

PRELIMINARY AQUATIC RESOURCES DELINEATION REPORT

ARRIVE FAIRFIELD LUXURY TOWNHOMES PROJECT FAIRFIELD, CALIFORNIA

PROJECT NO. 2102-0373

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1.0 INTRODUCTION

Padre Associates, Inc. (Padre) has prepared this Preliminary Aquatic Resources Delineation Report (Report) on behalf of Red Tail Multifamily Land Development, LLC (RTD) for the property located at 1776 Sunset Avenue, Fairfield, Solano County California (Project Site). The purpose of this Report is to identify and delineate the geographic extent of aquatic resource features and determine Federal and/or state jurisdiction. The methodology used in this delineation is consistent with guidance provided by the U.S. Army Corps of Engineers (ACOE) and Environmental Protection Agency (EPA) for Federal jurisdictional waters of the United States (waters of the U.S.) and wetlands and the State Water Resources Control Board (SWRCB) for waters of the State.

1.1 PROJECT LOCATION

The Project Site is located at 1776 Sunset Avenue, Fairfield, California and consists of three separate parcels identified with Solano County Assessor's Parcel Numbers (APNs) 0037-030-200, 0037-030-210, and 0037-060-480 and is within the Fairfield North 7.5-minute United States Geological Survey (USGS) quadrangle. The northern two parcels are currently undeveloped and the southern-most parcel contains a vacant single-family residence. The Project Site is bounded by East Tabor Avenue to the north, a flood control channel and Grange Middle School to the east, Brandon Way to the south, and Sunset Avenue to the west (see Figure 1).

1.2 PROJECT DESCRIPTION

The Project proposes development of the approximately 8.71-acre property consisting of construction of multi-family residential units and associated infrastructure including streets and driveways and improvement of a storm water outfall system that drains into the adjacent flood control channel. The Project will eliminate a relict channel of Laurel Creek (relict channel), which was hydrologically isolated and partially backfilled in conjunction with the construction of an adjacent flood control channel constructed in the mid-1980s by the ACOE. A portion of the Project Site is currently developed with one vacant single-family residential building, a concrete pad, and asphalt paved area at the south end of the Project Site. The remainder of the Project Site is vacant land that has been previously disturbed and is routinely disked to reduce fire hazard. The Project is currently in the initial planning and permitting phase.

1.3 EXISTING SITE CONDITIONS

The Project Site consists primarily of vacant land that is partially developed and has a history of disturbance that includes mowing and disking for fire breaks and recent use of the Project Site as a homeless encampment.

The Project Site was generally level with several topographical features (soil berms, a large soil mound, depressions) creating moderate topographical variability. The relict channel extended north to south in the western portion of the Project Site. The study area boundary also includes a small area on the west bank of the Flood Control Channel where improvements to an outfall drainage are proposed to direct stormwater run-off onto the armored bank of the existing Flood Control Channel.

Based on a review of readily available historical information, the Project Site was historically utilized for agricultural and residential purposes from at least the 1930s (Padre, 2021a). The Project Site has been disturbed through past and present property maintenance activities. The primary vegetation type was disturbance-adapted non-native annual grassland and an assemblage of wetland and riparian plant species concentrated in the relict channel. Details on biological resources of the Project Site including botanical, wildlife, and potentially occurring sensitive plant and wildlife species can be found in the draft biological resources survey report (Padre, 2021b) for the Project.

1.4 CLIMATE SUMMARY

The Project Site is situated in Climate Zone 12, which includes part of the Northern California Central Valley situated just inland of the Bay Area (PEC, 2006). The climate in this zone is characterized by cooler winters and hotter summers than the Bay Area, and tule fog is common in the winter east of Mount Diablo. Some lower areas receive frost on winter nights (PEC, 2006). Most of the rainfall in this zone occurs between November and April. At the Fairfield Weather Station, located approximately 2.6 miles northwest of the Project Site, the average maximum temperature includes a range of 55.9°F in January to 89.2°F in July for the 80-year period between 1941 and 2021. The average minimum temperature for this time period includes a range of 38.1°F in December and January to 56.3°F in August. The average annual precipitation for this station is 22.48 inches with a range of 0.02 inches in July and 4.72 inches in January. Average snowfall for the Project Site is zero inches per year.

Using climate data from the Fairfield Station, it was determined that the delineation field effort occurred during a period of average rainfall. Therefore, climatic conditions at the Project Site can be considered normal. Table 1-1 – Precipitation Analysis shows analysis of climate data obtained from the National Resources Conservation Service (NRCS) Climate Analysis for Wetlands Table (WETS table) used to determine site conditions at the time of surveys (NRCS, 2020c) (Appendix A – WETS table). The three months prior to the survey are shown on the left followed by the lower than average rainfall, average rainfall, and above average rainfall amounts as determined based on long-term rainfall records. Under the Rain Fall column are the actual precipitation values for each of the three months leading up to the survey. Each month's condition (dry, normal, wet) is assigned based on comparison to the long-term rainfall records and is considered against a weighted number that prioritizes the month prior to surveys over the two preceding months. The condition value and month weight value are then multiplied, and the results summed and compared to an index evaluating values from six to 18. The sum value of 11 that was generated using the Fairfield Station climate data indicates that the August 2021 delineation survey was conducted at a time that had normal rainfall conditions.

Table 1-1. Precipitation Analysis

Long-term Rainfall Records (Period of Record 1941-2021)					Analysis				
Timing	Month	3 yrs. in 10 < (Inches)	Average (Inches)	3 yrs. in 10 > (Inches)	2021 Rain Fall (Inches)	Condition ¹	Condition Value ¹	Month Weight Value	Products of previous two columns
First month prior to surveys	July	0.00	0.02	0.00	0.00	N	2	3	6
Second month prior to surveys	June	0.00	0.15	0.00	0.00	N	2	2	4
Third month prior to surveys	May	0.13	0.49	0.47	0.00	D	1	1	1
								Sum²	11
¹ Condition / Condition Value: D = Dry / 1 N = Normal / 2 W = Wet / 3				² Index for Sum: 6 - 9 = period preceding surveys has been drier than normal 10-14 = period preceding surveys has been normal 15-18 = period preceding surveys has been wetter than normal					

Precipitation in the months preceding a delineation can influence wetland indicators observed in the field. It is important to understand the influence that precipitation in months leading up to the surveys may have on field conditions at the time surveys were conducted. The normal rainfall conditions concluded by the precipitation analysis was taken into consideration during analysis of the field data collected for this Report.

1.5 REGIONAL SETTING

The Project Site is located in the densely populated and highly developed City of Fairfield, approximately three miles of the northern extent of Suisun Slough and approximately 60 miles southwest of the Sierra Nevada foothills at an elevation of approximately 40 feet above mean sea level. The surrounding land uses include transportation, commercial, and residential. The regional topography is generally flat to minimally sloping.

The United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map of the Project vicinity (USFWS, 2020a) was reviewed prior to the delineation of waters and wetlands on the Project Site. The NWI depicted a Riverine feature labeled as Laurel Creek running north to south in the eastern-central portion of the Project Site.

The Project Site is located within the Central Coast Subregion of the Central Western California Region of the California Floristic Province. These geographic subdivisions provide an eco-geographic context for plant diversity in California (Baldwin et. al., 2012).

1.6 GEOLOGY AND SOILS

The Project Site is located along the western margin of the Great Valley Geomorphic Province. The Fairfield area is located along the valley floor north of Suisun Bay. The Project Site is underlain primarily by alluvial fan deposits from the late Pleistocene age, consisting of interbedded sand, gravel, silt and clay (Wiegers et. al., 2006).

United States Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey indicated that there were two soil types within the Project Site. Antioch-San Ysidro complex, thick surface, zero to two percent slopes, and Yolo loam, clay substratum (NRCS, 2021a). Antioch soil series consists of moderately alkaline clay and clay loam and are on nearly level to strongly sloping alluvial fans and terraces. Yolo series consists of very deep, well drained soils that formed in alluvium from mixed rocks and are on alluvial fans and flood plains. These soils are not considered hydric soils (NRCS, 2021b). See Appendix A – Figures for the Soil Map of the Project Site.

2.0 REGULATORY AUTHORITY

2.1 FEDERAL REGULATIONS

2.1.1 Waters of the United States

The ACOE is responsible for the issuance of permits for the placement of dredged or fill material into waters of the U.S. pursuant to Section 404 of the Clean Water Act (CWA) (33 USC 1344).

In non-tidal waters the lateral extent of Federal jurisdiction is determined by the ordinary high water mark (OHWM), which is defined as the: “...*line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*” (33 CFR 328[e]). Additional physical characteristics, including matted vegetation, sediment sorting, multiple observed flow events, water staining, and others, have also been used to determine the OHWM (U.S. Army Corps of Engineers, 2005).

Wetlands could also be regulated as waters of the U.S if they were adjacent to jurisdictional waters (other than waters that are themselves wetlands). The ACOE regulation concerning wetlands adjacent to jurisdictional waters is defined at 33 CFR 328.4(c)(4).

Non-tidal waters of the U.S. The limits of jurisdiction in non-tidal waters:

- In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or
- When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands.

The term adjacent is defined at 33 CFR 328.3(C) as:

The term adjacent means bordering, contiguous, or neighboring. Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes and the like are “adjacent wetlands.”

In 2015, the ACOE and EPA issued new definitions for waters/wetlands (U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, 2015), known as the 2015 Clean Water Rule. In December 2018 the ACOE and EPA proposed a revised definition of waters of the U.S. that was published in the Federal Register in early 2019, and subsequently repealed the 2015 Clean Water Rule reverting regulation back to the 1986 regulations with subsequent guidance. On January 23, 2020, the ACOE and EPA finalized the Navigable Waters Protection Rule to define waters of the U.S and it became effective on June 23, 2020. On August 30, 2021, in the case of Pascua Yaqui Tribe v. U.S. Environmental Protection Agency, the U.S. District Court for the District of Arizona vacated and remanded the Navigable Waters Protection Rule. Subsequently, the EPA and ACOE halted implementation of the Navigable Waters Protection Rule and, until further notice, are interpreting “waters of the U.S.” consistent with the pre-2015 regulations (USEPA, 2021).

According to the USEPA, under the current implementation of CWA regulation, the term waters of the U.S. means:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
 - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the U.S. under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the U.S.

In addition, the pre-2015 regulations use the 1986 definition and subsequent guidance from previous U.S. Supreme Court decisions.

In January 2001, the U.S. Supreme Court ruled in the case of *Northern Cook County v. United States Army Corps of Engineers et al.* (SWANCC) that isolated intrastate non-navigable waters could not be considered “waters of the U.S.” under Section 404 of the Clean Water Act on the basis of the migratory bird rule (U.S. Supreme Court, 2001). Based on the SWANCC decision and subsequent guidance from the ACOE (2001), waters covered by subsection (a) (3) that could affect interstate commerce solely by virtue of their use as habitat by migratory birds were no longer considered waters of the U.S.

In 2006, the U.S. Supreme Court, in its decision in *Rapanos v. United States and Carabell v. United States* (*Rapanos* decision), revisited the jurisdictional scope of Section 404 of the CWA with respect to waters of the U.S. The Court confirmed ACOE jurisdiction over waters that have been or are navigable waters. However, disputes arose over waterbodies and wetlands associated with intermittent and ephemeral waterbodies.

The Court provided two new analytical standards for determining whether waterbodies that are not traditional navigable waters (TNWs), including wetlands adjacent to those non-TNWs, are subject to CWA jurisdiction. These standards are:

- 1) if the water body is relatively permanent, or if the water body is a wetland that directly abuts (e.g., the wetland is not separated from the tributary by uplands, a berm, dike, or similar feature) a relatively permanent water body (RPW) it is under the jurisdiction of the CWA, or
- 2) if a water body, in combination with all wetlands adjacent to that water body, has a significant nexus with TNWs, it is under the jurisdiction of the CWA.

In response to the *Rapanos* Decision, the ACOE and the U.S. EPA issued new guidance to determine over which waters bodies to assert jurisdiction (U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, 2006). The agencies will assert CWA jurisdiction over:

- a) Traditional Navigable Waters (TNWs)
- b) All wetlands adjacent to TNWs
- c) Non-navigable tributaries of TNWs that are relatively permanent tributary waters (RPW tributaries typically flow year-round or have continuous flow at least seasonally); and,
- d) Wetlands that directly abut RPWs
- e) Non-RPWs determined to have a “significant nexus” with a TNW, based on a fact-specific analysis.

The classes of water bodies that are subject to CWA jurisdiction only if such a significant nexus is demonstrated are: non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally; wetlands adjacent to such tributaries; and wetlands adjacent to but that do not directly abut a relatively permanent, non-navigable tributary. A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological integrity of a TNW. Principal considerations when evaluating significant nexus include the volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, plus the hydrologic, ecological, and other functions performed by the tributary and all of its adjacent wetlands.

2.1.2 Federal Wetlands

Wetlands are a special category of waters of the U.S., and are defined at 33 CFR 328.3(b) as: “...those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

The ACOE utilizes the *Corps of Engineers Wetland Delineation Manual* (1987), herein referred to as *1987 ACOE Manual*, to identify wetlands subject to regulatory jurisdiction (jurisdictional wetlands) under the CWA. In central and southern California, Nevada, Arizona, and the other arid regions of the western U.S. the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* prepared by the ACOE’s Engineer Research and Development Center (2008) is used to delineate jurisdictional wetlands.

The ACOE identifies jurisdictional wetlands based on a three-parameter definition using vegetation, soil, and hydrological characteristics. Excluding unusual conditions (atypical conditions or disturbed sites), all three parameters must be present for a site to be considered a jurisdictional wetland.

2.1.3 Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403)

The ACOE is also responsible for authorizing work affecting navigable waters of U.S. Structures or work under or over a navigable water of the U.S. is considered to have an impact on the navigable capacity of the waterbody (33 CFR 322.3[a]). There are no Section 10 waters on or near the Project Site.

2.1.4 Section 14 of the Rivers and Harbors Act of 1899 (33 U.S.C. 408)

The secretary of the Army may upon the recommendation of the Chief of Engineers grant other entities for the permanent or temporary alteration or use of any ACOE Civil Works Project. An alteration refers to any action by any entity other than the ACOE that builds upon, alters, improves, moves, occupies, or otherwise affects the usefulness, or the structural or ecological integrity of a ACOE project. Section 408 permission requires a determination that the requested alteration is not injurious to the public interest and will not impair the usefulness of the project. This means that ACOE has the authority to review, evaluate, and approve all alterations to federally authorized civil works projects to make sure they are not harmful to the public and still meet the project's intended purposes mandated by congressional authorization.

2.2 STATE REGULATIONS

2.2.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (CA Water Code §§ 13000-13999.10) mandates that waters of the State of California shall be protected. Current policy in California is that activities that may affect waters of the State shall be regulated to attain the highest quality. waters of the State include any surface water or groundwater, including saline waters, within the boundaries of the State. The Porter-Cologne Act establishes that the State assumes responsibility for implementing portions of the Federal CWA, rather than operating separate state and Federal water pollution control programs in California. Consequently, the State is involved in activities such as setting water quality standards, issuing discharge permits, and operating grant programs. Pursuant to Section 401 of the CWA, the ACOE cannot issue a Federal CWA permit until the State of California first issues a Water Quality Certification to ensure that a project will comply with state water quality standards. The CWA's 401 certification requirement applies to many types of permits and is an important tool for the State to control projects that might degrade state waters.

In 2019, the State Water Resources Control Board adopted the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material (Procedures), for inclusion in the Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. The Procedures consist of four major elements: 1) a wetland definition; 2) wetland delineation procedures; 3) a wetland jurisdictional framework; and 4) procedures for the submittal, review and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. The Procedures took effect in May 2020.

2.2.1.1 Waters of the State

State Water Code defines waters of the State broadly to include any surface water or groundwater including saline waters, within the boundaries of the State. These include:

- Natural wetlands;
- Wetlands created by modification of a water of the State;
- Wetlands that meet definition of waters of the U.S.; and
- Artificial wetlands that meet the following criteria:
 - o Agency approved mitigation projects,
 - o Specifically identified in a water quality control plan as a wetland or other water of the State,
 - o Resulting from historic human activity, not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape, and
 - o Greater than or equal to one acre in size, unless constructed for one of a variety of industrial or land management purposes.

2.2.1.2 State Wetland

A State wetland is defined in the new Procedures as an aquatic feature that “...*under normal circumstances has continuous or recurrent saturation of the upper substrate caused by groundwater, shallow surface water, or both; duration of saturation sufficient to cause anaerobic conditions in the upper substrate; and, vegetation that is dominated by hydrophytes or lacks vegetation.*”

If an aquatic feature meets the definition of a wetland it may be considered a water of the State.

2.2.2 California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) administers several laws and programs designed to protect fish and wildlife resources in the State of California, including Section 1602 of the California Fish and Game Code, which requires a Lake or Streambed Alteration Agreement between CDFW and any state or local governmental agency or public utility before the initiation of any construction project that will:

- Substantially divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake;
- Use materials from a streambed; or
- Result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.

Therefore, the CDFW claims jurisdiction over the bed, bank, and channel of drainage features with regard to activities regulated under Section 1602 of the California Fish and Game Code. The CDFW has adopted the same wetland definition as the USFWS, classified by the presence of only one parameter; however, CDFW does not specifically regulate wetlands.

3.0 METHODOLOGY

The fieldwork for the delineation was conducted on August 26, 2021, by Padre biologists Sarah Powell and Christina Santala within the Project Site. Prior to the field delineation, Padre conducted a literature review to determine the general character of the proposed Project Site, identify potential areas of interest, and to locate previously documented wetlands and waters. Documents and resources reviewed included the following:

- USGS 7.5-minute topographic map for Fairfield North;
- NRCS Websoil Soil Survey;
- USFWS NWI Map for the Project region;
- United States Department of Homeland Security Federal Emergency Management Agency (FEMA) flood zone map for the Project region;
- WETS Climate Table (NRCS 2021c);
- Phase I Environmental Site Assessment for 1776 Sunset Avenue, includes aerial imagery from 1937 to 2016 (Padre 2021a); and
- Biological Resources Constraints Analysis, East Tabor and Sunset Avenue, City of Fairfield (LSA, 2020).

An aquatic resources delineation study area (study area) was identified prior to beginning field surveys. The study area includes all Project permanent and temporary impact areas, staging areas, and access routes. The boundaries of the study area are depicted in the attached Figure 5-1 – Preliminary Federal Aquatic Resources Delineation Map.

3.1 WATERS OF THE UNITED STATES

Physical indicators of OHWM, such as the natural line on the bank, shelving, destruction of terrestrial vegetation, and the presence of litter and debris are used to record the location of OHWM within a waters of the U.S.

Evaluation of the extent of jurisdiction within channels (the adjacent flood control channel and the relict Laurel Creek channel) followed the guidelines of *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar et. al., 2008) and *data was recorded on the Updated Datasheet for the Identification of the OHWM in the Arid West Region of the Western United States* (Curtis and Lichvar, 2010).

3.2 WETLANDS

The ACOE has prescribed methodologies for delineating waters and wetlands pursuant to the CWA. Methods for delineating wetlands are detailed in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and further refined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Regional Supplement) (U.S. Army Corps of Engineers, 2008). These manuals require that, under normal circumstances, an area possess three technical criteria (parameters) to be designated as a jurisdictional wetland. These criteria are prevalence of hydrophytic vegetation, presence of hydric soils, and a wetland hydrology.

Sample plot locations were determined based on topography and vegetation communities within the areas of interest to characterize the features and determine potential jurisdiction. The locations of sample plots were recorded using a Global Positioning System (GPS) unit. The GPS data were used to identify sample plot locations depicted on Figure 2 – Preliminary Aquatic Resources Delineation Map, attached to this Report. The vegetation, soil, and hydrology were examined at all sample plots and approved wetland data sheets were prepared (Appendix B – Wetland Delineation Data Forms). Sampling methods are discussed in this section.

3.2.1 Hydrophytic Vegetation

Hydrophytic vegetation is plant life that occurs in areas that are frequently flooded or have saturated soil for a prolonged duration during the growing season. In accordance with ACOE methodology, for a site to display a positive wetland vegetation indicator, a dominance or prevalence of hydrophytic (water-loving) plants species must be present.

To determine the dominance or prevalence of hydrophytic vegetation, a sample plot located in the lowest topographic area of each potential seasonal wetland was selected. The plot size was determined according to the Regional Supplement. A five-foot radius plot is used in areas with only herbaceous vegetation and a 15-foot radius plot is used in areas with shrubs and sub-shrubs, and a 30-foot radius plot is used in wooded areas (U.S. Army Corps of Engineers, 2008). The shape of the sample plot areas can be adjusted in order to fit within vegetation communities observed in the field. Within each plot, the plants were identified to species using standard taxonomic references (Baldwin et. al., 2012; Mason, 1957). The hydrophytic class of each plant species was determined in accordance with the *National Wetland Plant List, version 3.4* (U.S. Army Corps of Engineers, 2018b) as facultative, facultative-wetland, or obligate wetland species.

3.2.2 Hydric Soils

At each sample plot location, a soil pit was excavated to a depth of approximately 18 inches below ground surface (bgs), where possible, to determine the extent of saturation and to examine the soil for evidence of wetland hydrology. Once the pit was excavated, a soil sample was obtained from below the A horizon, approximately 10 inches below ground surface (bgs), and examined for evidence of redoximorphic characteristics, such as low matrix chroma, gleying, and/or mottling resulting from anaerobic conditions. After moistening, the soil color was determined using Munsell soil color charts (Munsell Color, 1990). Soil texture was evaluated using field methods described by the ACOE (Environmental Laboratory, 1987). The characteristics of the soils were then compared against descriptions of soil-mapping units detailed in the Natural Resources Conservation Service Web Soil Survey (NRCS, 2020).

3.2.3 Wetland Hydrology

Hydrologic characteristics of the sample plots were evaluated by identifying primary and secondary indicators including evidence of inundation, free water in the soil pit, soil saturation, drainage patterns, oxidized root channels in the upper 12 inches of the soil, and/or surface soil cracking.

3.3 WATERS OF THE STATE

Waters of the State were determined based on field survey results from the preliminary aquatic resource delineation and map. For state jurisdictional wetlands regulated by the Regional Water Quality Control Board (RWQCB), the methodology described for Federal aquatic resource delineations was employed in the field, and data analyzed consistent with the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (SWRCB, 2019). The Procedures do not include guidance for jurisdictional determination for other waters of the State; therefore, non-wetland waters of the State regulated by RWQCB include all waters of the U.S., including features that are consistent with any current or historic final judicial interpretation of “waters of the U.S.” or any current or historic Federal regulation defining “waters of the U.S.”.

For non-wetland waters of the State regulated by CDFW, the top of bank or outside canopy boundary of riparian vegetation was used to delineate CDFW jurisdiction.

4.0 RESULTS

There were four potential aquatic features identified within the study area boundary during the August 2021 field survey consisting of the relict channel (CH-1), a seasonal wetland within the bottom of the relict channel (SW-1), the constructed Flood Control Channel located east of the property (CH-2), and an excavated feature referred to as the basin (EX-1). The results of the aquatic resources delineation field survey and the geographic extent of the preliminary jurisdictional limits of the ACOE, RWQCB, and CDFW for the aquatic features are discussed this section. Table 4-1 – Aquatic Resources Summary Table lists aquatic resource features observed and documented within the Project Site. Descriptions of each feature follow Table 4-1. See Appendix C – Photographs for representative photographs of aquatic features.

Table 4-1. Aquatic Resources Summary Table

Aquatic Resource	Dimensions				Preliminary Jurisdictional Determination
	Square Feet (ft²)	Acres (ac)	Length (ft)	Width (ft)	
Relict channel (CH-1)	23,379	0.54	665	53	CDFW
Seasonal wetland¹ (SW-1)	10,441	0.24	646	26	ACOE, RWQCB
Flood Control Channel (CH-2)	301	0.007	24	13	ACOE, RWQCB, CDFW, CVFPB²
Total Preliminary Jurisdictional Area					
Agency	Ac (ft²)		Aquatic Resources		
ACOE	0.247 (10,742)		SW-1, CH-2		
RWQCB	0.247 (10,742)		SW-1, CH-2		
CDFW	0.547 (23,680)		CH-1, CH-2		
Notes:					
¹The Seasonal Wetland is located in the bottom of the relict channel (CH-1). CH-1 does not have an OHWM, and therefore, was determined to be potentially jurisdictional based on the boundary of the seasonal wetland (SW-1) located in the bottom of the relict channel.					
²Central Valley Flood Protection Board					
NA - Not applicable					

4.1 OTHER WATERS OF THE U.S.

There were two channel features evaluated to determine whether they could be considered waters of the U.S. These include the constructed Flood Control Channel that occurs east of the site and the relict Laurel Creek channel that was cut off when the Flood Control Channel was constructed, rerouting flows around the site. Evaluation of these features as potential waters of the U.S. included a combination of desktop review (e.g., review of historic aerial imagery) and surveys for field indicators of OHWM. These features are described below.

4.1.1 Flood Control Channel

The Flood Control Channel is adjacent and parallel to the eastern boundary of the study area, and a small portion of the west bank of the Flood Control Channel occurs within the study area at a location for the proposed storm drain outfall. The Flood Control Channel runs north to south through the City of Fairfield and eventually flows into the Suisun Marsh and Suisun Bay in the Sacramento-San Joaquin Delta, and the Pacific Ocean, a TNW.

Transects were walked on the east and west banks of the Flood Control Channel to identify the OHWM. As observed, the bed and banks at the proposed outfall location were covered with a solid armoring material intended to minimize erosion within the channel. The dimensions of the armored area were approximately 130 feet long (upstream and downstream extending beyond the study area boundary), ten feet deep, and 95 feet wide. No obvious OHWM indicators were visible, and no vegetation was growing on the armored banks. There was shallow, flowing water and ponding in eroded and/or areas of sediment buildup that supported sparse to dense hydrophytic vegetation in the channel bed; however, those locations were outside of the study area boundary. No field indicators of OHWM were noted on the west bank due to the level of disturbance and the bank armoring. Shelving and an abrupt transition to upland grasses above the armored banks was the only field indicator of a potential OHWM. No stream gauges were identified on the Flood Control Channel.

4.1.2 Relict Channel

The relict channel was identified as a Riverine feature in the USFWS NWI (USFWS, 2021a). The relict channel was created as a result of construction of the flood control channel in the 1980's that diverted flows in Laurel Creek to the east of the property.

Based on review of historical imagery (Padre, 2021), Laurel Creek north of East Tabor Avenue was converted to a flood control channel with the development of residential housing sometime between 1957 and 1968. As of the 1968 aerial imagery, Laurel Creek north of East Tabor Avenue appears to be channelized and still connected via culvert to Laurel Creek in its natural configuration within the study area. Based on review of 1982 aerial imagery, prior to construction of the flood control channel east of the site, Laurel Creek flowed from north to south through the property, and apparently through culverts under East Tabor and Sunset Avenues, then continued through relatively undeveloped areas to the south. Based on review of 1993 aerial imagery, after the flood control channel east of the study area was constructed, Laurel Creek within the property still appeared to be connected via culverts under East Tabor Avenue and Sunset Avenue. Based on a review of aerial imagery between 2006 and 2016, Laurel Creek appears to have lost connectivity with the Flood Control Channel upstream and has become the distinct and disconnected relict channel that was observed onsite at the time of field surveys. A review of historic and current topographic maps shows the Laurel Creek Channel flowing through the site as an intermittent stream in its original configuration through the alignment of the relict channel.

Based on the August 2021 field visit, there was no culvert at the upstream limits of the relict channel that would convey flows under East Tabor Avenue. There was a culvert present at the downstream end, as identified and described in the Project constraint's analysis (LSA, 2020). The culvert was partially buried and covered with vegetation and debris. According to LSA, the presence of the culvert at the south end of the relict channel suggests that there is hydrological

connectivity to the other channel segments west of Sunset Avenue which after several hundred feet enters a larger City storm drain which eventually discharges to the Laurel Creek Flood Control Channel (LSA, 2020).

Within the Project Site, the relict channel was an average of approximately 600 feet long, 30 feet wide (from top of bank), and six feet deep. Transects were walked on the east and west banks of the relict channel to search for indicators of OHWM. The vegetation within the relict channel exhibited variable cover ranging from sparse to dense and was comprised of native and non-native hydrophytic and riparian herbaceous and tree species with intermittent occurrences of non-native upland grasses. The northern portion of the relict channel had recently sustained a fire as evidenced by bare, blackened soil, charred tree stumps, branches and trunks, and root sprouting from trees that were impacted by the fire. There was no surface water present at the time of the survey. The relict channel appeared to function as a water collection feature with water ponding in the bottom of the channel based on direct precipitation and overland surface flow from the immediately surrounding area. In the lower portion of the relict channel there appeared to be a connection with ground water as evidenced by saturation of the soil at the surface at SP-3A and water present in the sample pit at SP-2A (approximately 12" below ground surface) at the time of field surveys during the dry season. No evidence of flow from upstream tributaries and no OHWM field indicators were observed and as such, no cross-section sample or OHWM Arid West Data Sheet (Lichvar et. al., 2008) was completed. However, field indicators for wetland hydrology and hydrophytic plants were observed; therefore, Padre conducted a wetland delineation to map the geographic extent of the seasonal wetland that occurs within the bottom of the relict channel (see Section 4.2.1 below).

4.2 WETLANDS

There were two features evaluated to determine whether they met the three parameters for classification as a wetland. These include the seasonal wetland that occurs in the bottom of the relict channel and a topographic basin. These features are described below.

4.2.1 Seasonal Wetland

There was one seasonal wetland identified during the field survey occurring in the bottom of the relict channel as described in Section 4.1.2 above. Three representative sample locations within the potential seasonal wetland feature were chosen based on changes in vegetation cover and composition. The hydrophytic vegetation and wetland hydrology indicators were assessed, then a soil test pit was dug for hydric soil assessment. The three parameters were met at all three sample locations and paired upland sample plots were evaluated, to map the extent of the wetland feature using GPS. Appendix B – Wetland Delineation Forms contains the wetland data forms completed during the field survey.

4.2.1.1 Hydrophytic Vegetation

The seasonal wetland exhibited a distinct assemblage of hydrophytic vegetation designated as a site-specific Mixed Wetland Riparian vegetation type transitioning to Wild oats and brome grassland on the banks of the relict channel. The dominant to co-dominant species consisted of cocklebur (*Xanthium strumarium*), perennial pepperweed (*Lepidium latifolium*), and Hardstem bulrush (*Schoenoplectus acutus*) with component herbaceous and tree species including narrowleaf cattail (*Typha angustifolia*), creeping wild-rye (*Elymus triticoides*), curly dock

(*Rumex crispus*), and California black walnut. These species are hydrophytic with an indicator status ranging from facultative wetland species (plants that occur in wetlands and non-wetlands) to obligate (plants that almost always occur in wetlands). Sparse cover of upland species observed within the seasonal wetland vegetation included ambrosia (*Ambrosia psilostachya*), wild oats (*Avena barbata*), black mustard (*Brassica nigra*), and palm trees (*Washingtonia robusta* and *Phoenix* sp.). A complete list of plant species observed during the field survey is compiled and attached in Appendix D – Plant List.

4.2.1.2 Wetland Hydrology

Surveys were conducted in August 2021, during the dry season. At the time of the field survey, there was no surface water present in the seasonal wetland, though saturation was observed at SP-3A and subsurface water in the soil test pit was observed at SP-2A. The primary indicators of wetland hydrology observed at the sampled plots included presence of a high water table (A2), Saturation (A3), Drainage patterns (B10) and Dry-Season Water Table (B11). Indicators of wetland hydrology were observed within the wetland sample plots (SP-1A, SP-2A, and SP-3A).

4.2.1.3 Hydric Soils

Based on a review and analysis of the U.S. Department of Agriculture's Web Soil Survey for Solano County, the Project Site is underlain by Antioch-San Ysidro complex, thick surface, zero to two percent slopes (soil map unit symbol AsA), and Yolo loam, clay substratum (soil map unit symbol Yr) (NRCS, 2021a). These soil mapping units are described below in Table 4-2 – Soil Mapping Units and Characteristics.

Soil textures observed at the wetland sample plot locations ranged from clay to clay-loam and silty clay-loam, consistent with the soil mapping units. Soil pits were excavated at all sample plot locations and the three soil pits in the seasonal wetland (SP-1A, SP-2A, and SP-3A) met the hydric soil parameter. SP-1A had a matrix color of dark brown (7.5YR 3/2) with reddish yellow redox features (7.5YR 6/8), SP-2A had a matrix color of very dark grayish brown (10YR 3/2) in the top three inches and a matrix color of black (7.5YR 2.5/1) with strong brown (7.5YR 5/8) redox features from three to 18 inches. SP-3A had a matrix color of black (7.5YR 2.5/1) with dark reddish brown (5YR 3/4) redox features. All of the soil profiles observed at the wetland sample plots met depleted below dark surface (A11) hydric soil indicator as evidenced by values of three or less and chromas of two or less.

Soil colors at the upland sample plot locations (SP-1B, SP-2B, SP-3B, and SP-4A) tended to be lighter in color (10YR 3/3 and 7.5 YR 3/4) and lacked redox concentrations. These sample plots did not meet the hydric soil indicator.

Table 4-2. Soil Mapping Units and Characteristics at 1776 Sunset Avenue, Fairfield, CA

Soil Mapping Unit (Taxonomic Class)	Location	Typical Profile (by horizon)	Drainage Class ¹	PERM ²	AWC ³	Runoff ⁴	ERD ⁵	Hydric
Antioch-San Ysidro complex, thick surface, 0 to 2 percent slopes (AsA)	Northern portion of study area (underlies northern part of relict channel)	H1 (0-25") Sandy Loam H2 (25-35") Clay loam H3 (35-54") Sandy clay loam H4 (54-68") Stratified sandy loam to clay loam	4	-	2	5	3	No
Yolo loam, clay substratum (Yr)	Southern portion of study area (underlies southern part of relict channel)	H1 (0-28") Loam H2 (28-45") Loam H3 (45-60") clay	3	-	3	3	2	No

¹Drainage Class

1. Excessively drained
2. Somewhat excessively drained
3. Well drained
4. Moderately well drained
5. Somewhat poorly drained
6. Poorly drained
7. Very poorly drained

²PERM (Permeability)

- 1 Very slow (< 0.06 inch)
- 2 Slow (0.06 to 0.2 inch)
- 3 Moderately slow (0.2 to 0.6 inch)
- 4 Moderate (0.6 to 2 inches)
- 5 Moderately rapid (2 to 6 inches)
- 6 Rapid (6 to 20 inches)
- 7 Very rapid (>20 inches)

³AWC (Available Water Capacity)

- 1 Very low (0 to 2.5 inches)
- 2 Low (2.5 to 5 inches)
- 3 Moderate (5 to 7.5 inches)
- 4 High (7.5 to 10 inches)
- 5 Very High (> 10 inches)

⁴Surface Runoff

- 1 Negligible
- 2 Very low
- 3 Low
- 4 Medium
- 5 High
- 6 Very high

⁵ERD (Effective Rooting Depth)

- 1 Very deep (> 60 inches)
- 2 Deep (40 to 60 inches)
- 3 Moderately deep (20 to 40 inches)
- 4 Shallow (10 to 20 inches)
- 5 Very shallow (< 10 inches)

4.3 BASIN

The Basin was a linear feature located in the south-central portion of the Project Site and was characterized as distinct topographical depression with a culvert at the western end, and approximately 210 feet long and 32 feet wide for a total of approximately 4,600 square feet (0.1 acre) in size. There was a culvert located at the west end of the basin; however, the culvert was almost completely buried. No indicators of OHWM were observed on this feature, but because of the potential for the topographic depression to collect water, the presence of a culvert to convey water, and the observation of hydrophytic species within the basin, a sample plot was positioned in the basin where the highest density of hydrophytic species was observed to determine if the basin met the three parameters for consideration as a wetland. Although some facultative species were noted at this location, the dominance test and the prevalence index were not met; therefore, the hydrophytic vegetation indicator was not met. In addition, the soils did not meet any of the hydric soil indicators and no indicators of wetland hydrology were observed. The basin feature did not meet any of the three parameters for consideration as a wetland and was not mapped as an aquatic feature.

5.0 JURISDICTIONAL DETERMINATION

Aquatic resources mapped and evaluated during the August 2021 field survey includes the relict channel (CH-1), one seasonal wetland (SW-1), and one man-made Flood Control Channel (CH-2).

5.1 FEDERAL JURISDICTIONS

5.1.1 Relict Channel and Seasonal Wetland

The relict channel did not have indicators of OHWM and has been disconnected from the upstream connectivity with the Flood Control Channel; therefore, it was not mapped as other waters of the U.S. However, the seasonal wetland in the channel bottom was considered potentially jurisdictional based on the presence of the three wetland indicators. Sample plots 1B, 2B, and 3B served as paired datapoints to wetland sample plots 1A, 2A, and 3A for the purposes of determining the geographic extent of the seasonal wetland within the channel bottom. While there is not enough flow through the relict channel to create an OHWM, there may still be flowing water through the relict channel from the collection of surface water draining from the Project Site and potential for connectivity to TNW downstream of the Project Site based on the presence of a culvert under Sunset Avenue suggesting connectivity to other channel segments south and west of the study area. Additionally, it was noted that the relict channel segments enter City storm drains that discharge to the Flood Control Channel (LSA, 2020). Therefore, the seasonal wetland within the relict channel is potentially jurisdictional as an adjacent wetland with surface or subsurface connectivity to a water of the U.S. downstream of the study area.

On the basis of this delineation, a total of 0.24-acre of seasonal wetland occurring within the bottom of the relict channel may be connected to offsite wetlands and waters of the U.S. and is potentially considered federally jurisdictional.

5.1.2 Flood Control Channel

The Flood Control Channel is a man-made feature that was constructed in the 1980's as part of the Fairfield Vicinity Streams Flood Control Project (LSA, 2020). The Flood Control Channel is part of the Federal and state flood control system within an Adopted Plan of Flood Control, as defined by California Code of Regulations Title 23 and is under the jurisdiction of the Central Valley Flood Protection Board.

The feature contains perennial to intermittent surface flows and supports hydrophytic vegetation along much of its extent. The portion of the Flood Control Channel within the study area is limited to a small area on the west bank that is proposed for construction of an outfall feature for drainage of the subject property. The Flood Control Channel is considered a perennial water of the U.S. and is considered federally jurisdictional.

A total of 0.007-acres of Federal jurisdictional waters of the U.S. occur within the study area below the OHWM on the west bank of the Flood Control Channel.

5.2 STATE JURISDICTION

Data collected during delineation field surveys was analyzed to determine the geographic extent of state jurisdiction(s) within the study area, including waters of the State under RWQCB jurisdiction, and stream features under CDFW jurisdiction.

5.2.1 Relict Channel and Seasonal Wetland

5.2.1.1 Regional Water Quality Control Board

The seasonal wetland met the definition of waters of the State, defined as any surface water or groundwater, including saline waters, within the boundary of the State. The seasonal wetland also met the State definition of a wetland as any area that under normal circumstances, has (1) continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation sufficient to cause anaerobic conditions in the upper substrate; and, (3) supports vegetation dominated by hydrophytes or lacks vegetation. Therefore, the seasonal wetland is considered a State wetland and jurisdictional waters of the State.

The Procedures do not include guidance for jurisdictional determinations for other waters of the State. Because the relict channel does not have an OHWM and is not considered a water of the U.S. outside the limits of the seasonal wetland in the channel bottom, the relict channel is not considered waters of the State based on the definitions at 23 CCR 3831(w). Therefore, the limits of waters of the State are consistent with the limits of waters of the U.S. on this feature.

5.2.1.2 California Department of Fish and Wildlife

The bed and bank of the relict channel is potentially a 1600 jurisdictional stream feature under California Fish and Game Code Section 1602 jurisdiction. CDFW typically extends jurisdiction to top of bank or limits of riparian vegetation. There is no riparian corridor on the relict channel; therefore, potential CDFW jurisdiction extends to top of bank.

5.2.2 Flood Control Channel

5.2.2.1 Regional Water Quality Control Board

The Flood Control Channel is considered a perennial water of the U.S. All waters of the U.S. are also considered waters of the State; therefore, the Flood Control Channel meets the definition of a water of the State. The portion of the Flood Control Channel within the study area is limited to a small area on the west bank that is proposed for construction of an outfall feature for drainage of the subject property. This area is subject to RWQCB jurisdiction.

5.2.2.2 California Department of Fish and Wildlife

The bed, bank, and channel of the Flood Control Channel is under CDFW Section 1600 jurisdiction. The portion of the Flood Control Channel within the study area is limited to a small area on the west bank that is proposed for construction of an outfall feature for drainage of the subject property. This area is subject to CDFW jurisdiction.

5.3 CONCLUSION

On the basis of the field delineation and data analysis, it has been concluded that the study area supports approximately 0.247 acres of potentially Federal jurisdictional waters of the U.S. (under ACOE jurisdiction) within the seasonal wetland feature in the bottom of the relict channel and the Flood Control Channel adjacent to the Project Site. Additionally, it has been concluded that the study area contains approximately 0.247 acres of potentially state jurisdictional aquatic resources under RWQCB jurisdiction and 0.547 acre under CDFW jurisdiction. These preliminary jurisdictional findings are subject to the verification and approval of the ACOE, RWQCB, and/or CDFW.

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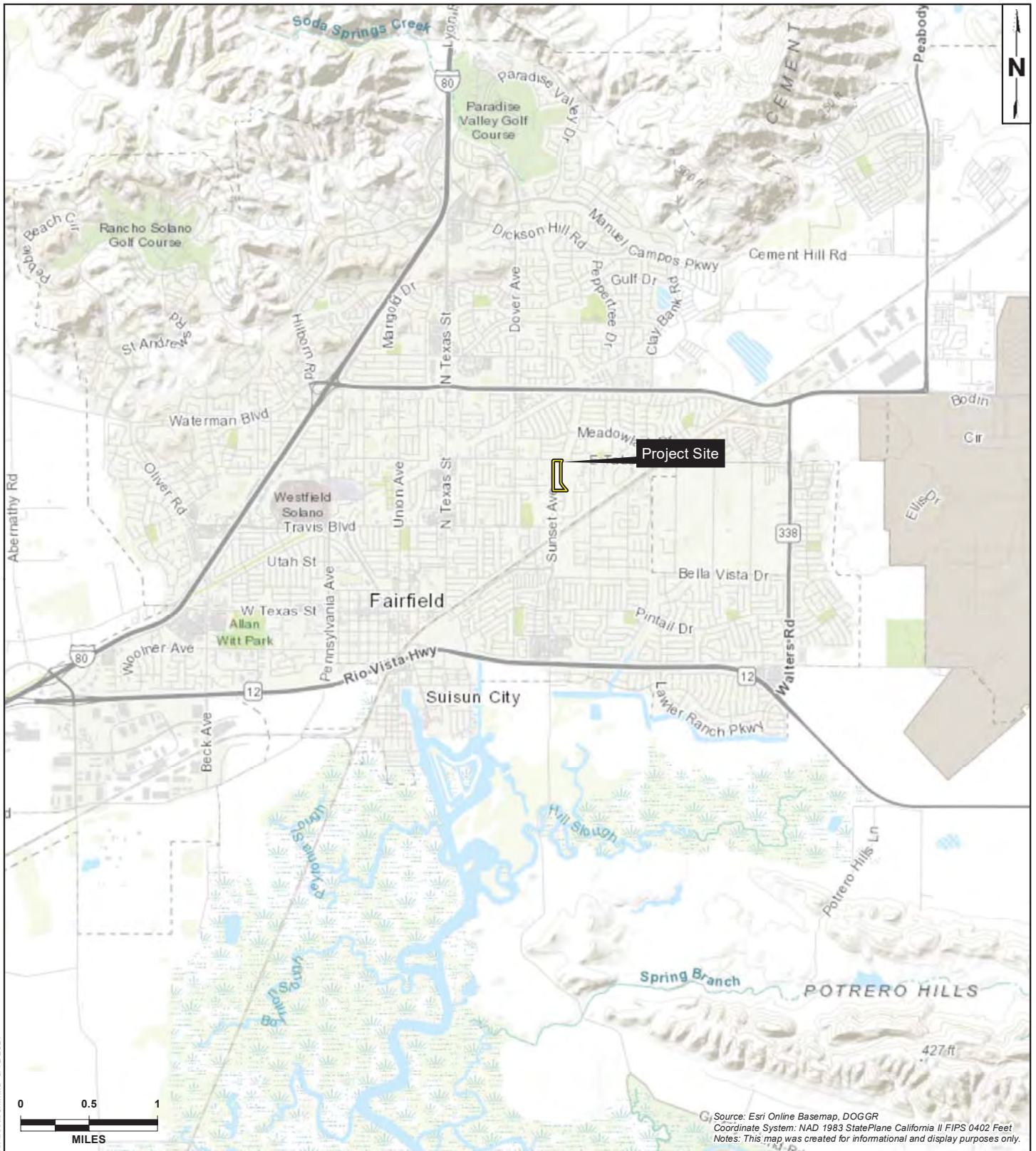
FIGURES

Figure 1. Project Location

Figure 2. Preliminary Aquatic Resources Delineation Map

Figure 3. National Wetland Inventory and FEMA Map

Figure 4. Soils Map



LEGEND:
 Project Boundary

MAP EXTENT:

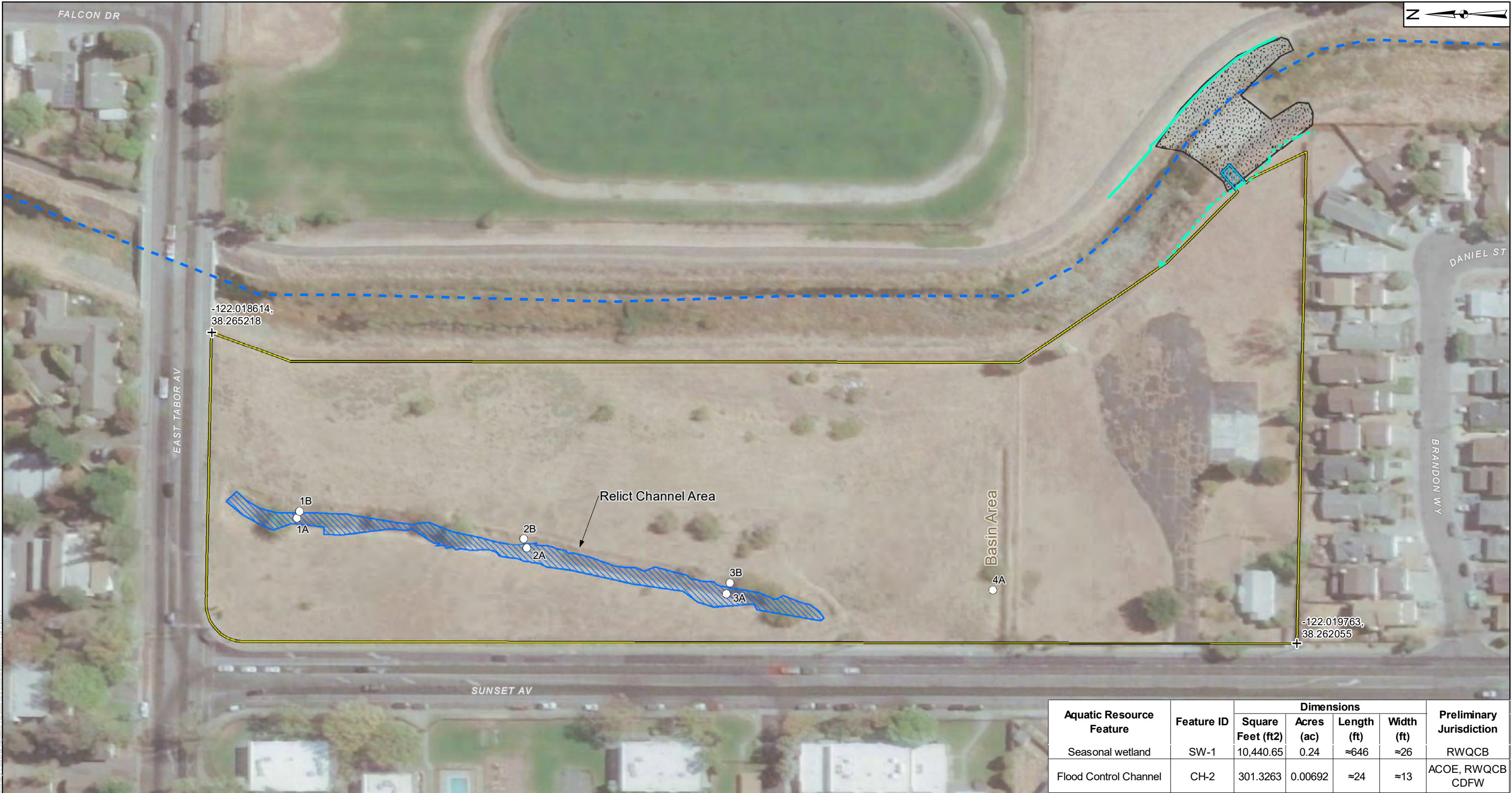


padre
 associates, inc.
 ENGINEERS, GEOLOGISTS &
 ENVIRONMENTAL SCIENTISTS

PROJECT NAME: ARRIVE FAIRFIELD LUXURY TOWNHOMES FAIRFIELD, CA	
PROJECT NUMBER: 2102-0373	DATE: October 2021

PROJECT LOCATION

FIGURE
1



LEGEND:

- Sample Plot Location

+

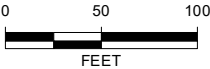
 Control Point
- OHWM

Potential OHWM
- Offsite Flood Control Channel

Armored Area; Bed and Bank
- Flood Control Channel

Seasonal wetland (SW-1)
- Study Area Boundary

Aquatic Resource Feature	Feature ID	Dimensions				Preliminary Jurisdiction
		Square Feet (ft2)	Acres (ac)	Length (ft)	Width (ft)	
Seasonal wetland	SW-1	10,440.65	0.24	≈646	≈26	RWQCB
Flood Control Channel	CH-2	301.3263	0.00692	≈24	≈13	ACOE, RWQCB CDFW

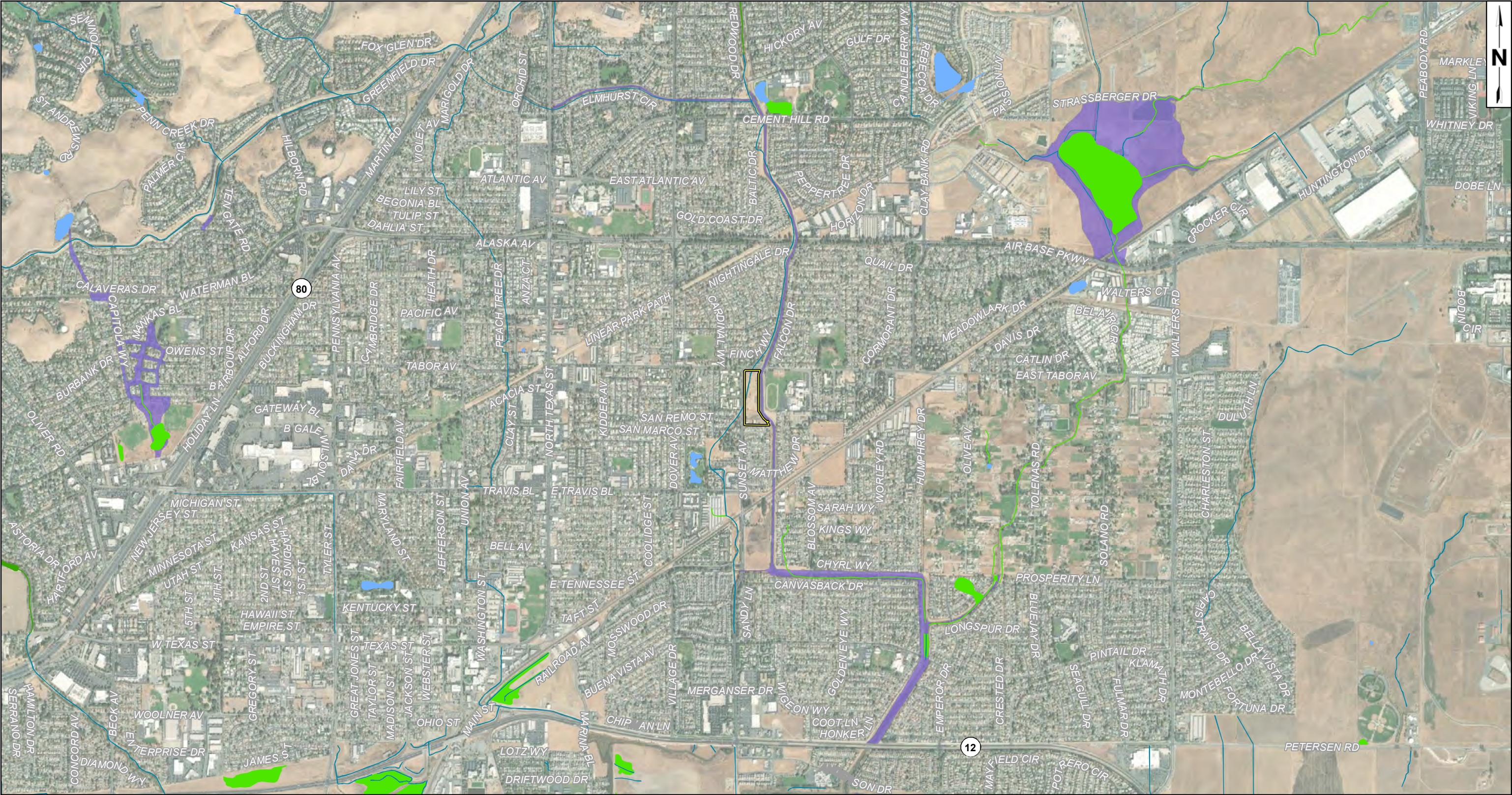


Source: Sources, Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: ARRIVE FAIRFIELD LUXURY TOWNHOMES FAIRFIELD, CA	
PROJECT NUMBER: 2102-0373	DATE: October 2021

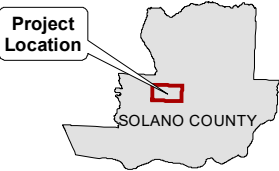
**PRELIMINARY FEDERAL AQUATIC
RESOURCES DELINEATION MAP**



LEGEND:

- 100 Year Flood Area - 1.0% Annual Chance
- NWI Feature Type**
 Freshwater Emergent Wetland
 Freshwater Forested/Shrub Wetland
- Freshwater Pond
 Riverine

MAP EXTENT:



Source: Esri Online Imagery Basemap, County of Solano,
U.S. Fish and Wildlife Services, FEMA
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: CF = Channel Feature; NWI = National Wetland Inventory
This map was created for informational and display purposes only.



PROJECT NAME: ARRIVE FAIRFIELD LUXURY TOWNHOMES, FAIRFIELD, CA	
PROJECT NUMBER: 2102-0373	DATE: October 2021

NWI AND FEMA MAP

Custom Soil Resource Report Soil Map



Figure 4
Map and Map legend/Information from
USDA NRCS Web Soil Survey Results
Online Survey completed on
September 10, 2021 by Padre Associates.

Custom Soil Resource Report

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 1:24,000.

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: Solano County, California
Survey Area Data: Version 14, May 29, 2020

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

Date(s) aerial images were photographed: Mar 30, 2019—Apr 17, 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
AsA	Antioch-San Ysidro complex, thick surface, 0 to 2 per cent slopes	8.0	83.2%
Yr	Yolo loam, clay substratum	1.6	16.8%
Totals for Area of Interest		9.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

APPENDIX A

WETS Table

WETS Table

WETS Station: FAIRFIELD, CA								
Requested years: 1941 - 2021								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	55.9	38.1	47.0	4.72	2.01	5.75	8	0.0
Feb	61.9	41.3	51.6	4.05	1.70	4.74	7	0.0
Mar	66.1	43.6	54.8	3.12	1.47	3.81	6	0.0
Apr	71.4	46.2	58.8	1.42	0.51	1.71	3	0.0
May	78.0	50.5	64.2	0.49	0.13	0.47	1	0.0
Jun	84.9	54.3	69.6	0.15	0.00	0.09	0	0.0
Jul	89.2	56.2	72.7	0.02	0.00	0.00	0	0.0
Aug	88.8	56.3	72.6	0.05	0.00	0.00	0	0.0
Sep	86.8	54.8	70.8	0.22	0.00	0.16	1	0.0
Oct	78.4	50.2	64.3	1.20	0.38	1.27	2	0.0
Nov	65.5	43.1	54.3	2.70	1.08	3.24	5	0.0
Dec	56.3	38.1	47.2	4.32	1.93	5.22	7	0.0
Annual:					18.50	26.44		
Average	73.6	47.7	60.7	-	-	-	-	-
Total	-	-	-	22.48			40	0.0

GROWING SEASON DATES

Years with missing data:	24 deg = 29	28 deg = 30	32 deg = 23
Years with no occurrence:	24 deg = 46	28 deg = 20	32 deg = 4
Data years used:	24 deg = 52	28 deg = 51	32 deg = 58
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	1/4 to 1/1: 362 days	2/12 to 12/7: 298 days
70 percent *	No occurrence	No occurrence	1/29 to 12/21: 326 days
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)													
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1950												M3.86	3.86
1951	3.40	2.10	2.19	0.98	M0.83	0.00	0.00	0.00	MT	M1.28	4.84	8.25	23.87
1952	9.00	M1.31	2.68	0.77	0.27	0.40	M0.00	T	M0.00	M0.00	M2.08	M7.79	24.30
1953	4.31	T	M2.26	M2.58	M0.35	M0.38	0.00	0.04	M0.00	M0.00	M2.93	0.72	13.57
1954	M3.02	2.94	M2.76	1.97	0.17	M0.00	M0.00	M0.00	0.00	M0.00	M0.00	M4.96	15.82
1955	3.16	M1.61	0.53	2.21	0.32	M0.00	M0.00	0.00	0.28	M0.05	2.06	13.66	23.88
1956	7.89	2.11	M0.32	1.10	M0.08	0.04	0.00	0.00	0.55	M0.41	0.12	M0.33	12.95
1957	M2.48	4.46	M1.69	1.61	M0.73	0.00	M0.00	M0.00	M0.41	3.66	0.37	2.73	18.14

1958	M4.22	9.55	6.02	4.33	0.64	0.33	0.15	0.07	0.04	0.13	0.08	26.66
1959	5.19	5.59	1.05	0.19	T	0.00	0.00	T	2.49	0.00	T	16.85
1960	3.11	4.79	2.21	1.05	0.74	0.00	T	0.00	0.00	0.13	M3.01	16.59
1961	4.06	0.96	1.92	0.71	0.20	0.04	0.00	0.05	0.15	M0.18	4.01	14.62
1962	0.80	6.25	3.05	0.22	0.00	0.00	0.00	0.00	T	7.85	0.16	20.91
1963	5.32	2.67	3.59	5.49	0.45	0.09	0.00	T	0.40	1.77	2.80	23.06
1964	3.22	0.00	1.91	0.12	0.22	0.93	0.04	0.05	0.00	2.23	2.85	16.58
1965	4.34	0.00	1.35	2.94	0.12	0.00	0.00	0.43	0.00	0.00	4.94	16.75
1966	4.46	2.49	0.26	0.34	0.45	0.00	0.08	0.18	0.37	0.00	5.68	18.70
1967	9.90	0.31	4.17	4.78	0.12	1.45	T	T	0.05	0.36	1.36	24.25
1968	4.93	3.11	2.31	0.29	0.40	0.00	0.00	1.18	0.00	0.75	3.55	20.96
1969	9.80	7.04	1.95	1.25	0.00	0.10	0.00	0.00	0.00	2.12	0.46	28.88
1970	11.75	1.36	1.86	0.16	0.00	0.39	0.00	0.00	0.00	0.76	5.94	28.22
1971	1.86	0.26	2.72	0.22	0.69	0.00	0.00	0.00	0.15	0.06	2.20	12.32
1972	1.30	1.54	0.19	1.00	0.02	0.20	0.00	0.00	0.98	4.60	6.73	18.23
1973	11.54	5.62	2.71	0.19	0.14	0.00	0.00	0.00	0.35	1.66	7.20	34.14
1974	3.64	1.06	4.61	1.80	0.11	0.00	0.60	0.00	0.00	1.29	0.88	17.78
1975	1.16	7.03	5.58	1.13	0.07	0.10	0.06	0.14	0.03	3.50	0.44	19.54
1976	0.52	1.31	1.89	0.86	0.00	0.01	0.00	0.66		0.33	1.02	7.86
1977	1.89	1.06	2.13	0.14	0.81	T	0.00	0.00	1.08	0.42	5.44	18.48
1978	9.73	5.25	5.12	2.02	0.05	0.05	0.00	0.00	0.23	0.00	1.67	24.96
1979	9.13	4.31	1.93	1.19	0.59	0.00	0.00	0.00	0.00	2.38	2.47	28.58
1980	6.94	10.33	3.58	1.24	0.34	0.01	0.13	0.00	0.00	0.20	0.08	25.52
1981	M5.14	1.11	3.74	0.36	0.04	0.00	0.00	0.00	0.19	1.40	5.91	23.61
1982	8.12	3.82	6.14	5.05	0.00	0.01	T	0.00	1.11	2.79	4.32	33.87
1983	5.78	8.72	10.89	3.06	0.79	M0.00	0.00	0.01	0.74	0.30	6.51	44.28
1984	0.30	1.49	1.17	0.80	T	0.08	0.00	0.17	0.10	1.96	6.52	13.85
1985	0.68	1.95	4.14	0.06	0.06	0.02	0.00	0.00	0.30	0.65	4.32	15.23
1986	4.57	11.30	5.61	0.99	0.19	0.00	0.00	0.00	1.09	0.38	0.10	25.37
1987	3.02	4.12	3.14	0.08	0.07	0.00	0.00	0.00	0.00	0.95	2.97	19.98
1988	5.62	0.39	0.26	1.49	0.68	0.36	0.00	T	0.00	0.17	3.86	16.76
1989	1.05	1.82	5.23	0.37	0.01	0.21	0.00	0.00	1.37	1.59	1.66	13.31
1990	4.26	2.44	0.80	0.24	3.25	0.00	0.00	0.00	0.26	0.23	0.35	12.83
1991	0.47	3.21	9.17	0.31	0.09	0.02	0.00	0.02	0.00	1.99	0.67	18.37

1992	2.18	7.09	4.14	0.63	0.00	0.49	0.00	0.00	0.00	3.17	0.26	9.55	27.51
1993	10.57	5.79	3.54	M0.55	M0.86	M0.96	0.00	0.00	0.00	0.59	2.65	2.39	27.90
1994	2.71	4.48	0.14	M1.19	1.26	0.00	0.00	0.00	0.02	0.28	5.30	4.49	19.87
1995	12.47	0.14	9.21	0.88	1.21	1.83	0.00	0.00	0.00	0.07	0.01	10.02	35.84
1996	8.65	8.34	2.32	2.18	M3.03	0.00	0.00	0.00	0.00	1.61	3.58	11.67	41.38
1997	11.07	0.28	0.52	0.20	M0.47	0.27	0.00	0.41	0.00	0.81	6.73	2.30	23.06
1998	8.95	14.71	2.35	2.30	3.29	0.00	0.00	0.00	0.34	0.71	4.29	1.57	38.51
1999	2.11	6.97	2.85	1.73	0.03	0.00	0.00	0.00	0.04	0.56	2.91	0.52	17.72
2000	5.98	11.25	2.87	1.29	0.98	0.17	0.00	0.00	0.08	2.54	1.15	1.13	27.44
2001	3.36	6.35	1.37	0.62	0.00	0.08	0.00	0.00	0.20	0.50	4.47	10.23	27.18
2002	3.10	1.37	1.95	0.10	1.33	0.00	0.00	0.00	0.00	0.00	3.80	13.86	25.51
2003	2.42	1.53	2.00	2.92	1.02	0.00	0.00	0.33	0.00	0.00	1.08	6.72	18.02
2004	2.84	7.68	0.91	0.16	0.05	0.00	0.00	0.00	0.04	2.30	3.30	6.66	23.94
2005	5.52	4.24	4.28	1.43	1.46	0.28	0.00	0.00	0.01	0.24	2.16	16.69	36.31
2006	4.13	4.02	8.87	4.96	0.60	0.00	0.00	0.00	0.00	0.12	2.55	3.41	28.66
2007	0.20	4.38	0.11	2.05	0.55	0.00	0.00	0.00	0.38	2.22	0.92	4.35	15.16
2008	7.80	3.96	0.46	0.05	0.00	0.00	0.00	0.00	0.00	0.45	2.67	2.87	18.26
2009	1.55	9.31	2.39	1.10	1.13	0.00	0.00	0.00	0.04	5.71	0.69	2.13	24.05
2010	8.29	4.14	1.66	3.43	0.98	0.00	0.00	0.00	0.03	2.38	2.50	7.13	30.54
2011	0.55	4.26	5.05	0.39	0.96	1.21	0.00	0.00	0.00	1.65	1.25	0.23	15.55
2012	0.55	1.04	6.77	M2.31	M0.04	0.03	M0.00	M0.00	0.00	1.48	M4.75	7.73	24.70
2013	0.60	M0.11	1.07	1.41	M0.37	M0.00	M0.00	M0.00	M1.10	M0.00	M1.28	0.74	6.68
2014	M0.26	9.58	2.66	M2.39	0.00	0.00	0.00	0.05	0.82	0.78	2.29	M10.44	29.27
2015	0.01	1.99	0.16	1.26	0.00	0.16	0.04	0.00	M0.00	0.12	2.08	4.01	9.83
2016	9.25	0.59	6.92	0.59	0.35	0.00	0.00	0.00	0.00	2.65	2.29	5.12	27.76
2017	13.87	11.47	3.49	3.40	0.00	0.32	0.00	0.00	0.02	0.14	2.69	0.03	35.43
2018	3.43	0.32	4.79	3.32	0.04	0.00	0.00	0.00	0.00	0.07	4.52	2.87	19.36
2019	6.29	10.43	5.57	0.36	2.83	0.00	0.00	0.00	0.00	0.00	M0.57	7.37	33.42
2020	1.56	0.00	1.84	0.83	0.71	0.00	0.00	0.00	0.00	0.00	1.35	2.03	8.32
2021	4.02	2.55	1.91	0.02	0.00	0.00	0.00	0.00					8.50

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

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

Creation date: 2021-09-10

APPENDIX B

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fairfield Bio & wetland; Sunset City/County: Fairfield Sampling Date: 8/26/2021
 Applicant/Owner: TK Consulting State: CA Sampling Point: CH-1A
 Investigator(s): Christina Santala, Sarah Powell Section, Township, Range: S19 T05N R01W
 Landform (hillslope, terrace, etc.): Channel Local relief (concave, convex, none): Concave Slope (%): Vert to flat
 Subregion (LRR): C Lat: 30.264980 Long: -122.019309 Datum:
 Soil Map Unit Name: Yolo loam NWI classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☒ Soil ☒ or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☒
Hydric Soil Present? Yes ☒ No ☐	
Wetland Hydrology Present? Yes ☒ No ☐	
Remarks: <u>Sample plot in bottom of "disturbed" channel, area recently burned, used as homeless encampment</u> <u>the "disturbed" area is the same area as the sample plot area.</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Juglans</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. <u></u>				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. <u></u>				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. <u></u>				
= Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet:
1. <u>Juglans hindsii (or english?)</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: <u>25</u> Multiply by:
2. <u></u>				OBL species <u>0</u> x 1 = <u>0</u>
3. <u></u>				FACW species <u>0</u> x 2 = <u>0</u>
4. <u></u>				FAC species <u>0</u> x 3 = <u>0</u>
5. <u></u>				FACU species <u>0</u> x 4 = <u>0</u>
= Total Cover				UPL species <u>0</u> x 5 = <u>0</u>
Herb Stratum (Plot size: <u>5'</u>)				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. <u>Xanthium strumarium</u>	<u>55</u>	<u>Y</u>	<u>FAC</u>	Prevalence Index = B/A = <u>0</u>
2. <u>Lepidium latifolium</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	
3. <u>Typha angustifolia</u>	<u>3</u>	<u>N</u>	<u>OBL</u>	
4. <u>Atriplex sp.</u>	<u>1</u>	<u>N</u>	<u></u>	
5. <u>Brassica nigra</u>	<u>1</u>	<u>N</u>	<u></u>	
6. <u>Avena barbata</u>	<u>1</u>	<u>N</u>	<u></u>	
7. <u>Ambrosia</u>	<u>1</u>	<u>N</u>	<u></u>	
8. <u></u>				
= Total Cover				
Woody Vine Stratum (Plot size: <u></u>)				
1. <u></u>				
2. <u></u>				
= Total Cover				
% Bare Ground in Herb Stratum <u></u>	% Cover of Biotic Crust <u></u>			

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%
☐ Prevalence Index is ≤3.0¹
☐ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present?

Yes ☒ No ☐

Remarks:

Juglans dominant (shrubs)

SOIL

Sampling Point:

CH 1A

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

[illegible]

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

Indicators for Problematic Hydric Soils³:

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

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Remarks: Used 2017 Pocket guide for hydric soils → confirmed / keyed indicators

HYDROLOGY

ARID WEST - check secondarys

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

Remarks: Moist soil start @ 2" below surface. Secondary indicators. Related to water table.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fairheld Bio-wetland/Sunset Ave. City/County: Fairheld Sampling Date: 8/26/21
 Applicant/Owner: TK Consulting State: CA Sampling Point: CHIB (paired pt)
 Investigator(s): C. Santala, S. Powell Section, Township, Range: S19 T05 R01W
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): concave Slope (%): 30%
 Subregion (LRR): C Lat: 38.264973 Long: -122.019271 Datum: _____
 Soil Map Unit Name: Yolo loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ☒
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No ☒
Hydric Soil Present? Yes _____ No _____	
Wetland Hydrology Present? Yes _____ No _____	
Remarks: <u>Sample point on bank in patch of Elymus triticoides</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. _____				
2. _____				
3. _____				
4. _____				
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>50</u> x 3 = <u>150</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>2</u> x 5 = <u>10</u> Column Totals: <u>52</u> (A) <u>160</u> (B) Prevalence Index = B/A = <u>3.1</u>
Sapling/Shrub Stratum (Plot size: _____)				
1. <u>Juglans</u>	<u>2</u>	<u>Y</u>	<u>up</u>	
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				Hydrophytic Vegetation Indicators: _____ Dominance Test is >50% ☒ Prevalence Index is ≤3.0' _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)
Herb Stratum (Plot size: <u>15'</u>)				
1. <u>Elymus triticoides</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Malvella</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	
3. <u>Lepidium latifolium</u>	<u>8</u>	<u>N</u>		
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: _____)				
1. _____				
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum _____	% Cover of Biotic Crust _____			Hydrophytic Vegetation Present? Yes _____ No ☒
Remarks: <u>Bareground, dry, green veg</u>				

SOIL

Sampling Point: CH 1B

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
☐ Surface Water (A1)	☐ Salt Crust (B11)	☐ Water Marks (B1) (Riverine)
☐ High Water Table (A2)	☐ Biotic Crust (B12)	☐ Sediment Deposits (B2) (Riverine)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Drift Deposits (B3) (Riverine)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)	☐ Drainage Patterns (B10)
☐ Sediment Deposits (B2) (Nonriverine)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Dry-Season Water Table (C2)
☐ Drift Deposits (B3) (Nonriverine)	☐ Presence of Reduced Iron (C4)	☐ Crayfish Burrows (C8)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Saturation Visible on Aerial Imagery (C9)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)	☐ Shallow Aquitard (D3)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)	☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes _____ No ☒ Depth (inches): _____ Saturation Present? Yes _____ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fairheld Bio Wetland: smelter City/County: Fairheld Sampling Date: 8/26/21
 Applicant/Owner: TK Consulting State: CA Sampling Point: CH-2A
 Investigator(s): C. Santala, S. Powe Section, Township, Range: S19 T05N R01W
 Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-45%
 Subregion (LRR): CA 10082 Lat: 38.264330 Long: -122.019398 Datum:
 Soil Map Unit Name: Ancho-San Ysidro Complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No ☒
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ☒ No <u></u>	Is the Sampled Area within a Wetland? Yes ☒ No <u></u>
Hydric Soil Present? Yes ☒ No <u></u>	
Wetland Hydrology Present? Yes ☒ No <u></u>	
Remarks: <u>Disturbed site, relict channel, urban area</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Palm (Pinnate)</u>				
2. <u></u>				
3. <u></u>				
4. <u></u>				
= Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u></u> x 1 = <u></u> FACW species <u></u> x 2 = <u></u> FAC species <u></u> x 3 = <u></u> FACU species <u></u> x 4 = <u></u> UPL species <u></u> x 5 = <u></u> Column Totals: (A) <u></u> (B) <u></u> Prevalence Index = B/A = <u></u>
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Palm (Pinnate)</u>	<u>1</u>	<u>N</u>		
2. <u></u>				
3. <u></u>				
= Total Cover				
Herb Stratum (Plot size: <u>15'</u>)				Hydrophytic Vegetation Indicators: ☒ Dominance Test is >50% ☐ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Lepidium latifolium</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Rumex crispus</u>	<u>2</u>	<u>N</u>	<u>FAC</u>	
3. <u>Ambrosia</u>	<u>2</u>	<u>N</u>		
4. <u></u>				
5. <u></u>				
6. <u></u>				
7. <u></u>				
8. <u></u>				
= Total Cover				
Woody Vine Stratum (Plot size: <u></u>)				Hydrophytic Vegetation Present? Yes ☒ No <u></u>
1. <u></u>				
2. <u></u>				
= Total Cover				
% Bare Ground in Herb Stratum <u></u> % Cover of Biotic Crust <u></u>				
Remarks: <u>No standing water; lepidium generally remnant but identifiable; some live Palm is a sapling</u>				

SOIL

Sampling Point: CH2A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/2	100					clay loam	
3-18	7.5YR 2.5/1	99	7.5YR 5/8	1			silty clay loam	

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

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

Indicators for Problematic Hydric Soils³:

- | | | |
|---|---|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) | ☐ 1 cm Muck (A9) (LRR C) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) | ☐ 2 cm Muck (A10) (LRR B) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) | ☐ Reduced Vertic (F18) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) | ☐ Red Parent Material (TF2) |
| ☐ Stratified Layers (A5) (LRR C) | ☐ Depleted Matrix (F3) | ☒ Other (Explain in Remarks) |
| ☐ 1 cm Muck (A9) (LRR D) | ☐ Redox Dark Surface (F6) | |
| ☒ Depleted Below Dark Surface (A11) | ☐ Depleted Dark Surface (F7) | |
| ☐ Thick Dark Surface (A12) | ☐ Redox Depressions (F8) | |
| ☐ Sandy Mucky Mineral (S1) | ☐ Vernal Pools (F9) | |
| ☐ Sandy Gleyed Matrix (S4) | | |

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

X molusk/inverte shell

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|--|--|
| ☐ Surface Water (A1) | ☐ Salt Crust (B11) | ☐ Water Marks (B1) (Riverine) |
| ☒ High Water Table (A2) | ☐ Biotic Crust (B12) | ☐ Sediment Deposits (B2) (Riverine) |
| ☒ Saturation (A3) | ☒ Aquatic Invertebrates (B13) | ☐ Drift Deposits (B3) (Riverine) |
| ☐ Water Marks (B1) (Nonriverine) | ☐ Hydrogen Sulfide Odor (C1) | ☐ Drainage Patterns (B10) |
| ☐ Sediment Deposits (B2) (Nonriverine) | ☐ Oxidized Rhizospheres along Living Roots (C3) | ☐ Dry-Season Water Table (C2) |
| ☐ Drift Deposits (B3) (Nonriverine) | ☐ Presence of Reduced Iron (C4) | ☐ Crayfish Burrows (C8) |
| ☐ Surface Soil Cracks (B6) | ☐ Recent Iron Reduction in Tilled Soils (C6) | ☐ Saturation Visible on Aerial Imagery (C9) |
| ☐ Inundation Visible on Aerial Imagery (B7) | ☐ Thin Muck Surface (C7) | ☐ Shallow Aquitard (D3) |
| ☐ Water-Stained Leaves (B9) | ☐ Other (Explain in Remarks) | ☐ FAC-Neutral Test (D5) |

Field Observations:

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

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

Saturation Present? Yes _____ No _____ Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

Water table 12" from top

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fairheld Bio-wetland; sunset Ave City/County: Fairheld Sampling Date: 8/26/21
 Applicant/Owner: TK Consulting State: CA Sampling Point: CH 28 (paired pt)
 Investigator(s): C. Sambala, S. Powell Section, Township, Range: S19 T05N R01W
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): _____ Slope (%): 0-1
 Subregion (LRR): Central Coast Lat: 38.264334 Long: -122.019384 Datum: _____
 Soil Map Unit Name: Anhoch-San Ysidro complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
Remarks:		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
1. _____				
2. _____				
3. _____				
4. _____				
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: _____) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover				
Herb Stratum (Plot size: _____) 1. <u>Avena sp.</u> <u>40</u> <u>Y</u> <u>UP</u> 2. <u>Bromus diandrus</u> <u>40</u> <u>Y</u> <u>UP</u> 3. <u>Ambrosia sp.</u> <u>1</u> <u>N</u> <u></u> 4. <u>Malva parviflora</u> <u>1</u> <u>N</u> <u></u> 5. <u>Lactuca scariola</u> <u>1</u> <u>N</u> <u></u> 6. _____ 7. _____ 8. _____ _____ = Total Cover <u>83</u>				
Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ _____ = Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				
Hydrophytic Vegetation Indicators: _____ Dominance Test is >50% _____ Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)				
Hydrophytic Vegetation Present? Yes _____ No <u>X</u>				
Remarks: <u>Avena dry/dead</u>				

Sampling Point: CH 2B

HYDROLOGY			
Wetland Hydrology Indicators:			
<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (2 or more required)</u>	
☐ Surface Water (A1)	☐ Salt Crust (B11)	☐ Water Marks (B1) (Riverine)	
☐ High Water Table (A2)	☐ Biotic Crust (B12)	☐ Sediment Deposits (B2) (Riverine)	
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Drift Deposits (B3) (Riverine)	
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)	☐ Drainage Patterns (B10)	
☐ Sediment Deposits (B2) (Nonriverine)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Dry-Season Water Table (C2)	
☐ Drift Deposits (B3) (Nonriverine)	☐ Presence of Reduced Iron (C4)	☐ Crayfish Burrows (C8)	
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)	☐ Shallow Aquitard (D3)	
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)	☐ FAC-Neutral Test (D5)	
Field Observations:		Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe) Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			
Dry soils			

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fairheld Bw swetland; sunset Ave City/County: Fairfield Sampling Date: 8/26/21
 Applicant/Owner: TIC Consulting State: CA Sampling Point: CH3A
 Investigator(s): C. Santala, S. Powell Section, Township, Range: S19 T05N R01W
 Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-1
 Subregion (LRR): Central Coast Lat: 38.263769 Long: -122.619544 Datum: _____
 Soil Map Unit Name: Antioch-san gandro complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ☒
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes ☒ No _____
Hydric Soil Present? Yes ☒ No _____	
Wetland Hydrology Present? Yes ☒ No _____	
Remarks: <u>Disturbed site, relict channel, urban area</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Schlotheimia</u>	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>15'</u>)				
1. <u>Schlotheimia</u>	<u>90</u>	<u>Y</u>	<u>OBL</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. <u>Lepidium latifolia</u>	<u>50</u>	<u>N</u>	<u>FAC</u>	
3. <u>Elymus trichocoides</u>	<u>20</u>	<u>N</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				

Remarks:
No standing water, bulrush primarily remnant/dense

SOIL

Sampling Point: CH 3A

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:				
Primary Indicators (minimum of one required; check all that apply)			Secondary Indicators (2 or more required)	
☐ Surface Water (A1)	☐ Salt Crust (B11)	☐ Water Marks (B1) (Riverine)		
☐ High Water Table (A2)	☐ Biotic Crust (B12)	☐ Sediment Deposits (B2) (Riverine)		
☒ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Drift Deposits (B3) (Riverine)		
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)	☐ Drainage Patterns (B10)		
☐ Sediment Deposits (B2) (Nonriverine)	☒ Oxidized Rhizospheres along Living Roots (C3)	☐ Dry-Season Water Table (C2)		
☐ Drift Deposits (B3) (Nonriverine)	☐ Presence of Reduced Iron (C4)	☐ Crayfish Burrows (C8)		
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Saturation Visible on Aerial Imagery (C9)		
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)	☐ Shallow Aquitard (D3)		
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)	☐ FAC-Neutral Test (D5)		
Field Observations:				
Surface Water Present?	Yes ☐ No ☒	Depth (inches): _____		
Water Table Present?	Yes ☐ No ☒	Depth (inches): _____		
Saturation Present? (includes capillary fringe)	Yes ☒ No ☐	Depth (inches): _____	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				
Remarks: Dense bulrush				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fairfield Bio Wetland; Sunset Ave City/County: Fairfield Sampling Date: 8/26/21
 Applicant/Owner: TIC Consulting State: CA Sampling Point: CH3B (paired pt)
 Investigator(s): C. Santala, S. Powell Section, Township, Range: 519 T05N R01W
 Landform (hillslope, terrace, etc.): slope/bank Local relief (concave, convex, none): concave Slope (%): 30%
 Subregion (LRR): C1C1 Coastal Lat: 38.263762 Long: -122.019521 Datum: _____
 Soil Map Unit Name: Antioch-San Ysidro complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No _____
 Hydric Soil Present? Yes _____ No X
 Wetland Hydrology Present? Yes _____ No X

Is the Sampled Area within a Wetland? Yes _____ No X

Remarks:

Disturbed site, relict channel, urban area

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet:
1. <u>Juglans</u>	<u>1</u>		<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species _____ x 3 = _____
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
_____ = Total Cover				UPL species _____ x 5 = _____
Herb Stratum (Plot size: _____)				Column Totals: _____ (A) _____ (B)
1. <u>Elymus tunicoides</u>	<u>80</u>	<u>Y</u>	<u>FAC</u>	Prevalence Index = B/A = _____
2. <u>Lepidium latifolium</u>	<u>10</u>		<u>FAC</u>	
3. <u>Bromus diandrus</u>	<u>10</u>	<u>N</u>		
4. <u>Avena sp</u>	<u>10</u>	<u>N</u>		
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	___ Dominance Test is >50%
2. _____	_____	_____	_____	___ Prevalence Index is ≤3.0 ¹
_____ = Total Cover				___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
				___ Problematic Hydrophytic Vegetation ¹ (Explain)
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Remarks: <u>Elymus remnant, some alive</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____

Sampling Point: CH 3B

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
☐ Surface Water (A1)	☐ Salt Crust (B11)	☐ Water Marks (B1) (Riverine)	
☐ High Water Table (A2)	☐ Biotic Crust (B12)	☐ Sediment Deposits (B2) (Riverine)	
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Drift Deposits (B3) (Riverine)	
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)	☐ Drainage Patterns (B10)	
☐ Sediment Deposits (B2) (Nonriverine)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Dry-Season Water Table (C2)	
☐ Drift Deposits (B3) (Nonriverine)	☐ Presence of Reduced Iron (C4)	☐ Crayfish Burrows (C8)	
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)	☐ Shallow Aquitard (D3)	
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)	☐ FAC-Neutral Test (D5)	
Field Observations:		Wetland Hydrology Present? Yes ☐ No ☒	
Surface Water Present? Yes ☐ No ☐ Depth (inches): _____			
Water Table Present? Yes ☐ No ☐ Depth (inches): _____			
Saturation Present? Yes ☐ No ☐ Depth (inches): _____ (includes capillary fringe)			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sunset Ave City/County: Fairfield, CA Sampling Date: 8/20/21
 Applicant/Owner: TK Consulting State: CA Sampling Point: 4A
 Investigator(s): S. Powell Section/Township/Range: S19 T05N R01W
 Landform (hillslope, terrace, etc.): Basin Local Relief (concave, convex, none): concave Slope (%): 0-1
 Subregion (LRR): C/Cood Lat: 38.262905 Long: -122.019605 Datum:
 Soil Map Unit Name: Antioch-San Ysidro complex NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of years? Yes X No (if no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks)

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

Hydrophytic Vegetation Present?	Yes <u></u>	No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u></u> No <u>X</u>
Hydric Soil Present?	Yes <u></u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u></u>	No <u>X</u>	

Remarks: Bottom of top depression at south end of vacant lot

VEGETATION

Tree Stratum (Plot size: <u></u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
1. <u></u>	<u></u>	<u></u>	<u></u>	
2. <u></u>	<u></u>	<u></u>	<u></u>	
3. <u></u>	<u></u>	<u></u>	<u></u>	
= Total Cover				Prevalence Index Worksheet: OBL species <u>0</u> X1 <u>0</u> FACW species <u>0</u> X2 <u>0</u> FAC species <u>30</u> X3 <u>90</u> FACU species <u>0</u> X4 <u>0</u> UPL species <u>81</u> X5 <u>405</u> Column Totals: <u>111</u> (A) <u>495</u> (B) Prevalence Index = B/A = <u>4.5</u>
Sapling/Shrub Stratum (Plot size: <u>15</u>)				
1. <u>Juglans hindsi</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u></u>	<u></u>	<u></u>	<u></u>	
3. <u></u>	<u></u>	<u></u>	<u></u>	Hydrophytic Vegetation Indicators: No Dominance Test is >50% No Prevalence Index is ≤3.0' Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
= Total Cover				
Herb Stratum (Plot size: <u></u>)				
1. <u>Dichotyles spicata</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Avena pectin</u>	<u>40</u>	<u>Y</u>	<u>NL</u>	Hydrophytic Vegetation Present? Yes <u></u> No <u>X</u>
3. <u>Involucris arvensis</u>	<u>1</u>	<u>N</u>	<u>NL</u>	
4. <u>Elymus triticoides</u>	<u>3</u>	<u>N</u>	<u>FAC</u>	
5. <u>Malva leprosa</u>	<u>2</u>	<u>N</u>	<u>FAC</u>	
6. <u>Bromus diandrus</u>	<u>40</u>	<u>Y</u>	<u>NL</u>	Remarks:
7. <u></u>	<u></u>	<u></u>	<u></u>	
8. <u></u>	<u></u>	<u></u>	<u></u>	
= Total Cover				
Woody Vine Stratum (Plot size: <u></u>)				
1. <u></u>	<u></u>	<u></u>	<u></u>	
2. <u></u>	<u></u>	<u></u>	<u></u>	
= Total Cover				
% Bare Ground in Herb Stratum: <u></u> % Cover of Biotic Crust: <u></u>				

Remarks:

Sampling Point 4A

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

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

Indicators for Problematic Hydric Soils³:

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

Hydric Soil Present? Yes _____ No X

Remarks:

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

Wetland Hydrology Present? Yes No ☒

Remarks:

APPENDIX C

Site Photographs



Photo 1. Relict channel; upstream (north) end (aspect northwest; 8/26/21).



Photo 2. Relict channel (aspect north; 8/26/21).



Photo 3. Relict channel (aspect southwest; 8/26/21).



Photo 4. Relict channel (aspect northeast; 8/26/21).



Photo 5. Relict channel; partially buried culvert at downstream (south) end (aspect southeast; 8/26/21).



Photo 6. Relict channel visible in top of photo, view from sidewalk on Sunset Avenue (aspect west; 8/26/21).



Photo 7. Seasonal wetland; sample plot CH-1A (within Relict Channel)
(8/26/21).



Photo 8. Seasonal wetland; paired upland sample plot CH-1B (8/26/21).



Photo 8. Seasonal wetland; sample plot CH-2A (8/26/21).



Photo 10. Seasonal wetland; paired upland sample plot CH-2B (8/26/21).



Photo 11. Seasonal wetland; sample plot CH-3A (8/26/21).



Photo 12. Seasonal wetland; paired upland sample plot CH-3B (8/26/21).



Photo 11. Basin feature, indistinct eastern end (aspect west; 8/26/21).



Photo 12. Basin feature; sample plot 4A (8/26/21).



Photo 11. Flood Control Channel lined with armoring substrate at proposed outfall location (aspect southeast; 8/26/21).



Photo 12. Flood Control Channel, top of bank at property boundary fence (aspect southeast; 8/26/21).

APPENDIX D

Plant List

**Plant Species Observed in Aquatic Resources Delineation Sample Plots
Arrive Fairfield Luxury Townhomes Project, Fairfield, California**

Scientific Name	Common Name	Habit	Wetland	Native	Family	Cal-IPC	Listing
			Indicator	Status			
			Status	Status		Rating	Status
<i>Ambrosia psilostachya</i>	Western ragweed	PH	FACU	N	Asteraceae		
<i>Atriplex</i> sp.	Saltbush	PH	-		Chenopodiaceae		
<i>Avena barbata</i>	Slim oats	AG	-		Poaceae	Moderate	
<i>Avena fatua</i>	Wild oats	AG	-		Poaceae	Moderate	
<i>Brassica nigra</i>	Black mustard	AH	-		Brassicaceae	Moderate	
<i>Bromus diandrus</i>	Ripgut grass	AG	-		Poaceae	Moderate	
<i>Convolvulus arvensis</i>	Bind-weed	PV	-		Convolvulaceae		
<i>Distichlis spicata</i>	Salt grass	PG	FAC	N	Poaceae		
<i>Elymus triticoides</i>	Creeping wild-rye	PG	FAC	N	Poaceae		
<i>Juglans hindsii</i>	Northern California black walnut	T	FAC	N	Juglandaceae		
<i>Lactuca serriola</i>	Prickly wild lettuce	AH	FACU		Asteraceae		
<i>Lepidium latifolium</i>	Broad-leaved peppergrass	PH	FAC		Brassicaceae	High	
<i>Malva parviflora</i>	Cheese-weed	AH	-		Malvaceae		
<i>Malvella leprosa</i>	Alkali mallow	PH	FACU	N	Malvaceae		
<i>Rumex crispus</i>	Curly dock	PH	FAC		Polygonaceae	Limited	
<i>Schoenoplectus acutus</i>	Hardstem bulrush	PH	OBL	N	Cyperaceae		
<i>Typha angustifolia</i>	Narrowleaf cattail	PH	OBL		Typhaceae		
<i>Xanthium strumarium</i>	Cocklebur	AH	FAC	N	Asteraceae		

Notes:

Scientific nomenclature follows Baldwin (2012).

N - Native species

Habit definitions:

AG - Annual grass.

AH - Annual herb.

F - Fern

PG - Perennial grass.

PH - Perennial herb.

PV - Perennial vine.

S - Shrub

T - Tree

Wetland indicator status (Lichvar and Kartesz, 2016):

OBL (Obligate Wetland Plants) - Almost always occur in wetlands.

FACW (Facultative Wetland Plants) - Usually occur in wetland, but may occur in non-wetlands.

FAC (Facultative Wetland Plants) - Occur in wetlands and non-wetlands.

FACU (Facultative Upland Plants) - Usually occur in non-wetlands, but may occur in wetlands.

UPL (Upland Plants) - Almost always occur in non-wetlands.

Cal-IPC (California Invasive Plant Council) Ratings:

High - These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Most are widely distributed ecologically.

Moderate - These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure.

Limited - These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score.