

APPENDIX A
AQUATIC RESOURCES REPORT

Clean Water Act Section 404 Delineation of Waters of the United States

City of Pleasanton Stream and Pond Maintenance
Pleasanton, Alameda County, California

Prepared for:

Rita Di Candia
City of Pleasanton
Operations Services Dept.
P.O. Box 520
Pleasanton, California 94566

Prepared by:

WRA, Inc.
2169-G East Francisco Blvd
San Rafael, California 94901
Contact: Élan Alford
alford@wra-ca.com



Date: December 2019

WRA Project #: 29118



TABLE OF CONTENTS

1.0 INTRODUCTION 1
 1.1 Project Background and Location 1
2.0 Regulatory Background 2
 2.1 Wetlands 2
 2.2 Non-Wetland Waters..... 3
3.0 PROJECT AREA DESCRIPTION 3
 3.1 Vegetation..... 4
 3.2 Soils 4
 3.3 Hydrology..... 7
4.0 METHODS 7
 4.1 Wetlands 8
 4.1.1 Routine Method 8
 4.2 Non-Wetland Waters..... 8
 4.3 Areas Potentially Exempt from Section 404 Jurisdiction..... 8
5.0 RESULTS 9
 5.1 Section 404 of the Clean Water Act..... 12
 5.1.1 Non-wetland Waters..... 12
 5.1.2 Wetland Waters..... 16
 5.2. Areas Exempt from Section 404 Jurisdiction 16
 5.3 Uplands..... 17
6.0 CONCLUSIONS..... 18
7.0 REFERENCES 19

LIST OF TABLES

Table 1. Twenty-five Study Area Locations 1
Table 2. Stream and Pond Features and Potential for Corps Jurisdiction 10
Table 3. Summary of Potentially Jurisdictional Features Mapped in the Project Area..... 12

LIST OF APPENDICES

Appendix A. Figures

 Figure 1. Project Area Location Map

Appendix B. Potential Wetlands and Waters of the United States

Appendix C. Soils in the Project Area

Appendix D. Project Area Photographs

Appendix E. Plant Species Observed within the Project Area

LIST OF ACRONYMS

CARI	California Aquatic Resources Inventory
CFR	Code of Federal Regulations
Corps	U. S. Army Corps of Engineers
CWA	Clean Water Act
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
NETR	Nationwide Environmental Title Research
NL	Not Listed
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary High Water Mark
PRISM	Parameter-Elevation Regressions on Independent Slopes Model
SFEI	San Francisco Estuary Institute
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
WRA	WRA, Inc.

LIST OF REPORT PREPARERS

Leslie Lazarotti, Principal-in-Charge/Project Director
Élan Alford, Associate Biologist
Samantha Hill, Biologist
Sundaran Gillespie, GISP, GIS Analyst

1.0 INTRODUCTION

1.1 Project Background and Location

WRA has been retained by The City of Pleasanton (City) to conduct a delineation of approximately 95-acres of Project Area for waters of the United States on a series of channels, ditches, and detention ponds in Alameda County. The Project Area includes 25 disparate Study Area locations; all creek segments, all drainage ditches, and 6 of the 8 detention ponds occur in the City of Pleasanton, Alameda County, California (Study Areas Location Map, Appendix A, Figure 1). Two detention ponds, Vineyard West and Vineyard East Detention Ponds, are located outside of the City urban boundary in unincorporated Alameda County.

The City is proposing to conduct routine maintenance activities at these Study Area streams and stormwater detention ponds. The City seeks to periodically remove debris, sediment, and/or vegetation from approximately seventeen (17) creek/channel sections and eight (8) stormwater detention ponds to maintain their flood control and stormwater treatment capacities (Table 1). Maintenance will also include the pruning or trimming of riparian trees occurring along the tops of stream banks as found to be necessary.

Table 1. Twenty-five Study Area Locations

Study Area	Feature Name
Creeks	
C-01	Pimlico Canal
C-02	Pleasanton Canal
C-03	Foothill High School Trash Rack
C-04	Bernal V-ditch
C-05	Bernal North/South V-ditch
C-06	Mission Creek Restoration Project
C-07	Lower Kottinger Creek
C-08	Upper Kottinger Creek
C-09	Touriga Creek
C-10	Junipero Canal
C-11	Mission Park Creek
C-12	Cemetery Creek
C-13	Gold Creek
C-14	Dublin Canyon Creek
C-15	Stonedale Channel
C-16	Arlington Creek
C-17	Rutledge Place Culvert
Detention Ponds	
P-01	Stoneridge Pond
P-02	Bernal Detention Pond Central
P-03	Canyon Oaks Detention Pond
P-04	Bernal West Detention Pond
P-05	Callippe Detention Pond
P-06	Oak Tree Farms Detention Pond
P-07	Vineyard West Detention Pond
P-08	Vineyard East Detention Pond

In July and October, 2019, WRA conducted a routine wetland delineation of the Study Areas to determine the presence of potential wetlands and non-wetland waters potentially subject to federal jurisdiction under Section 404 of the Clean Water Act (CWA). This report presents the results of this delineation, which are subject to verification by the U.S. Army Corps of Engineers (Corps).

2.0 Regulatory Background

Section 404 of the Clean Water Act gives the Environmental Protection Agency (EPA) and the Corps regulatory and permitting authority regarding discharge of dredged or fill material into “navigable waters of the United States.” Section 502(7) of the CWA defines “navigable waters” as “waters of the United States, including territorial seas.” Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term “waters of the United States” as it applies to the jurisdictional limits of the authority of the Corps under the CWA. A summary of the definition of “waters of the United States” in 33 CFR 328.3 (a) includes (1) waters used for commerce; (2) interstate waters and wetlands; (3) territorial seas; (4) impoundments of waters listed here; (5) tributaries to the above waters; (6) waters and wetlands adjacent to the above waters; and (7) prairie potholes, Carolina and Delmarva bays, pocosins, western vernal pools, and Texas coastal prairie wetlands, provided these features have a significant nexus to the above listed waters¹; (8) all waters located within the 100-year floodplain of waters listed above in items 1-3 or within 4,000 feet of the high tide line (HTL) or ordinary high water mark (OHWM) of a water listed above in items 1-5, provided those waters are determined to have a significant nexus to waters identified in items 1-3 above. For purposes of the determining Corps jurisdiction under the CWA, “navigable waters” as defined in the CWA are the same as “waters of the U.S.” defined in 33 CFR 328.3.

Areas not considered to be “waters of the United States” as defined in 33 CFR 328.3 (b), are summarized as follows: (1) waste treatment systems; (2) prior converted cropland; (3) specific classes of ditches, including (i) ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary, (ii) ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands, and (iii) ditches that do not flow, either directly or through another water, into a water identified in 33 CFR 328.3 paragraphs (a) (1) through (3); (4) artificially irrigated areas that would otherwise revert to dry land and manmade aquatic features in otherwise dry land such as stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, cooling ponds, reflecting pools, swimming pools, small ornamental waters, depressions incidental to mining and construction activity, erosional features, and puddles; (5) groundwater; (6) stormwater control features; (7) wastewater recycling structures, groundwater recharge basins, percolation ponds for wastewater recycling, and distribution networks for wastewater recycling.

2.1 Wetlands

Wetlands are defined in 33 CFR 328.3 (c) as:

...those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal

¹ Wetlands and non-wetland waters in this category are similarly situated and are combined, for purposes of a significant nexus analysis, in the watershed that drains to the nearest water identified in paragraphs (a)(1) through (3) of 33 CFR 328.3.

circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The basis for determining whether a given area is a wetland for the purposes of Section 404 of the CWA is outlined in the Corps *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Delineation Manual* for the respective region. As defined in 33 CFR 328.4 (c), the extent of federal jurisdiction within wetlands is defined as extending to the limit of the wetland as determined using the methods outlined in the manuals.

2.2 Non-Wetland Waters

The limit of federal jurisdiction in tidal non-wetland waters extends to the HTL which is defined in 33 CFR 328.4 (a) as:

...the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

The limit of federal jurisdiction in non-tidal non-wetland waters extends to the OHWM which 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 clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

3.0 PROJECT AREA DESCRIPTION

Project Area elevations range from approximately 300 to 440 feet. The Project Area consists of 25 Study Areas that capture a mixture of natural creeks, drainage channels, and detention ponds used and maintained by the city of Pleasanton. Nearly all Study Areas within the Project Area were historically used for various agricultural purposes such as row crops dating back to 1949 (NETR 2019). All Study Areas are located in the vicinity of existing infrastructure, residential, or commercial developments. The City of Pleasanton excavated the majority of the detention ponds in upland areas prior to 2002 with P-01 remaining as an undeveloped field until approximately 2012.

3.1 Vegetation

The dominant vegetation types in the Project Area's 25 Study Areas are ruderal grassland, riparian forest, landscaped areas, coast live oak woodland, perennial marsh and coyote brush scrub. Each of the 17 channel sites (designated by C-#) and eight (8) detention pond sites (designated by P-#) typically supports a mixed vegetation assemblage, representing a subset of vegetation types that occur across all Study Areas. Ruderal grassland includes areas that have been partially developed, residential areas, or lands that have been used in the past for agriculture. Dominant plant species observed in ruderal herbaceous grassland in the Project Area include wild oat (*Avena sativa*, UPL), Italian rye grass (*Festuca perennis*, FAC), and yellow star thistle (*Centaurea solstitialis*, NL). Dominant riparian forest tree layer includes coast live oak (*Quercus agrifolia*, NL), valley oak (*Quercus lobata*, FACU), and black walnut (*Juglans hindsii*, FAC), with lower densities of willow (*Salix* sp.) and sycamore (*Platanus racemosa*, FAC). Dominant plant species observed in perennial marsh in the Project Area include California bulrush (*Schoenoplectus californicus*, OBL), smartweed (*Persicaria* sp.) and goosefoot (*Chenopodium* sp.). Landscaped areas contain lawn and ornamental trees. Coast live oak woodland is dominated by coast live oak trees that grow in various canopy density, from open to closed. The coyote brush scrubland is dominated by mature coyote brush (*Baccharis pilularis*, NL).

3.2 Soils

The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service Soil Survey for *Alameda Area, California* (NRCS 2019) and California Soils Resources Lab (CSRL) SoilWeb (CSRL 2019) indicates the Project Area is composed of ten soil series: *Azule, Clear Lake, Danville, Diablo, Gravel Pits, Los Osos, Pleasanton, Positas, Sunnyvale, Sycamore, Yolo and Zamora*. The Project Area has 12 soil series, which are described below and in Appendix C.

Azule Series: The Azule series consists of moderately deep, well drained soils on hills with slopes of 9 to 75 percent. These soils form in material weathered from consolidated alluvium and from soft shale and fine grained sandstone and have medium to rapid runoff and slow permeability. In a typical profile, the surface layer is very dark grayish brown (2.5Y 3/2) slightly acid clay loam, 6 inches thick. This is underlain by very dark grayish brown to light yellowish brown (2.5Y 6/4) slightly acid clay to 25 inches. From 25 to 40 inches, the soil consists of light olive brown (2.5Y 5/4) consolidated sediment. Within the Project Area, this series occurs in Study Area C-13.

Clear Lake Series: The Clear Lake series consists of clays that formed under poorly drained conditions. These soils are underlain by alluvium from basic and sedimentary rock and occur on plains and flat basin areas. In a typical profile, the surface layer is black (N 4/0) or very dark gray (10YR 3/1) clay, about 39 inches thick. This is underlain by a dark-gray moderately alkaline clay that has light gray mottles, black (10YR 2/1) when moist. At a depth of about 46 inches, it is gray and light brownish-gray, moderately alkaline clay. At a depth of about 60 inches, it is light gray to white, mildly alkaline sandy clay loam. Within the Project Area, this series occurs in Study Area C-14.

Danville Series: The Danville series consists of very deep, well drained soils that formed in alluvium. Danville soils are on fans and terraces. The Danville silty clay loam,

3 to 10 percent slopes soil map unit occurs in Study Area. Within the Project Area, this series occurs in Study Area C-03.

Diablo Series: The Diablo series consists of moderately deep, well drained soils on hillslopes and mountain slopes. They formed from residuum weathered from calcareous shale. These soils are well drained and have very high runoff. The soil ecological setting is considered clayey hills and they are not considered to be hydric. Within the Project Area, this series occurs in Study Area C-14.

Gravel Pits: The gravel pits soil map unit consists of extremely gravelly sand up to 60 inches deep. Runoff is very low. Gravel pits make up 95 percent of the composition and are non-hydric soils. The remaining 5 percent are other minor components including stream terraces, which are hydric soils. No landform positions are provided for this soil type. Within the Project Area, this series occurs in Study Area P-07.

Los Osos Series: The Los Osos series consists of moderately deep, well drained soils on uplands with slopes of 5 to 75 percent. They formed in material weathered from firm to hard sandstone and shale. These soils have very high runoff and slow permeability. A typical profile includes five soil horizons: A, Btss1, Btss2, C, and Cr.

The A horizon is a very dark grayish brown (10YR 3/2) moderately acid (pH 6.0) loam from 0 to 14 inches. Beneath this, from 14 to 24 inches, is the Btss1 layer, a dark yellowish brown (10YR 4/4), moderately acid clay. This is underlain, from 24 to 32 inches, by the Btss2 horizon, a dark yellowish brown, slightly acid (pH 6.5) clay loam. Beneath this is the C horizon, a light olive brown (2.5Y 5/4), neutral (pH 7.0) sandy loam. The deepest horizon, from 39 to 43 inches, is the Cr horizon, a brown (10YR 4/3) sandstone. Within the Project Area, this series occurs in Study Areas C-14 and P-06.

Pleasanton Series: The Pleasanton map unit consists very deep, well drained and fine-loamy soils. They are located on nearly level to gently sloping alluvial fans and terraces. A typical Pleasanton series profile includes five soil horizons: Ap, A, B2t, B3, and C. The Ap horizon is a very dark grayish brown (10YR 3/2), slightly acid (pH 6.3) and gravelly fine sandy loam from 0-9 inches. Beneath this is an A horizon from 9-21 inches containing very dark grayish brown (10YR 3/2), neutral (pH 6.8) and gravelly fine sandy loam. This is underlain by a Bt horizon from 21-48 inches containing a 10YR 3/3), neutral (pH 7.3) and gravelly sandy clay loam. This is underlain by a B horizon from 48-64 inches containing a dark brown (10YR 3/3), neutral (pH 7.3), gravelly loam. The final horizon in the soil profile is a C horizon from 64-72 and contains a slightly alkaline (pH 7.4), dark yellowish brown (10YR 4/4) and gravelly fine sandy loam near gravelly loam.

Pleasanton gravelly loam, 3 to 12 percent slopes map unit occurs in Study Area. Within the Project Area, this series occurs in Study Areas C-03, C-09, C-13, P-05, and P-08.

Positas Series: The Positas series soils consist of well drained to excessively drained, shallow to moderately deep gravelly loam soils on nearly level to very steep high terraces south of the Livermore Valley. These soils formed in poorly sorted clay, sand, and gravel that are weakly consolidated in places. This well-drained soil has a very slowly permeable subsoil. Runoff is slow to medium, and the available water holding capacity is low.

Positas soils sloped at 2 to 20 percent and 20 to 40 percent series occur in the Study Area. Within the Project Area, this series occurs in Study Areas C-06, C-08, C-09, C-11, C-12, C-13, and C-16.

Sunnyvale Series: The Sunnyvale series consists of poorly drained, calcareous soils on nearly level valley floors north of Pleasanton. The surface soil is gray, granular, slightly calcareous, heavy clay loam. Sunnyvale soils are often used for irrigated row crops, for pasture, and for dry-farmed grain. A representative profile for the Sunnyvale series consists of an Ap horizon from 0 to 6 inches with dark gray to very dark grey (N4/ - N3/) silty clay. Similar colors are seen in an Alc2 horizon of silty clay from 6 to 14 inches. A Clca horizon extends from 14 to 34 inches, with light grey to dark grey (N7/ - N3/) silty clay.

Sunnyvale clay loam over clay: Is found on nearly level valley floors. The texture of surface soil ranges from silt loam to heavy clay loam or heavy silty clay loam. In some small areas the surface soil is strongly calcareous. This soil is poorly drained, the permeability of the subsoil is moderately slow, and runoff is slow. This soil type is hydric (NRCS 2018). Within the Project Area, this series occurs in Study Areas C-01, C-02, C-05, C-06, C-10, P-02, P-03, and P-04,.

Sunnyvale clay loam, drained: The Sunnyvale series consists of poorly drained silty clays that are underlain by alluvium from material derived from sedimentary rock. These soils are in low positions on the alluvial plains and have slopes of less than 2 percent. Sunnyvale silty clay, drained, as it occurs on alluvial flats and in depressions, and is hydric (NRCS 2018). The drained subtype of this series is typically used for agriculture such as row crops, sugar beets, prunes, and pears. Within the Project Area, this series occurs in Study Areas C-04 and P-02.

Sycamore Series: This soil unit consists of very deep, poorly drained soil that formed in alluvium derived from sedimentary rock. It is located on floodplains and has slopes of 0 to 2 percent, with elevations ranging from 10 to 50 feet. These soils have been artificially drained, runoff is slow, and permeability is moderate. The surface layer is a moderately alkaline silt loam about 18 inches thick that typically has a matrix chroma of 2. The water table is at a depth of 72 inches in most areas (USDA 1981). Within the Project Area, this series occurs in Study Areas C-04, C-06, P-01, and P-04..

Yolo series: The Yolo series consists of very deep, well drained soils that formed in alluvium from mixed rocks. Yolo soils are on alluvial fans and flood plains. Slopes range from 0 to 20 percent, but are typically 0 to 2 percent. The soil is well drained with slow to medium runoff and moderate permeability. Tillage pans have developed over broad areas and tend to restrict permeability. Within the Project Area, this series occurs in Study Areas C-04, C-05, C-06, C-07, C-08, C-11, C-15, and C-17.

Zamora series: The Zamora series consists of very deep, well drained soils that formed in alluvium from mixed rocks. Zamora soils are on nearly level to strongly sloping alluvial fans, stream terraces, and floodplains, usually with 0 to 9 percent slopes at elevations ranging from 30 to 1,300 feet. Mean annual precipitation ranges from 14 to 30 inches. Zamora soils exist in a dry, subhumid, mesothermal climate with hot dry summers and cool moist winters. Native vegetation typically consists of annual grasses, forbs, and widely spaced oaks. A typical profile includes five soil horizons: Ap, Bt1, Bt2,

Bt3, and Bwk. Within the Project Area, this series occurs in Study Areas C-06, P-04, and P-06.

3.3 Hydrology

The Project Area consists of natural creek segments (C-03, C-06, C-08, C-09, C-11, C-12, C-13, C-14, C-16, C-17, and P-06) and engineered or excavated channels and basins (C-01, C-02, C-04, C-05, C-07, C-10, C-15, and P-01) that are connected to surrounding creeks within the City of Pleasanton. Additional basins that were excavated in uplands occur (P-02, P-03, P-04, P-05, P-07, and P-08). The Project Area detention ponds are used as flood control features which are connected to the Project Area channels and creeks via culverts. Arroyo de la Laguna, a freshwater perennial stream, bounds nearly all Project Area sites to the west with C-06 functioning as a major artery that directs flow to Arroyo de la Laguna. Approximately 2,000 ft. south of Arroyo de la Laguna's connection to Arroyo Valle, which travels mainly east to west within the Project Area, the palustrine wetland feature transitions to a riverine feature (NWI 2019). All channel parcels of the Project Area are connected to Arroyo de la Laguna or Arroyo Valle, directly or indirectly. Other sources of hydrology to the Project Area is precipitation and surface run-off from adjacent lands. Precipitation typically occurs during the winter months, with little rainfall in the spring and summer. Average annual rainfall is 19 inches (NACSE 2019) with precipitation for the 2018 water year being slightly below average at approximately 15 inches for the entire Project Area (AHPS 2019).

4.0 METHODS

WRA, Inc. (WRA) biologists performed a delineation of aquatic resources within the Project Area in July and October of 2019. Prior to conducting the evaluation, WRA reviewed a range of background materials including the *Soil Survey of Alameda County* (USDA, 1980), the CSRL online soil viewer (CSRL 2019), the National Wetland Inventory (USFWS 2019), the California Aquatic Resource Inventory (SFEI 2019) and the U.S. Geological Survey (USGS) Livermore quadrangle map (USGS 2018). WRA also reviewed historic aerial imagery from Google Earth (Google Earth 2019) and Nationwide Environmental Title Research (NETR 2019).

During the on-site evaluation, WRA followed the methods outlined in *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Supplement; Corps 2008) and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* ("OHWM Guide"; Lichvar and McColley 2008). Potentially jurisdictional wetlands were identified and their boundaries mapped using the Routine Method described in the Corps Manual. The jurisdictional limits of non-wetland waters under Section 404 of the CWA were field checked based on a combination of field indicators described in the OHWM Guide.

4.1 Wetlands

4.1.1 Routine Method

WRA followed the Routine Method to evaluate the Project Area for the presence or absence of indicators of the three wetland parameters described in the Corps Manual (Environmental Laboratory 1987) and Arid West Supplement (Corps 2008). Data on vegetation, hydrology, and soils were collected at sample points within potential wetland communities and adjacent upland areas. Sample points that contained positive indicators for hydrophytic vegetation, hydric soils, and wetland hydrology were considered to be wetland. Except in cases of atypical or problematic wetland situations (i.e., difficult wetland situations, as described below), sample points that lacked one or more indicators were considered to be upland. Sample point data were reported on Arid West Supplement data forms. Sample point locations were recorded using a handheld GPS unit with sub-meter accuracy. Wetland boundaries were identified in the field using a combination of indicators observed on the ground, most often minor shifts in topography and changes in dominant vegetation, in addition to other indicators.

4.2 Non-Wetland Waters

This study also evaluated the presence of non-wetland waters potentially subject to Corps jurisdiction under Section 404 of the CWA. Non-wetland waters subject to Corps jurisdiction include lakes, rivers, and streams (including intermittent and ephemeral streams) in addition to all areas below the OHWM in non-tidal areas.

Perennial streams are defined as having flowing water year-round and determinations were based on presence of flowing water observed during site visits. Intermittent streams are defined as having flowing water during a portion of the year, often with groundwater providing input water for stream flow although it may not have flowing water during dry periods. Intermittent streams can show localized damp or wet areas during the dry season, more continuous flow indicators, or evidence of high flow regime than ephemeral streams. Ephemeral streams are defined as having flowing water occur only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Thus, determinations between intermittent and ephemeral streams were based on the interpretation of the location of the stream bed and flow indicators during dry season conditions.

4.3 Areas Potentially Exempt from Section 404 Jurisdiction

Some areas that meet the technical criteria for wetlands or waters may not be jurisdictional under the CWA per Section 404 regulations and the Corps Manual. Included in this category are:

- Some man-induced wetlands, including areas that are maintained only due to the presence of man-induced hydrology (1987 Corps Manual)
- Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (33 CFR 328.3a)
- Ditches dug wholly in, and draining only uplands and that do not carry a relatively permanent flow of water (51 Fed. Reg. 41206, Corps 2008)

- Artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing (51 Fed. Reg. 41206)
- Artificial reflecting or swimming pools, or other similar ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons (51 Fed. Reg. 41206)
- Areas that are isolated from and/or do not have a significant nexus to navigable waters of the U.S. (Corps 2008)

Features meeting the criteria for wetlands and non-wetland waters within the Project Area were evaluated in the context of these exemptions for making determinations of areas potentially within the Corps' jurisdiction.

5.0 RESULTS

Descriptions of the aquatic resources identified within the Project Area that are potentially subject to federal jurisdiction under Section 404 of the CWA and/or Section 10 of the RHA are provided in the following sections. Maps showing the location and extent of aquatic resources mapped within the Project Area are provided as Appendix B. Photographs of the Study Areas are provided as Appendix D. A list of all plant species observed during the delineation site visits is included as Appendix E. Table 2 below names the features to be regularly maintained by the City, what the feature type and general origin, and what WRA anticipates the regulatory status under the Corps to be based on the 2015 Clean Water Rule.

Table 2. Stream and Pond Features and Potential for Corps Jurisdiction

Number	Name	Feature Category	Potential Corps Jurisdiction?	Condition and Rationale
C-01	Pimlico Canal	Drainage Ditch	Yes	Concrete channel. Connects to channelized USGS Blue Line Stream on east end that then connects to Arroyo Mocho.
C-02	Pleasanton Canal	Drainage Ditch	Yes	Earthen engineered channel. Pleasanton Canal is a channelized USGS Blue Line Stream.
C-03	Foothill High School	Ephemeral Stream	Yes	Earthen channel. A USGS Blue Line Stream, unnamed feature that then connects to undergrounded system.
C-04	Bernal V-ditch	Drainage Ditch	Yes	Earthen engineered channel. Presumed underground connection to USGS Blue Line Stream, piped connection to Mission Creek
C-05	Bernal North/South V-ditch	Drainage Ditch	Yes	Earthen engineered channel. Connection to USGS Blue Line Stream, Mission Creek
C-06	Mission Creek Restoration Project	Ephemeral and Perennial Stream	Yes	Earthen engineered and natural channel. Mission Creek and downstream connection to a USGS Blue Line Stream, Arroyo de la Laguna.
C-07	Lower Kottinger Creek	Ephemeral Stream	Yes	Earthen engineered channel. Appears to have potential upstream connection to USGS Blue Line Stream, Kottinger Creek.
C-08	Upper Kottinger Creek	Intermittent Stream	Yes	Earthen channel. A USGS Blue Line Stream, Kottinger Creek.
C-09	Touriga Creek	Intermittent Stream	Yes	Earthen channel. A USGS Blue Line Stream.
C-10	Junipero Canal	Drainage Ditch	Yes	Earthen engineered channel. A USGS Blue Line Stream, Mission Creek.
C-11	Mission Park Creek	Ephemeral Stream and Detention Pond	Yes	Earthen channel. Mapped as historic portion of Mission Creek.
C-12	Cemetery Creek	Ephemeral Stream	Yes	Earthen channel, USGS Blue Line Stream.
C-13	Gold Creek	Ephemeral Stream	Yes	Earthen channel, USGS Blue Line Stream called Gold Creek.
C-14	Dublin Canyon Creek	Perennial Stream	Yes	Earthen channel, USGS Blue Line Stream called Dublin Creek
C-15	Stonedale Channel	Drainage Ditch	Yes	Engineered channel connects Gold Creek to Alamo Canal
C-16	Arlington Creek	Intermittent Stream and Perennial Marsh	Yes	Earthen channel, appears to connect to USGS Blue Line Stream named Happy Valley Creek

Number	Name	Feature Category	Potential Corps Jurisdiction?	Condition and Rationale
C-17	Rutledge Place Culvert	Ephemeral Stream	Yes	Earthen channel appears to have downstream connection to Mission Creek
P-01	Stoneridge Pond	Detention Pond	Yes	Earthen detention pond. Artificial water body, constructed through channelized portion of a USGS Blue Line Stream, Arroyo Las Positas.
P-02	Bernal Detention Pond Central	Detention Pond	Exempt (b6)	Earthen detention pond. Artificial water body adjacent to channelized feature.
P-03	Canyon Oaks Detention Pond	Detention Pond	Exempt (b6)	Earthen detention pond. Artificial water body that is adjacent to USGS Blue Line Stream.
P-04	Bernal Detention Pond West	Detention Pond	Exempt (b6)	Earthen detention pond. Artificial water body that is adjacent to USGS Blue Line Stream.
P-05	Callippe Detention Pond	Detention Pond	Exempt (b6)	Earthen detention pond. Artificial water body excavated in uplands.
P-06	Oak Tree Farms Detention Pond	Detention Pond and Ephemeral Stream	Yes	Earthen detention pond and earthen channel. Input is unnamed intermittent stream and output is piped stormdrain connection to Arroyo de la Laguna.
P-07	Vineyard West Detention Pond	Detention Pond	Exempt (b6)	Earthen detention pond. Artificial water body excavated in uplands.
P-08	Vineyard East Detention Pond	Detention Pond	Exempt (b6)	Earthen detention pond. Artificial water body excavated in uplands.

5.1 Section 404 of the Clean Water Act

5.1.1 Non-wetland Waters

A summary of aquatic resource acreages and linear channel length is provided in Table 3. Five types of non-wetland waters were delineated in the Study Area: drainage ditch, intermittent stream, ephemeral stream, perennial stream, and detention pond (Table 3). The five types of non-wetland waters are associated with natural creek segments, channelized drainage ditches and detention ponds throughout Pleasanton and the Project Area. There are 17 Study Area creek or channel segment features that generally convey water to the west/ southwest towards Arroyo de la Laguna. Two detention ponds are used as flood control features; one has a direct input from an intermittent stream and one appears to have been constructed by excavation in the location of a channel.

Table 3. Summary of Potentially Jurisdictional Features Mapped in the Project Area

Habitat Type	Classification*	Acres	Linear Feet	Potential Section 404 Waters of the U.S. (acres/linear feet)
Non-wetland Waters				
Drainage Ditch	R4, R6	2.45	7,632	2.45/ 7,632
Intermittent Stream	R4	1.18	5,920	1.18/ 5,920
Ephemeral Stream	R6	0.92	4,537	0.92/ 4,537
Perennial Stream	R3	2.36	5,255	2.36/ 5,255
Detention Pond	P	1.94	N/A	1.94
Wetland Waters				
Perennial Marsh	R4SB7	0.04	N/A	0.04
Total:		8.90	23,343	8.90/ 23,343

*See Federal Geographic Data Committee 2013

Drainage Ditch

Six drainage ditches (Study Areas C-01, C-02, C-04, C-05, C-10, and C-15) were delineated within the Project Area and throughout the City of Pleasanton. All of these reaches are channelized, used for drainage purposes, and can be categorized as drainage ditches.

Pimlico Canal: C-01 is located immediately south of Interstate 580 and north of Pimlico Drive. C-01 is a concrete lined drainage ditch with culverts feeding into the eastern and western portions of the linear feature. The edge of the concrete is lined with ruderal grassland with the rest of the Study Area is pavement. No water was observed in the ditch at the time of the site visit.

Pleasanton Canal: C-02 is located immediately south of the Pleasanton Sports Complex and north of a residential area. C-02 is a linear earthen channel that runs northeast to southwest. The channel is bordered by ruderal grassland along the top of bank with paved and developed areas occurring just outside of the ruderal grassland. No water was observed within the channel at the time of the site visit.

Bernal V-Ditch: C-04 flows between culverts from east to west along Bernal Avenue. Patelco Sports Complex borders the linear feature to the south. This linear feature is an engineered earthen drainage ditch with ruderal grassland located along the ordinary high water mark and at the top of bank. Some scattered riparian trees, such as black walnut, were observed along the top of bank. Outside the top of bank and riparian area, a paved road and paved trail are present. No water was observed within the ditch at the time of the site visit.

Bernal North/ South Ditch: C-05 is an engineered, linear drainage ditch which runs north to south perpendicular to Bernal Avenue and adjoins to Study Area C-06. The dominant vegetative community is ruderal grassland – some scattered riparian trees, such as black walnut and catalpa (*Catalpa bignonioides*) occur along the ditch. No water was observed within the ditch at the time of the site visit.

Junipero Canal: C-10 is an engineered linear earthen drainage ditch that runs east to west along Valley Avenue. Detention Basin P-03 is located along the north side of the ditch but it is unclear if this feature is connected. The drainage ditch has two overcrossings: Case Avenue and a former railbed, now informally used as a public trail. Below the OHWM, the ditch was dominated by obligate plant species, such as cattail (*Typha sp.*, OBL) and California bulrush. Above the OHWM, the banks were dominated by ruderal grassland. Some water was observed pooling under the Case Avenue Bridge, which, based on site observations, originates from localized nuisance flows.

Stonedale Channel: C-15 is a concrete-lined engineered channel which passes through two culverts: one on the western side of the channel which runs under Interstate 680 and a second on the eastern side of C-15 under Stonedale Drive. Vegetation observed within the channel includes cattails and watercress (*Nasturtium officinale*, OBL). A few inches of ponded water was observed within the ditch at the time of the site visit.

Intermittent Stream

Five intermittent stream segments were delineated throughout Project Area: Study Areas C-07, C-08, C-09, C-11, C-16.

Upper Kottinger Creek: C-08 runs adjacent to the north of Kottinger Drive and flows under Adams Way and Bernal Avenue via a series of concrete and cobblestoned culverts. Kottinger Community Park is located between Adams Way and Bernal Avenue and portions of the creek bank are landscaped with grass and developed with paved foot paths. Species observed within the associated riparian corridor includes valley oak and cottonwood (*Populus fremontii*, NL). Water was observed pooling at these culverts but creek segments between culverts were dry with shallow yet defined earthen bed and banks.

Touriga Creek: C-09 runs adjacent to Palomino Drive from Bernal Avenue and runs east to west through various residential area and its western-most point ends at Vintage Hills Park. C-09 runs under Concord Street and Touriga Drive via concrete culverts; some nuisance flow was

observed pooling on either side of these road crossings. C-09 has an associated riparian corridor; species species observed included valley oak, coast live oak, and Mexican fan palm (*Washingtonia robusta*, FACW). Portions of C-09 are landscaped with grass and developed with paved foot paths and residential area. Aside from water pooling near the road crossings, the creek was dry at the time of the site visit.

Mission Park Creek: C-11 is a small intermittent stream segment located within Mission Park. Within the Study Area, the creek flows from an engineered basin at the eastern end of the park, into a culverted segment beneath a recreational grass area, and daylights in the western portion of the park. While the creek has an associated coast live oak and weeping willow (*Salix babylonica*, FAC) riparian corridor, most of the Study Area is landscaped with ornamentals. No water was present within the creek at the time of the site visit. Minimal ponding originating from nuisance flows were observed within the basin.

Arlington Creek: C-16 is an intermittent creek located in a residential development in the southern portion of the City. The channel is earthen bed and banks with bank shelving for ordinary high water marks. A portion of the creek opens into an in-stream perennial marsh and resumes back to intermittent stream within the southern portion of Study Area. The northern portion of the creek runs east/ west through a culvert that travels under Arlington Drive and then occurs along a residential yard. Vegetation observed within the associated riparian corridor include willow and coyote brush. No water was observed within the creek at the time of the site visit.

Ephemeral Stream

There were seven ephemeral streams delineated within the Project Area; C-03, C-06, C-07, C-12, C-13, C-17, P-06. Water is conveyed in these features briefly during and following a precipitation event.

Foothill High School Trash Rack: C-03 is located within the boundaries of Foothill High School, adjacent to school recreation areas and campus. This segment of naturalized creek contains a defined earthen bed and bank with an OHWM as bank shelving. Species observed in the riparian corridor include black walnut and valley oak. No water was observed at the time of the site visit.

Mission Creek Restoration Project: A majority of C-06 is perennial stream with a small channelized northern portion that is ephemeral. It runs northeast/ southwest and sits south of Bernal Avenue. This portion of C-06 was dry at the time of the site visit.

Lower Kottinger Creek: C-07 is an ephemeral stream which runs through Lions Wayside Park and Delucchi Park in downtown Pleasanton. The stream is has an incised earthen bed and bank, portions of which have been stabilized with grouted rock. The creek has an associated riparian corridor; plant species observed in the riparian corridor include coast live oak, valley oak, walnut, and ornamental tree species. No water was observed in the northern reach at the time of the site visit. The lower reach had a few inches of clear flowing water that appear to be nuisance flows originating at the Neal Street overcrossing.

Cemetery Creek: C-12 is an ephemeral creek which flows perpendicular to Sunol Boulevard, adjacent to Pleasanton Veterans Memorial. This feature has a distinct earthen bed and bank and an associated riparian corridor dominated by black walnut and blue gum (*Eucalyptus globulus*, NL). No water was observed within the creek at the time of the site visit.

Gold Creek: C-13 is an ephemeral creek which runs adjacent to Foothill Road near the Stoneridge Drive/Foothill Road intersection. Located within Moller Park, the creek has a distinct riparian corridor dominated by coast live oak and buckeye (*Aesculus californica*, NL). Outside of the corridor, the park is predominantly landscaped with grass and walking paths. No vegetation was present in the channel. Pondered water occurred at some culvert locations but flowing water was not observed.

Rutledge Place Culvert: C-17 is located immediately south of Lund Ranch Road within a residential development. The feature runs from a culvert beneath Lund Ranch Road, flows north/ south and has a distinct earthen bed and bank. Vegetation observed includes coast live oak, valley oak, and a bare understory.

Oak Tree Farms Detention Pond: C-18 is located immediately west of a residential development at the southern end of Fondry Court with open and undeveloped land to the west. C-18 consists mainly of an ephemeral channel with distinct earthen bed and bank that feeds south to a detention pond P-06 (described with detention ponds below). Primary vegetation observed within the P-06 Study Area was ruderal grassland with some small younger coast live oak trees denoting the southern boundary of the channel's larger, off-site riparian corridor. The channel was dry at the time of the survey.

Perennial Stream

There were two perennial streams (Study Areas C-06 and C-14) delineated within the Project Area. Flowing water was observed at both of these features.

Mission Creek Restoration Project: C-06 spans from Bernal Avenue to Arroyo de la Laguna and travels south. Valley Avenue bisects C-06 which continues flowing under the road via culverts; it also travels under an Interstate 680 bridge. Habitat along this creek varies from coast live oak, coyote brush scrub, and riparian. Water was observed throughout much of the channel with the northernmost portion of the creek being dry. Mission Creek conveys water through a natural channel with its southern tip ending in a concrete channel that drains into Arroyo de la Laguna. Slowly flowing water of several inches to up to several feet deep were observed in different segments of the channel.

Dublin Canyon Creek: C-14 consists of four short segments of Dublin Canyon Creek and is located near the entrance of two residential developments, just south of I-580. Each segment has a distinct, steep bed and bank with mature riparian vegetation consisting of coast live oak, willow and sycamore. Flowing water was observed within the creek.

Detention Pond

There are two potentially jurisdictional detention ponds (Study Areas P-01 and P-06) located within the Project Area. These detention ponds are used as flood control features and are generally dry during the dry summer months.

Stoneridge Pond: P-01 is located immediately north of Stoneridge Drive with a parking lot adjacent to the north and Stoneridge Creek Way bordering the ponds western edge. Some riparian corridor was observed along the footpath that extends from Stoneridge Creek Way into the southwest tip of P-01. Habitat bordering above the ordinary high water mark of the basin

includes ruderal grassland which is surrounded by landscaped and developed area. The pond was dry at the time of the site visit.

Oak Tree Farms Detention Pond: P-06 consists mainly of detention pond that drains to the south with input from a distinct bed and bank/ephemeral stream feature north of it. The main biological community observed at P-06 was ruderal grassland; vegetation observed included yellow star thistle, Harding grass (*Phalaris aquatica*, FACU) and black mustard (*Brassica nigra*, NL). The detention pond was dry at the time of the survey and connects into culverts at the southeast end.

5.1.2 Wetland Waters

One in-stream wetland feature was delineated within the Project Area; a perennial marsh located within Arlington Creek (C-16). This determination was given for the perennial bulrush vegetation that is dominant in the feature. C-16 is located directly in a residential development to the east of Riddell Street and to the west of Arlington Drive. An intermittent stream feature runs east to west within C-16 which opens into an intervening section of perennial marsh as the stream feature turns south. Vegetation observed within the marsh includes California bulrush and smartweed. The perennial marsh then thins and returns to an intermittent stream feature with a defined bed and bank running south out of the Project Area.

5.2. Areas Exempt from Section 404 Jurisdiction

Non-Jurisdictional Areas Under the 2015 Rule

Currently, the state of California is subject to 2015 Clean Water Rule, and definitions included therein, published by the EPA and the Corps in 2015 (the “2015 Clean Water Rule” or the “Rule”). In the 2015 Clean Water Rule, waters of the U.S. are defined in paragraph (a) and include six feature types. However, the rule retains CWA exclusions and also has added back specific exclusions in the Rule, paragraph (b). The categorically excluded features below are not considered waters of the U.S. (33 CFR 328.3)(b), even where they otherwise may meet definitions for included features defined in paragraph 33 CFR 328.3 (a). As relevant here, the Rule excludes certain stormwater basins, including those (b6) stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.

Table 3 below names the features to be regularly maintained by the City, what the feature type and general origin, and what WRA anticipates the regulatory status under the Corps to be based on the 2015 Clean Water Rule and the non-jurisdictional (b6) definitions would be. The site analysis provides an origin assessment based upon review of the Alameda Creek Watershed and Arroyo de la Laguna subwatershed (Sowers and Richard 2003). The non-jurisdictional (b6) exemption for stormwater control features constructed to convey, treat, or store stormwater that are created in dry land is directly applicable to the following Study Areas: Bernal Detention Pond Central (P-02), Canyon Oaks Detention Pond (P-03), Bernal West Detention Pond (P-04), Happy Valley Golf Course Detention Pond (P-05), Vineyard West Detention Pond (P-07), and Vineyard East Detention Pond (P-08).

Exempt Detention Ponds

There are six detention ponds (Study Areas P-02, P-03, P-04, P-05, P-07, and P-08) located within the Project Area that are presumed to be exempt from Corps jurisdiction. These

detention ponds are used as flood control features and are generally dry during the dry summer months.

Bernal Central Detention Pond: Study Area P-02 is located just north of where Interstate 680 and Laguna Creek Lane intersect and appears to have been entirely excavated in uplands. P-02 contains a series of different basins that vary in elevation and size with some being dammed by rip-rap walls. The basin located in the northwest corner of P-02 contained water that was dammed by a rip-rap wall along the southern end; all other basins were dry. Some riparian habitat was observed along the top of bank which included cottonwood and coyote brush.

Canyon Oaks Detention Pond: Study Area P-03 is located immediately north of C-10 and appears to be entirely excavated in uplands. The detention pond contains two distinct basins that lacked vegetation and had a dry, cracked surface. Vegetation community observed outside of the dry basin comprised of ruderal grassland.

Bernal West Detention Pond: Study Area P-04 is located adjacent to the southern end of C-06 and has residential area bordering the pond to the north. The detention pond appears to have been entirely excavated in uplands. Some standing water was observed near the culvert at the trail entrance that begins at Laguna Creek Lane. Habitat outside of the basin consisted of ruderal grassland.

Happy Valley Golf Course Detention Pond: Study Area P-05 is bordered by Westbridge Lane to the north and residential area to the west and the detention pond appears to have been entirely excavated in uplands. The basin was dry at the time of the site visit. Ruderal grassland occurs along the bank with some developed land along the western portion of the basin.

Vineyard West Detention Pond: Study Area P-07 is located immediately north of Vineyard Avenue with agriculture fields to the south and several ponds/ lakes to the north including Island Pond and Shadow Cliffs Lake. Surrounding area to the south includes residential development. The detention pond appears to have been excavated entirely in uplands. P-07 is a long detention pond feature with culverts located on the eastern and western portions of the site. Vegetation community observed includes ruderal grassland. Rip rap berms were observed near the culverts with a paved path occurring near the northwest border of the site. No water was observed during the site visit.

Vineyard East Detention Pond: Study Area P-08 is located approximately 0.5 miles to the south of P-07 immediately north of Vineyard Avenue. The detention pond appears to have been entirely excavated in uplands. Biological communities observed includes ruderal grassland and riparian; vegetation observed includes wild oat, yellow star thistle and willow. No water was observed at the time of the site visit. Portions of the top of bank surrounding the pond are developed with a gravel driving path.

5.3 Uplands

The majority of upland within the Project Area are ruderal non-native forb and grassland areas. Dominant vegetation in areas determined to be uplands included wild oat, ripgut brome, harding grass, black walnut, coyote brush and yellow star thistle.

6.0 CONCLUSIONS

The results of this delineation of aquatic resources was based on conditions observed during the time of the assessment and information provided to WRA by The City of Pleasanton. It should be noted that the Corps makes all final decisions regarding regulatory jurisdiction, and WRA recommends securing a Jurisdictional Determination from the Corps before embarking on any project activities that could result in the loss of Waters of the United States.

7.0 REFERENCES

- Baldwin, BG, DH Goldman, DJ Keil, R Patterson, TJ Rosatti, and DH Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, second edition. University of California Press, Berkeley, CA.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi 39180-0631.
- Federal Register. November 13, 1986. Department of Defense, Corps of Engineers, Department of the Army, 33 CFR Parts 320 through 330, Regulatory Programs of the Corps of Engineers; Final Rule. Vol. 51, No. 219; page 41217.
- Google Earth. 2019. Aerial Imagery 1993-2018. Accessed July, 2019.
- Jepson Flora Project (eds.). 2018. Jepson eFlora. Online at: <http://ucjeps.berkeley.edu/IJM.html>; accessed July, 2019.
- J.M. Sowers and C. M. Richard. 2003. Creek and Watershed Map of the Pleasanton & Dublin Area. Oakland Museum of California. Accessed online July 2019: <http://explore.museumca.org/creeks/133B-RescALaguna.html>
- Lichvar, RW., NC Melvin, ML Banks, WN Kirchner. 2012. The National Wetland Plant List Indicator Rates Definitions [ERDC/CRREL TN-12-1]. Cold Regions Research and Engineering Laboratory, U.S. Army Corps of Engineers Research and Development Center. Hanover, NH. July 2012.
- Lichvar, RW., DL Banks, WN Kirchner, NC Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. *Phytoneuron* 2016-30: 1-17.
- Munsell Color. 2009. Munsell Soil Color Charts. Munsell Color. Grand Rapids, MI. 40pp.
- [NETR] Nationwide Environmental Title Research. 2018. Historic Aerials 1946-2014. Available online at: <https://www.historicaerials.com/>. Accessed July 2019.
- [NRCS] Natural Resources Conservation Service. 2018. Web Soil Survey. Available online at the following link: <https://websoilsurvey.sc.egov.usda.gov/>. Accessed July 2019.
- PRISM. 2018. Data Explorer: Time Series Values for Individual Locations. Online at <http://www.prism.oregonstate.edu/explorer/>. Accessed July 2019.
- San Francisco Estuary Institute (SFEI). 2017. "California Aquatic Resource Inventory (CARI) version 0.3." Accessed July 2019. <http://www.sfei.org/data/california-aquatic-resource-inventory-cari-version-03-gis-data#sthash.xJsEKV3r.dpbs>
- U.S. Army Corps of Engineers (Corps). 2005. Regulatory Guidance Letter No. 05-05. Ordinary High Water Mark Identification. December 7.
- U.S. Army Corps of Engineers (Corps). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). September.

[USDA] U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 2018. Official Soil Series Descriptions. USDA-NRCS, Lincoln, NE. <https://soilseries.sc.egov.usda.gov/osdlist.aspx> Accessed July 2019.

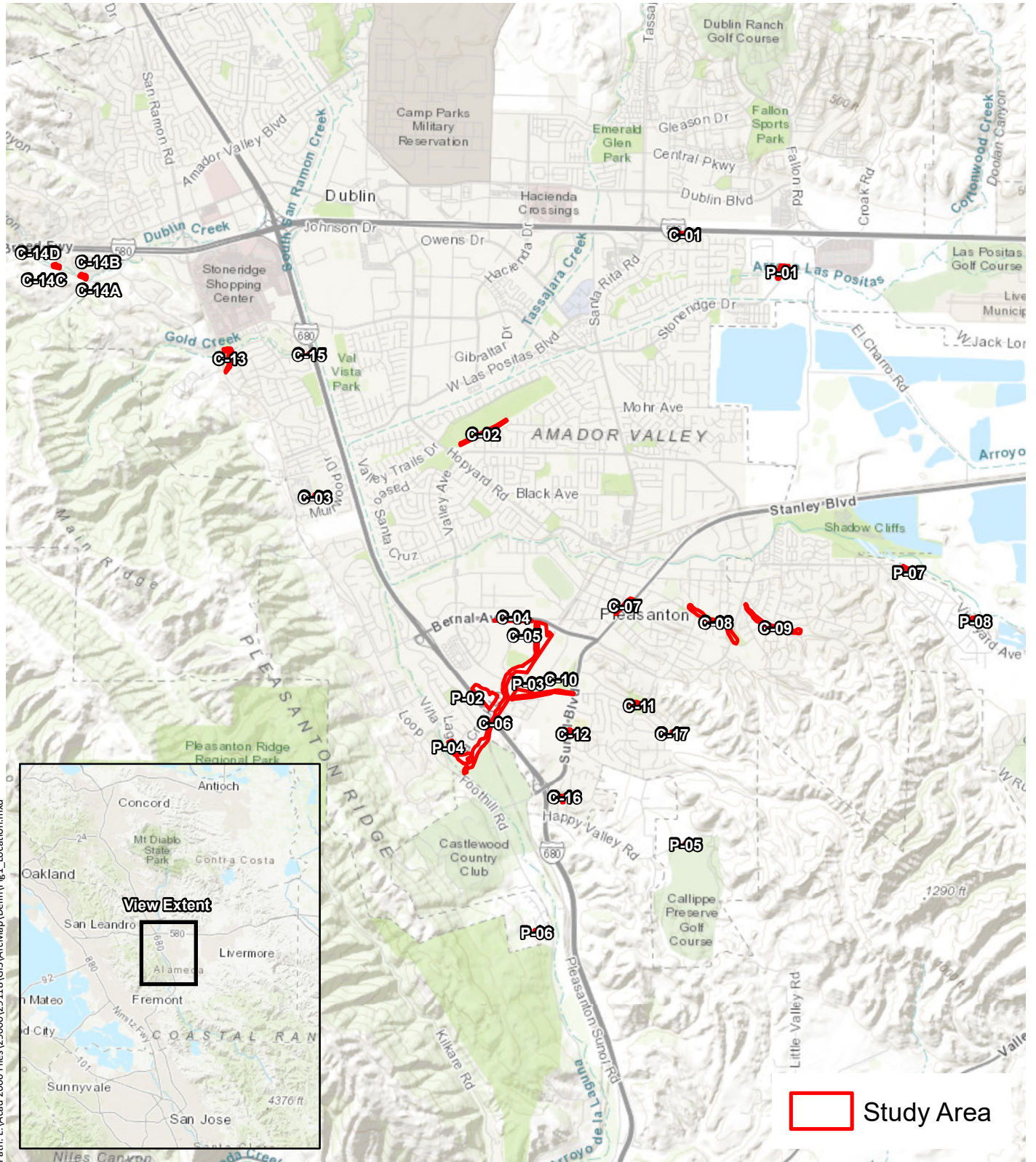
[USDA] U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 2010. Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 7.0, 2010.

[USFWS] U.S. Fish and Wildlife Service. 2018. National Wetlands Inventory website. U.S. Department of the Interior, USFWS, Washington, D.C. <http://www.fws.gov/nwi/> Accessed July 2019.

[USGS] U.S. Geological Survey. 2012. Pleasanton, California 7.5 minute topographic map.

APPENDIX A
FIGURES

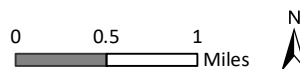
This Page Intentionally Left Blank



Sources: ESRI World Topo, WRA | Prepared By: SGillespie, 11/19/2019

Figure 1. Study Area Location Map

City of Pleasanton
 Stream Maintenance Program
 Alameda County, California



This Page Intentionally Left Blank

APPENDIX B
POTENTIAL WETLANDS AND WATERS OF THE UNITED STATES

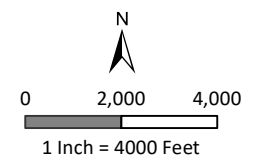
This Page Intentionally Left Blank

Appendix B-1. Potential Section 404 Jurisdictional Features (Overview)

City of Pleasanton
Stream Maintenance Program
Alameda County, California



- Study Area
- Appendix Index



**Appendix B-2.
Potential Section 404
Jurisdictional Features
(C-01)**

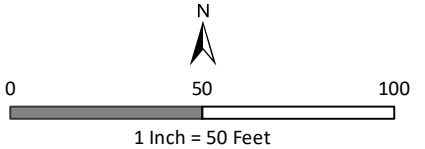
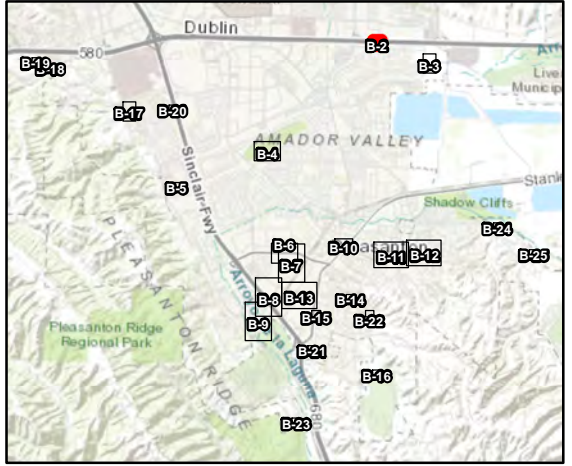
City of Pleasanton
Stream Maintenance Program
Alameda County, California



Study Area

Potential Waters of the U.S.

Drainage Ditch



Study Area ID	Study Area Name	Acres		
C-01	Pimlico Canal	0.35		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-01	Drainage Ditch	0.11	10	495

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



Path: L:\Acad 2000 Files\290001\29118\GIS\ArcMap\Delim\AppB_2_CorpsDelim.mxd

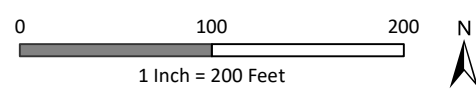


Path: L:\Aead 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-3_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019

Appendix B-3. Potential Section 404 Jurisdictional Features (P-01)

City of Pleasanton
Stream Maintenance Program
Alameda County, California



Appendix B-4. Potential Section 404 Jurisdictional Features (C-02)

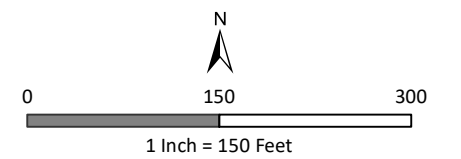
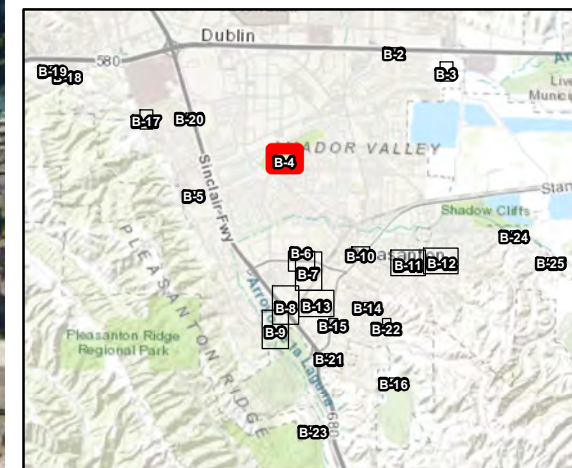
City of Pleasanton
Stream Maintenance Program
Alameda County, California



 Study Area

Potential Waters of the U.S.

 Drainage Ditch



Study Area ID	Study Area Name	Acres		
C-02	Pleasanton Canal	3.42		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-02	Drainage Ditch	0.71	15	2060

Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-4_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



Appendix B-5. Potential Section 404 Jurisdictional Features (C-03)

City of Pleasanton
Stream Maintenance Program
Alameda County, California

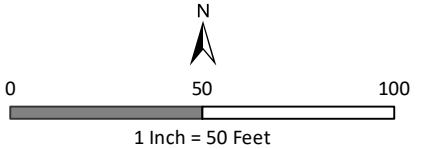
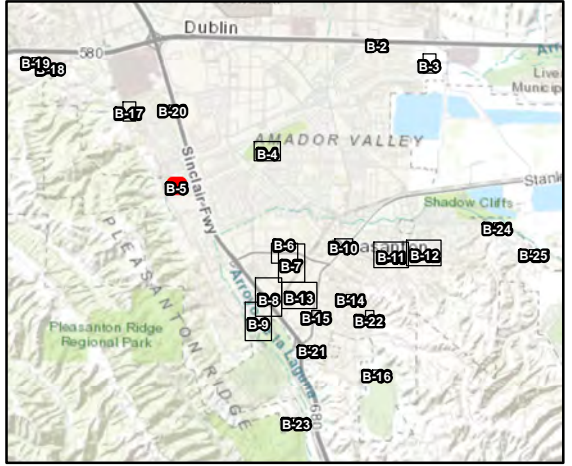


Study Area

Potential Waters of the U.S.



Ephemeral Stream



Study Area ID	Study Area Name	Acres		
C-03	Foothill High School Trash Rack	0.30		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-03	Ephemeral Stream	0.03	12	92

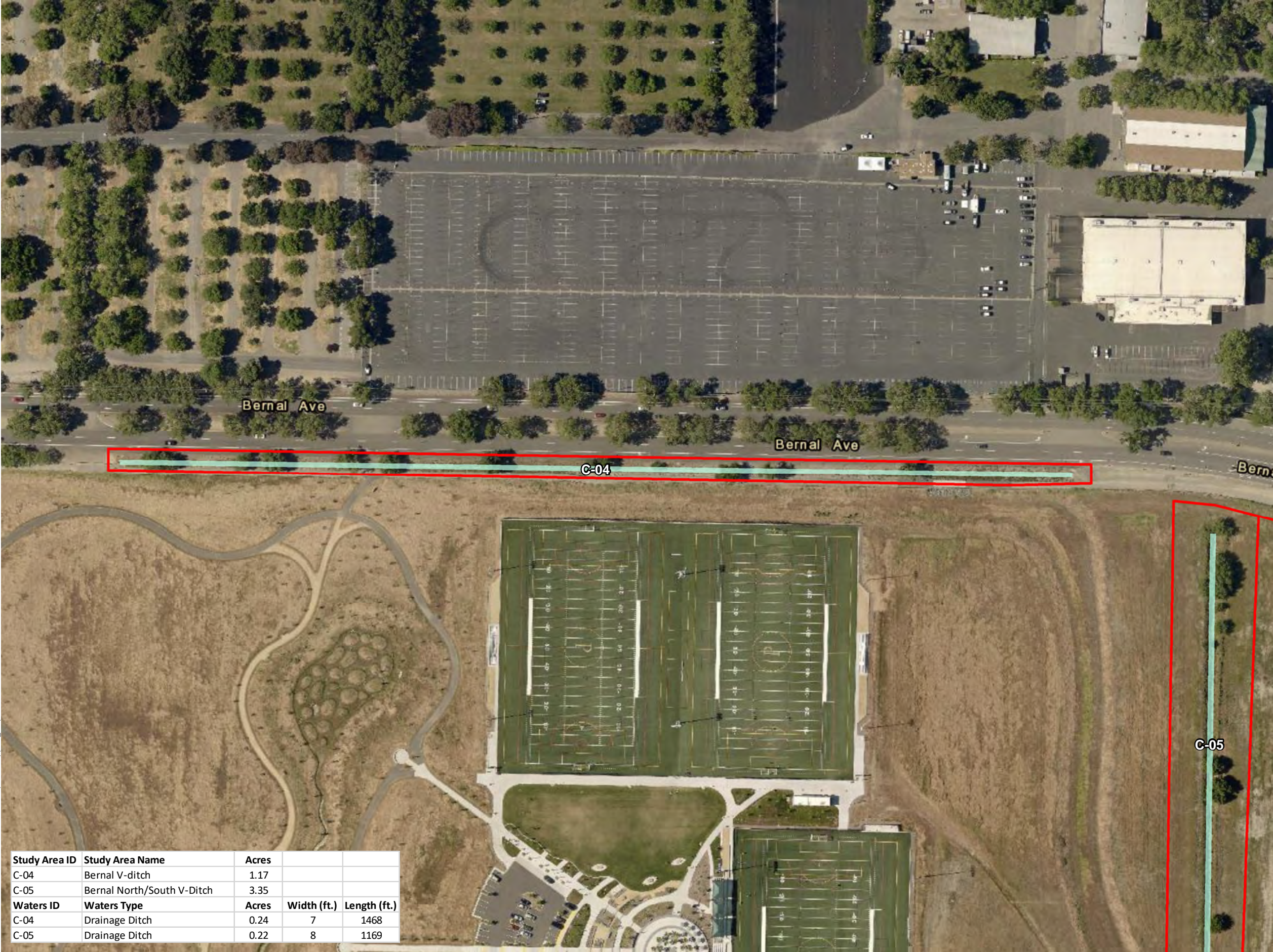
Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



Path: L:\Acad 2000 Files\299000\29118\GIS\ArcMap\Delim\AppB-5_CorpsDelim.mxd

**Appendix B-6.
Potential Section 404
Jurisdictional Features
(C-04, C-05)**

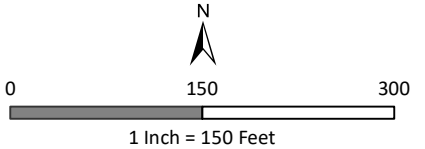
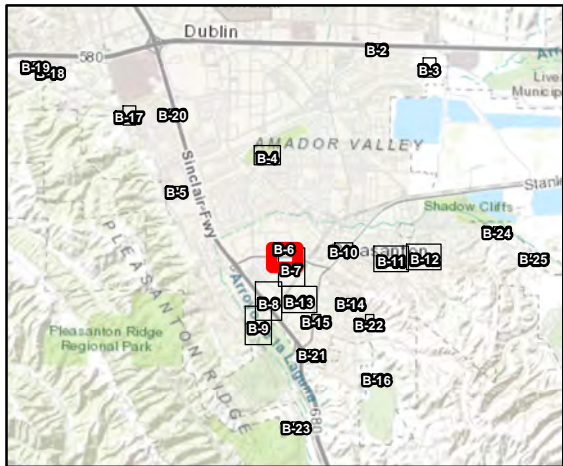
City of Pleasanton
Stream Maintenance Program
Alameda County, California



Study Area

Potential Waters of the U.S.

Drainage Ditch



Study Area ID	Study Area Name	Acres		
C-04	Bernal V-ditch	1.17		
C-05	Bernal North/South V-Ditch	3.35		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-04	Drainage Ditch	0.24	7	1468
C-05	Drainage Ditch	0.22	8	1169

Path: L:\Acad 2000 Files\299000\29118\GIS\ArcMap\Delim\AppB-6_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



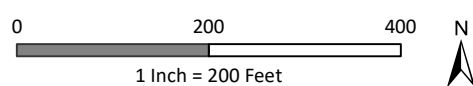


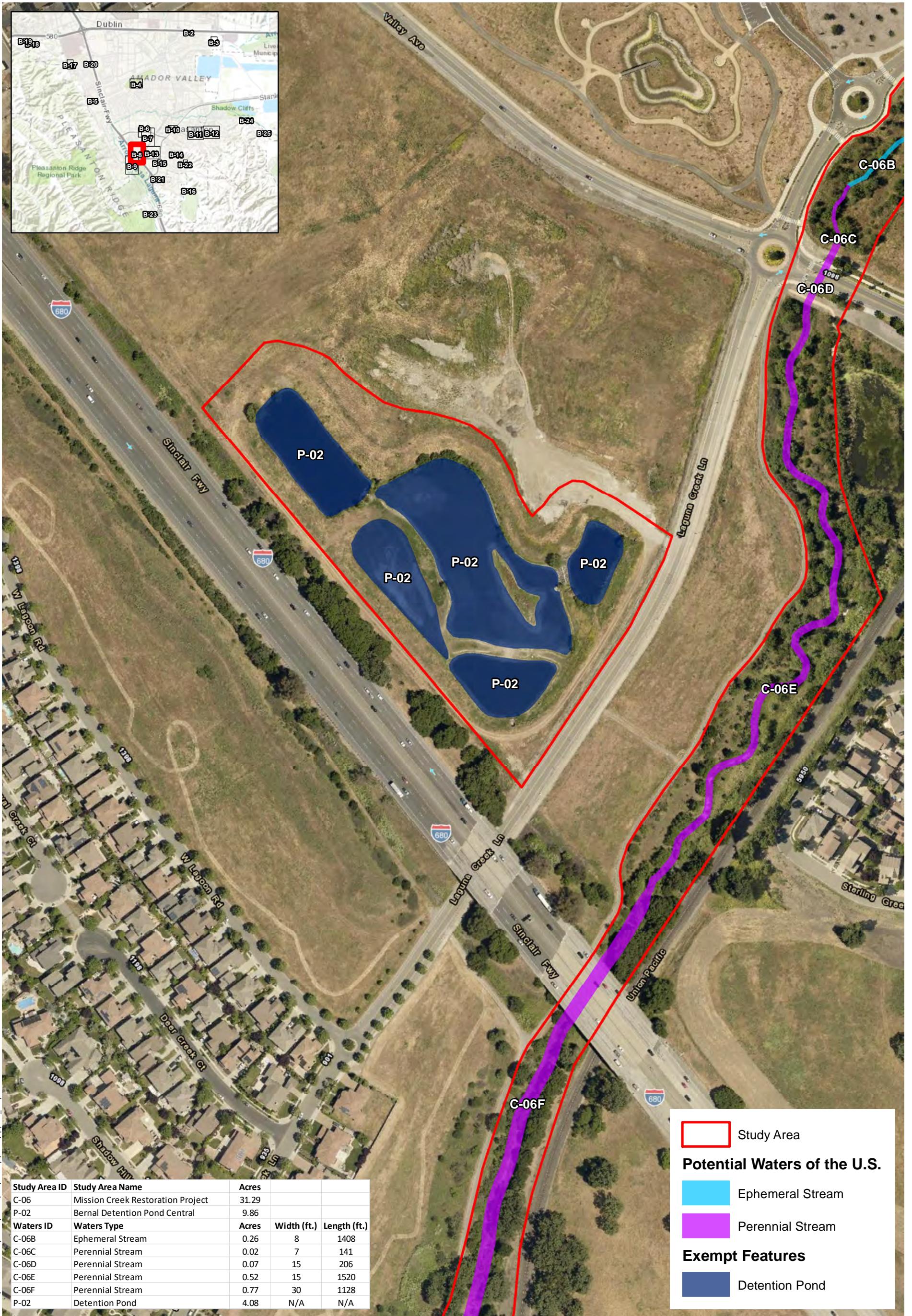
Path: L:\Aead 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-7_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/26/2019

Appendix B-7. Potential Section 404 Jurisdictional Features (C-04, C-05, C-06)

City of Pleasanton
Stream Maintenance Program
Alameda County, California





Study Area ID	Study Area Name	Acres		
C-06	Mission Creek Restoration Project	31.29		
P-02	Bernal Detention Pond Central	9.86		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-06B	Ephemeral Stream	0.26	8	1408
C-06C	Perennial Stream	0.02	7	141
C-06D	Perennial Stream	0.07	15	206
C-06E	Perennial Stream	0.52	15	1520
C-06F	Perennial Stream	0.77	30	1128
P-02	Detention Pond	4.08	N/A	N/A

Study Area

Potential Waters of the U.S.

- Ephemeral Stream
- Perennial Stream

Exempt Features

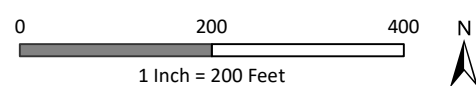
- Detention Pond

Path: L:\Aead 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-8_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/26/2019

Appendix B-8. Potential Section 404 Jurisdictional Features (C-06, P-02)

City of Pleasanton
Stream Maintenance Program
Alameda County, California



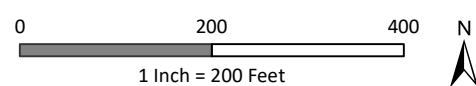


Path: L:\Lead 2000 Files\29000\29118\GIS\ArcMap\Delin\AppB-9_CorpsDelin.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019

Appendix B-9. Potential Section 404 Jurisdictional Features (C-06, P-03)

City of Pleasanton
Stream Maintenance Program
Alameda County, California



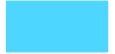
Appendix B-10. Potential Section 404 Jurisdictional Features (C-07)

City of Pleasanton
Stream Maintenance Program
Alameda County, California



Study Area

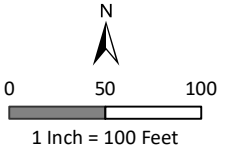
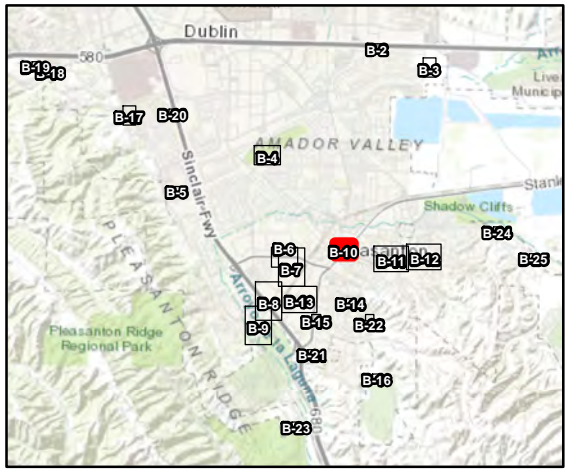
Potential Waters of the U.S.



Ephemeral Stream



Intermittent Stream



Study Area ID	Study Area Name	Acres		
C-07	Lower Kottinger Creek	0.92		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-07A	Ephemeral Stream	0.10	8	542
C-07B	Intermittent Stream	0.16	8	328


Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019




Appendix B-11. Potential Section 404 Jurisdictional Features (C-08)

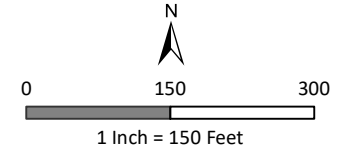
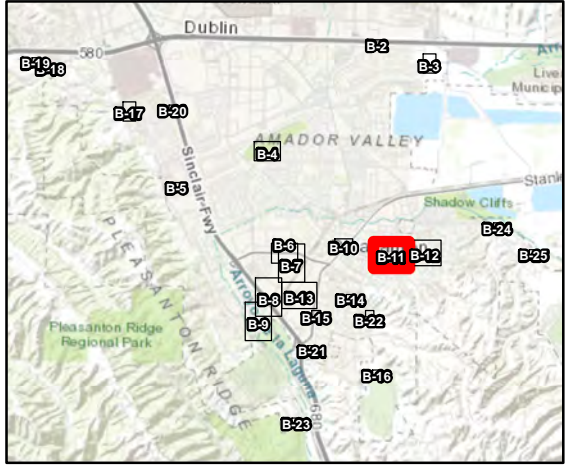
City of Pleasanton
Stream Maintenance Program
Alameda County, California



 Study Area

Potential Waters of the U.S.

 Intermittent Stream



Study Area ID	Study Area Name	Acres		
C-08	Upper Kottinger Creek	8.01		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-08	Intermittent Stream	0.34	6	2450


Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019




Appendix B-12. Potential Section 404 Jurisdictional Features (C-09)

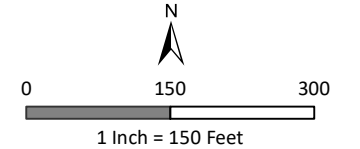
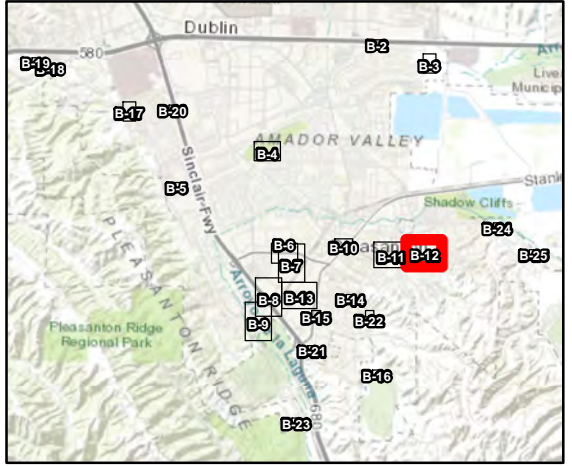
City of Pleasanton
Stream Maintenance Program
Alameda County, California



 Study Area

Potential Waters of the U.S.

 Intermittent Stream



Study Area ID	Study Area Name	Acres		
C-09	Touriga Creek	6.63		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-09	Intermittent Stream	0.58	10	2537

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



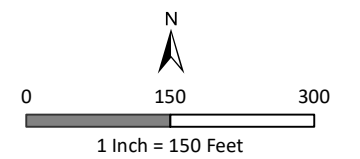
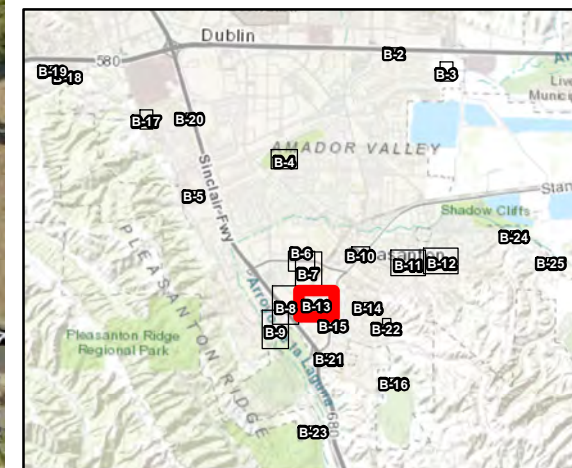
Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-12_Corps\Delim.mxd

**Appendix B-13.
Potential Section 404
Jurisdictional Features
(C-10, P-03)**

City of Pleasanton
Stream Maintenance Program
Alameda County, California



- Study Area
- Potential Waters of the U.S.**
- Drainage Ditch
- Exempt Features**
- Detention Pond



Study Area ID	Study Area Name	Acres		
C-10	Junipero Canal	5.18		
P-03	Canyon Oaks Detention Pond	3.43		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-10A	Drainage Ditch	0.89	25	1577
C-10B	Drainage Ditch	0.27	15	795
P-03	Detention Pond	1.36	N/A	N/A

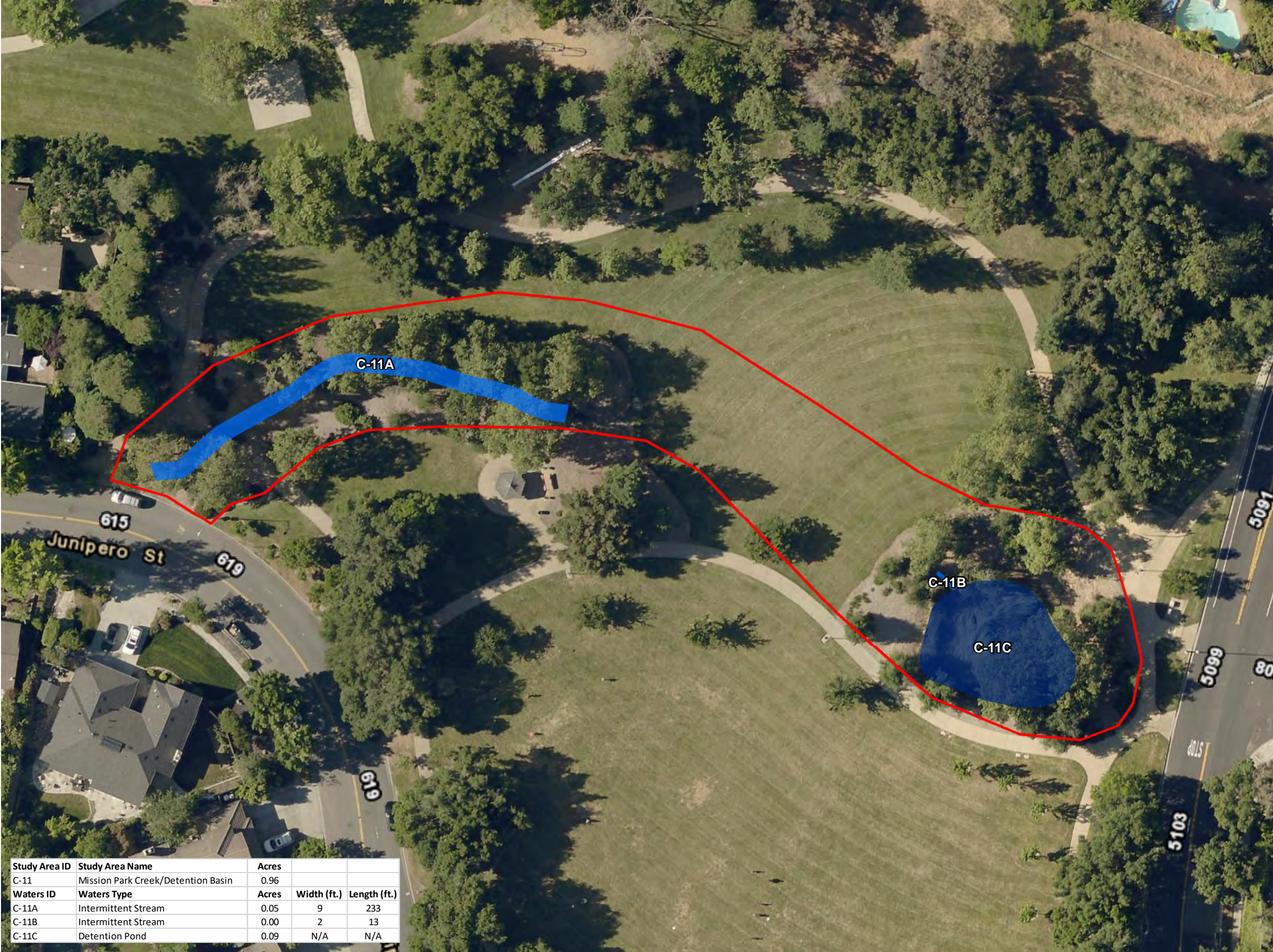
Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-13_CorpsDelim.mxd


Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019




**Appendix B-14.
Potential Section 404
Jurisdictional Features
(C-11)**


City of Pleasanton
Stream Maintenance Program
Alameda County, California

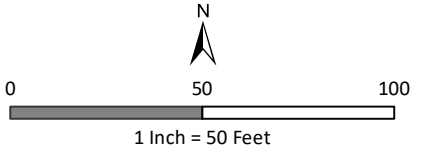
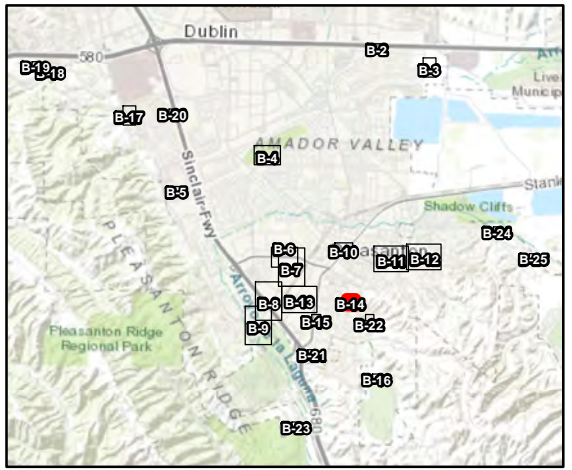


 Study Area

Potential Waters of the U.S.

 Detention Pond

 Intermittent Stream



Study Area ID	Study Area Name	Acres		
C-11	Mission Park Creek/Detention Basin	0.96		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-11A	Intermittent Stream	0.05	9	233
C-11B	Intermittent Stream	0.00	2	13
C-11C	Detention Pond	0.09	N/A	N/A

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



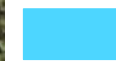
Appendix B-15. Potential Section 404 Jurisdictional Features (C-12)

City of Pleasanton
Stream Maintenance Program
Alameda County, California

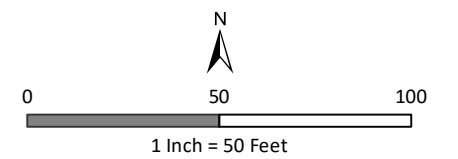
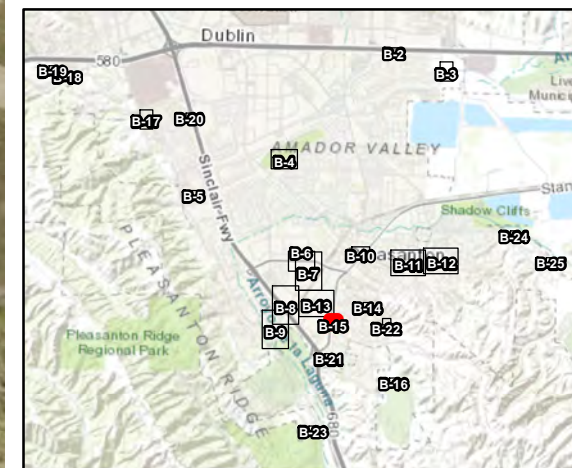


Study Area

Potential Waters of the U.S.



Ephemeral Stream



Study Area ID	Study Area Name	Acres		
C-12	Cemetery Creek	0.81		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-12	Ephemeral Stream	0.05	6	365

Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-15_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



**Appendix B-16.
Potential Section 404
Jurisdictional Features
(P-05)**

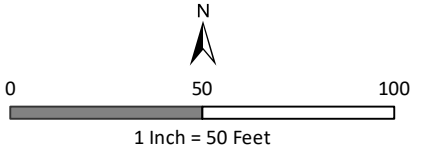
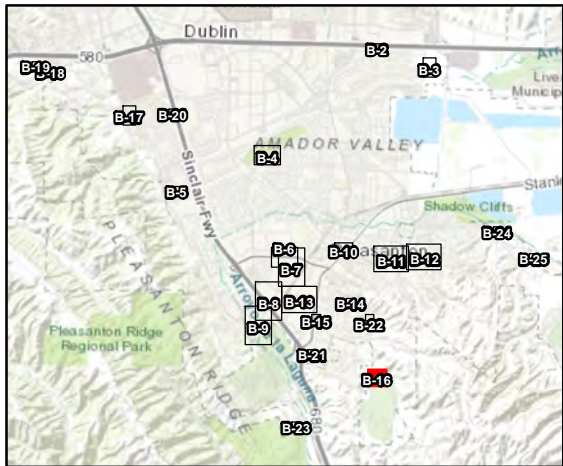
City of Pleasanton
Stream Maintenance Program
Alameda County, California



 Study Area

Exempt Features

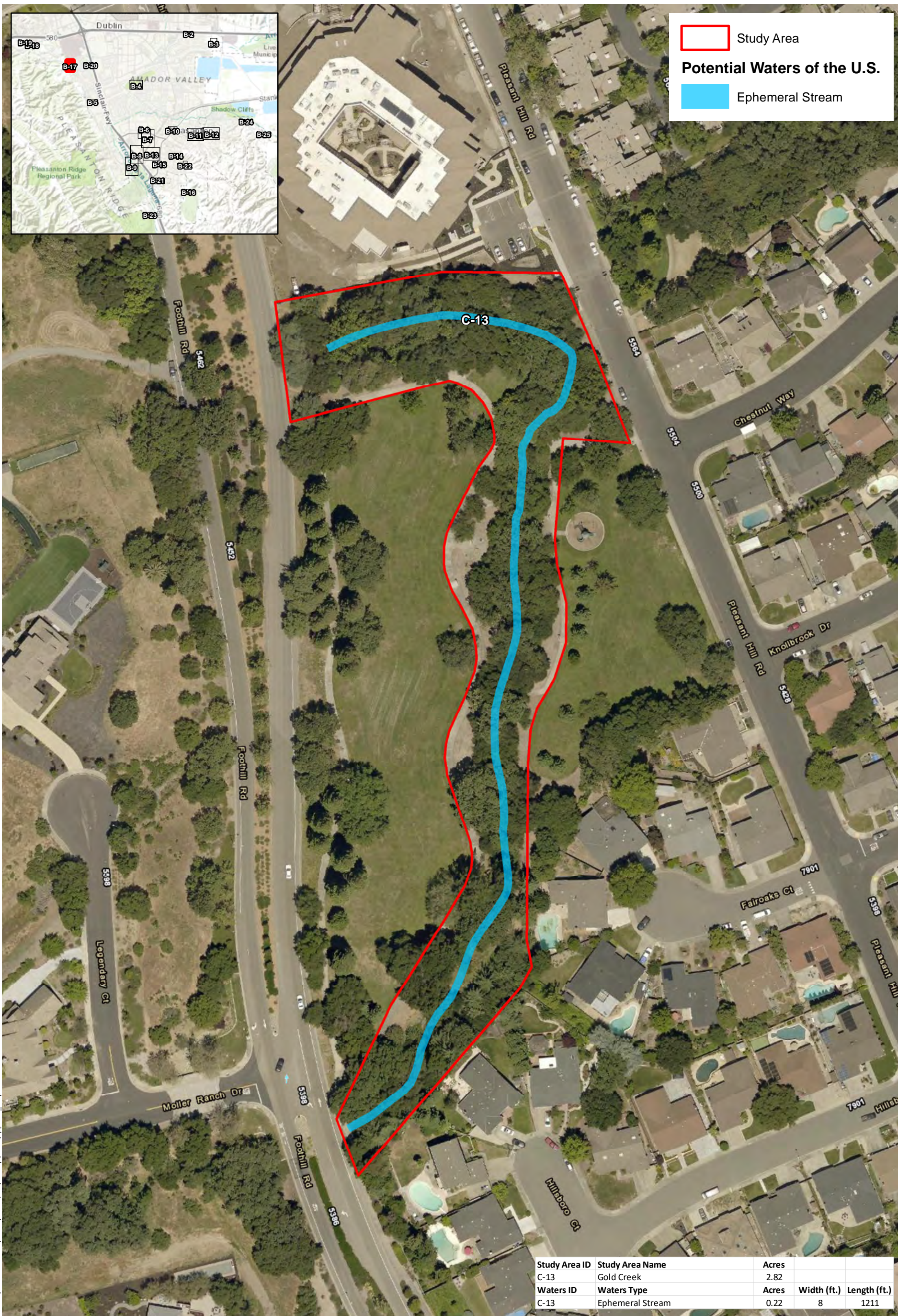
 Detention Pond



Study Area ID	Study Area Name	Acres	Width (ft.)	Length (ft.)
P-05	Callippe Detention Pond	0.18		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
P-05	Detention Pond	0.08	N/A	N/A

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



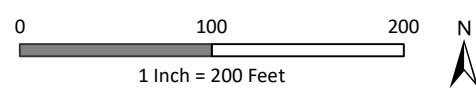


Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-17_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019

Appendix B-17. Potential Section 404 Jurisdictional Features (C-13)

City of Pleasanton
 Stream Maintenance Program
 Alameda County, California




**Appendix B-18.
Potential Section 404
Jurisdictional Features
(C-14A, C-14B)**

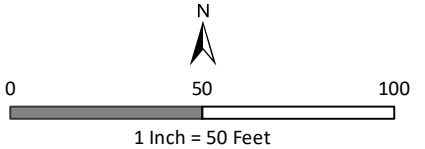
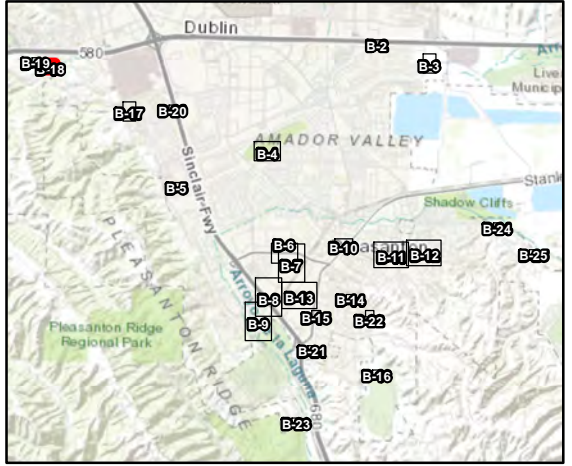
City of Pleasanton
Stream Maintenance Program
Alameda County, California



 Study Area

Potential Waters of the U.S.

 Perennial Stream



Study Area ID	Study Area Name	Acres		
C-14A	Dublin Canyon Creek Segment A	0.52		
C-14B	Dublin Canyon Creek Segment B	0.37		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-14A	Perennial Stream	0.05	15	157
C-14B	Perennial Stream	0.04	15	126

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-18_CorpsDelim.mxd


**Appendix B-19.
Potential Section 404
Jurisdictional Features
(C-14C, C-14D)**

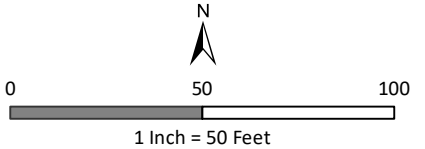
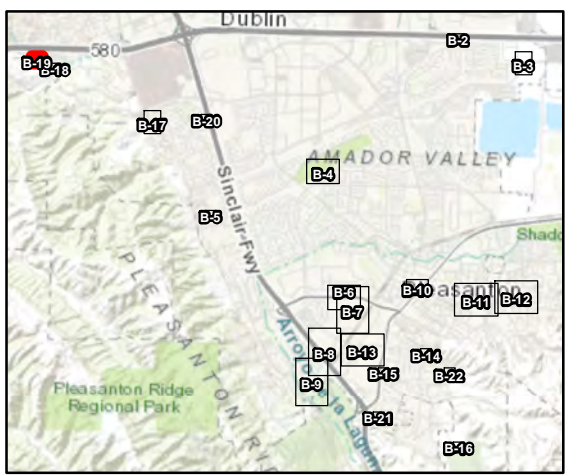
City of Pleasanton
Stream Maintenance Program
Alameda County, California



 Study Area

Potential Waters of the U.S.

 Perennial Stream



Study Area ID	Study Area Name	Acres		
C-14C	Dublin Canyon Creek Segment C	0.42		
C-14D	Dublin Canyon Creek Segment D	0.36		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-14C	Perennial Stream	0.04	15	119
C-14D	Perennial Stream	0.03	10	107

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-19_CorpsDelim.mxd

Appendix B-20. Potential Section 404 Jurisdictional Features (C-15)

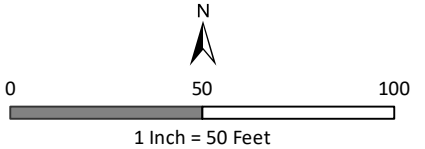
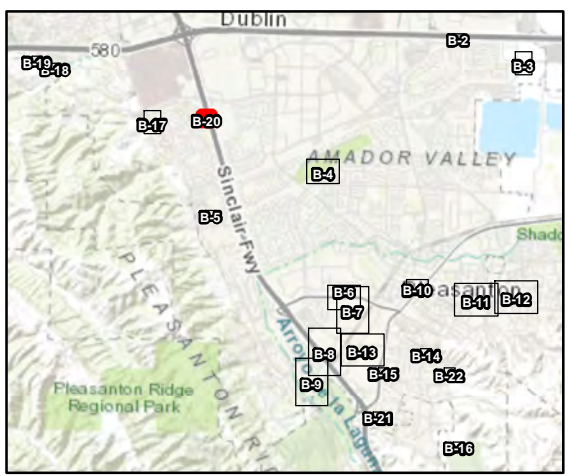
City of Pleasanton
Stream Maintenance Program
Alameda County, California



Study Area

Potential Waters of the U.S.

Drainage Ditch



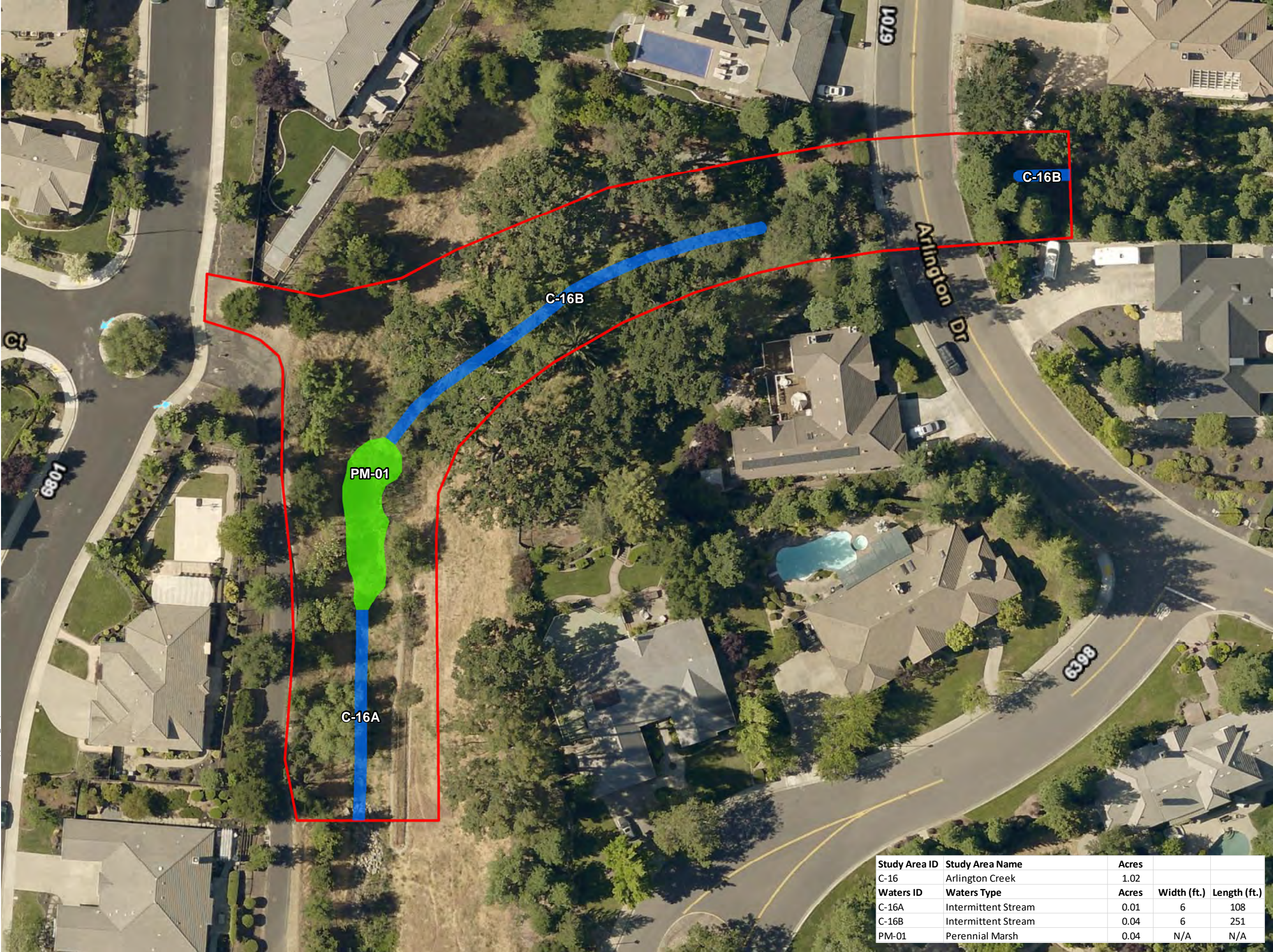
Study Area ID	Study Area Name	Acres		
C-15	Stonedale Channel	0.08		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-15	Drainage Ditch	0.01	6	67

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019

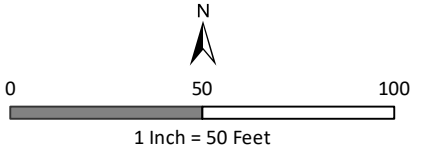
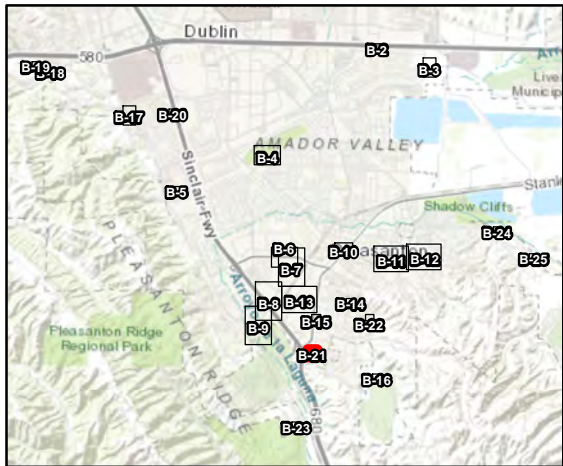


**Appendix B-21.
Potential Section 404
Jurisdictional Features
(C-16)**

City of Pleasanton
Stream Maintenance Program
Alameda County, California



- Study Area
- Perennial Marsh
- Intermittent Stream



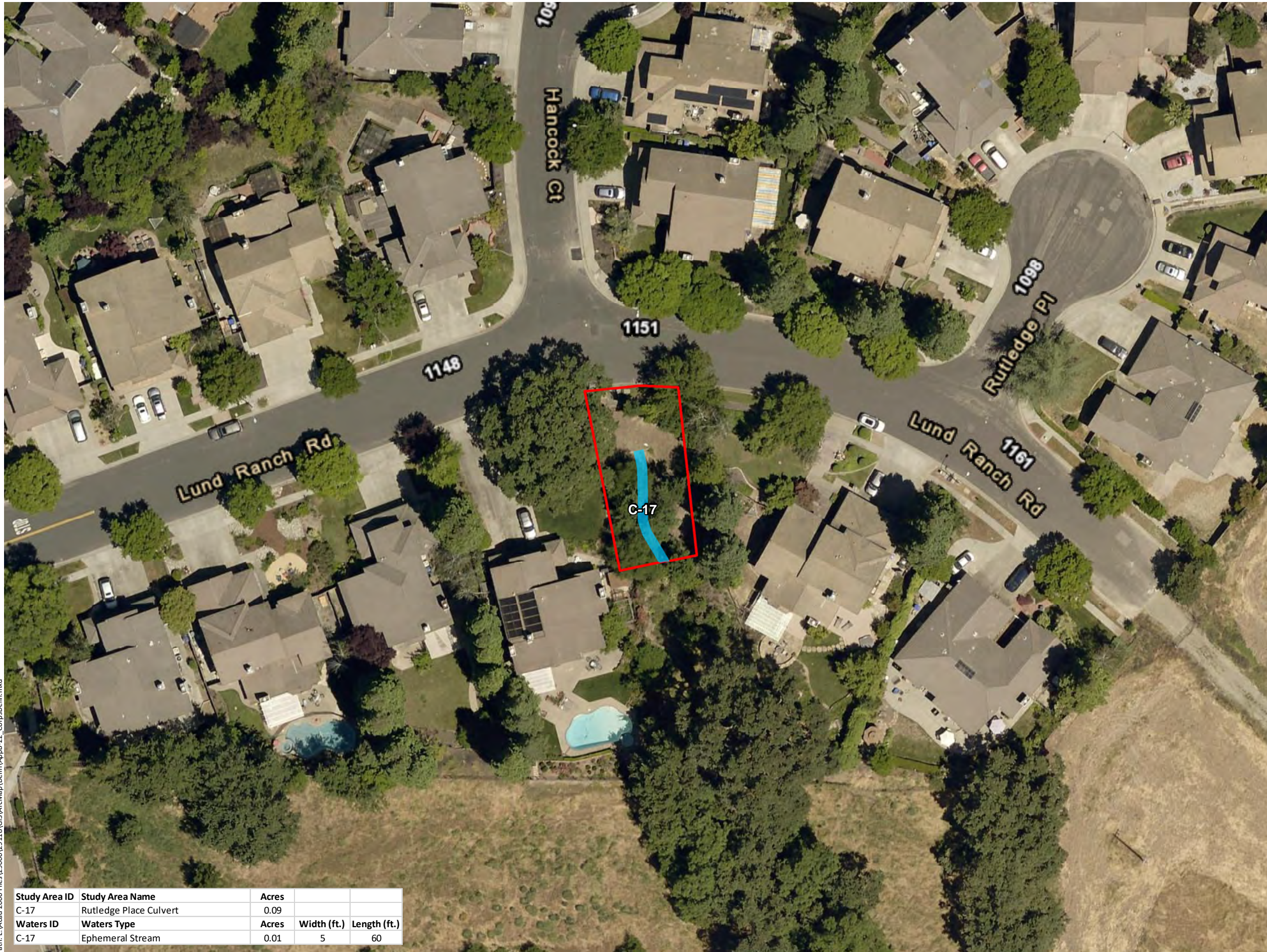
Study Area ID	Study Area Name	Acres			
C-16	Arlington Creek	1.02			
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)	
C-16A	Intermittent Stream	0.01	6	108	
C-16B	Intermittent Stream	0.04	6	251	
PM-01	Perennial Marsh	0.04	N/A	N/A	

Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-21_Corps\Delim.mxd




Appendix B-22. Potential Section 404 Jurisdictional Features (C-17)

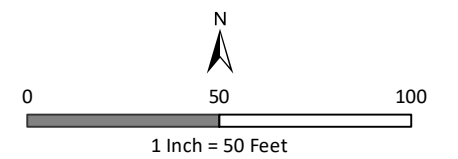
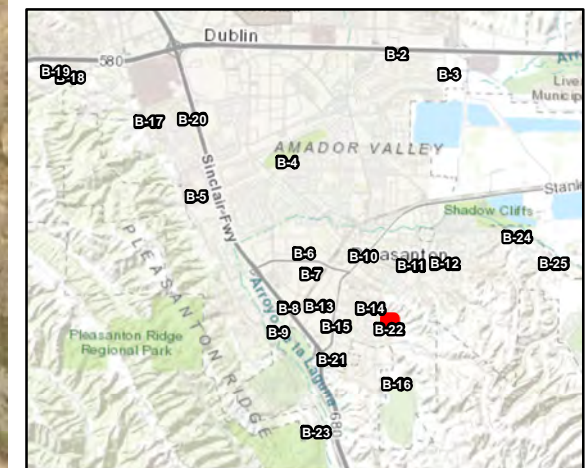
City of Pleasanton
Stream Maintenance Program
Alameda County, California



 Study Area

Potential Waters of the U.S.

 Ephemeral Stream



Study Area ID	Study Area Name	Acres		
C-17	Rutledge Place Culvert	0.09		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-17	Ephemeral Stream	0.01	5	60

Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppendB-22_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



Appendix B-23. Potential Section 404 Jurisdictional Features (P-06)

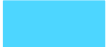
City of Pleasanton
Stream Maintenance Program
Alameda County, California

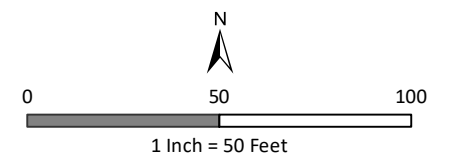
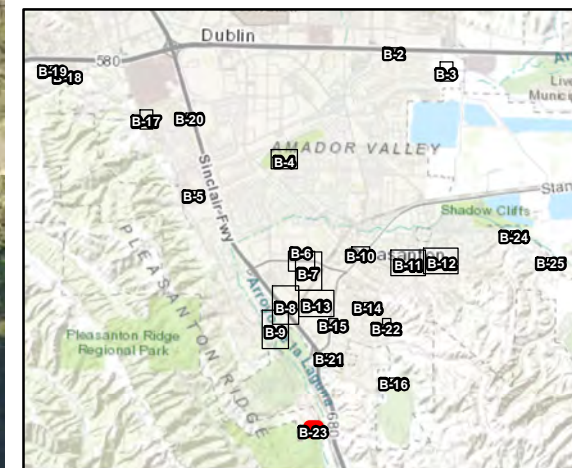


 Study Area

Potential Waters of the U.S.

 Detention Pond

 Ephemeral Stream



Study Area ID	Study Area Name	Acres		
P-06	Oak Tree Farms Creek/Detention Pond	0.35		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
C-18	Ephemeral Stream	0.01	4	102
P-06	Detention Pond	0.02	N/A	N/A

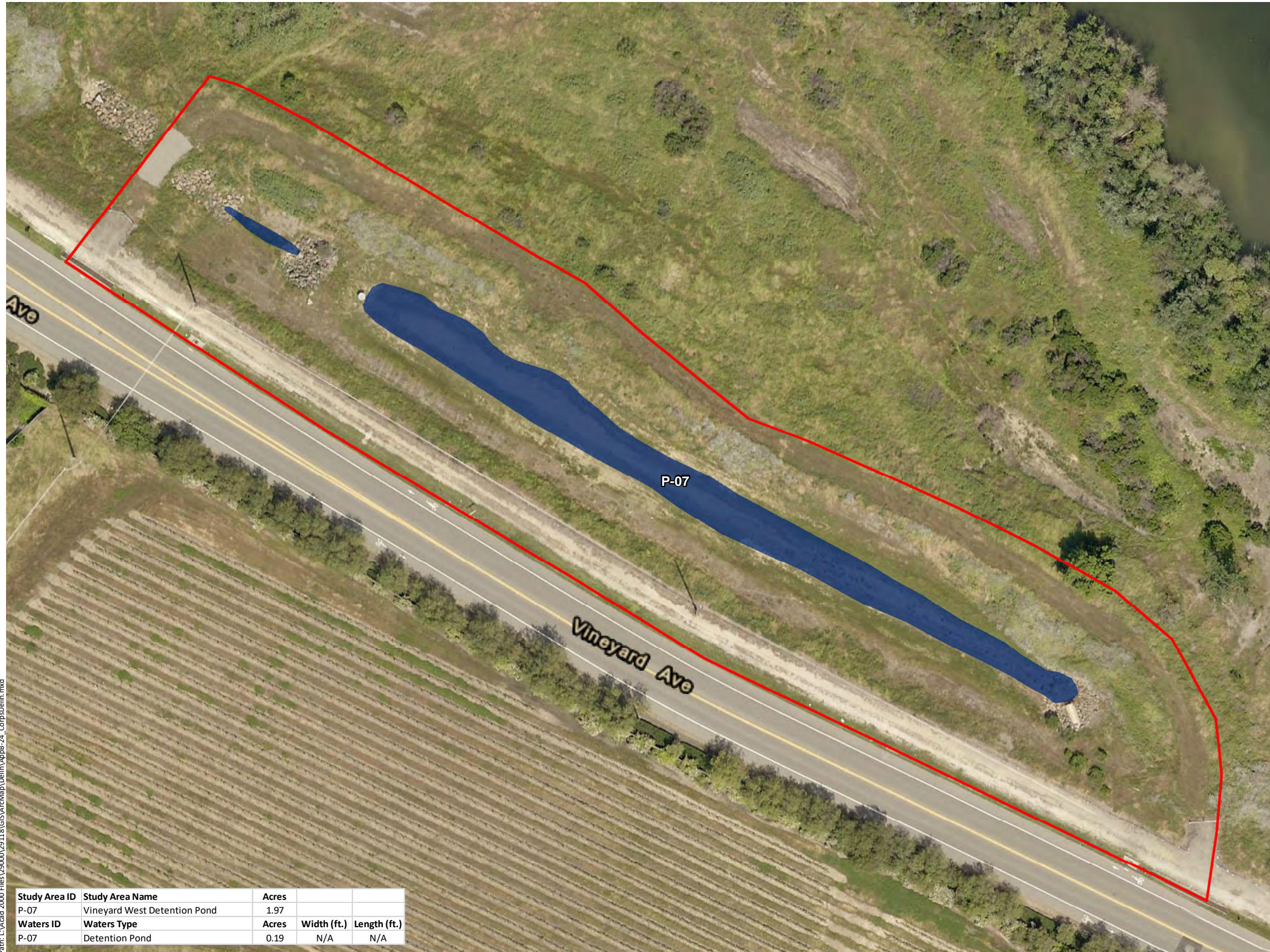
Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-23_CorpsDelim.mxd

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019

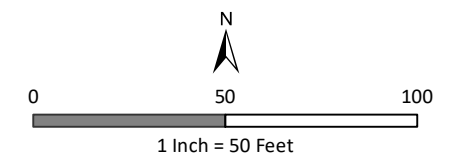
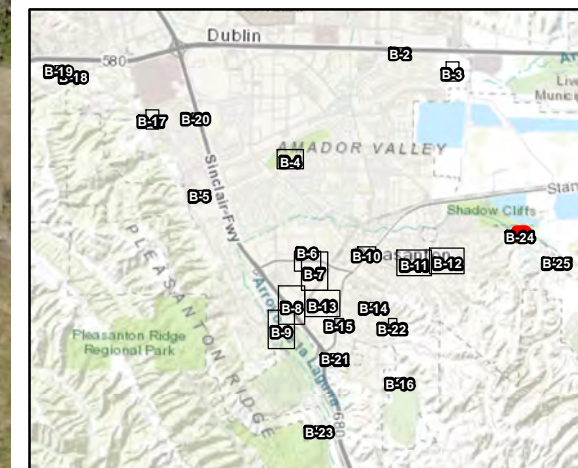


Appendix B-24. Potential Section 404 Jurisdictional Features (P-07)

City of Pleasanton
Stream Maintenance Program
Alameda County, California



- Study Area
- Exempt Features**
- Detention Pond



Study Area ID	Study Area Name	Acres		
P-07	Vineyard West Detention Pond	1.97		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
P-07	Detention Pond	0.19	N/A	N/A

Path: L:\Acad 2000 Files\29000\29118\GIS\ArcMap\Delim\AppB-24_CorpsDelim.mxd



Appendix B-25. Potential Section 404 Jurisdictional Features (P-08)

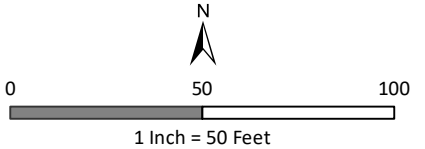
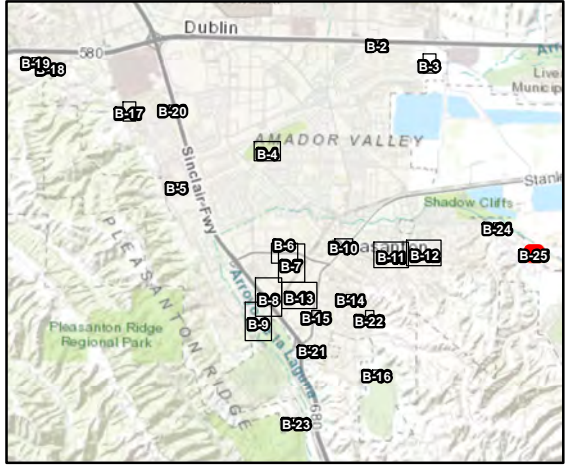
City of Pleasanton
Stream Maintenance Program
Alameda County, California



Study Area

Exempt Features

Detention Pond



Study Area ID	Study Area Name	Acres		
P-08	Vineyard West Detention Pond	1.45		
Waters ID	Waters Type	Acres	Width (ft.)	Length (ft.)
P-08	Detention Pond	0.23	N/A	N/A

Sources: Alameda County 2017, WRA | Prepared By: SGillespie, 11/19/2019



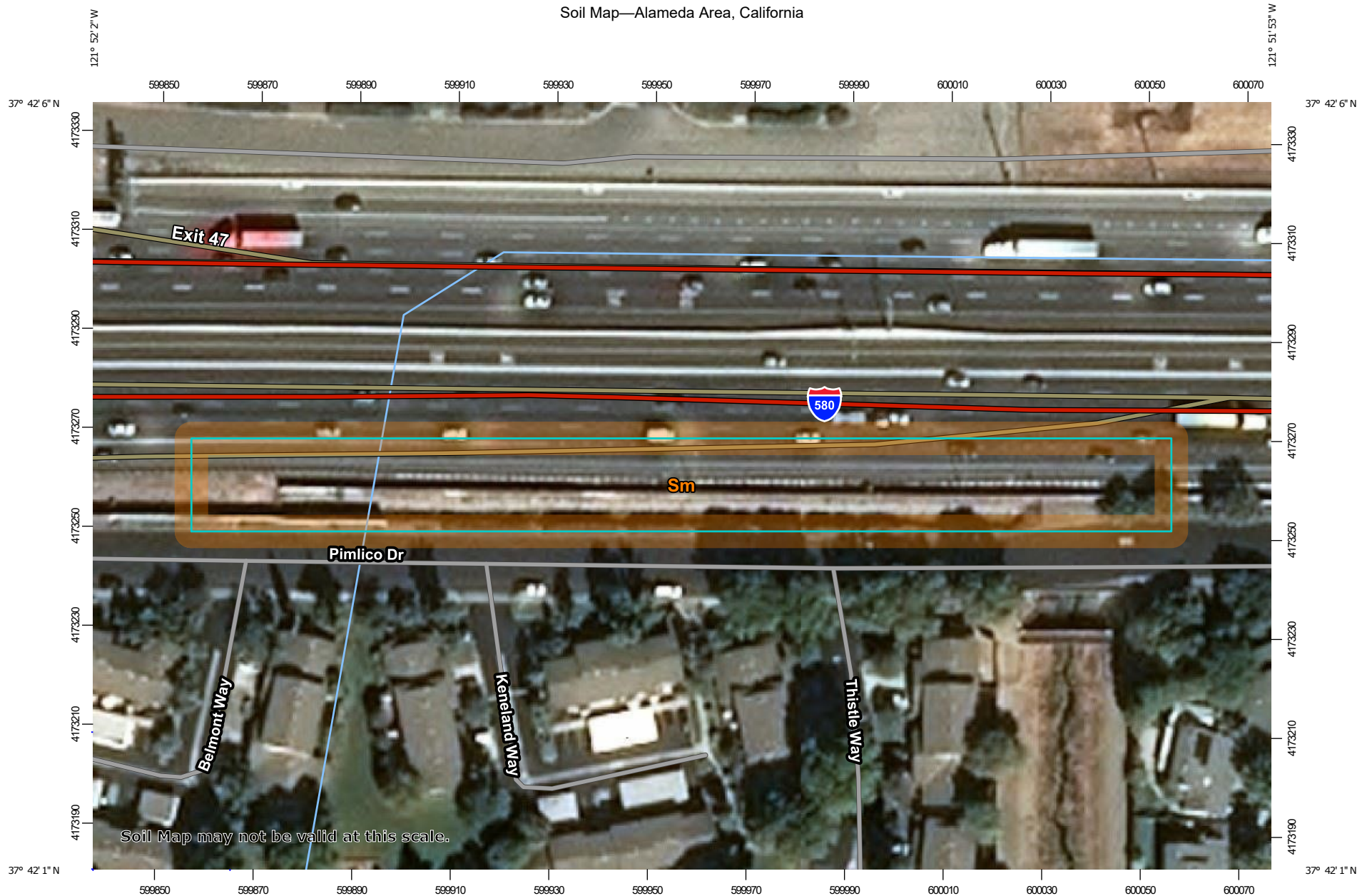
Path: L:\Acad 2000 Files\290001\29118\GIS\ArcMap\Delim\AppB-25_Corps\Delim.mxd

This Page Left Intentionally Blank

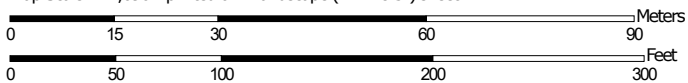
APPENDIX C
SOILS IN THE PROJECT AREA

This Page Intentionally Left Blank

Soil Map—Alameda Area, California



Map Scale: 1:1,090 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

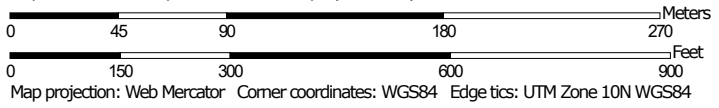
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sm	Sunnyvale clay loam over clay	0.9	100.0%
Totals for Area of Interest		0.9	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.

Map Scale: 1:3,140 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

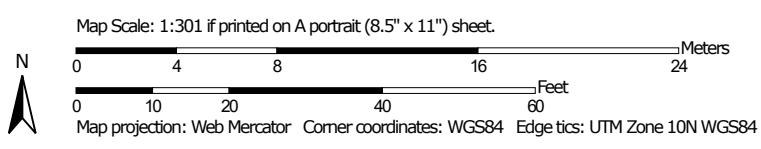
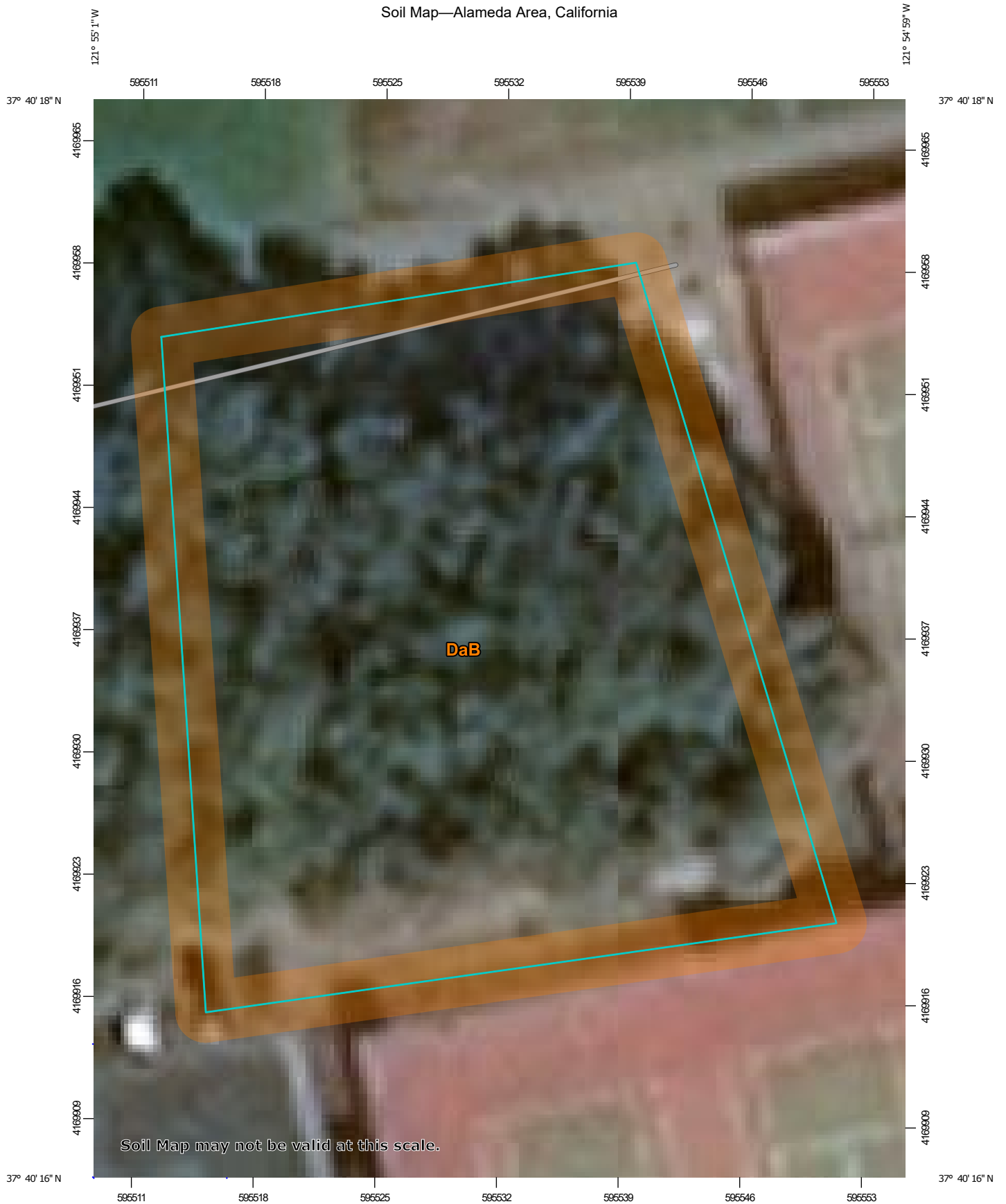
Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sm	Sunnyvale clay loam over clay	5.3	100.0%
Totals for Area of Interest		5.3	100.0%

Soil Map—Alameda Area, California



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

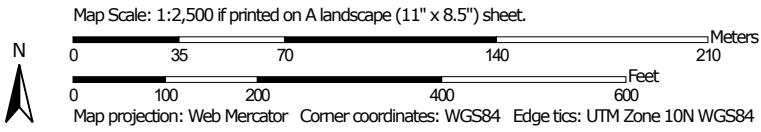
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DaB	Danville silty clay loam, 3 to 10 percent slopes	0.3	100.0%
Totals for Area of Interest		0.3	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

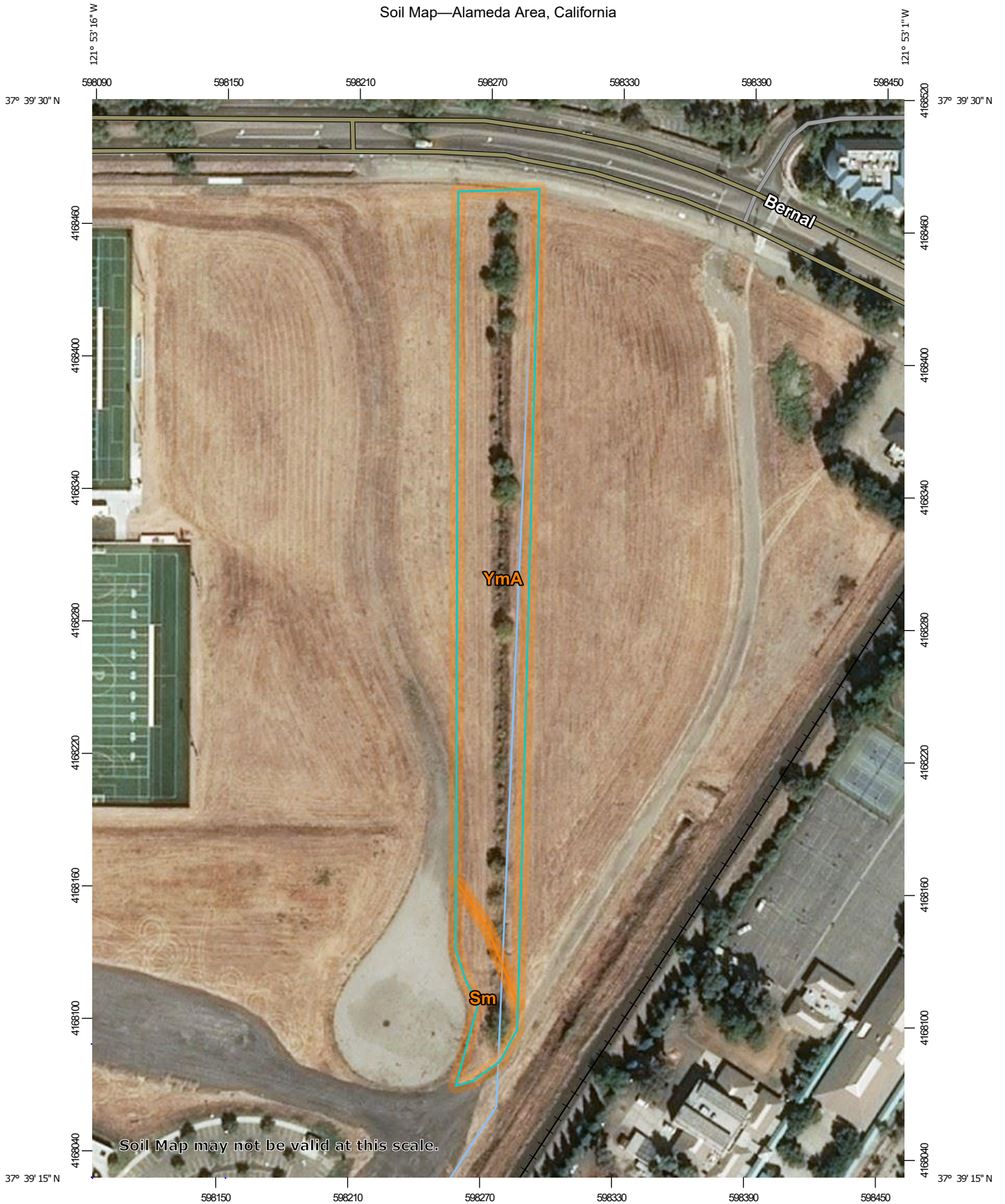
Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

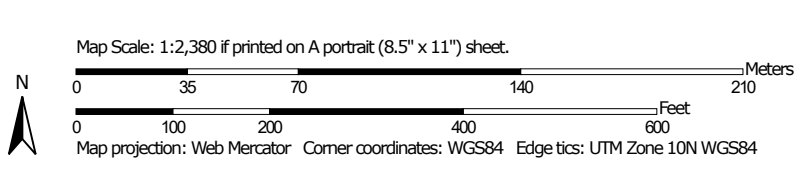
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sn	Sunnyvale clay loam, drained	0.3	15.4%
So	Sycamore silt loam, 0 to 2 percent slopes, MLRA 14	0.1	3.9%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	1.5	80.6%
Totals for Area of Interest		1.9	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

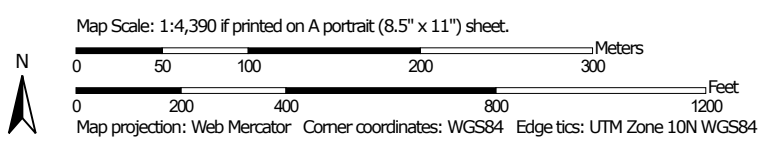
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sm	Sunnyvale clay loam over clay	0.3	11.1%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	2.8	88.9%
Totals for Area of Interest		3.1	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

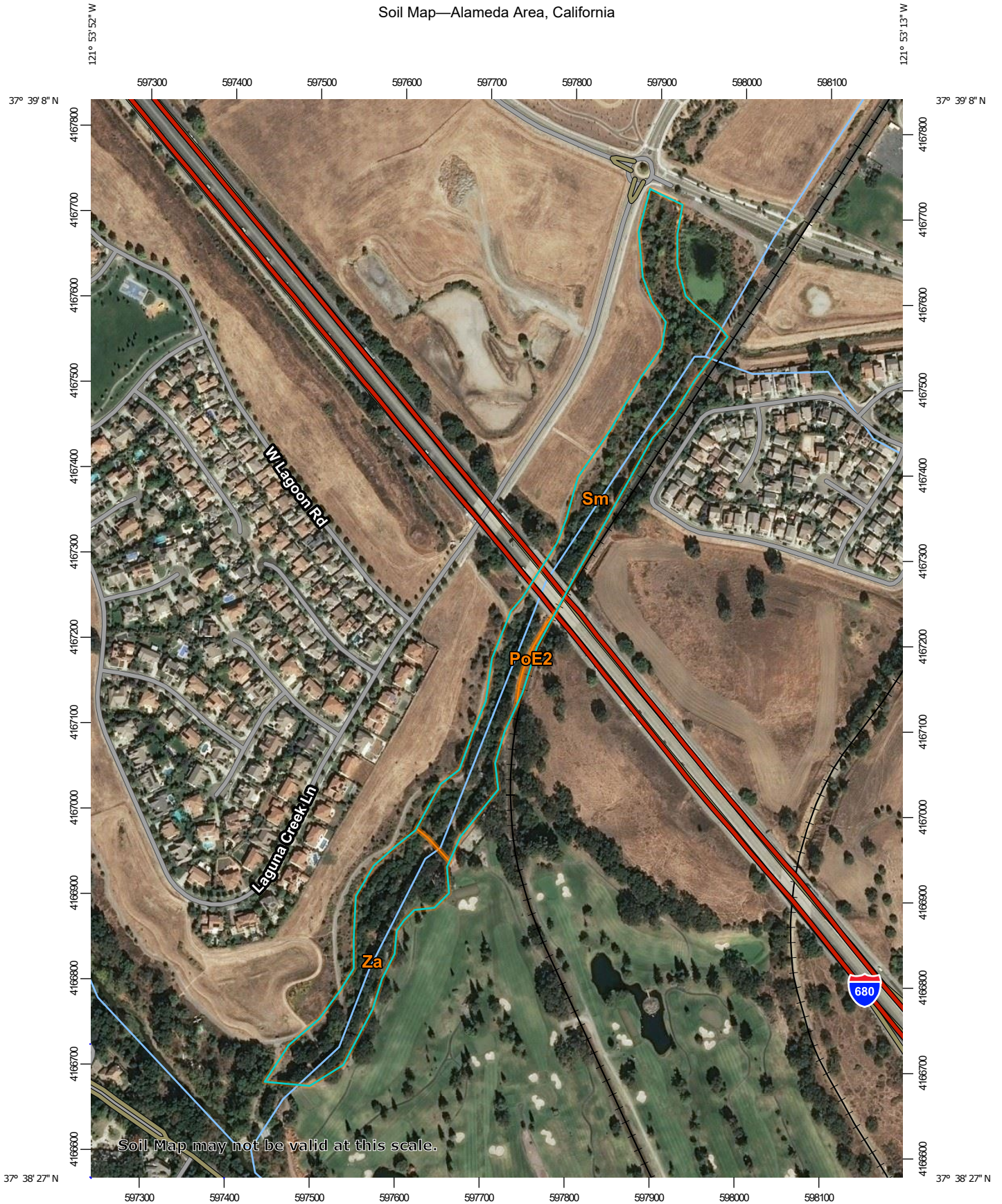
Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

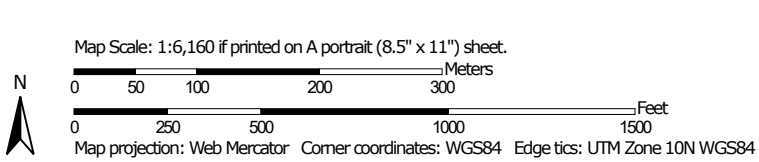
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sm	Sunnyvale clay loam over clay	6.0	42.4%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	8.2	57.6%
Totals for Area of Interest		14.2	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

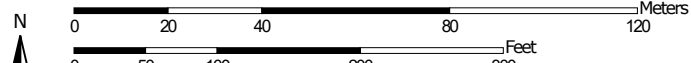
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PoE2	Positas gravelly loam, 20 to 40 percent slopes, eroded	0.1	0.9%
Sm	Sunnyvale clay loam over clay	9.6	66.7%
Za	Zamora silt loam, 0 to 4 percent slopes	4.7	32.4%
Totals for Area of Interest		14.4	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.

Map Scale: 1:1,610 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

10/25/2019
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

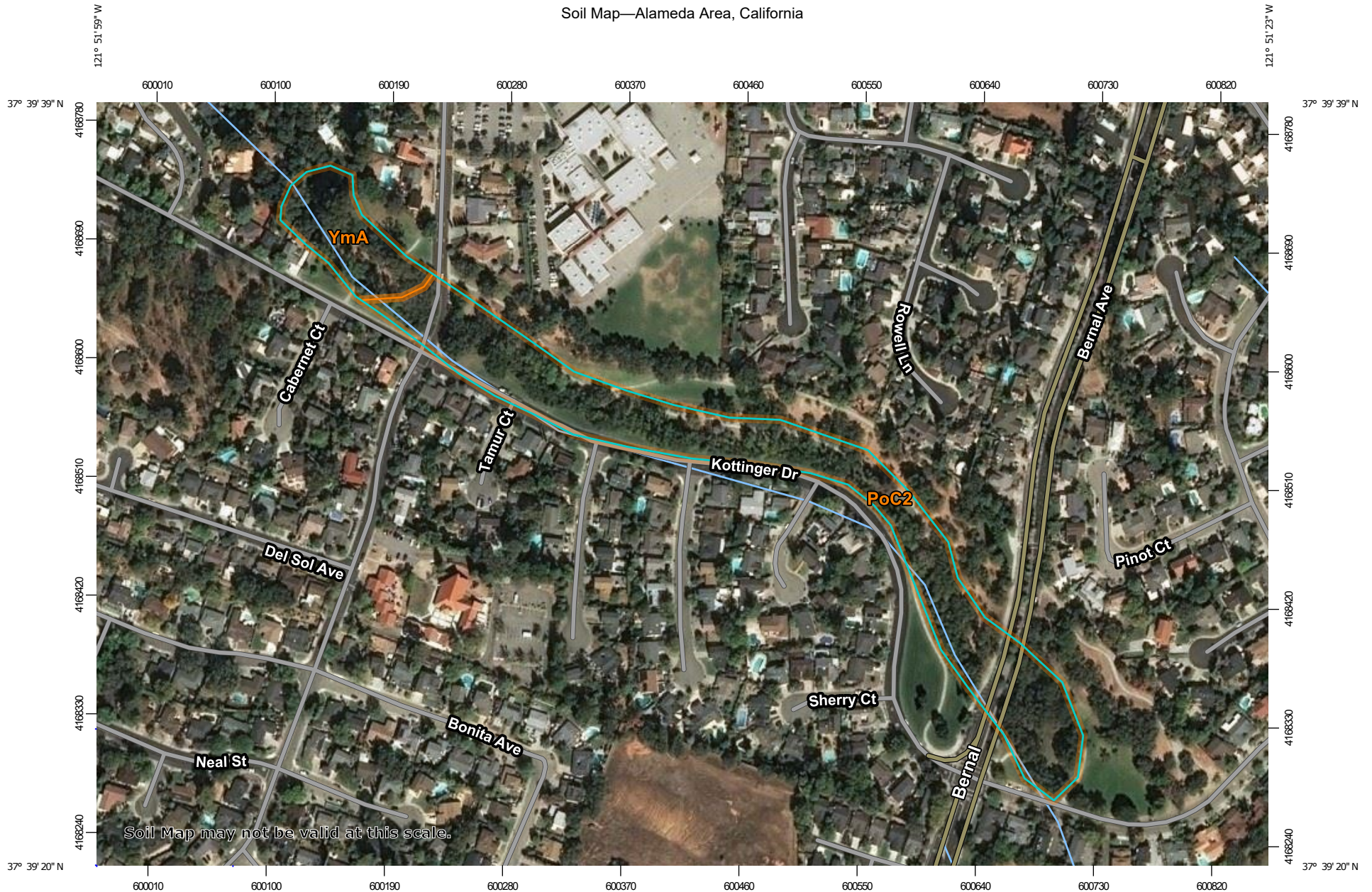
Date(s) aerial images were photographed: Apr 29, 2019—May 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

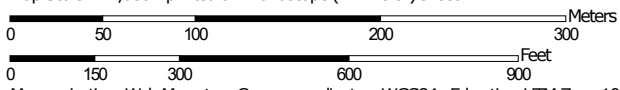
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	2.8	100.0%
Totals for Area of Interest		2.8	100.0%

Soil Map—Alameda Area, California



Map Scale: 1:4,080 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

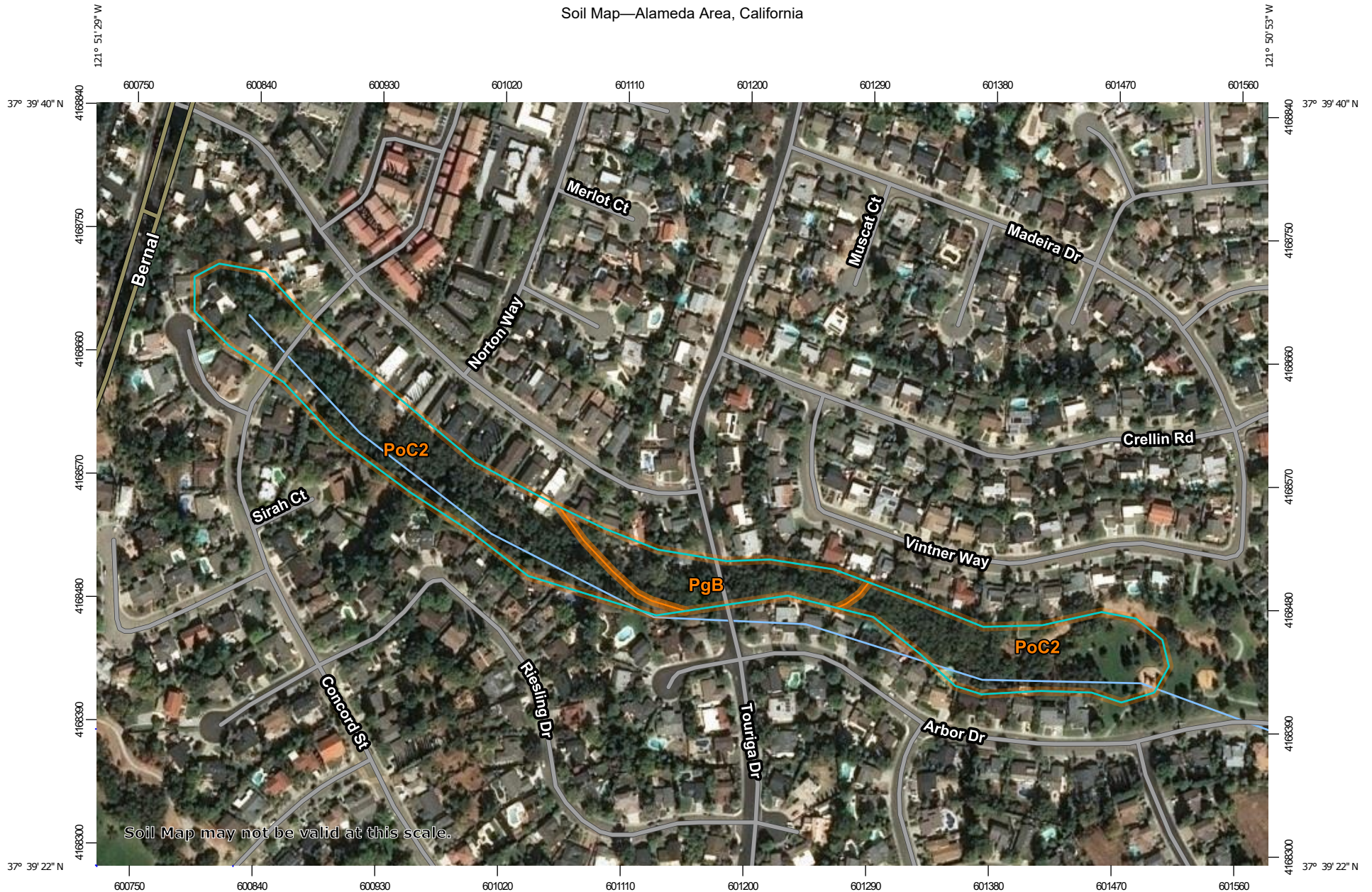
Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

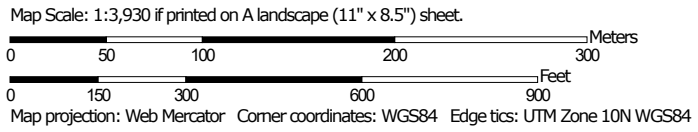
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PoC2	Positas gravelly loam, 2 to 20 percent slopes, eroded	6.9	82.8%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	1.4	17.2%
Totals for Area of Interest		8.3	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

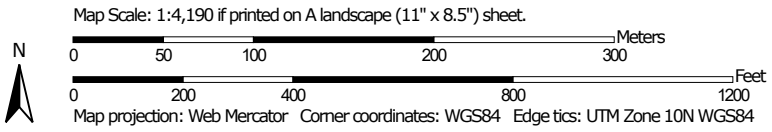
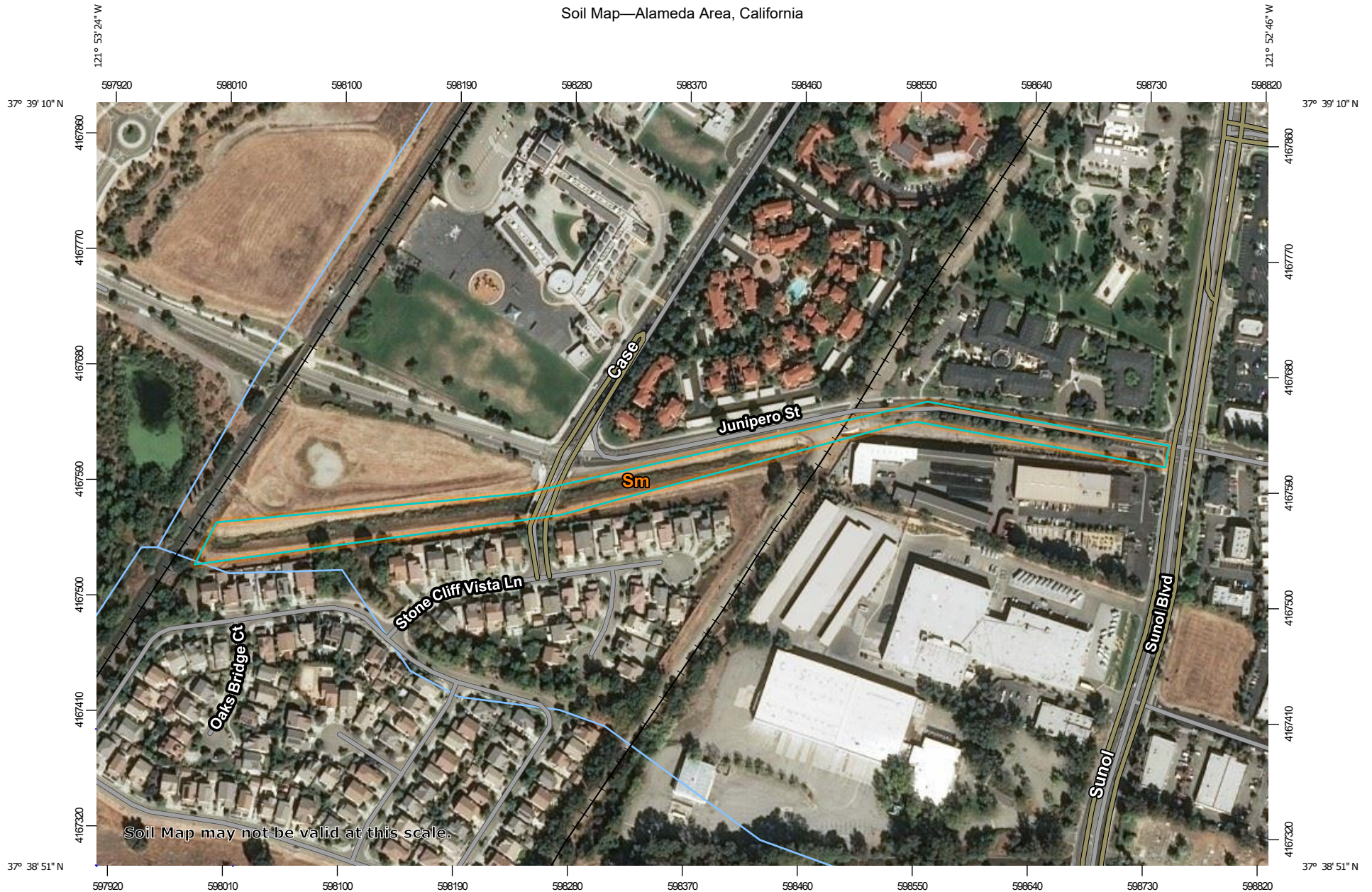
Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PgB	Pleasanton gravelly loam, 3 to 12 percent slopes	1.6	18.0%
PoC2	Positas gravelly loam, 2 to 20 percent slopes, eroded	7.1	82.0%
Totals for Area of Interest		8.7	100.0%

Soil Map—Alameda Area, California



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

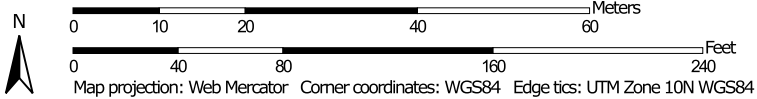
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sm	Sunnyvale clay loam over clay	3.8	100.0%
Totals for Area of Interest		3.8	100.0%

Soil Map—Alameda Area, California




Soil Map may not be valid at this scale.

Map Scale: 1:878 if printed on A landscape (11" x 8.5") sheet.




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

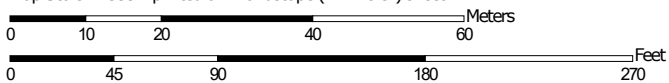
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PoC2	Positas gravelly loam, 2 to 20 percent slopes, eroded	0.1	8.2%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	0.8	91.8%
Totals for Area of Interest		0.9	100.0%

Soil Map—Alameda Area, California



Map Scale: 1:999 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

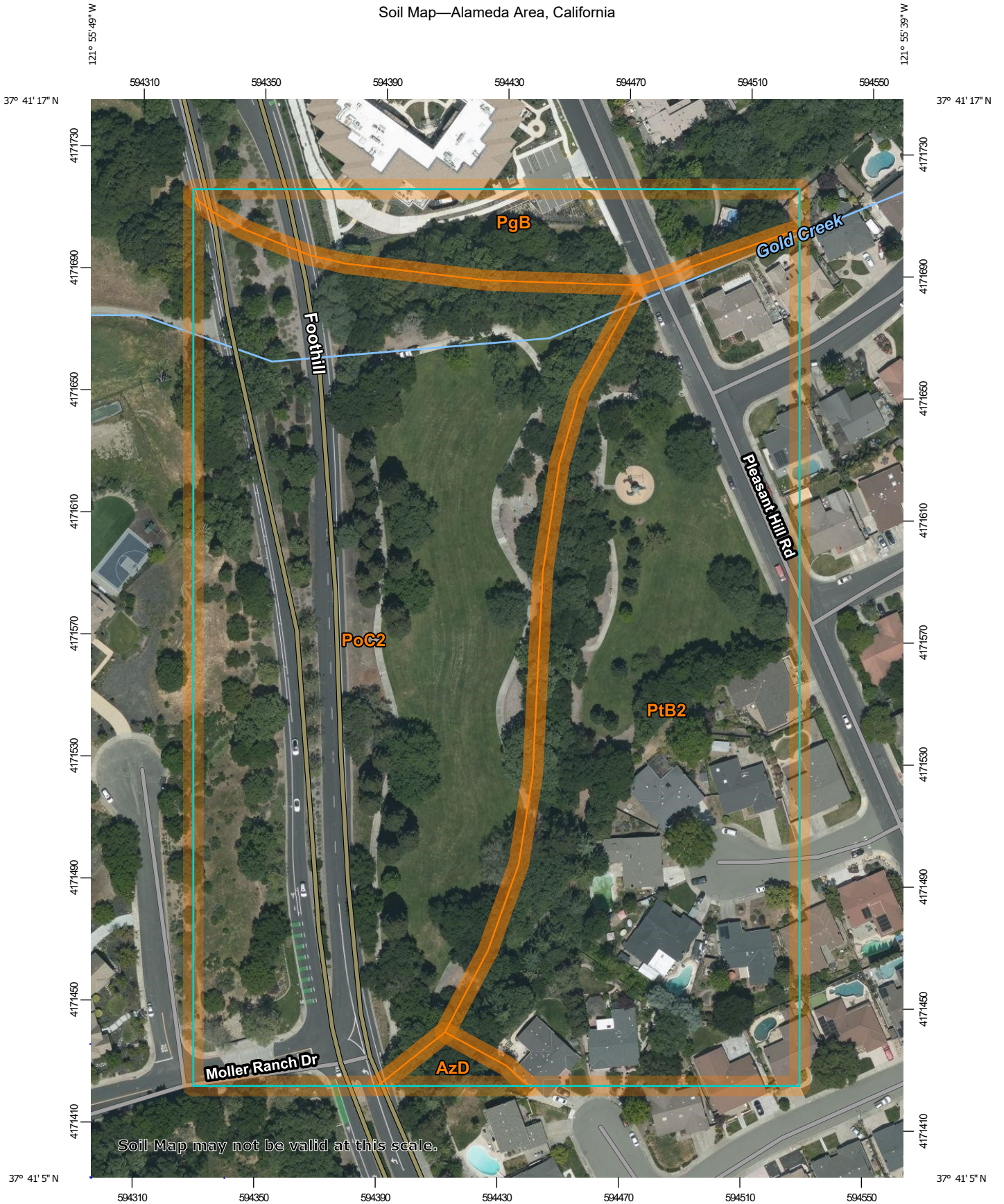
Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

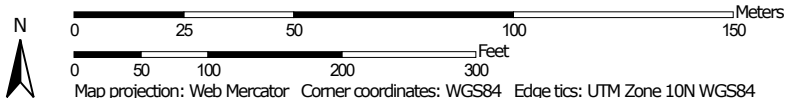
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PoC2	Positas gravelly loam, 2 to 20 percent slopes, eroded	1.7	100.0%
Totals for Area of Interest		1.7	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.

Map Scale: 1:1,720 if printed on A portrait (8.5" x 11") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 29, 2019—May 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

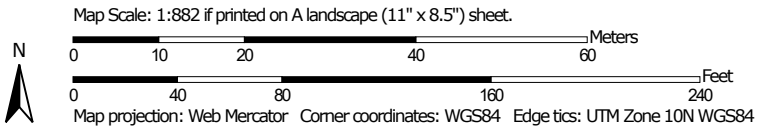
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AzD	Azule clay loam, 3 to 30 percent slopes	0.1	0.8%
PgB	Pleasanton gravelly loam, 3 to 12 percent slopes	1.2	8.1%
PoC2	Positas gravelly loam, 2 to 20 percent slopes, eroded	7.5	51.5%
PtB2	Positas gravelly loam, thick surface, 2 to 10 percent slopes, eroded	5.8	39.6%
Totals for Area of Interest		14.5	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

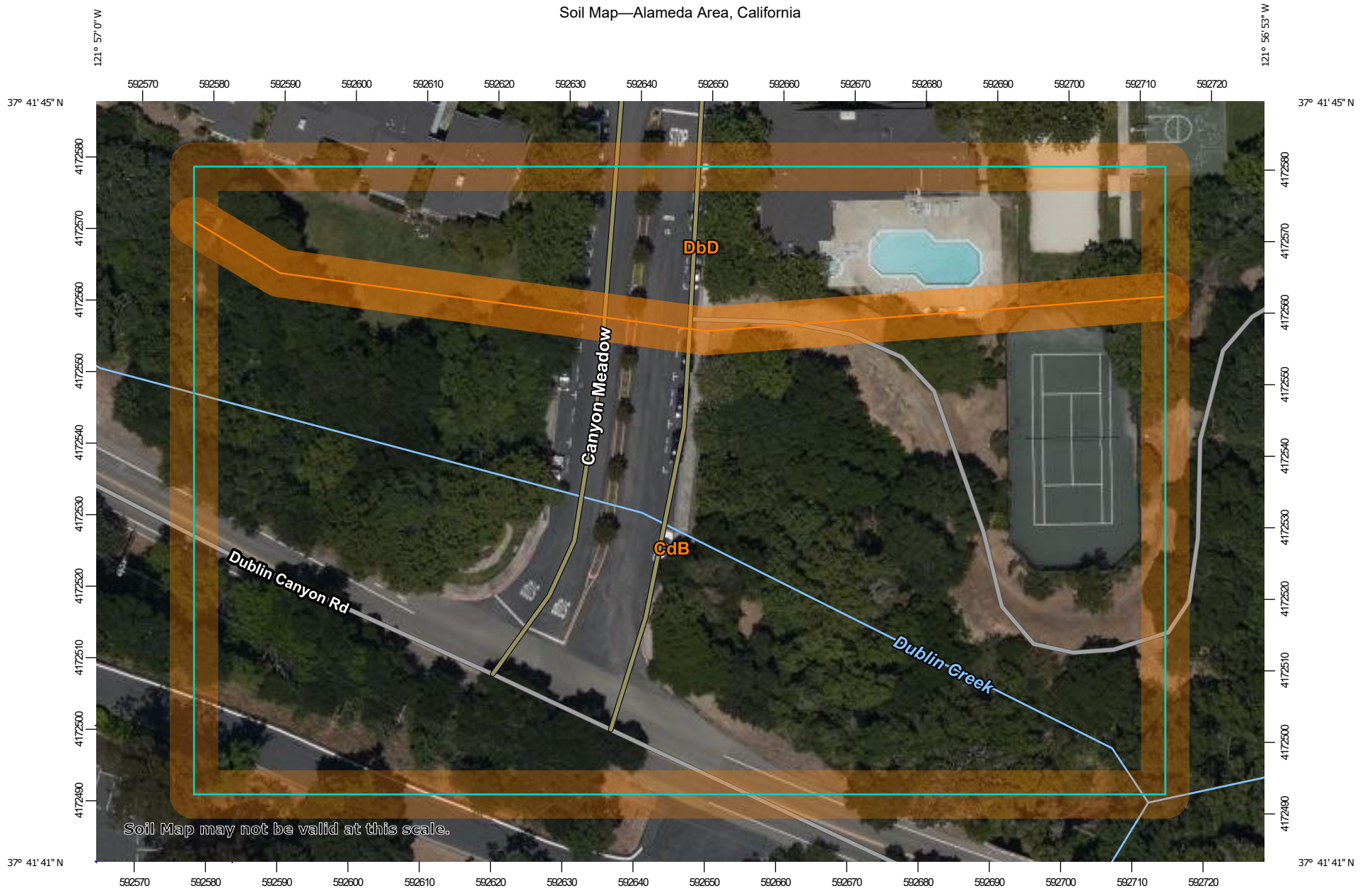
Date(s) aerial images were photographed: May 31, 2019—Jun 6, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

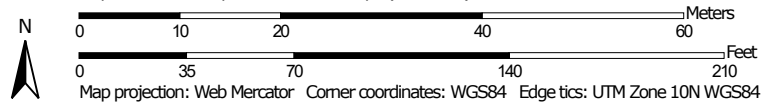
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CdB	Clear Lake clay, drained, 3 to 7 percent slopes	2.4	60.7%
DbD	Diablo clay, 15 to 30 percent slopes, MLRA 15	0.0	0.7%
LuD	Los Osos and Millsholm soils, 7 to 30 percent slopes	1.5	38.7%
Totals for Area of Interest		4.0	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.

Map Scale: 1:750 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 31, 2019—Jun 6, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

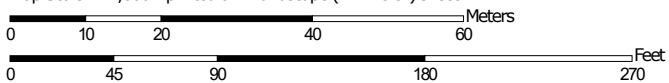
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CdB	Clear Lake clay, drained, 3 to 7 percent slopes	2.3	78.3%
DbD	Diablo clay, 15 to 30 percent slopes, MLRA 15	0.6	21.7%
Totals for Area of Interest		3.0	100.0%

Soil Map—Alameda Area, California



Map Scale: 1:1,000 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

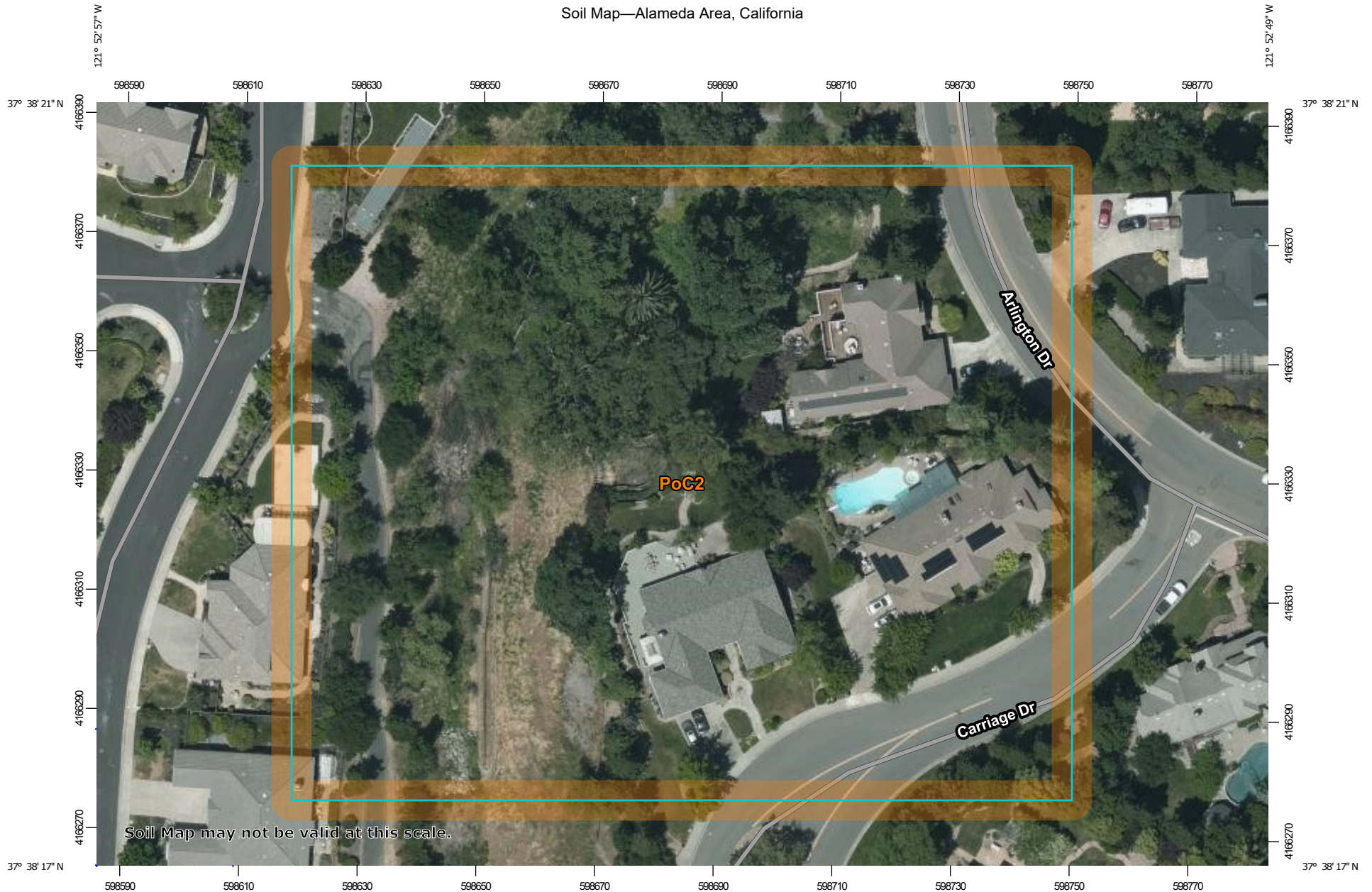
Date(s) aerial images were photographed: Apr 29, 2019—May 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

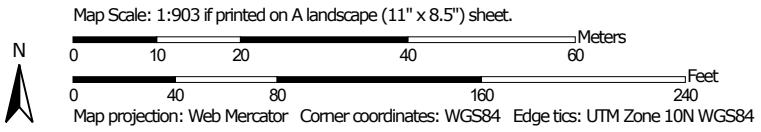
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PoC2	Positas gravelly loam, 2 to 20 percent slopes, eroded	0.7	14.9%
PoE2	Positas gravelly loam, 20 to 40 percent slopes, eroded	1.3	28.5%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	2.6	56.6%
Totals for Area of Interest		4.6	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 29, 2019—May 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

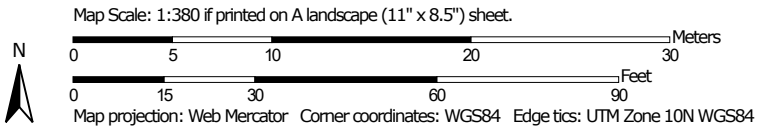
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PoC2	Positas gravelly loam, 2 to 20 percent slopes, eroded	3.5	100.0%
Totals for Area of Interest		3.5	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 29, 2019—May 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

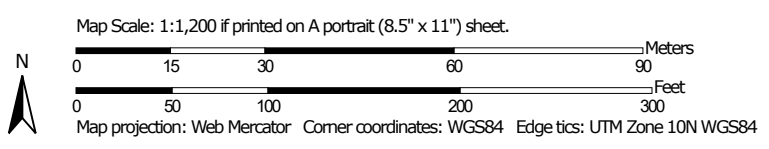
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cc	Clear Lake clay, 0 to 3 percent slopes, MLRA 14	0.0	1.9%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	0.7	98.1%
Totals for Area of Interest		0.7	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

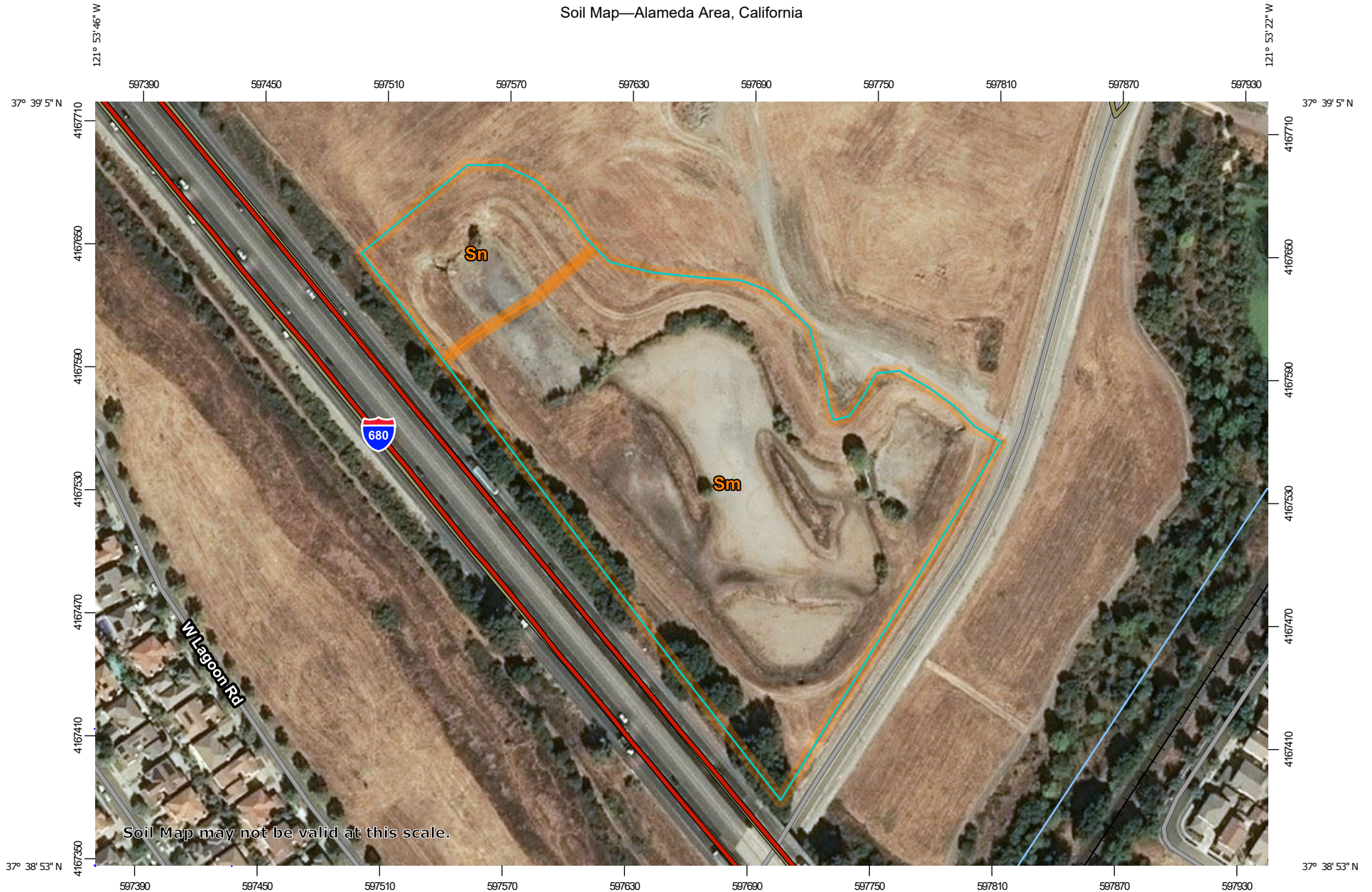
Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

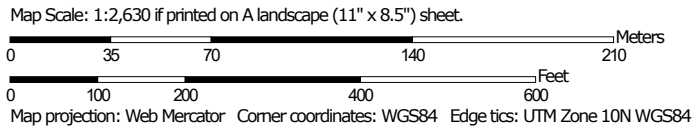
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
So	Sycamore silt loam, 0 to 2 percent slopes, MLRA 14	3.6	100.0%
Totals for Area of Interest		3.6	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

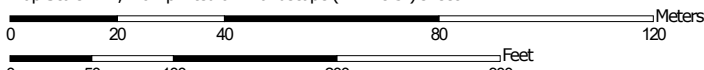
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sm	Sunnyvale clay loam over clay	8.9	85.6%
Sn	Sunnyvale clay loam, drained	1.5	14.4%
Totals for Area of Interest		10.4	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.

Map Scale: 1:1,410 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sm	Sunnyvale clay loam over clay	3.4	100.0%
Totals for Area of Interest		3.4	100.0%

Soil Map—Alameda Area, California



Map Scale: 1:2,380 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

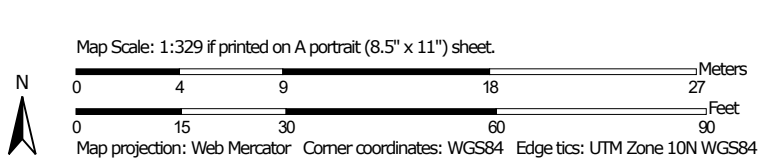
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
So	Sycamore silt loam, 0 to 2 percent slopes, MLRA 14	5.6	88.1%
Za	Zamora silt loam, 0 to 4 percent slopes	0.8	11.9%
Totals for Area of Interest		6.3	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Oct 15, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

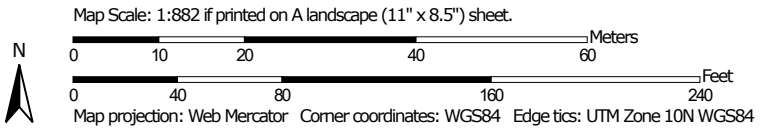
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PgB	Pleasanton gravelly loam, 3 to 12 percent slopes	0.3	100.0%
Totals for Area of Interest		0.3	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 29, 2019—May 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

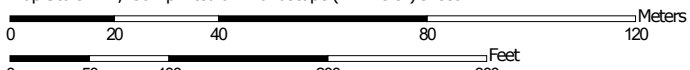
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LuD	Los Osos and Millsholm soils, 7 to 30 percent slopes	1.7	54.6%
Za	Zamora silt loam, 0 to 4 percent slopes	1.4	45.4%
Totals for Area of Interest		3.2	100.0%

Soil Map—Alameda Area, California



Map Scale: 1:1,450 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 29, 2019—May 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

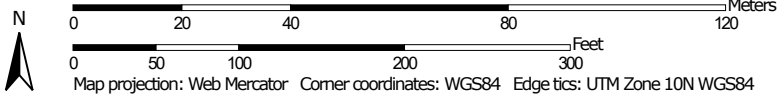
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Gp	Gravel pits	6.5	62.6%
W	Water	0.8	8.2%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	2.5	24.1%
Yo	Yolo loam over gravel, 0 to 3 percent slopes	0.5	5.1%
Totals for Area of Interest		10.3	100.0%

Soil Map—Alameda Area, California



Soil Map may not be valid at this scale.

Map Scale: 1:1,390 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alameda Area, California

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 29, 2019—May 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Gp	Gravel pits	2.1	27.5%
Lm	Livermore very gravelly coarse sandy loam	0.3	3.8%
PgB	Pleasanton gravelly loam, 3 to 12 percent slopes	4.9	65.0%
YmA	Yolo loam, calcareous substratum, 0 to 6 percent slopes, MLRA 14	0.3	3.7%
Totals for Area of Interest		7.6	100.0%

This Page Intentionally Left Blank

APPENDIX D
PROJECT AREA PHOTOGRAPHS

This Page Intentionally Left Blank



Photo 1: Concrete channel of Pimlico canal (C-01)

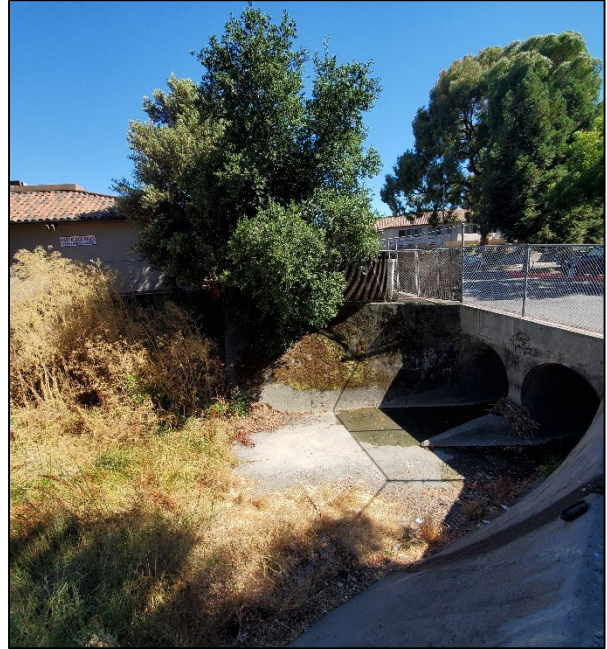


Photo 2: Concrete culvert at Pleasanton Canal (C-02)



Photo 3: Cattails in channel at C-02

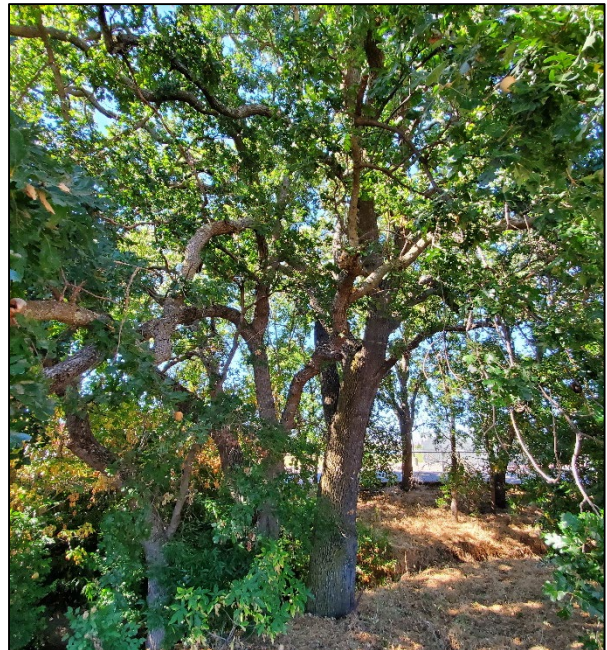


Photo 4: Riparian forest at Foothill High School Trash Rack (C-03)



Photo 5: Excavated channel at Bernal V-Ditch (C-04)



Photo 6: Culvert at C-04



Photo 7: Excavated channel at Bernal North/South Ditch (C-05)



Photo 8: Dry creekbed at C-05



Photo 9: Intermittent stream at Mission Creek Restoration Project (C-06)



Photo 10: Manmade drainage at southern end of C-06



Photo 11: Manmade drainage feature at C-06 next to Arroyo de la Laguna



Photo 12: C-06 flowing under underpass



Photo 13: St. Mary Creek (C-07)

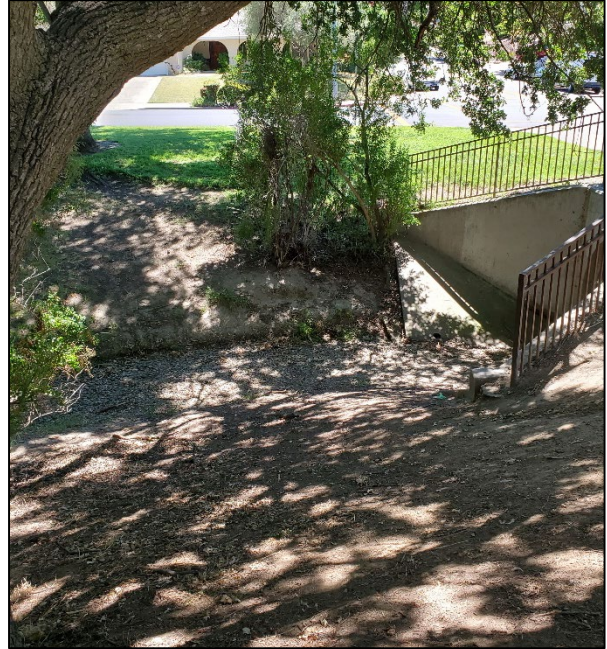


Photo 14: Upper Kottinger Creek (C-08)



Photo 15: Streambed and riparian forest at C-08



Photo 16: Standing water near culvert at Touriga Creek (C-09)



Photo 17: Riparian forest at C-09



Photo 18: Bed and bank of C-09 lined with stones



Photo 19: Junipero Canal (C-10)

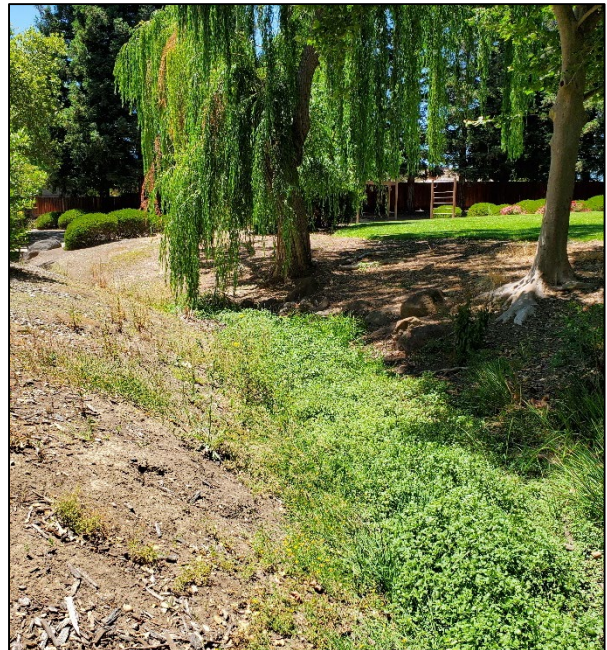


Photo 20: Mission Creek Park (C-11)



Photo 21: Cemetery Creek (C-12)



Photo 22: Gold Creek (C-13)



Photo 23: Dublin Canyon Creek (C-14)



Photo 24: Stonedale Channel (C-15)



Photo 25: Arlington Creek (C-16)



Photo 26: Rutledge Place Culvert (C-17)



Photo 27: Stoneridge Pond (P-01)

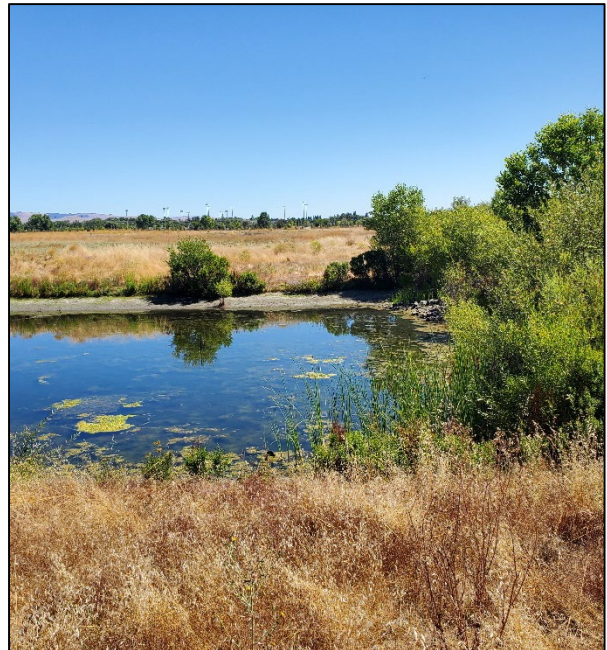


Photo 28: Bernal Detention Pond (P-02)



Photo 29: Bernal Central Detention Pond (P-02)



Photo 30: Canyon Oaks Detention Pond (P-03)



Photo 31: Bernal West Detention Pond (P-04)



Photo 32: Culvert at P-04

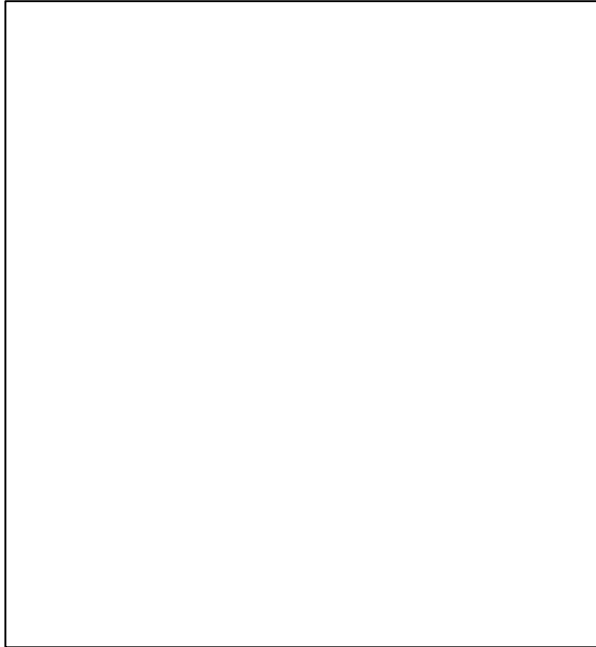


Photo 33: Callippe Detention Pond (P-05)



Photo 34: Oak Tree Farms Detention Pond (P-06)



Photo 35: Vineyard West Detention Pond (P-07)



Photo 36: Vineyard East Detention Pond (P-08)

This Page Intentionally Left Blank

APPENDIX E

PLANT SPECIES OBSERVED WITHIN THE PROJECT AREA

This Page Intentionally Left Blank

Appendix E. List of plant and wildlife species observed within the Study Area during the July and October, 2019 site visit.

Scientific Name	Common Name
Wildlife	
<i>Cathartes aura</i>	turkey vulture
<i>Aphelocoma californica</i>	California scrub jay
<i>Agelaius tricolor</i>	Tricolored blackbird
<i>Buteo jamaicensis</i>	red-tailed hawk
<i>Carpodacus mexicanus</i>	house finch
<i>Pipilo maculatus</i>	Spotted towhee
<i>Charadrius vociferus</i>	killdeer
<i>Sayornis nigricans</i>	black phoebe
<i>Zenaida macroura</i>	mourning dove
<i>Spinus psaltria</i>	Lesser goldfinch
<i>Mimus polyglottos</i>	Northern mockingbird
<i>Melospiza crissalis</i>	California towhee
<i>Corvus brachyrhynchos</i>	American crow
<i>Hirundo rustica</i>	Barn swallow
<i>Thryomanes bewickii</i>	Bewicke's wren
<i>Psaltriparus minimus</i>	bushtit
<i>Petrochelidon pyrrhonota</i>	Cliff swallow
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Melanerpes formicivorus</i>	Acorn woodpecker
<i>Leuconotopicus villosus</i>	Hairy woodpecker
<i>Otospermophilus beecheyi</i>	California ground squirrel
Plants	
<i>Aesculus californica</i>	buckeye
<i>Avena barbata</i>	slender oat
<i>Avena sativa</i>	wild oat
<i>Baccharis pilularis</i> ssp. <i>pilularis</i>	coyote brush
<i>Baccharis salicina</i>	willow baccharis
<i>Brassica nigra</i>	black mustard
<i>Bromus diandrus</i>	riggut brome
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Catalpa bignonioides</i>	southern catalpa
<i>Centaurea solstitialis</i>	yellow star thistle
<i>Chenopodium</i> sp.	goosefoot
<i>Cirsium vulgare</i>	spear thistle
<i>Convolvulus arvensis</i>	field bindweed
<i>Cynodon dactylon</i>	Bermuda grass
<i>Cyperus eragrostis</i>	tall cyperus
<i>Epilobium brachycarpum</i>	tall annual willowherb
<i>Eschscholzia californica</i>	California poppy

<i>Eucalyptus globulus</i>	Blue gum
<i>Festuca myuros</i>	rattail fescue
<i>Festuca perennis</i>	Italian rye grass
<i>Foeniculum vulgare</i>	fennel
<i>Hedera canariensis</i>	canary ivy
<i>Helminthotheca echioides</i>	bristly ox-tongue
<i>Heteromeles arbutifolia</i>	toyon
<i>Hordeum marinum</i>	seaside barley
<i>Juglans nigra</i>	black walnut
<i>Lactuca canadensis</i>	Canada wild lettuce
<i>Lepidium latifolium</i>	perennial pepperweed
<i>Liquidambar styraciflua</i>	sweetgum
<i>Lolium rigidum</i>	rigid Italian rye grass
<i>Lotus corniculatus</i>	bird's foot trefoil
<i>Mentha pulegium</i>	pennyroyal
<i>Nasturtium officinale</i>	watercress
<i>Nerium oleander</i>	Oleander
<i>Persicaria hydropiper</i>	common smartweed
<i>Phalaris aquatica</i>	harding grass
<i>Plantago arenaria</i>	Indian plantain
<i>Polypogon monspeliensis</i>	rabbitsfoot grass
<i>Populus fremontii</i>	Fremont cottonwood
<i>Pseudognaphalium californicum</i>	ladies' tobacco
<i>Quercus agrifolia</i>	coast live oak
<i>Quercus lobata</i>	valley oak
<i>Raphanus sativus</i>	jointed charlock
<i>Rosa sp.</i>	Rose
<i>Rubus armeniacus</i>	Himalayan blackberry
<i>Rumex crispus</i>	curly dock
<i>Sequoia sempervirens</i>	coast redwood
<i>Schoenoplectus californicus.</i>	California bulrush
<i>Salix babylonica</i>	Weeping willow
<i>Tribulus terrestris</i>	puncture vine
<i>Trifolium hirtum</i>	rose clover
<i>Typha angustifolia</i>	narrow leaf cattail
<i>Typha latifolia</i>	broadleaf cattail
<i>Ulmus americana</i>	American elm
<i>Vicia sativa</i>	spring vetch
<i>Washingtonia robusta</i>	Mexican fan palm
<i>Xanthium strumarium</i>	cocklebur