrologic connection with Arroyo Mocho.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Foeniculum vulgare*	40	Yes	FAC
2. *Epilobium ciliatum*	25		FACW
3. *Cyperus eragrostis*	5		FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	70 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % % 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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	30	x 2 =	60
FAC species	40	x 3 =	120
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	70 (A)		180 (B)

Prevalence Index = B/A = 2.57

Hydrophytic Vegetation Indicators:

- [X] 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.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks: Thatch is also 10% cover.

SOIL

Sampling Point: 5

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
0-5	10 YR 3/2	100					sandy clay	
5-6							sand	
6-18	10YR 4/2	80	10YR 4/6	20	C	M	sandy clay	

[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.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Redox present in bottom soil layer.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks: Although not located within OHWM, this off channel feature occasionally receives high flow from Arroyo Mocho. Drainage pattern and drift deposits were present.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/26/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 6

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Land Grant

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

Subregion (LRR): C - Mediterranean California Lat: 37.678352 N Long: 121.792564 W Datum: NAD 83

Soil Map Unit Name: Livermore gravelly loam NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

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

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

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

Remarks: Feature is located outside of OHWM, but is in a depression and likely receives flow from Arroyo Mocho during high flow events. Water has been released into Arroyo Mocho since last site visit.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Persicaria punctata*	21	Yes	OBL
2. *Cyperus eragrastis*	16	Yes	FACW
3. *Cynodon dactylon*	15	Yes	FACU
4. *Conium maculatum*	10	No	FACW
5. *Xanthium strumarium*	5	No	FAC
6. *Rumex pulcher*	5	No	FAC
7. *Geranium dissectum*	1	No	UPL
8. *unidentified grass*	7	No	
Total Cover:	80 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % % 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	21	x 1 =	21	
FACW species	26	x 2 =	52	
FAC species	10	x 3 =	30	
FACU species	15	x 4 =	60	
UPL species	1	x 5 =	5	
Column Totals:	73	(A)	168	(B)

Prevalence Index = B/A = 2.30

Hydrophytic Vegetation Indicators:

- [X] 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.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks:

SOIL

Sampling Point: 6

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
0-3	2.5Y 4/2	100					sandy clay	river rock and sand below

[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.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Soil is riverwash and therefore considered hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches):	1.5
Water Table Present?	Yes ◉	No ○	Depth (inches):	3
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks: No flow here but ponded water present in adjacent pockets. Soil is saturated to surface.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/26/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 7

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Land Grant

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

Subregion (LRR): C - Mediterranean California Lat: 37.678310 N Long: 121.804832 W Datum: NAD 83

Soil Map Unit Name: Yolo loam, 0 to 3 percent slopes NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

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

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

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

Remarks: Point has similar vegetation and hydrology as other instream wetlands that also exhibited hydric soils. Point is located below OHWM

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Paspalum notatum*	30	Yes	FAC
2. *Cyperus eragrostis*	20	Yes	FACW
3. *Xanthium strumarium*	15	No	FAC
4. *Echinochloa muricata*	15	No	FACW
5. *Rumex pulcher*	5	No	FAC
6. *Persicaria punctata*	5	No	OBL
7.			
8.			
Total Cover:	90 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 10 % % 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: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	35	x 2 =	70
FAC species	50	x 3 =	150
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	90 (A)		225 (B)

Prevalence Index = B/A = 2.50

Hydrophytic Vegetation Indicators:

- [X] 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.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks:

SOIL

Sampling Point: 7

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
0-8	10YR 5/4	40					sandy clay	mixed matrix
	10YR 3/2	60						
8-18	10YR 5/4	75	10YR 4/6	5	C	PL	sandy clay	mixed matrix
	10YR 2/2	20						

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks: Surface water is present 18 inches from pit. Sample point exhibits wetland vegetation and hydrology indicators. Feature is located within OHWM and therefore it is assumed saturated for more than 14 consecutive days in the growing season.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

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

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks: Wetland hydrology indicators are present

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/26/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 8

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Land Grant

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): C - Mediterranean California Lat: 37 40' 41.653 N Long: 121 48'17.291 W Datum: NAD 83

Soil Map Unit Name: Yolo loam, 0 to 3 percent slopes NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

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

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

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

Remarks: Sample point is a paired data point to sample point 7.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Avena barbata*	40	Yes	UPL
2. *Brassica nigra*	40	Yes	UPL
3. *Paspalum notatum*	6	No	FAC
4.			
5.			
6.			
7.			
8.			
Total Cover:	86 %		
Woody Vine Stratum			
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: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	6	x 3 =	18
FACU species		x 4 =	0
UPL species	80	x 5 =	400
Column Totals:	86 (A)		418 (B)

Prevalence Index = B/A = 4.86

Hydrophytic Vegetation Indicators:

- [•] 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.

Hydrophytic Vegetation Present? Yes ( ) No (•)

Remarks:

SOIL

Sampling Point: 8

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
0-14	10YR 4/2	100					sandy clay	
14-18	10YR 3/2	50					sandy clay	mixed matrix
	10YR 4/3	50						

[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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

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

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks: No hydrology indicators, this is a paired upland datapoint to sample point 7.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project City/County: Livermore, Alameda County Sampling Date: 11/26/12

Applicant/Owner: Zone 7 Water Agency State: CA Sampling Point: 9

Investigator(s): M. Giolli, N. Dvorak Section, Township, Range: Las Positas Land Grant

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): C - Mediterranean California Lat: 37.679752 N Long: 121.805817 W Datum: NAD 83

Soil Map Unit Name: Livermore very gravelly coarse sandy loam NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

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

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

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

Remarks: Located within OHWM. Riprap is located underneath vegetation and soil.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Echinochloa muricata*	70	Yes	FACW
2. *Cyperus eragrostis*	15	No	FACW
3. *Rumex pulcher*	5	No	FAC
4. *Lepidium latifolium*	5	No	FAC
5. *Xanthium strumarium*	1	No	FAC
6.			
7.			
8.			
Total Cover:	96 %		
Woody Vine Stratum			
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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	85	x 2 =	170
FAC species	11	x 3 =	33
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	96 (A)		203 (B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

- [x] 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.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks:

SOIL

Sampling Point: 9

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
0-12	10YR 3/2	100					sandy clay	soil layer over riprap
12								riprap

[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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks: Water table present at 2 inches below surface. Wetland vegetation and wetland hydrology indicators are present. Feature is located within OHWM and it is assumed to be saturated for at least 14 consecutive days during the growing season.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ◉	No ○	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): to surface

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks: Located within OHWM.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Zone 7 Stanley Avenue Pilot Project | City/County: Livermore, Alameda County | Sampling Date: 11/26/12

Applicant/Owner: Zone 7 Water Agency | State: CA | Sampling Point: 10

Investigator(s): M. Giolli, N. Dvorak | Section, Township, Range: Las Positas Land Grant

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none | Slope (%): 1

Subregion (LRR): C - Mediterranean California | Lat: 37 40' 46.984 N | Long: 121 48' 20.933 W | Datum: NAD 83

Soil Map Unit Name: Livermore very gravelly coarse sandy loam | NWI classification: not mapped

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

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

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

Remarks: Located above OHWM. This is a paired sample point to sample point 9.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Brassica nigra*	40	Yes	UPL
2. *Helminthotheca echioides*	25	Yes	FACU
3. *Conium maculatum*	10	No	FACW
4. *Geranium dissectum*	10	No	UPL
5. *Festuca perennis*	3	No	FAC
6. *Epilobium cilatum*	3	No	FACW
7. *Rumex pulcher*	2	No	FAC
8. *Cynodon dactylon*	2	No	FACU
Total Cover:	95 %		
Woody Vine Stratum			
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: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	13	x 2 =	26
FAC species	5	x 3 =	15
FACU species	27	x 4 =	108
UPL species	50	x 5 =	250
Column Totals:	95 (A)		399 (B)

Prevalence Index = B/A = 4.20

Hydrophytic Vegetation Indicators:

- (●) 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.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: 10

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
0-16	10YR 3/2	100					sandy loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ 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 Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

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

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

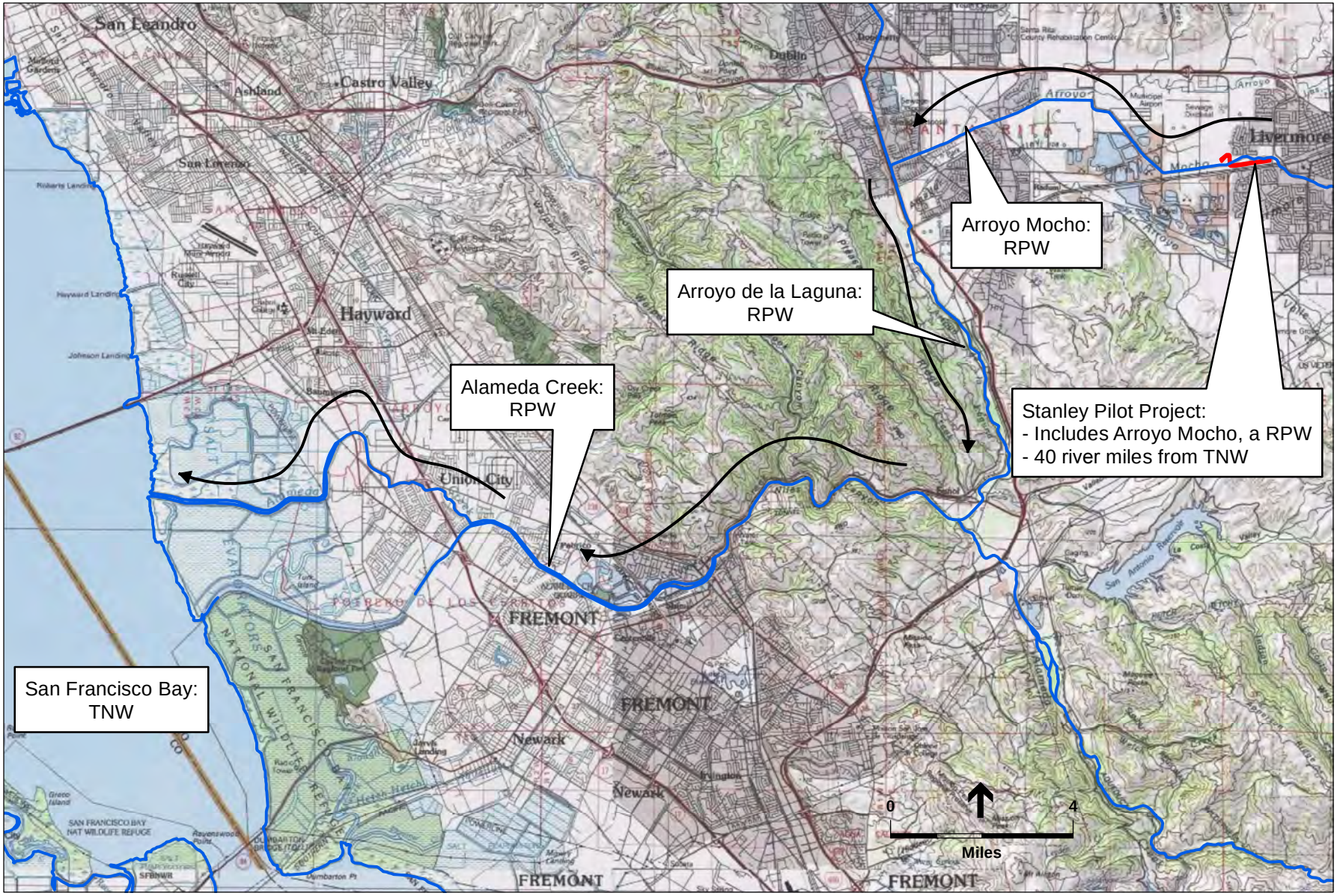
Wetland Hydrology Present? Yes ○ No ◉

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

Remarks: No hydrology indicators observed.

APPENDIX C

Jurisdictional Determination Analysis Map



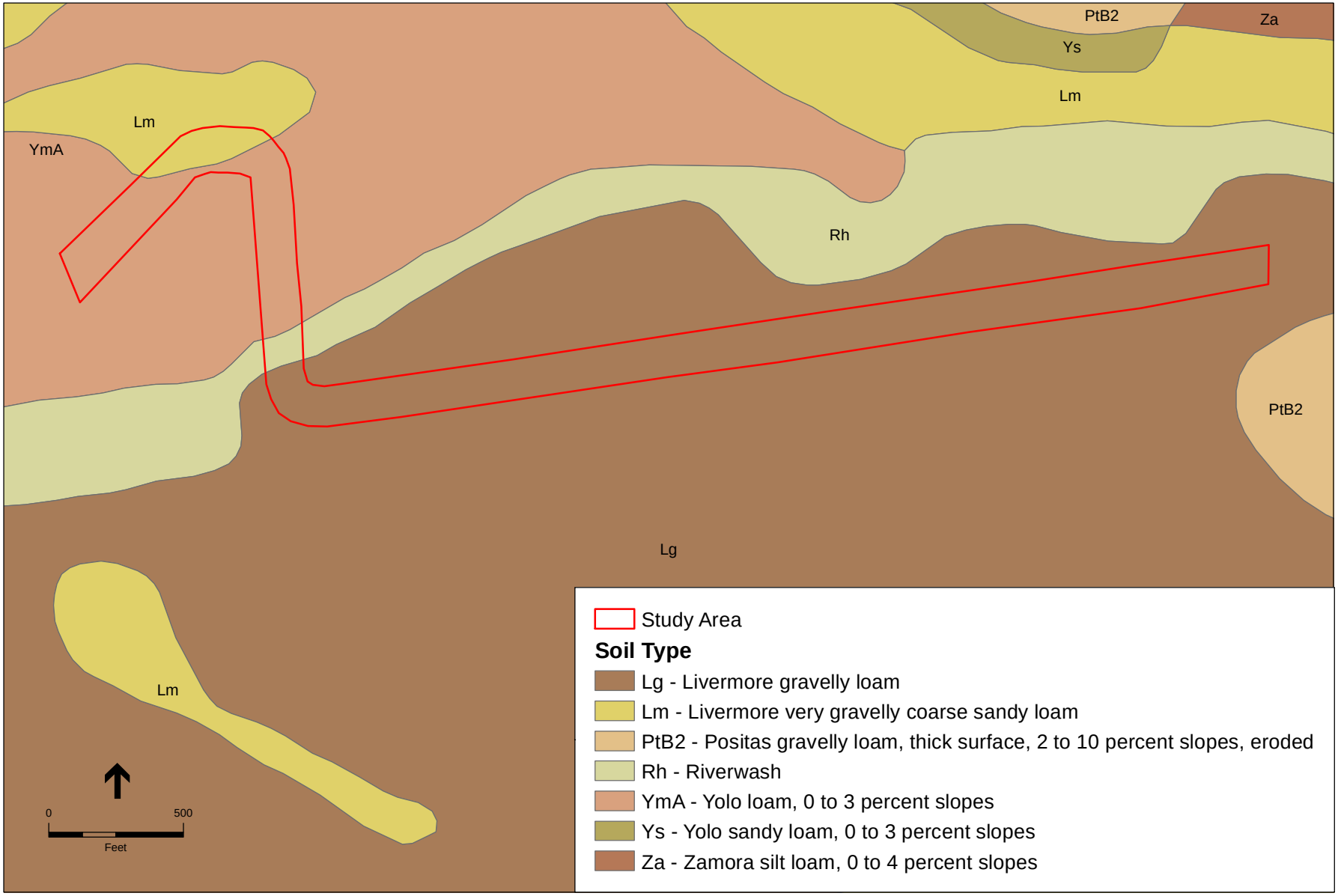
SOURCE: ESRI, 2012; ESA, 2012

Zone 7 Water Agency: Stanely Pilot Project . 201459.11

Figure C-1

Jurisdictional Determination Analysis Map

APPENDIX D
Soils Map



SOURCE: ESA, 2012; USDA NRCS, 2004

Appendix D

Soil Types within the Wetland Delineation Study Area

APPENDIX E

WETS Tables for Livermore, Alameda County

WETS Station : LIVERMORE, CA4997 Creation Date: 08/29/2002
Latitude: 3740 Longitude: 12146 Elevation: 00480
State FIPS/County(FIPS): 06001 County Name: Alameda
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	57.0	37.4	47.2	2.99	1.39	3.66	6	0.0
February	61.9	40.3	51.1	2.73	1.28	3.34	6	0.0
March	65.6	42.3	53.9	2.44	1.00	2.97	6	0.0
April	71.3	44.2	57.8	0.95	0.50	1.17	3	0.0
May	77.1	48.5	62.8	0.43	0.05	0.51	1	0.0
June	84.1	52.5	68.3	0.09	0.00	0.12	0	0.0
July	89.1	54.9	72.0	0.03	0.00	0.00	0	0.0
August	88.8	54.9	71.9	0.08	0.00	0.00	0	0.0
September	86.0	53.2	69.6	0.24	0.00	0.24	0	0.0
October	78.2	48.3	63.3	0.82	0.25	1.00	1	0.0
November	65.1	41.8	53.5	1.75	0.54	2.08	4	0.0
December	57.1	36.9	47.0	2.04	1.02	2.49	4	0.0
Annual	-----	-----	-----	------	10.76	16.37	--	----
Average	73.5	46.3	59.9	------	------	------	--	----
Total	-----	-----	-----	14.61	------	------	31	0.0

GROWING SEASON DATES

Probability	Temperature: 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	> 365 days > 365 days	1/ 9 to 12/29 355 days	2/26 to 11/27 276 days
70 percent *	> 365 days > 365 days	> 365 days > 365 days	2/14 to 12/ 9 299 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1930-2002 prcp

Station : CA4997, LIVERMORE
Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
30				0.63									0.63
31	3.45	1.67	M0.57	0.36	0.93	0.11	0.00	0.00	M0.00	0.27	1.89	5.63	14.88
32	1.29	3.15	0.19	0.41	0.37	0.00	0.00	0.00	0.00	0.00	0.51	2.03	7.95
33	4.51	0.44	2.09	0.13	0.70	0.03	0.00	0.00	0.01	0.75	0.00	3.69	12.35
34	1.29	2.86	0.00	0.13	0.60	0.53	0.00	0.00	0.27	0.62	2.71	2.32	11.33
35	3.53	0.52	3.16	3.28	0.00	0.00	0.00	0.04	0.00	0.79	0.21	1.53	13.06
36	3.28	6.76	0.71		0.46	0.10	0.00	0.00	0.00	0.40	0.02	3.26	14.99
37	3.38	4.13	5.07	0.68	0.17	0.20	0.00	0.00	0.00	0.55	2.46	4.57	21.21
38	2.40	6.14	4.09	0.90	0.02	0.00	0.00	0.00	0.00	1.00	1.08	0.52	16.15
39	2.40	1.57	2.18	0.53	0.18	0.00	M0.00	0.00	0.16	1.23	0.15	0.78	9.18
40	8.13	M4.54	2.60	0.35	0.14	0.00	0.00	0.00	0.25	0.50	0.43	4.63	21.57
41	3.24	4.19	2.07	2.76	0.23	0.00	0.00	0.03	0.00	0.72	0.89	5.34	19.47
42	3.89	1.68	1.42	3.10	1.00	0.00	0.00	0.00	0.09	1.08	3.05	1.73	17.04
43	4.48	1.68	2.39	1.14	0.00	0.06	0.00	0.00	0.00	0.30	0.53	1.23	11.81
44	2.36	4.89	1.01	M0.94	0.73	0.00	0.00	0.00	0.00	0.77	3.41	2.03	16.14
45	0.87	3.68	3.19	0.20	0.17	0.00	0.00	0.02	0.00	1.07	2.07	M2.98	14.25

```
46 0.76  1.23  1.69  0.02  0.61  0.00  0.24  0.00  0.02  0.02  2.93  2.07  9.59
47 0.69  1.45  2.34  0.53  0.17  0.36  0.00  0.00  0.00  1.84  0.85  0.51  8.74
48 0.20  1.11  2.79  2.50  1.03 M0.16  0.03 M0.00 M0.00 M0.46  0.34 M2.71 11.33
49M1.39  2.47  3.38  0.02 M0.34 M0.00  0.03  0.16  0.05  0.08  1.20 M1.21 10.33
50 4.65  1.54  1.44 M0.85 M0.59  0.01 M0.00  0.00  0.08 M1.84 M5.95  4.95 21.90
51 2.23 M1.81 M1.82  0.55 M0.35 M0.06 M0.00 M0.00  0.00  1.04 M3.01  6.07 16.94
52 7.60  1.40 M2.36  2.20 M0.16  0.04 M0.00  0.00 M0.10  0.01  2.11  6.33 22.31
53 2.07  0.05 M1.12 M1.42  0.61  0.59 M0.00 M0.15  0.00 M0.21 M1.33 M0.64  8.19
54 2.19  2.27 M3.00  0.73  0.16 M0.27  0.00  0.00 M0.04 M0.00  1.68 M3.33 13.67
55M2.45  1.69 M0.38 M1.28  0.65  0.00  0.00 M0.01  0.01 M0.01 M1.31 10.15 17.94
56 5.49 M1.15  0.14  1.92 M0.63  0.00  0.00  0.00 M0.63  0.79  0.03  0.48 11.26
57 2.65 M2.23  1.30  1.14 M2.65 M0.04  0.00  0.00 M0.05  1.06  0.37 M1.62 13.11
58 3.16  5.37  4.44  3.74  0.66  0.41  0.00  0.00  0.02  0.09  0.14  0.86 18.89
59 2.45  3.59  0.29  0.35  0.00  0.00  0.00  0.07  1.89  0.00  0.00  0.75  9.39
60 2.98  4.12  0.60  0.48  0.42  0.00  0.02  0.00  0.01  0.05  2.92  1.25 12.85
61 2.08  1.04  1.92  1.03  0.69  0.19  0.00  0.13  0.16  0.15  2.24  0.82 10.45
62 0.73  5.61  1.82  0.22  0.00  0.00  0.00  0.00  0.00  3.64  0.28  1.55 13.85
63 1.40  4.50  2.60  3.47 M0.70  0.00  0.00  0.00  0.33  0.93  3.18  0.19 17.30
64 2.37  0.08  1.57  0.21  0.48  0.32  0.00  0.12  0.04  0.85  2.44  4.91 13.39
65 2.11  0.59  1.73  1.53  0.00  0.00  0.00  0.21  0.00  0.03  4.22  3.23 13.65
66 1.05  1.17  0.17  0.33  0.10  0.12  0.17  0.00  0.11  0.00  3.43  2.35  9.00
67 6.14  0.29  4.15  4.65  0.19  0.48  0.00  0.00  0.02  0.24  0.88  1.62 18.66
68 3.93  0.90  2.40  0.43  0.15  0.00  0.00  0.00  0.00  0.43  2.48  3.04 13.76
69 6.28  4.76  0.55  1.24  0.08  0.00  0.00  0.00  0.00  1.10  0.49  2.34 16.84
70 5.38  1.18  1.42  0.40  0.07  0.32  0.00  0.00  0.00  0.41  5.24  5.27 19.69
71 1.19  0.33  1.75  1.37  0.54  0.00  0.00  0.00  0.13  0.04  0.46  3.27  9.08
72 0.90  0.79  0.14  0.64  0.00  0.04        0.00  0.58  2.98        2.22  8.29
73 5.50                0.29  0.03  0.00  0.00  0.00  0.08  2.08  3.71  3.80 15.49
74 1.50  0.71  2.69  1.62  0.00  0.00  0.00  0.00  0.00  0.50  0.66        7.68
75 0.84  3.65  5.24  1.42  0.00  0.06  0.10  0.35  0.00  1.27  0.08  0.21 13.22
76 0.30  1.46  0.48  0.39  0.00  0.18  0.00  0.91  0.95  0.50  0.50  0.73  6.40
77 1.15  0.83  0.82  0.16  1.01  0.00  0.10  0.00  0.22  0.13        3.07  7.49
78 5.44  2.95        2.49  0.01  0.00  0.00  0.00  0.04  0.00  2.16  0.58 13.67
79 4.52  3.19  1.86  0.88  0.34  0.00  0.06  0.00  0.00  1.51  1.13  2.66 16.15
80 4.16  4.24  1.36  1.32  0.48  0.00  0.70  0.00  0.00  0.04  0.28  1.18 13.76
81 3.97  1.11  2.94  0.61  0.11  0.00  0.00  0.00  0.06  2.07  3.44  2.57 16.88
82 5.29  2.16  5.58  1.50  0.00  0.28  0.00  0.01  1.48  2.24  3.72  2.80 25.06
83 6.28  5.56  6.14  3.51  0.21  0.00  0.00  0.50  1.02  0.27  5.44  3.44 32.37
84 0.33  1.87  1.00  0.53  0.01  0.03  0.00  0.00  0.04  1.25  4.71  1.51 11.28
85 0.48  1.25  2.62  0.32  0.07  0.22  0.00  0.03  0.13  0.89  2.69  1.97 10.67
86 2.04  7.11  4.09  0.40  0.14  0.00  0.01  0.00  0.45  0.04  0.08  0.92 15.28
87 1.83  3.47  2.30  0.16  0.09        0.00  0.00  0.00  0.87  1.40  2.30 12.42
88 1.78  0.38  0.26  1.15  0.45  0.10  0.00  0.00  0.00  0.11  1.92  2.03  8.18
89 0.81  0.95  2.94  0.88  0.08  0.10  0.00  0.00  1.33  1.13  1.02  0.10  9.34
90 1.54  2.46  0.87  0.37  1.78  0.00  0.02  0.00  0.06  0.08  0.39  1.45  9.02
91 0.31  2.20  5.87  0.34  0.35  0.08  0.00  0.21  0.04  1.65  0.31  1.19 12.55
92 1.39  4.61  1.97  0.43  0.00  0.09  0.00  0.00  0.00  0.90  0.15  4.79 14.33
93 6.41  4.53  2.91  0.63  0.51  0.30  0.00  0.00  0.00  0.57  2.00  1.81 19.67
94 0.94  3.33  0.15  1.20  1.78  0.04  0.00  0.00  0.00  0.58        1.36  9.38
95 6.64  0.33  6.66  1.02  0.92  0.70  0.00  0.00  0.00  0.00  0.01  5.37 21.65
96 5.17  4.10  2.34  1.91  1.05  0.00  0.00  0.00  0.00  1.08  2.55  4.43 22.63
97 5.81  0.15  0.06  0.15  0.29  0.17  0.00  0.42  0.00  0.28  4.23  1.95 13.51
98 5.47  7.30  2.37  1.37  2.00  0.13  0.00  0.00  0.18  0.54  2.48  0.73 22.57
99 3.23  3.33  1.67  0.99  0.08  0.01  0.00  0.03  0.04  0.15  1.26  0.25 11.04
 0 4.61  4.87  1.25  0.59  0.69  0.18  0.00  0.01  0.24        0.49  0.45 13.38
 1 1.92  2.89  1.22  1.80  0.00  0.12  0.00  0.00  0.09  0.37  1.92  5.09 15.42
 2
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WETS Station : NEWARK, CA6144
Latitude:  3731      Longitude:  12202        Elevation:  00010
State FIPS/County(FIPS):  06001     County Name: Alameda
Start yr. - 1971   End yr. - 2000
```

Month	Temperature (Degrees F.)			Precipitation (Inches)				
					30% chance will have		avg # of days w/.1 or more	avg total snow fall
	avg daily max	avg daily min	avg	avg	less than	more than		
January	57.6	42.0	49.8	2.96	1.35	3.62	6	0.0
February	61.1	45.2	53.1	2.81	1.27	3.43	6	0.0
March	63.7	47.3	55.5	2.39	1.03	2.92	6	0.0
April	67.2	49.8	58.5	2.62	0.40	2.83	2	0.0
May	70.4	52.9	61.7	0.42	0.03	0.47	1	0.0
June	74.5	56.0	65.3	0.12	0.00	0.12	0	0.0
July	76.7	57.7	67.2	0.03	0.00	0.00	0	0.0

APPENDIX F
Representative Photographs

Photo 1: View of Arroyo Mocho facing northwest from the top of bank at the southwest corner of the study area. (November 15, 2012).

Photo 2: View of instream wetlands facing east from Sample Point 3. (November 15, 2012).

Source: ESA, 2012

Figure B-1
Representative Photographs

Photo 3: View of the eastern-most grade control structure facing east. Photo shows instream wetlands and channel of Arroyo Mocho.
(November 15, 2012).

Photo 4: View of instream wetlands and other waters facing northwest from the dragons tooth structure located east of Isabel Avenue.
(November 26, 2012).

Source: ESA, 2012

Figure B-2
Representative Photographs

Photo 5: View of instream wetlands and other waters facing northwest from the dragons tooth structure located west of Isabel Avenue. (November 26, 2012).

Photo 6: View of instream wetlands and other waters facing northeast from the western end of the survey area. (November 26, 2012).

Source: ESA, 2012

Figure B-3
Representative Photographs

Photo 7: View of seasonal wetland (SW-1) and sample point 6. (November 26, 2012).

Photo 8: View of seasonal wetland (SW-2). (November 15, 2012).

Source: ESA, 2012

Figure B-4
Representative Photographs

Construction Emissions Summary

Summary of Criteria Pollutants Emissions

	Phase 1 Average Daily Construction Emissions (pounds/day)			
Emissions Source	**ROG**	**NOx**	**PM10**	**PM2.5**
Construction - Phase 1	2.25	29.92	1.06	0.98
Vehicle Trips - Phase 1	0.41	10.40	0.27	0.25
Total (pounds/day)	2.66	40.32	1.34	1.23
BAAQMD Significance Threshold	54	54	82	54

	Phase 2 Average Daily Construction Emissions (pounds/day)			
Emissions Source	**ROG**	**NOx**	**PM10**	**PM2.5**
Construction - Phase 2	2.36	31.50	1.11	1.02
Vehicle Trips - Phase 2	0.21	5.32	0.14	0.13
Total (pounds/day)	2.58	36.82	1.26	1.16
BAAQMD Significance Threshold	54	54	82	54

Summary of Greenhouse Gas Emissions

	Phase 1 Annual Emissions (metric tons/year)			
Emissions Source	**CO2**	**N2O**	**CH4**	**CO2e**
Construction - Phase 1	129.3	0.0	0.0	130.5
Vehicle Trips - Phase 1	71.2	0.0	0.0	71.4
Phase 1 - Total (metric tons/year)	200.5	0.0	0.0	201.9
	Phase 2 Annual Emissions (metric tons/year)			
Emissions Source	**CO2**	**N2O**	**CH4**	**CO2e**
Construction - Phase 2	61.4	0.0	0.0	61.9
Vehicle Trips - Phase 2	17.1	0.0	0.0	17.2
Phase 2 - Total (metric tons/year)	78.5	0.0	0.0	79.1
Total Project Emissions (metric tons)	279.0	0.0	0.0	281.0

Phase 1 (2013) Off-road Equipment Inventory

Project Equipment Use Summary - Phase 1

Equipment	total hours	Total workdays
Excavator	720	90
Grader	720	90
Off-Highway Truck	800	100
Tractor/Loader/Backhoe	800	100
Total Workdays	---	**100**
See tables below for details		

Phase 1 Sediment Removal

Equipment	No.	hours/day	days/location	total hours	Total days
Excavator	0	0	0	0	0
Grader	0	0	0	0	0
Off-Highway Truck	1	8	10	80	10
Tractor/Loader/Backhoe	1	8	10	80	10

Notes: It is assumed that sediment removal would take up to two weeks to complete; work would occur 5 days a week.

Phase 1 Removal of Grade Control Structures

Equipment	No.	hours/day	days/location	total hours/ location	total hours	Total days
Excavator	1	8	10	80	160	20
Grader	1	8	10	80	160	20
Off-Highway Truck	1	8	10	80	160	20
Tractor/Loader/Backhoe	1	8	10	80	160	20

Notes: It is assumed that each of the two Phase 1 grade control removal sites would take up to 2 weeks to complete; work would occur 5 days a week.

Phase 1 Channel Construction

Equipment	No.	hours/day	days/location	total hours/ location	total hours	Total days
Excavator	1	8	35	280	560	70
Grader	1	8	35	280	560	70
Off-Highway Truck	1	8	35	280	560	70
Tractor/Loader/Backhoe	1	8	35	280	560	70

a week.

Off-road Construction Equipment Criteria Pollutant Emission Factors

Equipment	Offroad HP Range	Equipment Emission Rates (lb/hour)			
		ROG	NOx	PM10	PM2.5
Excavators	175-250	0.06	0.92	0.03	0.03
Graders	175-250	0.07	1.06	0.03	0.03
Off-Highway Trucks	175-250	0.10	1.09	0.05	0.04
Tractors/Loaders/Backhoes	175-250	0.06	0.87	0.03	0.03
Notes: Emission factors are based on CARB's Off-road emissions inventory database (see Off-road Output). A factor of					

Phase 1 Average Daily Onsite Criteria Pollutant Exhaust Emissions

Equipment	Total Hours	Total Emissions (pounds/day)			
		ROG	NOx	PM10	PM2.5
Excavators	720	45.46	661.27	21.26	19.56
Graders	720	53.15	761.84	24.52	22.56
Off-Highway Trucks	800	79.35	874.30	38.13	35.08
Tractors/Loaders/Backhoes	800	47.34	694.75	22.41	20.62
Total Emissions (pounds) =		225.29	2,992.16	106.33	97.82
Average Daily Emissions (pounds/day)=		2.25	29.92	1.06	0.98

GHG Emissions and Fuel Factors for Diesel Equipment

Fuel	CO2 (g/gal)	N2O (g/gal)	CH4 (g/gal)
Diesel Fuel	10,210.00	0.26	0.58
Notes: Emission factors obtained from TCR, 2011, Tables 13.1 and 13.6.			

Equipment Type	Fuel Consumption (Liter/hr)	Fuel Consumption (gal/hr)
Excavators	16.36	4.32
Graders	16.54	4.36
Off-Highway Trucks	15.68	4.14
Tractors/Loaders/Backhoes	14.70	3.88
emissions inventory database (see Off-road Output).		

Phase 1 Onsite GHG Construction Emissions

Equipment	Total Hours	Total Emissions (metric tons)			
		CO2	N2O	CH4	CO2e
Excavators	720	31.73	0.00	0.00	32.01
Graders	720	32.08	0.00	0.00	32.36
Off-Highway Trucks	800	33.79	0.00	0.00	34.09
Tractors/Loaders/Backhoes	800	31.68	0.00	0.00	31.96
Total Construction Exhaust Emissions		129.29	0.00	0.01	130.43

Phase 2 (2015) Off-road Equipment Inventory

Project Equipment Use Summary: Phase 2

Equipment	total hours	Total workdays
Excavator	360	45
Grader	360	45
Off-Highway Truck	360	45
Tractor/Loader/Backhoe	360	45
Total Workdays	---	**45**
See tables below for details		

Phase 2 Removal of Grade Control Structures

Equipment	No.	hours/day	days/location	total hours/ location	total hours	Total days
Excavator	1	8	10	80	80	10
Grader	1	8	10	80	80	10
Off-Highway Truck	1	8	10	80	80	10
Tractor/Loader/Backhoe	1	8	10	80	80	10

Notes: It is assumed that the Phase 2 grade control removal would take up to 2 weeks to complete; work would occur 5 days a week.

Phase 2 Channel Construction

Equipment	No.	hours/day	days/location	location	total hours	Total days
Excavator	1	8	35	280	280	35
Grader	1	8	35	280	280	35
Off-Highway Truck	1	8	35	280	280	35
Tractor/Loader/Backhoe	1	8	35	280	280	35

Notes: It is assumed that the Phase 2 channel construction site would take up to 7 weeks to complete; work would occur 5 days a week.

Off-road Construction Equipment Criteria Pollutant Emission Factors

Equipment	Offroad HP Range	Equipment Emission Rates (lb/hour)			
		ROG	NOx	PM10	PM2.5
Excavator	175-250	0.06	0.92	0.03	0.03
Grader	175-250	0.07	1.06	0.03	0.03
Off-Highway Truck	175-250	0.10	1.09	0.05	0.04
Tractor/Loader/Backhoe	175-250	0.06	0.87	0.03	0.03
Notes: Emission factors are based on CARB's Off-road emissions inventory database (see Off-road Output). A factor of					

Phase 2 Average Daily Onsite Criteria Pollutant Exhaust Emissions

Equipment	Total Hours	Total Emissions (pounds/day)			
		ROG	NOx	PM10	PM2.5
Excavator	360	22.73	330.63	10.63	9.78
Grader	360	26.58	380.92	12.26	11.28
Off-Highway Truck	360	35.71	393.44	17.16	15.79
Tractor/Loader/Backhoe	360	21.30	312.64	10.09	9.28
Total Emissions (pounds) =		106.31	1,417.63	50.14	46.12
Average Daily Emissions (pounds/day)=		2.36	31.50	1.11	1.02

GHG Emissions and Fuel Factors for Diesel Equipment

Fuel	CO2 (g/gal)	N2O (g/gal)	CH4 (g/gal)
Diesel	10,210.00	0.26	0.58
Notes: Emission factors obtained from TCR, 2011, Tables 13.1 and 13.6.			

Equipment Type	Fuel Consumption (Liter/hr)	Fuel Consumption (gal/hr)
Excavator	16.36	4.32
Grader	16.54	4.36
Off-Highway Truck	15.68	4.14
Tractor/Loader/Backhoe	14.70	3.88
emissions inventory database (see Off-road Output).		

Phase 2 Onsite GHG Construction Emissions

Equipment	Total Hours	Total Emissions (metric tons)			
		CO2	N2O	CH4	CO2e
Excavator	360	15.87	0.00	0.00	16.01
Grader	360	16.04	0.00	0.00	16.18
Off-Highway Truck	360	15.21	0.00	0.00	15.34
Tractor/Loader/Backhoe	360	14.26	0.00	0.00	14.38
Total Construction Exhaust Emissions		61.37	0.00	0.00	61.91

Phase 1 (2013) On-road Criteria Pollutant Emissions

Emission Factors

Vehicle Type	Units	Running Exhaust Emission Factors			
		ROG	NOx	PM10	PM2.5
Light duty truck (LDT2 gas)*	g/mile	0.06	0.29	0.00	0.00
Light duty truck (LDT2 gas)	lb/mile	0.00	0.00	0.00	0.00
Light duty truck (LDT2 diesel)*	g/mile	0.08	0.88	0.06	0.06
Light duty truck (LDT2 diesel)	lb/mile	0.00	0.00	0.00	0.00
Heavy duty truck (T7 diesel)*	g/mile	0.46	12.13	0.31	0.29
Heavy duty truck (T7 diesel)	lb/mile	0.00	0.03	0.00	0.00

* Emission factor obtained online from EMFAC 2011, for Alameda, average model years, and average speed.

Phase 1 Worker and Material Delivery/Off-haul Trips Criteria Pollutant Emissions

Vehicle Type	Trips/year	miles/trip	ROG	NOx	PM10	PM2.5
Light duty truck (gas)	250	20	0.69	3.17	0.02	0.02
Light duty truck (diesel)	250	20	0.85	9.70	0.69	0.64
Heavy duty truck - Rock Delivery	95	94	9.12	238.75	6.18	5.69
Heavy duty truck - Haul Off	1,475	20	30.11	788.70	20.42	18.80
Maximim Annual Emissions (pounds/year)			**40.77**	**1040.32**	**27.32**	**25.15**
Average Day Emissions (lbs/day)			**0.41**	**10.40**	**0.27**	**0.25**

All trips per day are round-trips. The light-duty truck trips represent employee commute trips. Heavy duty truck trips represent offhaul and fill. For rock deliveries, Livermore is 47 miles from Vallejo (94-mile round trip). Trips amounts based on Project Description Table 3.

It is assumed that a 5-person crew would work 100 days and that half of the total trips would be associated with light-duty diesel vehicles and half would be associated with light-duty gasoline vehicles.

Phase 1 On-road GHG Emissions

Emission Factors

Vehicle Type	Running Exhaust Emission Factors (pounds/mile)		
	CO2**	CH4***	N2O***
Light duty truck (gas)	1.0226	0.0001	0.0001
Light duty truck (diesel)	0.7951	0.0001	0.0001
Heavy duty truck	3.8498	0.0000	0.0000
Total	5.6674	0.0003	0.0002

** Emission factor obtained online from EMFAC 2011, for Alameda County, average model years, and average speed.

*** California Climate Action Registry, General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009 Tables C.3 and C.6.

Phase 1 Worker and Material Delivery/Off-haul Trips GHG Emissions

Vehicle Type	Trips/year	miles/trip	CO2	CH4	N2O	CO2e
Light duty truck (gas)	250	20	2.32	0.00	0.00	2.38
Light duty truck (diesel)	250	20	1.80	0.00	0.00	1.86
Heavy duty truck - Rock Delivery	95	94	15.59	0.00	0.00	15.61
Heavy duty truck - Haul Off	1,475	20	51.51	0.00	0.00	51.56
Total (metric tons)	NA	NA	71.23	0.00	0.00	71.41

All trips per day are round-trips. The light-duty truck trips represent employee commute trips. Heavy duty truck trips represent offhaul and fill. For rock deliveries, Livermore is 47 miles from Vallejo (94-mile round trip). Trips amounts based on Project Description Table 3.

It is assumed that a 5-person crew would work 100 days and that half of the total trips would be associated with light-duty diesel vehicles and half would be associated with light-duty gasoline vehicles.

Notes: 0.907194 metric tons = 1 ton; 2000 pounds = 1 ton.

Global Warming Potential for CH4 = 23; GWP for N2O = 296.

Gasoline emission factors for GHG

0.0563 g CH4/mile (CCAR, 2009)
0.03639 g NO2/mile (CCAR, 2009)

Diesel emission factors for GHG (CCAR, 2009)

0.0048 g CH4/mile (CCAR, 2009)
0.0051 g NO2/mile (CCAR, 2009)

Reference:

California Climate Action Registry, General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009. Tables C.3 and C.6.

Phase 2 (2015) On-road Criteria Pollutant Emissions

Emission Factors

Vehicle Type	Units	Running Exhaust Emission Factors			
		ROG	NOx	PM10	PM2.5
Light duty truck (LDT2 gas)*	g/mile	0.06	0.29	0.00	0.00
Light duty truck (LDT2 gas)	lb/mile	0.00	0.00	0.00	0.00
Light duty truck (LDT2 diesel)*	g/mile	0.08	0.88	0.06	0.06
Light duty truck (LDT2 diesel)	lb/mile	0.00	0.00	0.00	0.00
Heavy duty truck (T7 diesel)*	g/mile	0.46	12.13	0.31	0.29
Heavy duty truck (T7 diesel)	lb/mile	0.00	0.03	0.00	0.00

* Emission factor obtained online from EMFAC 2011, for Alameda, average model years, and average speed.

Phase 2 Worker and Material Delivery/Haul-off Trips Criteria Pollutant Emissions

Vehicle Type	Trips/year	miles/trip	ROG	NOx	PM10	PM2.5
Light duty truck (gas)	113	20	0.31	1.43	0.01	0.01
Light duty truck (diesel)	113	20	0.38	4.37	0.31	0.29
Heavy duty truck - Rock Delivery	45	94	4.32	113.09	2.93	2.70
Heavy duty truck - Haul Off	225	20	4.59	120.31	3.12	2.87
Maximim Annual Emissions (pounds/year)			**9.61**	**239.20**	**6.37**	**5.86**
Average Day Emissions (lbs/day)			**0.21**	**5.32**	**0.14**	**0.13**

All trips per day are round-trips. The light-duty truck trips represent employee commute trips. Heavy duty truck trips represent offhaul and fill. For rock deliveries, Livermore is 47 miles from Vallejo (94-mile round trip). Trips amounts based on Project Description Table 3.

It is assumed that a 5-person crew would work 45 days and that half of the total trips would be associated with light-duty diesel vehicles and half would be associated with light-duty gasoline vehicles.

Phase 2 On-road GHG Emissions

Emission Factors

Vehicle Type	Running Exhaust Emission Factors (pounds/mile)		
	CO2**	CH4***	N2O***
Light duty truck (gas)	1.0226	0.0001	0.0001
Light duty truck (diesel)	0.7951	0.0001	0.0001
Heavy duty truck	3.8498	0.0000	0.0000
Total	5.6674	0.0003	0.0002

** Emission factor obtained online from EMFAC 2011, for Alameda County, average model years, and average speed.

*** California Climate Action Registry, General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009 Tables C.3 and C.6.

Phase 2 Worker and Material Delivery/Off-haul Trips GHG Emissions

Vehicle Type	Trips/year	miles/trip	CO2	CH4	N2O	CO2e
Light duty truck (gas)	113	20	1.04	0.00	0.00	1.07
Light duty truck (diesel)	113	20	0.81	0.00	0.00	0.84
Heavy duty truck - Rock Delivery	45	94	7.39	0.00	0.00	7.39
Heavy duty truck - Haul Off	225	20	7.86	0.00	0.00	7.87
Total (metric tons)	NA	NA	17.10	0.00	0.00	17.17

All trips per day are round-trips. The light-duty truck trips represent employee commute trips. Heavy duty truck trips represent offhaul and fill. For rock deliveries, Livermore is 47 miles from Vallejo (94-mile round trip). Trips amounts based on Project Description Table 3.
It is assumed that a 5-person crew would work 45 days and that half of the total trips would be associated with light-duty diesel vehicles and half would be associated with light-duty gasoline vehicles.
Notes: 0.907194 metric tons = 1 ton; 2000 pounds = 1 ton.
Global Warming Potential for CH4 = 23; GWP for N2O = 296.

Gasoline emission factors for GHG

0.0563 g CH4/mile (CCAR, 2009)
0.03639 g NO2/mile (CCAR, 2009)

Diesel emission factors for GHG (CCAR, 2009)

0.0048 g CH4/mile (CCAR, 2009)
0.0051 g NO2/mile (CCAR, 2009)

Reference:

California Climate Action Registry, General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009. Tables C.3 and C.6.

EMFAC Output

Vehicle Type	FUEL	MDLYR	SPEED (Miles/hr)	POP (Vehicles)	VMT (Miles/day)	TRIPS (Trips/day)
LDT2	GAS	AllMYr	AllSpeeds	176,143	6,868,144.93	1,108,948.15
LDT2	DSL	AllMYr	AllSpeeds	88	3,227.66	492.246
T7 single construction	DSL	AllMYr	AllSpeeds	922	68,361.09	0

Vehicle Type	FUEL	MDLYR	SPEED (Miles/hr)	ROG_RUNEX (gms/mile)	TOG_RUNEX (gms/mile)	NOX_RUNEX (gms/mile)	CO2_RUNEX (gms/mile)	PM10_RUNEX (gms/mile)
LDT2	GAS	AllMYr	AllSpeeds	0.063	0.086	0.288	463.838	0.002
LDT2	DSL	AllMYr	AllSpeeds	0.077	0.087	0.88	360.652	0.063
T7 single construction	DSL	AllMYr	AllSpeeds	0.463	0.527	12.127	1,746.27	0.314

Vehicle Type	FUEL	MDLYR	SPEED (Miles/hr)	PM2_5_RUNEX (gms/mile)	SOX_RUNEX (gms/mile)
LDT2	GAS	AllMYr	AllSpeeds	0.002	0.005
LDT2	DSL	AllMYr	AllSpeeds	0.058	0.003
T7 single construction	DSL	AllMYr	AllSpeeds	0.289	0.017

Off-road Output

Calendar Year	AirBasin	Equipment Class	Equipment TypeID	Equipment Type	Horsepower Bin	BaseBSFC	Fuel Consumption (Liter/hr)*	Base NOx
2013	SF	Construction and Mining	14.00	Excavators	250.00	6,289,822.66	16.36	94.21
2013	SF	Construction and Mining	15.00	Graders	250.00	5,200,653.90	16.54	88.78
2013	SF	Construction and Mining	17.00	Off-Highway Trucks	250.00	3,482,696.93	15.68	64.77
2013	SF	Construction and Mining	28.00	Tractors/Loaders/Backhoes	250.00	2,462,411.15	14.70	38.81

Equipment Type	Horsepower Bin	NOx (lbs/hr)	BasePM	PM (lbs/hr)	BaseHC	HC (lbs/hr)	BaseActivity	Base Population	Base AvgHP
Excavators	250.00	0.92	3.03	0.03	5.11	0.05	205,147.28	394.43	218.47
Graders	250.00	1.06	2.86	0.03	4.89	0.06	167,801.44	251.83	204.35
Off-Highway Trucks	250.00	1.09	2.82	0.05	4.64	0.08	118,523.00	104.63	211.02
Tractors/Loaders/Backhoes	250.00	0.87	1.25	0.03	2.09	0.05	89,376.62	178.14	204.22

BaseBSFC: brake-specific fuel consumpion (pounds per year); base emissions are in tons per year; base activity is hours per year.

*Assumes there is 1.874 pounds/liter of diesel

APPENDIX E: MITIGATION MONITORING AND REPORTING PLAN

Mitigation Measure	Mitigation Implementation Responsibility	Monitoring and Reporting Actions, Timing, and Responsibility
Mitigation Measure AIR-1: Comply with the following applicable BAAQMD basic control measures: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, and graded areas, and unpaved access roads) shall be watered two times a day [limited to active construction areas]. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California Airborne Toxics Control Measure Tile 13, Section 2485 of California of Regulations). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • Post a publicly visible sign with the telephone number and person to contact at Zone 7 Water Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations	Construction contractor is responsible for implementation of all air quality control measures.	Construction contractor shall perform daily inspections and bi-weekly documentation to Zone 7 that measures are being implemented, and identifying any lapses or issues.

APPENDIX E: MITIGATION MONITORING AND REPORTING PLAN

Mitigation Measure	Mitigation Implementation Responsibility	Monitoring and Reporting Actions, Timing, and Responsibility
Mitigation Measure BIO-1: Implement measures to reduce impacts to California red-legged frogs and Pacific pond turtle. The following measures shall be implemented to reduce impacts to these species: • In-stream disturbances shall be performed during the dry season when Arroyo Mocho flows cease in the project area (e.g., May 15 to October 15, or as early as May 1 if conditions are dry). Additionally, upstream water releases from DWR shall be ceased or diverted around the site during the construction period to minimize the likelihood of animal movement through the project area during construction. • A qualified biological monitor shall perform a preconstruction survey of the project area prior to construction to verify that California red-legged frogs and pond turtles are not present in work areas. Additionally, in the event that standing water is present in the sediment basin at the time of construction, the monitor shall perform periodic inspections of the project site to verify the absence of California red-legged frog and pond turtle should water be present. • A biological resource education program shall be provided for construction crews and contractors before construction activities begin. The program shall describe the life history and identification of the California red-legged frog and Pacific pond turtle, protective measures to be implemented if sensitive species are identified or suspected to be in the work area (i.e., immediate notification of the biological monitor and temporary protective buffers of 100 feet), and penalties for handling or harming these species. • If pond turtles are identified in the work area, construction activities shall cease until the individual disperses from the project site, or is relocated by the biological monitor. In addition, if a California red-legged frog is located, work shall be ceased in the immediate area and the U.S. Fish and Wildlife shall be notified before work is reinitiated.	Zone 7 is responsible for implementing all biological surveys, and will prepare materials for education program. Construction contractor responsible for implementing education program. Construction contractor shall coordinate with Zone 7 on timing for start of project, pending results of pre-construction surveys.	Construction contractor will notify Zone 7 immediately should they encounter California red-legged frogs or Pacific pond turtle in the project area. Zone 7 is responsible for notifying U.S. Fish and Wildlife as needed. Construction contractor will provide documentation to Zone 7 that the educational program has been implemented for all onsite workers.

APPENDIX E: MITIGATION MONITORING AND REPORTING PLAN

Mitigation Measure	Mitigation Implementation Responsibility	Monitoring and Reporting Actions, Timing, and Responsibility
Mitigation Measure BIO-2: If construction or vegetation removal must be performed during the nesting period (February 1 through August 31), Zone 7 shall retain a qualified biologist to survey trees and dense wetland vegetation within 250 feet of the project site for any nesting birds to verify the presence or absence of nests no more than 14 days prior to construction activities. If active nests are observed, buffer zones will be established around trees/shrubs with nests, with a buffer size established by the qualified biologist through consultation with the appropriate regulatory agency (e.g., CDFW). Buffer zones will be avoided during construction activities until young have fledged or the nest is otherwise abandoned.	Zone 7 is responsible for implementing all biological surveys. Construction contractor shall coordinate with Zone 7 on timing for start of project, pending results of pre-construction surveys. Contractor shall observe buffer zones, as applicable.	Construction contractor will notify Zone 7 immediately should they encounter any nesting birds.
Mitigation Measure HYD/WQ-1: A detailed Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and implemented. Water quality protection measures set forth in the 401 water quality certification or 404 Clean Water Act permit will also be implemented.	Construction contractor shall prepare SWPPP for Zone 7 approval prior to start of work. Construction contractor shall be responsible for adhering to measures in SWPPP and all related water quality measures in permits – such as from RWQCB (401), CDFW (SAA), and USACW (404). Construction contractor shall coordinate with Zone 7 on timing for start of project, pending receipt of all	Construction contractor shall conduct daily inspections and bi-weekly documentation to Zone 7 that all measures are being implemented, and identifying any lapses or issues.

APPENDIX E: MITIGATION MONITORING AND REPORTING PLAN

Mitigation Measure	Mitigation Implementation Responsibility	Monitoring and Reporting Actions, Timing, and Responsibility
	necessary environmental permits. Work may not begin before permits have been issued to Zone 7 and all on-site measures are in place, as applicable.	
Mitigation Measure HYD/WQ-2: Implement Best Management Practices (BMPs) to control short-term construction water quality impacts. Construction BMPs would reduce erosion of disturbed soils during construction activities, and are used to minimize wind and water erosion and transport of sediments during construction. Further, these measures will reduce the risk of accidental spills of petroleum products into the creek. Measure may include these or similar measures: • Regular inspection of coffer-dams; • Back-up pumping capability in the event of failure of the cofferdam; • Any stockpiled soil, awaiting removal from the site, would be placed and sloped so that it would not be subject to accelerated erosion. (See also Mitigation Measure AIR-1); • Refueling outside the riparian corridor with measures for containing accidental fuel spills; • All construction equipment and machinery shall be checked for leaks prior to entry into the stream channel; and • Any construction equipment shall not be stored or stockpiled in the creek channel.	Construction contractor to identify suitable BMPs for Zone 7 review and approval. Construction contractor responsible for implementing and adhering to BMP measures.	Construction contractor to conduct daily inspections and bi-weekly documentation to Zone 7 that all measures are being implemented, and identifying any lapses or issues.

APPENDIX E: MITIGATION MONITORING AND REPORTING PLAN

Mitigation Measure	Mitigation Implementation Responsibility	Monitoring and Reporting Actions, Timing, and Responsibility
Mitigation Measure NOI-1: Noise generating construction work will generally be limited to weekdays from 8a.m. to 5p.m., or as specified in the City's ordinances. All construction work shall be conducted only as prescribed by City permits. Construction equipment shall be equipped with noise arrestors.	Construction contractor shall be responsible for adhering to BMP measures, and other applicable ordinances.	Daily inspections and bi-weekly documentation to Zone 7 that all measures are being implemented, and identifying any lapses or issues.
Mitigation Measure TRAF-1: Develop a traffic plan in coordination with the City of Livermore. The plan may include measure such as: • construction signs that advise drivers of closed lanes (if applicable) or other traffic changes / cautions; • establishing a 24-hour emergency telephone resource for questions and complaints; and • providing flaggers as needed when trucks are maneuvering in traffic.	Zone 7 to negotiate conditions of traffic permits from City of Livermore. Construction contractor shall be responsible for adhering to all conditions set forth in the permit. Construction contractor shall coordinate with Zone 7 and City of Livermore on timing for start of project, pending receipt of traffic permit. Work may not begin before permits have been issued and all conditions are in place, as applicable.	Daily inspections and bi-weekly documentation to Zone 7 that all measures are being implemented, and identifying any lapses or issues.