Appendix C

Preliminary Delineation of Wetlands and Other Waters
Sonoma County, California











H. T. HARVEY & ASSOCIATES

Ecological Consultants

50 years of field notes, exploration, and excellence

Mirabel Road Corridor Improvements and West County Trail Project Preliminary Delineation of Wetlands and Other Waters Sonoma County, California

Project #3328-25

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May 2025

Executive Summary

During a site visit conducted on January 8 and 9, 2025, H. T. Harvey & Associates wetland ecologists performed a delineation of jurisdictional waters (wetlands and other waters) in support of the Mirabel Road Corridor Improvement and West County Trail Project located in the unincorporated town of Forestville in Sonoma County, California. The entire Study Area (2.64 acres) was surveyed for wetlands and other waters that may be subject to regulation under Section 404 of the Clean Water Act administered by the U.S. Army Corps of Engineers, Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act administered by the Regional Water Quality Control Board, and riparian habitats subject to Section 1600 et seq. of the State Fish and Game Code regulated by the California Department of Fish and Wildlife. The on-site determination took into account normal precipitation conditions during the January 2025 site visits relative to the 30-year average, and the results are based on the conditions present at the time of the surveys. The Study Area is located in the Porter-Creek-Russian River watershed (Hydrologic Unit Code 180101100902) (EPA 2025).

A summary of potential jurisdictional waters mapped within the Study Area is provided below. The subset of waters expected to be disclaimed by the U.S. Army Corps of Engineers due to a lack of continuous surface connection to Traditional Navigable Waters and their tributaries have been calculated separately in the table below.

Summary of Potential Jurisdictional Waters and Wetlands within the Delineation Study Area

Habitat Type	Acres
Total Potential Waters of the U.S.	**0.017**
Seasonal Wetland	0.015
Perennial Emergent Wetland	0.001
Intermittent Stream	0.001
Culverts	0.004
Waters Expected to be Disclaimed under Section 404 due to Lack of Continuous Surface Connection[1]	**0.054**
Isolated Seasonal Wetland	0.014
Isolated Forested Wetland	0.040
Total Waters of the State	**0.080**
Seasonal Wetland	0.029
Forested Wetland	0.040
Perennial Emergent Wetland	0.001
Intermittent Stream	0.001
Mixed Riparian	0.009
Culverts	0.004
Total CDFW Jurisdictional Habitats	**0.010**
Mixed Riparian	0.009
Intermittent Stream	0.001
Culvert	<0.001
Total Non-jurisdictional Areas[2]	**2.559**
Wetland Delineation Study Area Total	**2.638**

[1] Waters expected to be disclaimed under Section 404 are included under the totals for waters of the state

[2] Non-jurisdictional areas were mapped as California annual grassland, developed, landscaped, oak woodland, non-jurisdictional culverts, and roadside ditches.

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Section 1. Introduction

1.1 Study Area Description

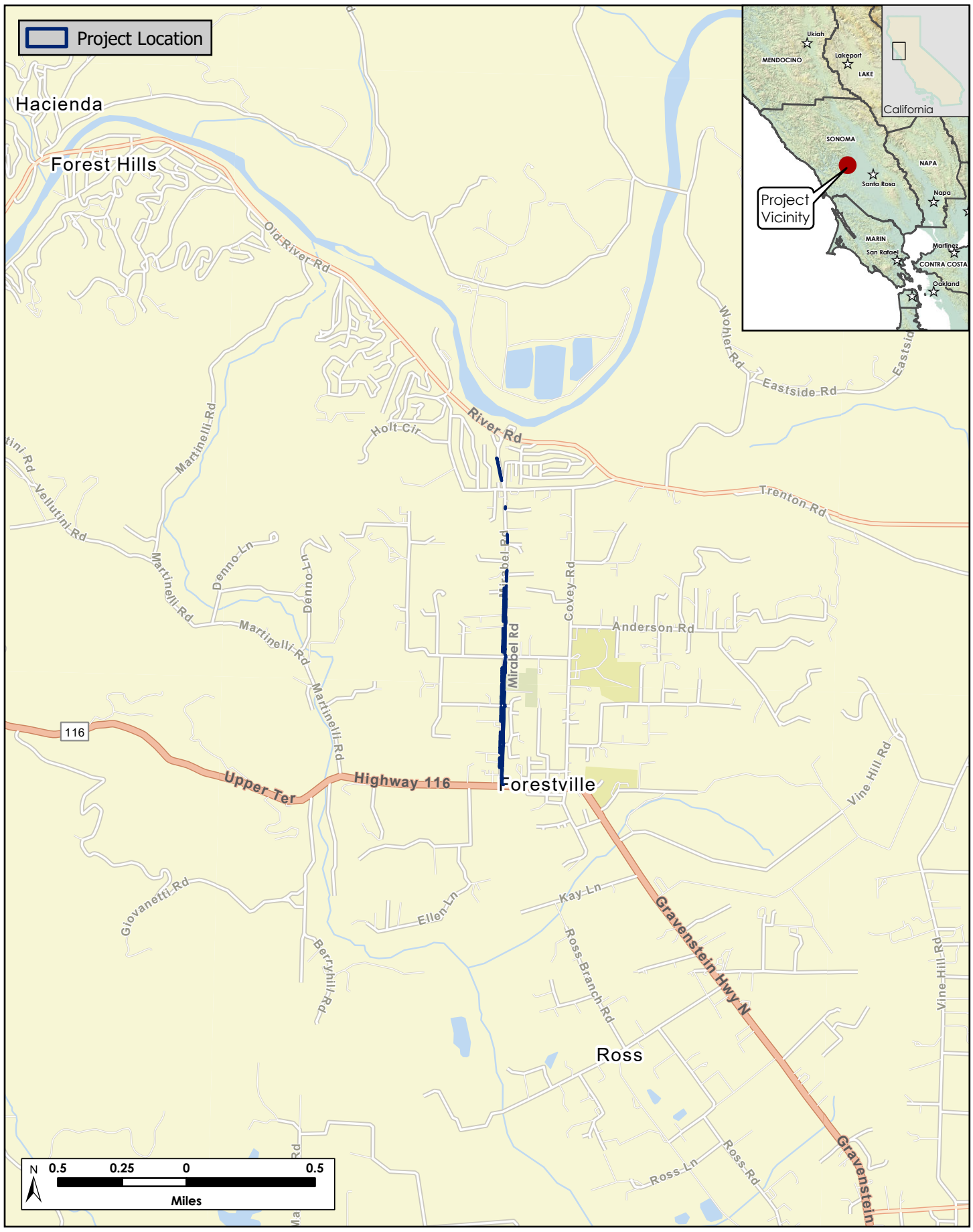
The delineation Study Area for the Mirabel Road Widening Project (project) is located in the unincorporated town of Forestville, Sonoma County, California (Figure 1). The Study Area extends from State Route 116 and extends north to River Road, along Mirabel Road. The surrounding areas include predominantly rural residential areas as well as agricultural properties. The parcels bordering Mirabel Road have a variety of land use designations. At the southern end of the Study Area, where Mirabel Road and Highway 116 intersect, and at the northern portion of the Study Area where River Road and Mirabel Road intersect, land use is Neighborhood Commercial District. The central portion is of Mirabel Road is bordered by Rural Residential designations. The wetland delineation described in this report focused on the entirety of the Study Area shown in Figure 2. The Study Area is located within the *Camp Meeker, California* U.S. Geological Survey (USGS) 7.5-minute quadrangle (Figure 3). Elevations along the project alignment range from 69 feet above mean sea level at the northern end of the site to 196 feet mean sea level at the southern end near the Highway 116; with the two topographic high points at 183 (northern) and 225 (southern) feet above sea level (asl) (Google LLC 2025).

The climate in the project vicinity is coastal Mediterranean, with most rain falling in the winter and spring. Mild cool temperatures are common in the winter. Hot to mild temperatures are common in the summer. Climate conditions in the vicinity include a 30-year average of approximately 42 inches of annual precipitation with a monthly average temperature range from 44.5ºF to 71.1ºF (PRISM Climate Group 2025).

Figure 4 shows the soil units mapped by the National Resource Conservation Service (NRCS) within the Study Area, and Table 1 summarizes the associated texture, drainage classification, landform setting, and hydric soil status (NRCS 2025a, b) for the five soil types found within the Study Area.

Table 1. Soil Type, Texture, Drainage Classification, and Hydric Soil Status for Soil Types Occurring within the Study Area

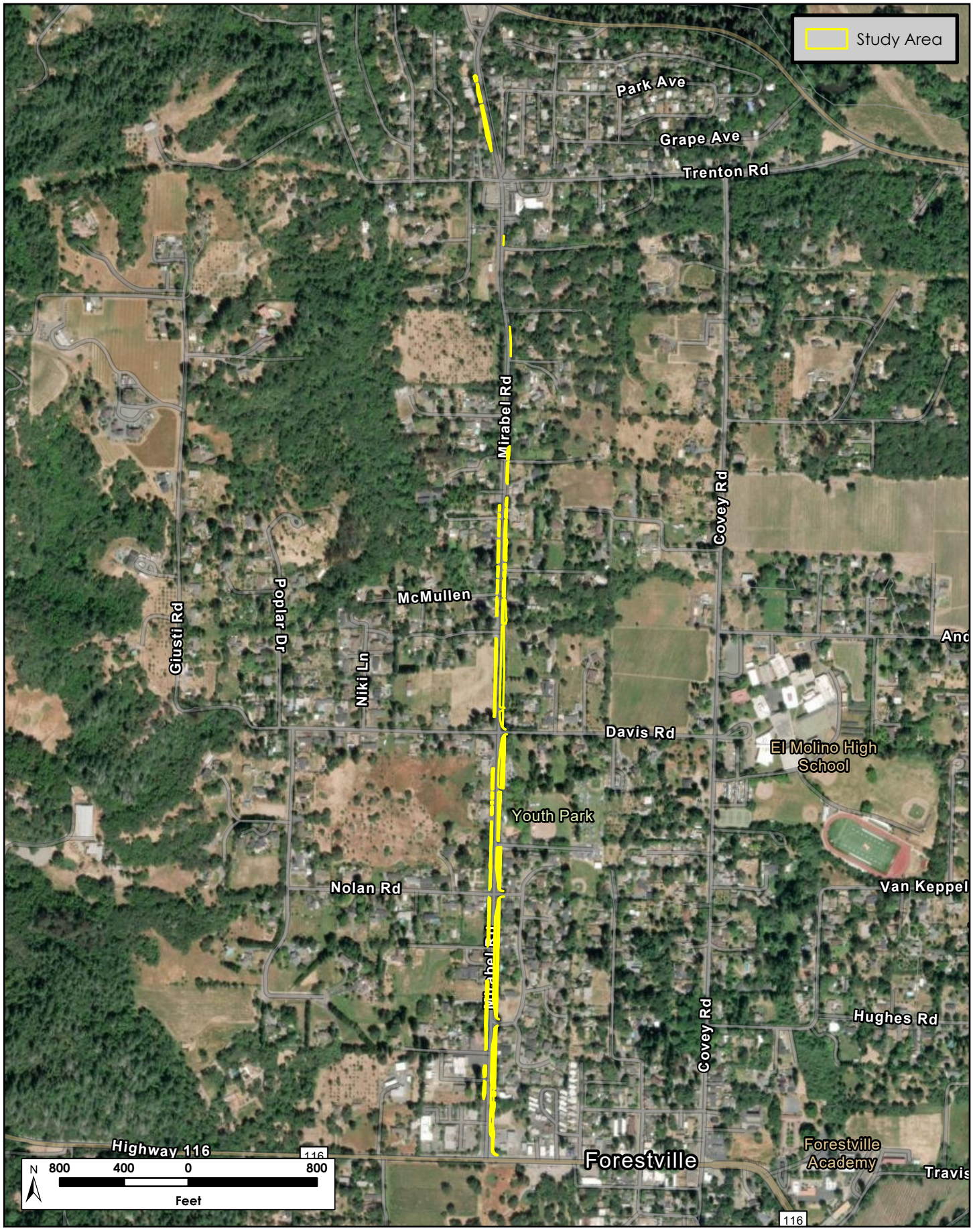
Soil Symbol	Soil Name	Soil Texture	Drainage Classification	Landform	Hydric Status
GdC	Goldridge, 2 to 9 percent slopes	Fine sandy loam	Moderately well drained	Hills	Yes
GdD	Goldridge, 9 to 15 percent slopes	Fine sandy loam	Moderately well drained	Hills	No
GdE2	Goldridge, 15 to 30 percent slopes, eroded	Fine sandy loam	Moderately well drained	Hills	No
JoE	Josephine, 9 to 30 percent slopes	Loam	Well drained	Mountain slopes	No



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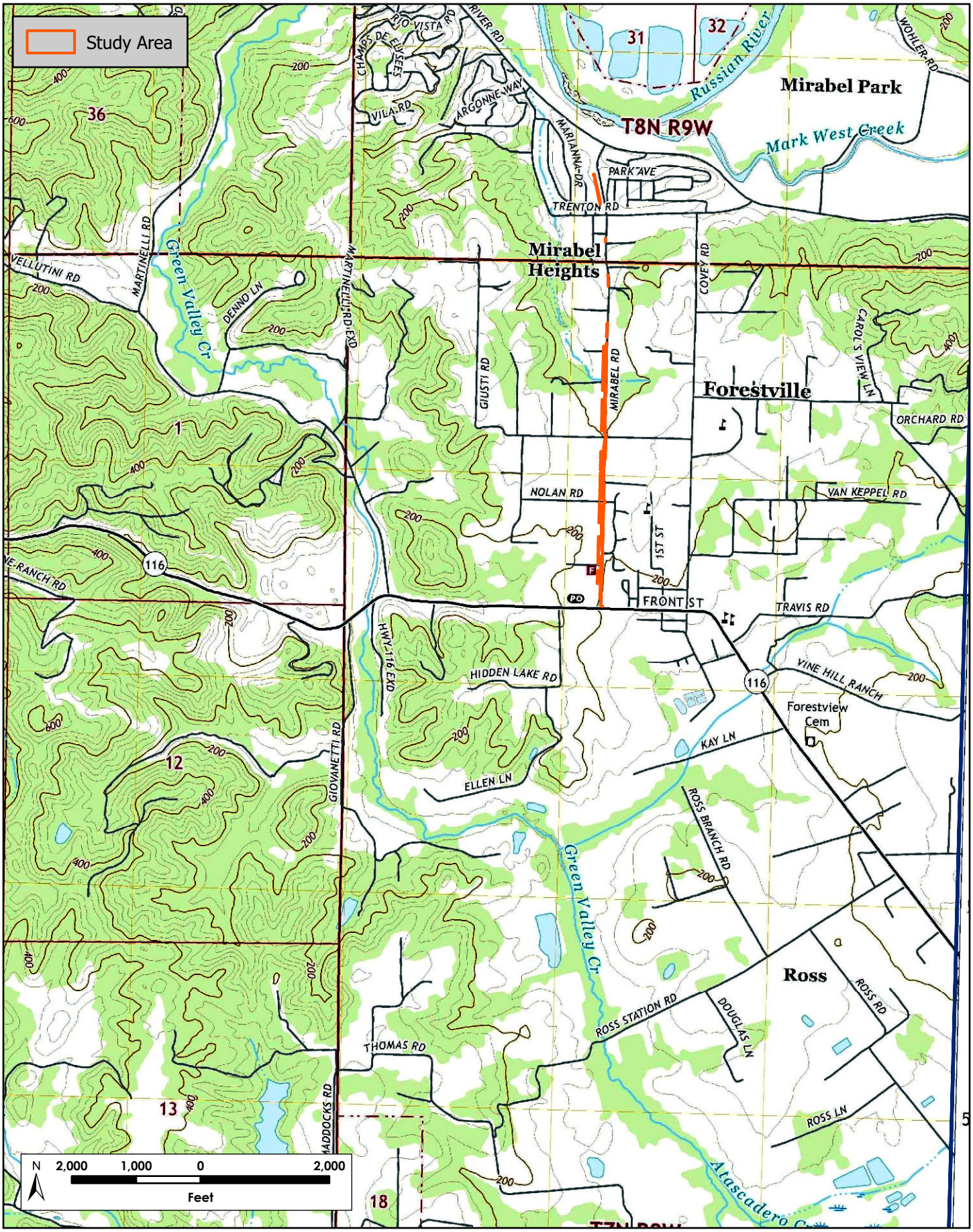
Figure 1. Vicinity Map
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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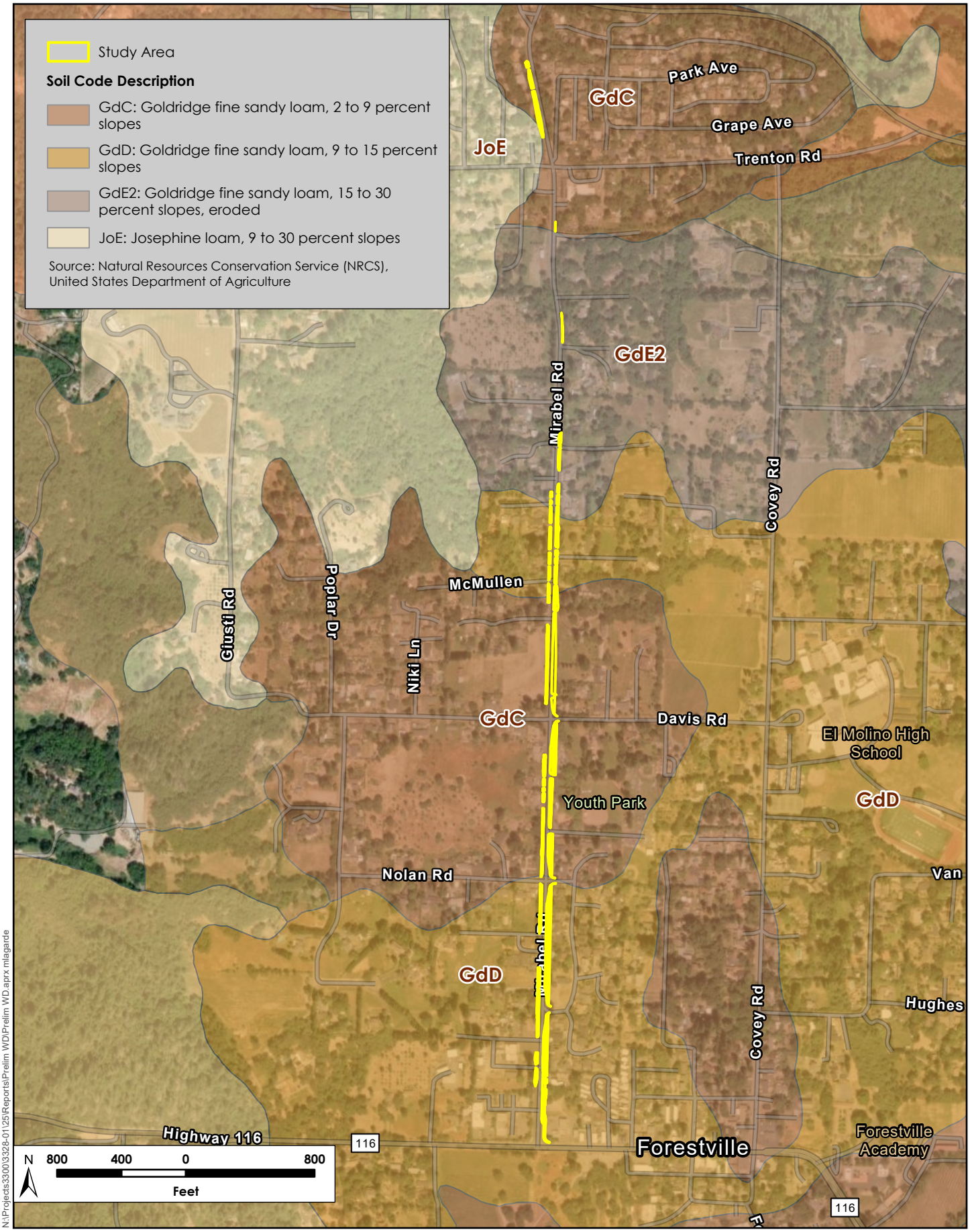
Figure 2. Study Area
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 3. USGS Topographic Map
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Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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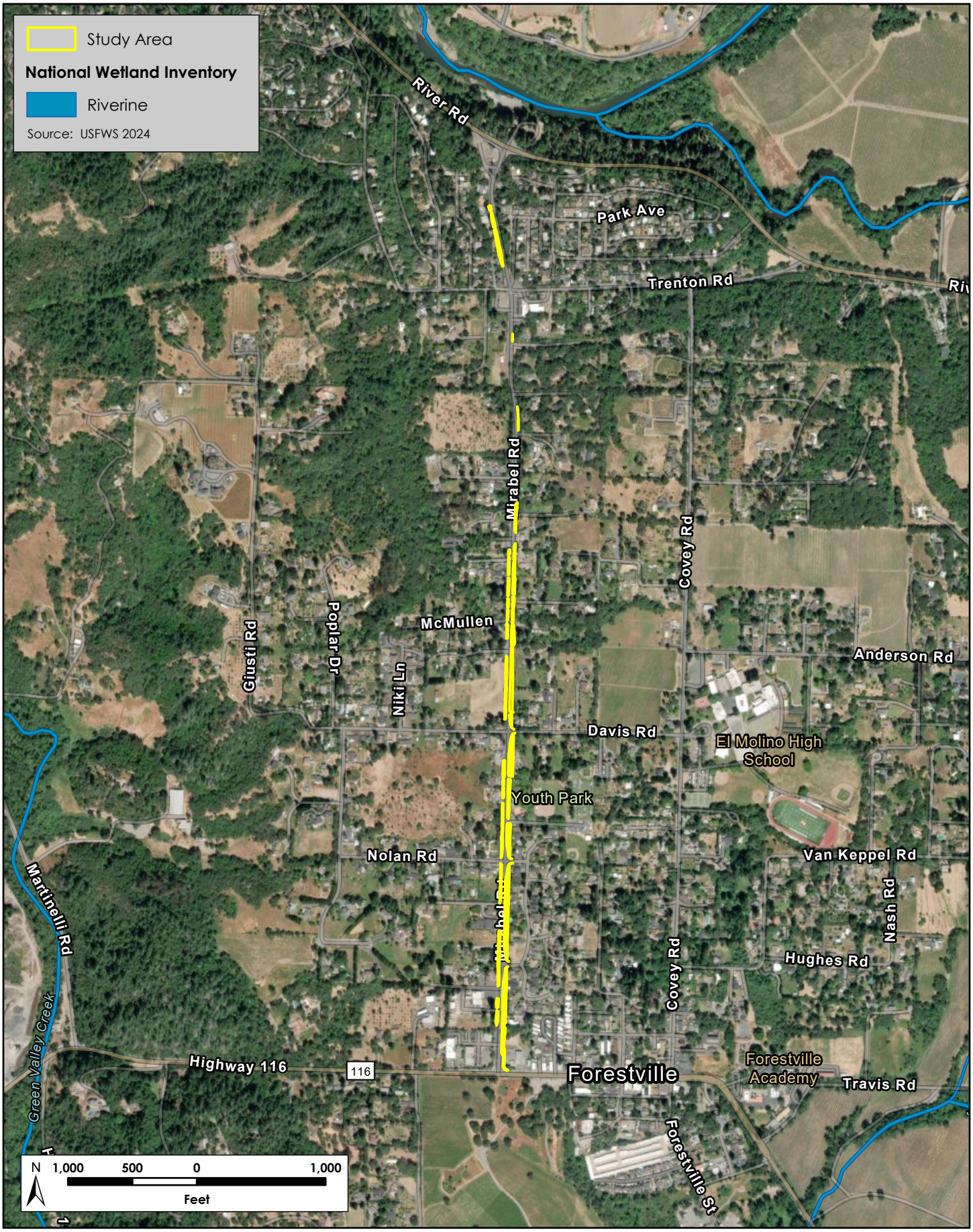
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Figure 4. NRCS Soils Map
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025

The U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) map of the Study Area is depicted on Figure 5 (NWI 2025). The NWI does not identify any aquatic features within the Study Area. However, the northern portion of the Study Area flows into the Russian River, which is classified as:

- A perennial river: riverine, lower perennial, unconsolidated bottom, and permanently flooded (R2UBH); bordered by
- A freshwater forested/shrub wetland: palustrine, scrub-shrub, broad-leaved deciduous, and temporarily flooded (PSS1A)

NWI maps are based on interpretation of aerial photography, limited verification of mapped units, and/or classification of wetland types using the classification system developed by Cowardin et al. (1979). These data are available for general reference purposes and do not necessarily correspond to the actual presence or absence of jurisdictional waters.



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Figure 5. National Wetlands Inventory Map
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025

Section 2. Survey Methods

Before the delineation survey was conducted, topographic maps and aerial photos of the Study Area were obtained and reviewed from several sources, such as the USGS topographic map (Figure 3), NRCS soils map (Figure 4), NWI map (Figure 5), Google Earth imagery (Google LLC 2025), and the University of California Santa Barbara Library's collection of historical aerial photography (UCSB 2025).

H. T. Harvey & Associates senior wetland ecologist Katie Gallagher, M.S., and wetland ecologist Katie Tyree, B.A. surveyed the Study Area on January 8, 2025, and Katie Tyree visited the site alone the following day, on January 9, 2025. The purpose of the surveys was to identify the extent and distribution of wetlands and other waters that may be subject to regulation by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW). Weather conditions during the surveys, were sunny, dry, and clear.

H. T. Harvey & Associates wetland ecologists performed a technical delineation of wetlands and other waters within the approximately 2.64-acre Study Area. The delineation was performed in accordance with the *Corps of Engineers 1987 Wetlands Delineation Manual* (Corps Manual) (Environmental Laboratory 1987). Additionally, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West (Version 2.0)* (Regional Supplement) (USACE 2008) was followed to document site conditions relative to hydrophytic vegetation, hydric soils, and wetland hydrology. The Study Area is located on the border between the Arid West region and Western Mountains region and contains landscape characteristics of both regions: 1) climate – the area is generally hot and dry with a long summer, although the average annual precipitation is much higher than 15 inches, topping out at 42 inches and the precipitation falls as rain instead of snow; 2) vegetation – the elevation is just above sea level and the dominant naturally occurring tree cover includes oaks and willows rather than conifers; 3) soils – the soils are better developed and higher in organic matter content; 4) hydrology – ephemeral drainages predominate and the Russian River headwaters are in the Arid West region. The Study Area exhibits more landscape characteristics for the Arid West region than the Western Mountain region.

H. T. Harvey & Associates wetland ecologists performed preliminary mapping of the extent and distribution of wetlands and other waters of the U.S. that may be subject to regulation under Section 404 of the Clean Water Act as well as waters of the state that may be subject to regulation under the Porter-Cologne Water Quality Control Act (Porter-Cologne), which is administered by the RWQCB, and stream features that may be subject to regulation by CDFW under Section 1602 of the Fish and Game Code.

The "Revised Definition of 'Waters of the U.S. Conforming," (conforming rule), which became effective on September 8, 2023, was consulted to make determinations on likely jurisdictional status of features that met wetland parameters following the May 2023 Supreme Court decision in *Sackett v. Environmental Protection Agency*. This revised definition of waters of the U.S. clarifies that wetlands must be adjacent (defined as having a continuous surface connection) to relatively permanent bodies of water to be considered jurisdictional. To

ensure that the wetlands and other waters in the Study Area have a continuous surface connection to relatively permanent, standing, or continuously flowing bodies of water downstream, K. Tyree conducted a wetland connectivity study to off-site relatively permanent waters after the January 9, 2025, site visit. Unnamed drainages connecting on-site wetlands and intermittent streams to off-site relatively permanent waters were assessed via historical and current aerial imagery since off-site locations were on private property and not accessible at the time of the site visit. Consistent with recent guidance from the USACE and the Environmental Protection Agency, we assumed that even where there was a continuous surface or culverted connection between three-parameter wetlands and a relatively permanent body of water or its tributaries, if this connection occurred through non-jurisdictional features such as roadside ditches for longer than 725 feet, the connection was too long and tenuous to consider the wetland adjacent (Memorandum on NWK-2024-00392, dated November 21, 2024).

The following sections present descriptions of the methods used to identify jurisdictional waters (wetlands and other waters).

2.1 Identification of Jurisdictional Waters

The "Routine Determination Method, On-Site Inspection Necessary (Section D)" outlined in the Corps Manual (Environmental Laboratory 1987), and the updated data forms, vegetation sampling methods, and hydric soil and hydrology indicators developed for the Arid West Regional Supplement (USACE 2008) were used to examine the vegetation, soils, and hydrology on site. This three-parameter approach to identifying wetlands is based on the presence of a prevalence or dominance of hydrophytic vegetation, hydric soils, and wetland hydrology.

In addition to applying these survey methods, we compiled this report in accordance with guidance provided in *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (USACE 2016a) and *Information Requested for Verification of Corps Jurisdiction* (USACE 2016b). These documents list the information that must be submitted as part of a request for a jurisdictional determination, including:

- Vicinity map (Figure 1)
- Study Area map (Figure 2)
- USGS quadrangle map (Figure 3)
- Soils map (Figure 4)
- NWI map (Figure 5)
- Land cover map (Figure 6)
- Photo point locations (located at sample point locations, and numbered according to sample points, depicted on Figure 6)
- Preliminary identification of waters map (Figure 7)
- Plant species observed (Appendix A)
- Current soil survey report (Appendix B)

- Data forms for wetlands sample points (Appendix C)
- Data forms for ordinary high water mark (OHWM) datasheets (Appendix D)
- Written rationale for sample point choice (Section 3.1, "Observations, Rationales, and Assumptions")
- Color photos (Appendix E)
- Aquatic resources table (Appendix F)

During the survey, the Study Area was examined for topographic features, drainages, alterations to site hydrology or vegetation, and recent significant disturbance. A determination was then made as to whether normal environmental conditions were present at the time of the field survey. In the field, the techniques used to identify wetlands included digging soil pits to sample soil from various depths, observing the vegetation growing near the soil sample points, and characterizing the current surface and subsurface hydrologic features present near the sample points through both observation of indicators and direct observation of hydrology. Features meeting wetland vegetation, soil, and hydrology criteria were then mapped in the field using a sub-meter GPS unit.

Features were evaluated in relation to the conforming rule, which indicates waters that do not have a "continuous surface connection" to navigable waters or their tributaries, as per Sackett v. Environmental Protection Agency, are not to be considered waters of the U.S.

To determine if wetlands would be deemed jurisdictional pursuant to the conforming rule, a wetland connectivity study was conducted to determine the presence or absence of a continuous surface connection for wetlands and other waters in the Study Area to downstream jurisdictional waters was conducted. A continuous surface connection was determined to be present if wetland or other water flows directly via a mapped surface connection (such as the presence of OHWMs) into a tributary of a paragraph (a)(1) water.

2.1.1 Identification of Section 404 Jurisdictional Wetlands (Special Aquatic Sites)

Where wetland field characteristics were present, the surveyor examined vegetation, soils, and hydrology using the Routine Determination Method outlined in the Corps Manual (Environmental Laboratory 1987) and the updated data forms, vegetation sampling methods, and hydric soil and hydrology indicators developed for the Arid West Regional Supplement (USACE 2008).

Hydrophytic Vegetation. Plants that can grow in soils that are saturated or inundated for long periods of time, which contain little or no oxygen when wetted, are considered adapted to those soils and are called hydrophytic. There are different levels of adaptation, as summarized in Table 2. Some plants can only grow in soils saturated with water (and depleted of oxygen), some are mostly found in this condition, and some are found equally in wet soils and in dry soils. Plants observed at each of the sample sites were identified to species, where possible, using the Jepson eFlora (Jepson Flora Project 2025). The wetland indicator status of each species was obtained from the *Arid West 2020 Regional Wetland Plant List* (USACE 2020). Wetland indicator species are designated according to their frequency of occurrence in wetlands. For instance, a species with a

presumed frequency of occurrence of 67 to 99% in wetlands is designated a facultative wetland indicator species. The wetland indicator groups, indicator symbol, and the frequencies of occurrence of species within wetlands, provided as a percentage, are shown in Table 2.

Table 2. Wetland Indicator Status Categories for Vascular Plants

Indicator Category	Symbol	Frequency of Occurrence in Wetlands*
Obligate	OBL	>99% (Almost always is a hydrophyte, rarely in uplands)
Facultative wetland	FACW	67 – 99% (Usually a hydrophyte but occasionally found in uplands)
Facultative	FAC	34 – 66% (Commonly occurs as either a hydrophyte or non-hydrophyte)
Facultative upland	FACU	1 – 33% (Occasionally is a hydrophyte, but usually occurs in uplands)
Upland	UPL**	<1% (Rarely is a hydrophyte, almost always in uplands)
Not Listed	NI	Considered to be an upland species

*Based on information contained in the Corps Manual (Environmental Laboratory 1987).

**Plant species that are not listed in the Arid West 2020 National Wetland Plant List (USACE 2020) are considered UPL species in Appendix A – Plants Observed in the Study Area

Obligate and facultative wetland indicator species are hydrophytes that occur "in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987). Facultative indicator species may be considered wetland indicators when found growing in hydric soils that experience periodic saturation. Plant species that are not on the regional list of wetland indicator species are considered upland species. A complete list of the vascular plants observed within the Study Area, including their current indicator statuses, has been provided in Appendix A.

Hydric Soils. Up to 18 inches of the soil profile were examined for hydric soil indicators. The National Technical Committee for Hydric Soils defines a hydric soil as one formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper 12 inches of soil (NRCS 2010). Hydric soils include soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. In general, evidence of a hydric soil includes characteristics such as reducing soil conditions, soils with bright mottles and/or low matrix chroma, and soils listed as hydric by the U.S. Department of Agriculture on the National Hydric Soils List (NRCS 2025b). Reducing soil conditions can also include circumstances where there is evidence of frequent ponding for long or very long duration. A long duration is defined as a period of inundation for a single event that ranges from 7 days to a month and very long is greater than one month (Environmental Laboratory 1987).

Munsell Soil Notations (Munsell 2021) were recorded for the soil matrix of each soil sample. The Munsell color system is based on three color dimensions: hue, value, and chroma. A brief description of each component of the system is described below, in the order they are used in describing soil color (i.e., hue/value/chroma):

1. **Hue.** The Munsell Soil Color Chart is divided into five principal hues: yellow (Y), green (G), purple (P), blue (B), and red (R), along with intermediate hues such as yellow-red (YR) and green-yellow (GY). Examples of commonly encountered hue numbers include 2.5YR, 10YR, and 5Y.
2. **Value.** *Value* refers to lightness, ranging from white to grey to black. Common numerical values for value in the Munsell Soil Color Chart range from 2 for saturated soils to 8 for faded or light colors. Hydric soils often show low-value colors when soils have accumulated sufficient organic material to indicate development under wetland conditions, but can show high-value colors when iron depletion has occurred, removing color value from the soil matrix. Value numbers are commonly reported as 8/, 2.5/, and 6/.
3. **Chroma.** *Chroma* describes the purity of the color, from "true" or "pure" colors to "pastel" or "washed out" colors. Chromas commonly range from 1 to 8, but can be higher for gleys. Soil matrix chroma values that are 1 or less, or 2 or less when mottling is present, are typical of soils that have developed under anaerobic conditions. Chroma numbers are listed, for example, as /1, /5, and /8.

The NRCS Web Soil Survey (NRCS 2025a) was consulted to determine which soil types have been mapped in the Study Area (Table 1 and Figure 4). Detailed descriptions of these soil types are provided in Appendix B.

Wetland Hydrology. Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Wetland hydrology indicators provide evidence that the site has a continuing wetland hydrologic regime. Primary indicators might include visual observation of surface water (A1), high water table (A2), soil saturation (B1), and hydrogen sulfide odor (C1). Secondary indicators might include a passing score for the FAC-neutral test (D5) and saturation visible on aerial imagery (C9). Each of the sample points was examined for positive field indicators (primary and secondary) of wetland hydrology, following the guidance provided in the Regional Supplement.

An area that meets the definition of a wetland, containing hydrophytic vegetation, hydric soils, and wetland hydrology, could be rejected as a Section 404 wetland if it does not have a continuous surface connection to a waters of the U.S. Section 404 wetlands that have a continuous surface connection to waters of the U.S. were observed in the Study Area.

2.1.2 Identification of Section 404 Jurisdictional Other Waters

Surveys were also conducted within the Study Area for "other waters", which includes lakes, slough channels, seasonal ponds, tributary waters, non-wetland linear drainages, and salt ponds. Such areas are identified by the (seasonal or perennial) presence of standing or running water and generally lack hydrophytic vegetation. In non-tidal or muted tidal waters, USACE jurisdiction extends to the OHWM, which is defined in 33 CFR Part 328.3 as "the line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation or the presence of litter and debris."

In concert with USACE's efforts to revise the wetland delineation manuals and make them more specific to different geographic regions of the United States, as described above, efforts have been initiated by USACE to develop an OHWM delineation manual. In particular, two relatively recent publications have attempted to further refine the definition of OHWM and the delineation of the OHWM in the Arid West (including California):

- *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States A Delineation Manual.* (Lichvar & McColley 2008).

- *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Interim Version* (David et al. 2022)

For purposes of the current study, the identification of the OHWM in the field was based on observation of a suite of natural geomorphic field indicators that have formed during channel-forming events. These features included changes in vegetation and bent vegetation, wrack and scour, sediment sorting, and channel bed morphology, among other factors. The presence of one or more of the natural geomorphic field indicators listed above, taking into consideration such factors as size of the watershed, channel slope, landscape setting, elevation, gradient, land use practices, and soil type, was taken as direct evidence of an OHWM, and such channels, if exhibiting intermittent or perennial hydrology, were identified as "other waters."

For the purposes of the current study, two OHWM transects were surveyed in the field, based on presence of an NWI Cowardin feature or the topography of the site. Both transects contained geomorphic field indicators, which was indicative of all the ditches on site with OHWM. Section 404 "other waters" were observed in the Study Area; however, the extent of federal jurisdiction depends on the connectivity of the "other waters" to traditional navigable waters or historical streams.

2.2 Identification of Waters of the State

Porter-Cologne broadly defines waters of the state as "any surface water or groundwater, including saline waters, within the boundaries of the state." Because Porter-Cologne applies to any water, whereas the Clean Water Act applies only to certain waters, California's jurisdictional reach overlaps and may exceed the boundaries of waters of the U.S. For example, Water Quality Order No. 2004-0004-DWQ states that "shallow" waters of the state include headwaters, wetlands, and riparian areas. Where forested riparian habitat is not present, jurisdiction is taken to the top of bank or levee. Where forested habitat occurs, the outer canopy of any riparian trees rooted within top of bank or closely associated with the stream may be considered jurisdictional as these trees can provide allochthonous input to the channel below.

On April 2, 2019, the SWRCB adopted the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State,* and these Procedures became effective May 28, 2020, and were updated April 6, 2021. In these new guidelines, riparian habitats are not specifically described as waters of the state but instead as important buffer habitats to streams that do conform to the State Wetland Definition. The Procedures

describe riparian habitat buffers as important resources that may both be included in required mitigation packages for permits for impacts to waters of the state, as well as areas requiring permit authorization from the RWQCBs to impact.

The 2019 Procedures also clarify that wetland-upland boundaries for wetlands comprising waters of the state should be set using the USACE delineation framework (Environmental Laboratory 1987, USACE 2008), with one important distinction. Some areas in California function as wetlands despite lacking abundant wetland vegetation. For example, non-vegetated playas, tidal flats, and some types of seasonal wetlands provide a variety of wetland functions, including water filtration, groundwater recharge, and the support of wetland wildlife. While USACE procedures require 5% vegetative cover to be considered a wetland rather than "other waters", the RWQCB has determined that no such minimum vegetative cover is necessary for an area to be considered a wetland under the State Wetland Definition. Waters of the state were identified within the Study Area.

2.3 Identification of CDFW Jurisdiction

Ephemeral and intermittent streams, rivers, creeks, dry washes, sloughs, blue line streams on USGS maps, and watercourses with subsurface flows fall under CDFW jurisdiction per Section 1602 of the Fish and Game Code. Canals, aqueducts, irrigation ditches, and other means of water conveyance may also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. A stream is defined in Title 14, California Code of Regulations Section 1.72, as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and that supports fish and other aquatic life. Jurisdiction does not include tidal areas such as tidal sloughs unless there is freshwater input. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation." Using this definition, CDFW extends its jurisdiction to encompass riparian habitats that function as a part of a watercourse. California Fish and Game Code Section 2786 defines riparian habitat as "lands which contain habitat which grows close to and which depends upon soil moisture from a nearby freshwater source." The lateral extent of a stream and associated riparian habitat that would fall under the jurisdiction of CDFW can be measured in several ways, depending on the particular situation and the type of fish or wildlife at risk. At minimum, CDFW would claim jurisdiction over a stream's bed and bank. Where riparian habitat is present, the outer edge of riparian vegetation is generally used as the line of demarcation between riparian and upland habitats. CDFW jurisdictional watercourses and associated riparian habitats were observed within the Study Area.

Section 3. Survey Results and Discussion

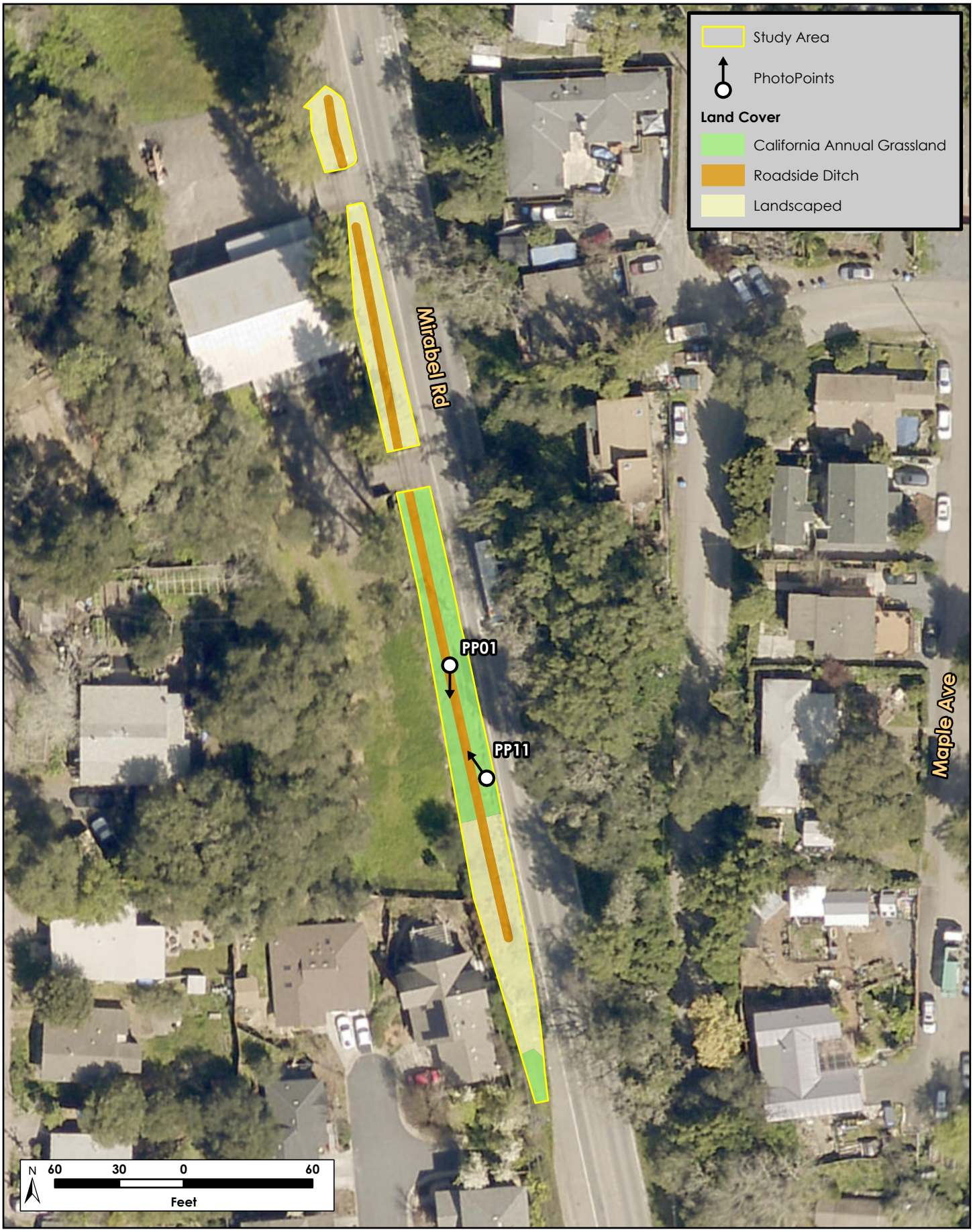
The following biotic habitat types were mapped within the Study Area: (1) California annual grassland, (2) landscaped, (3) developed, (4) oak woodland, (5) roadside ditch, (6) forested wetland, (7) seasonal wetland, (8) mixed riparian, (9) perennial emergent wetland, and (10) intermittent stream (Figure 6). Eleven sample points (SPs, Appendix C) and two OHWM transects (Appendix D) were examined to identify jurisdictional features (Figures 7 and 8). The results of the delineation are summarized below in Table 3.

Table 3. Summary of Potential Jurisdictional Waters and Wetlands within the Delineation Study Area

Habitat Type	Acres
Total Potential Waters of the U.S.	**0.017**
Seasonal Wetland	0.015
Perennial Emergent Wetland	0.001
Intermittent Stream	0.001
Culverts	0.004
Waters Expected to be Disclaimed under Section 404 due to Lack of Continuous Surface Connection[1]	**0.054**
Isolated Seasonal Wetland	0.014
Isolated Forested Wetland	0.040
Total Waters of the State	**0.080**
Seasonal Wetland	0.029
Forested Wetland	0.040
Perennial Emergent Wetland	0.001
Intermittent Stream	0.001
Mixed Riparian	0.009
Culverts	0.004
Total CDFW Jurisdictional Habitats	**0.010**
Mixed Riparian	0.009
Intermittent Stream	0.001
Culvert	<0.001
Total Non-jurisdictional Areas[2]	**2.559**
Wetland Delineation Study Area Total	**2.638**

[1] Waters expected to be disclaimed under Section 404 are included under the totals for waters of the state

[2] Non-jurisdictional areas were mapped as California annual grassland, developed, landscaped, oak woodland, non-jurisdictional culverts, and roadside ditches.



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Figure 6a. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 6b. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 6c. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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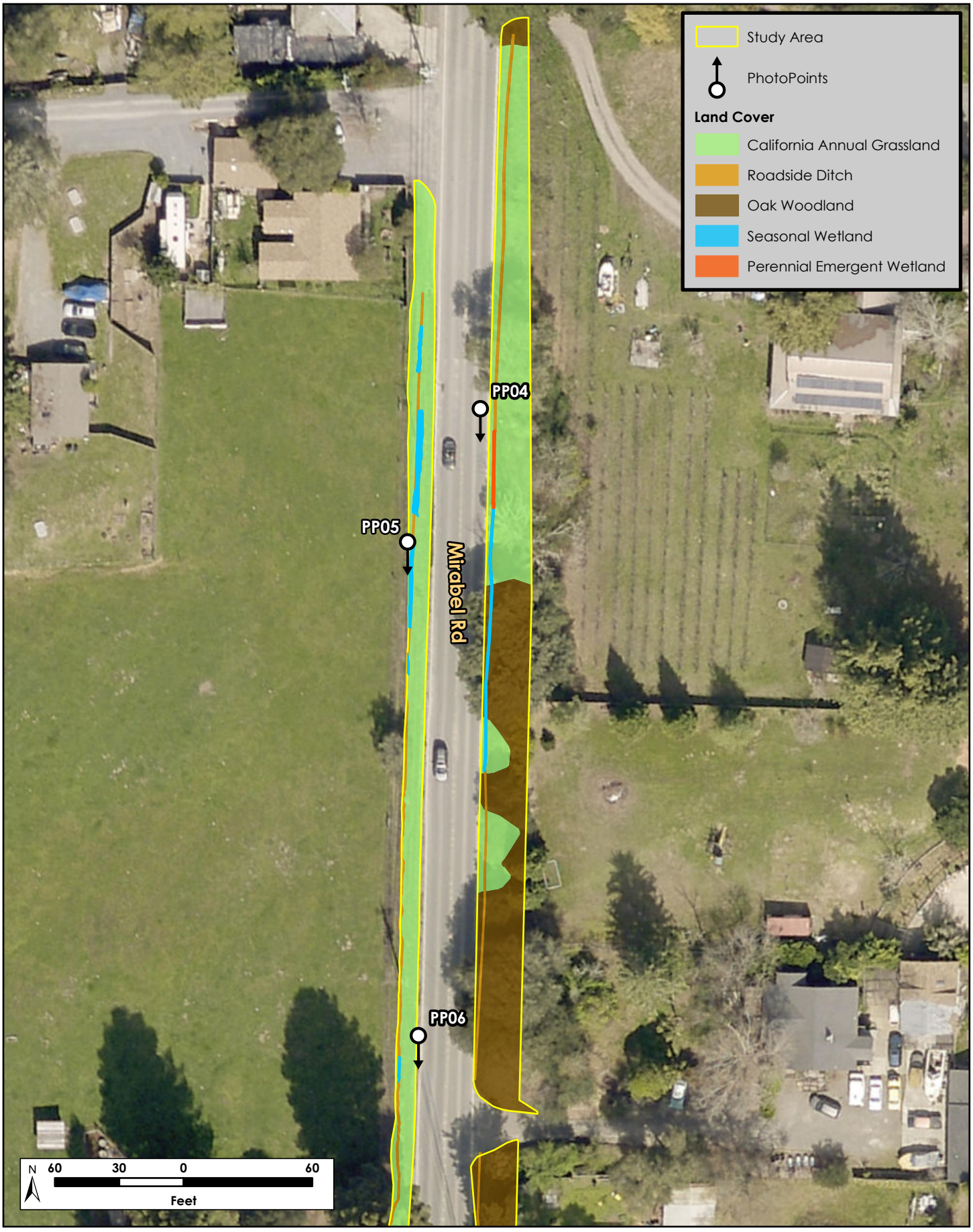
Figure 6d. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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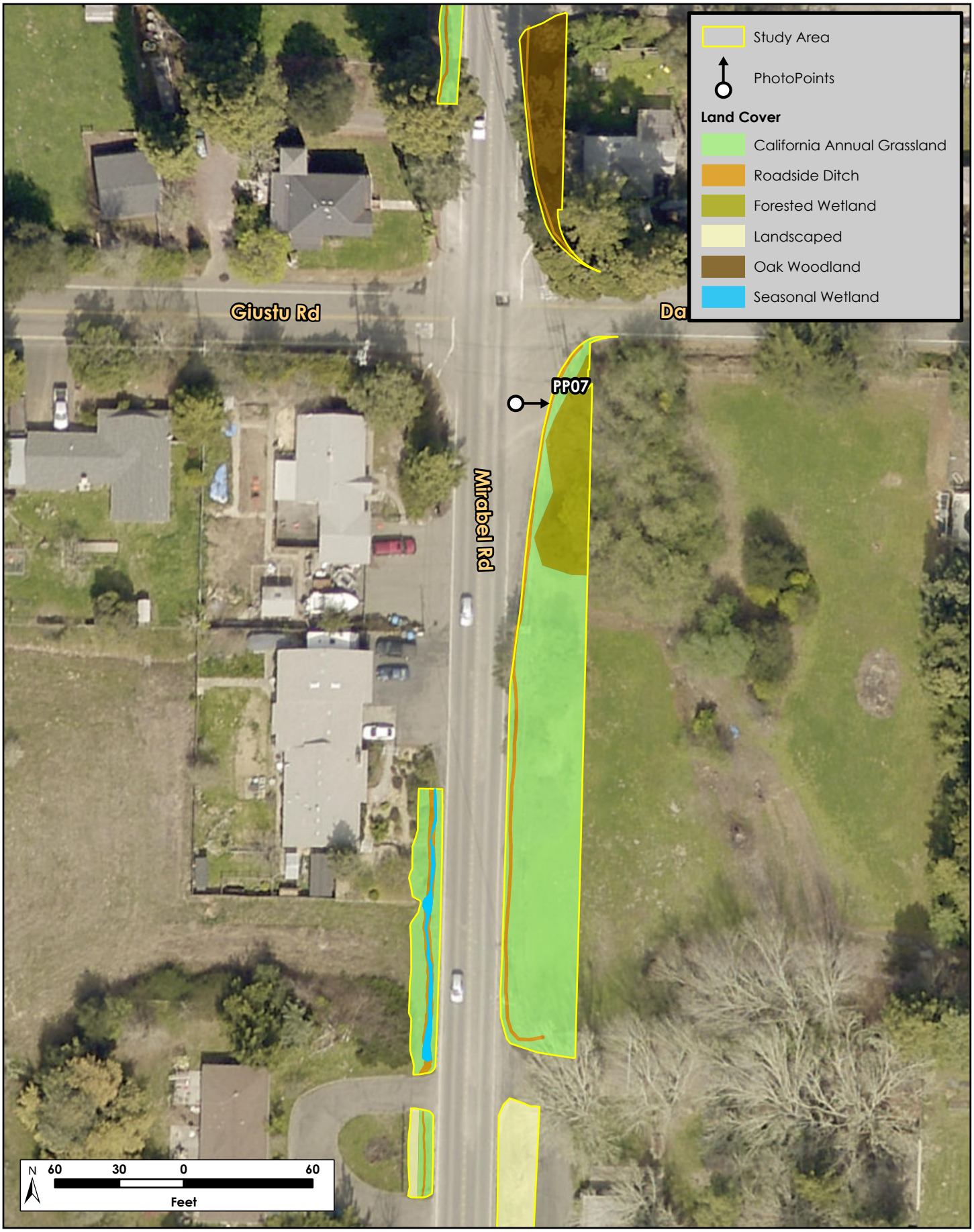
Figure 6e. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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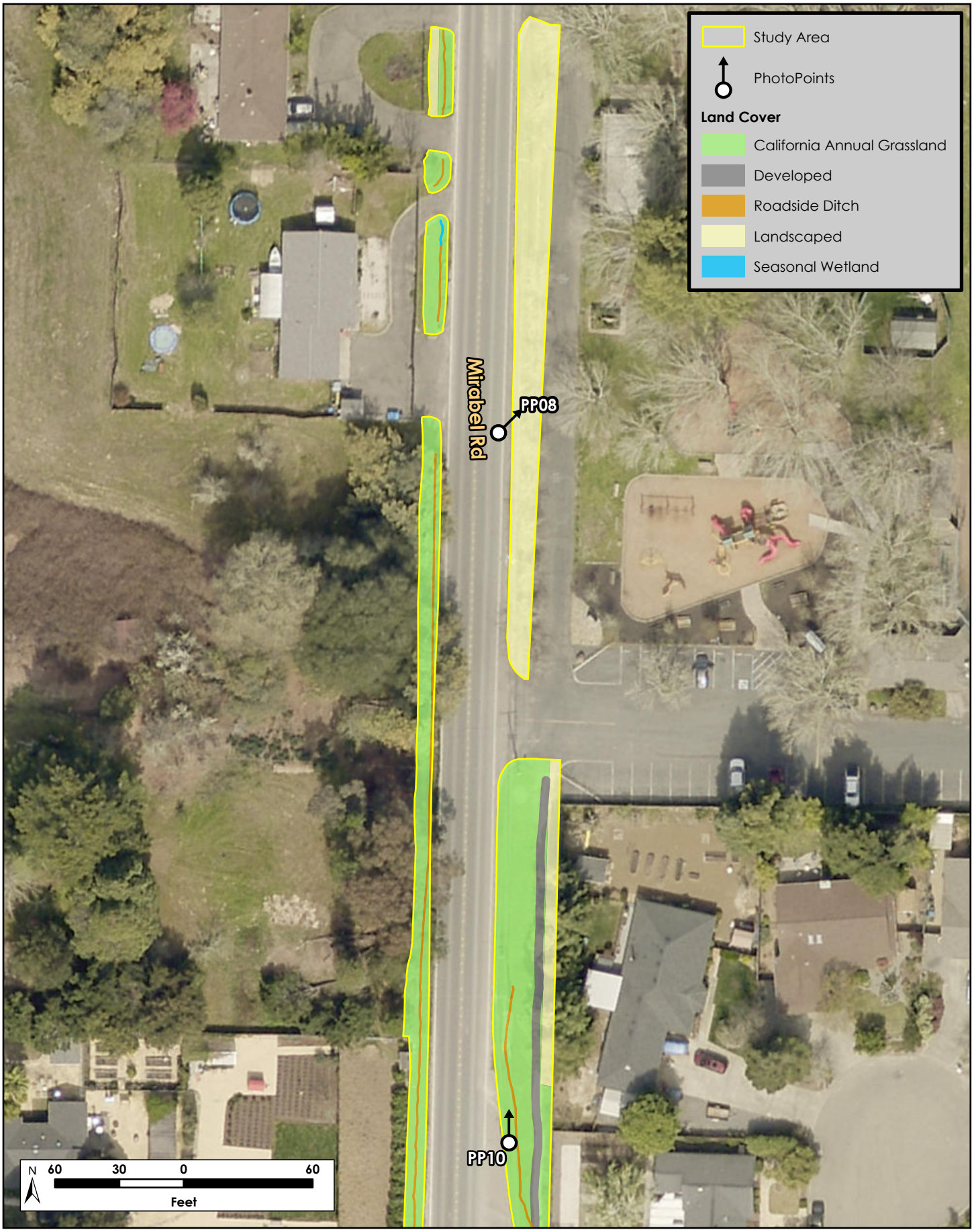
Figure 6f. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 6g. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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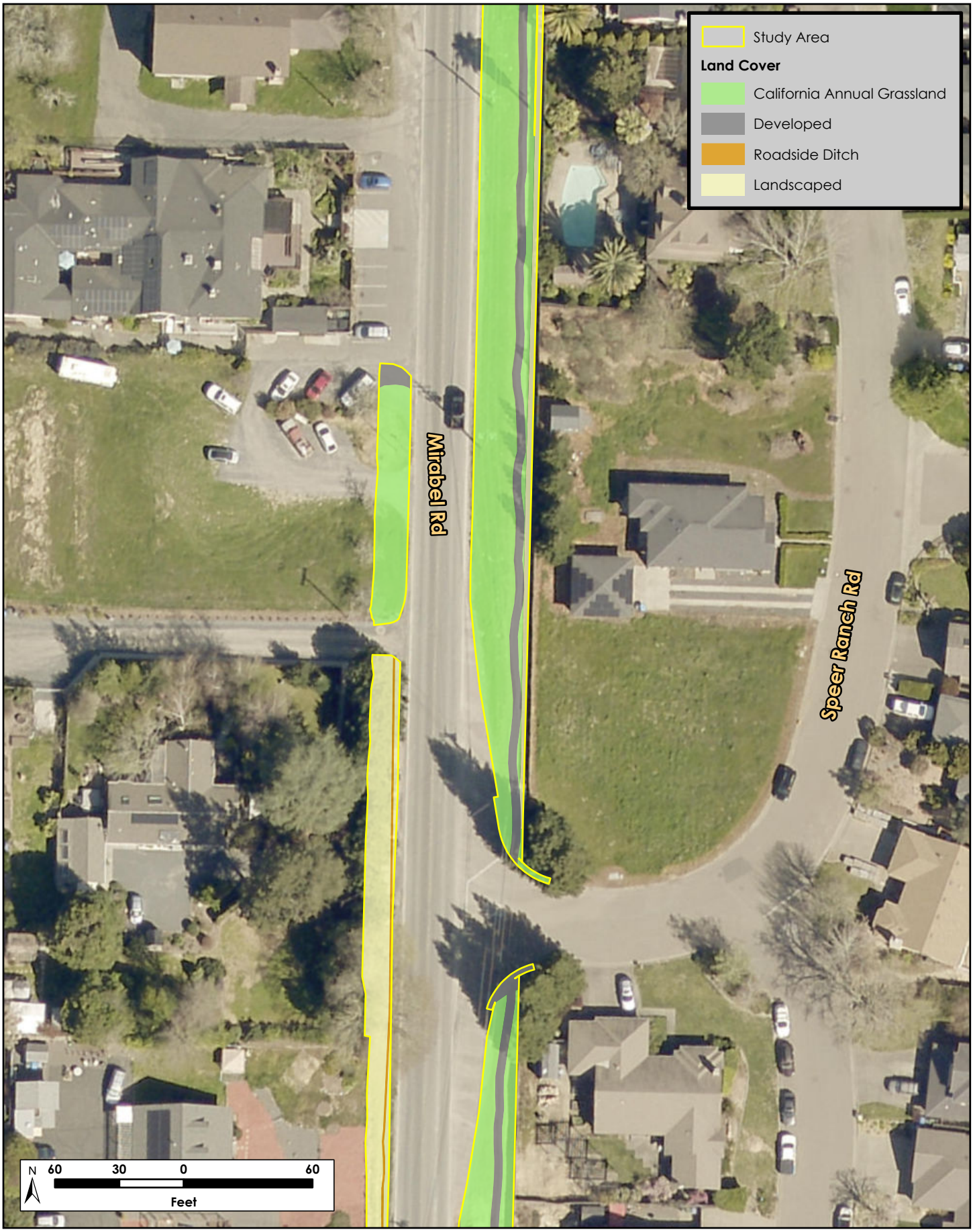
Figure 6h. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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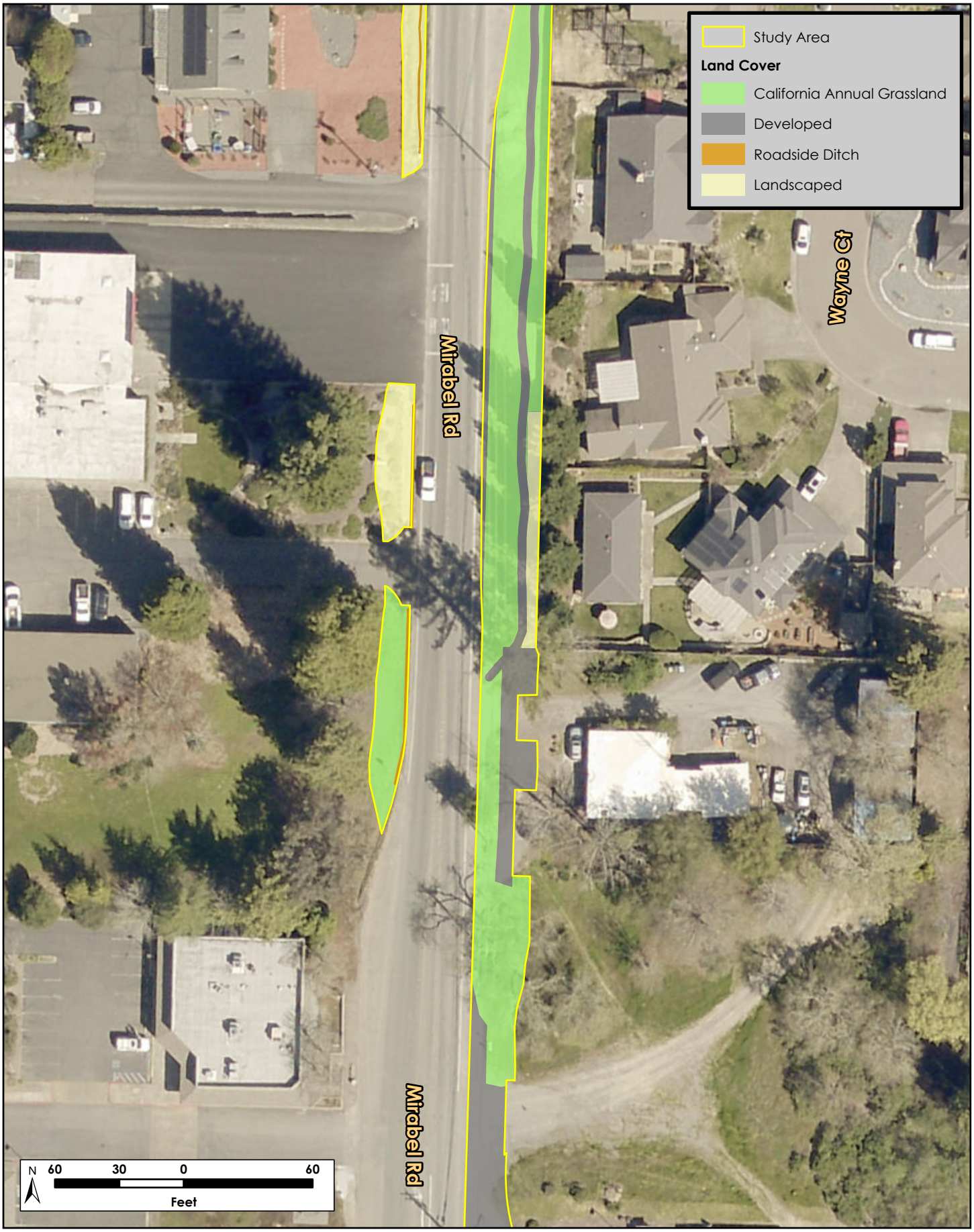
Figure 6i. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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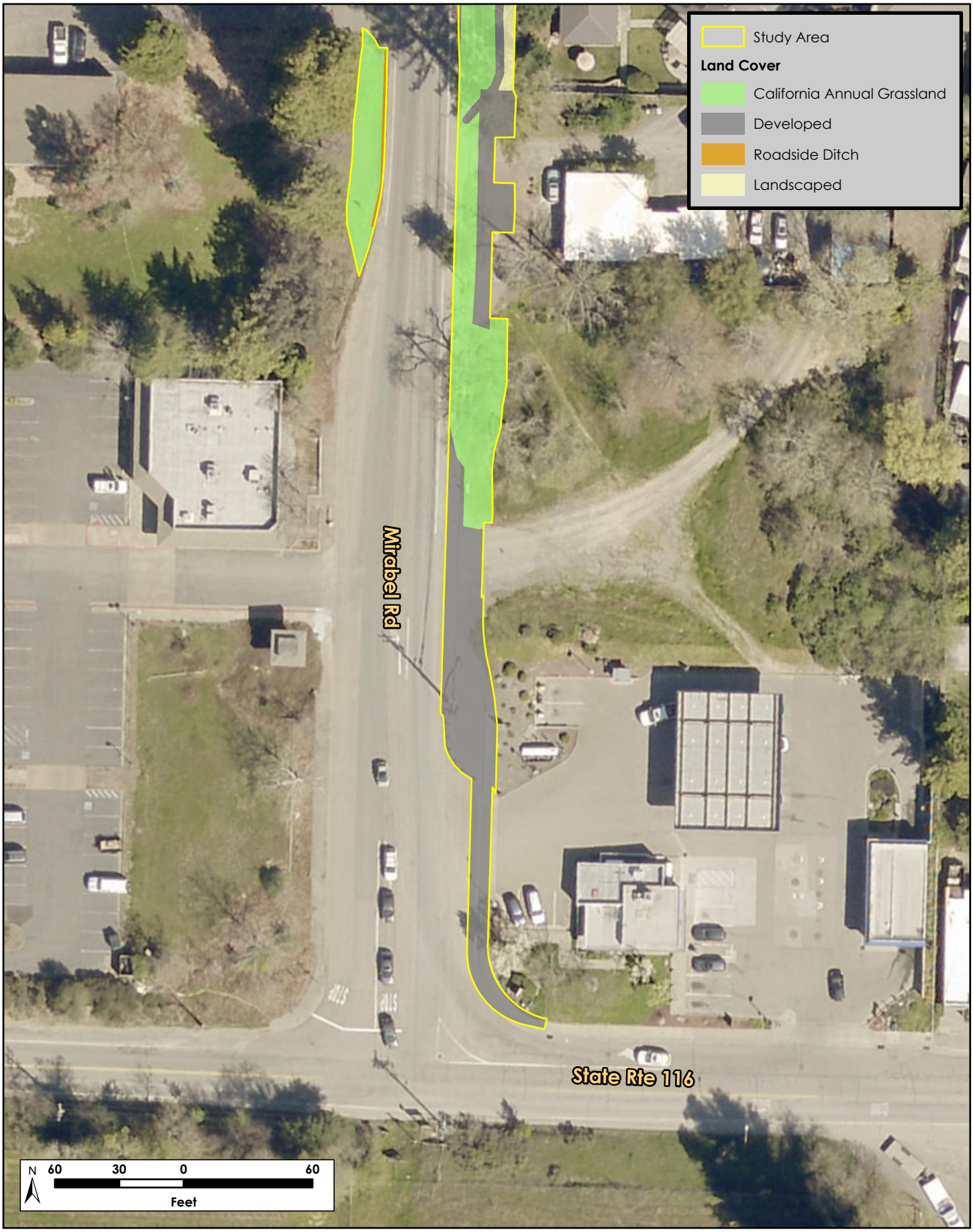
Figure 6j. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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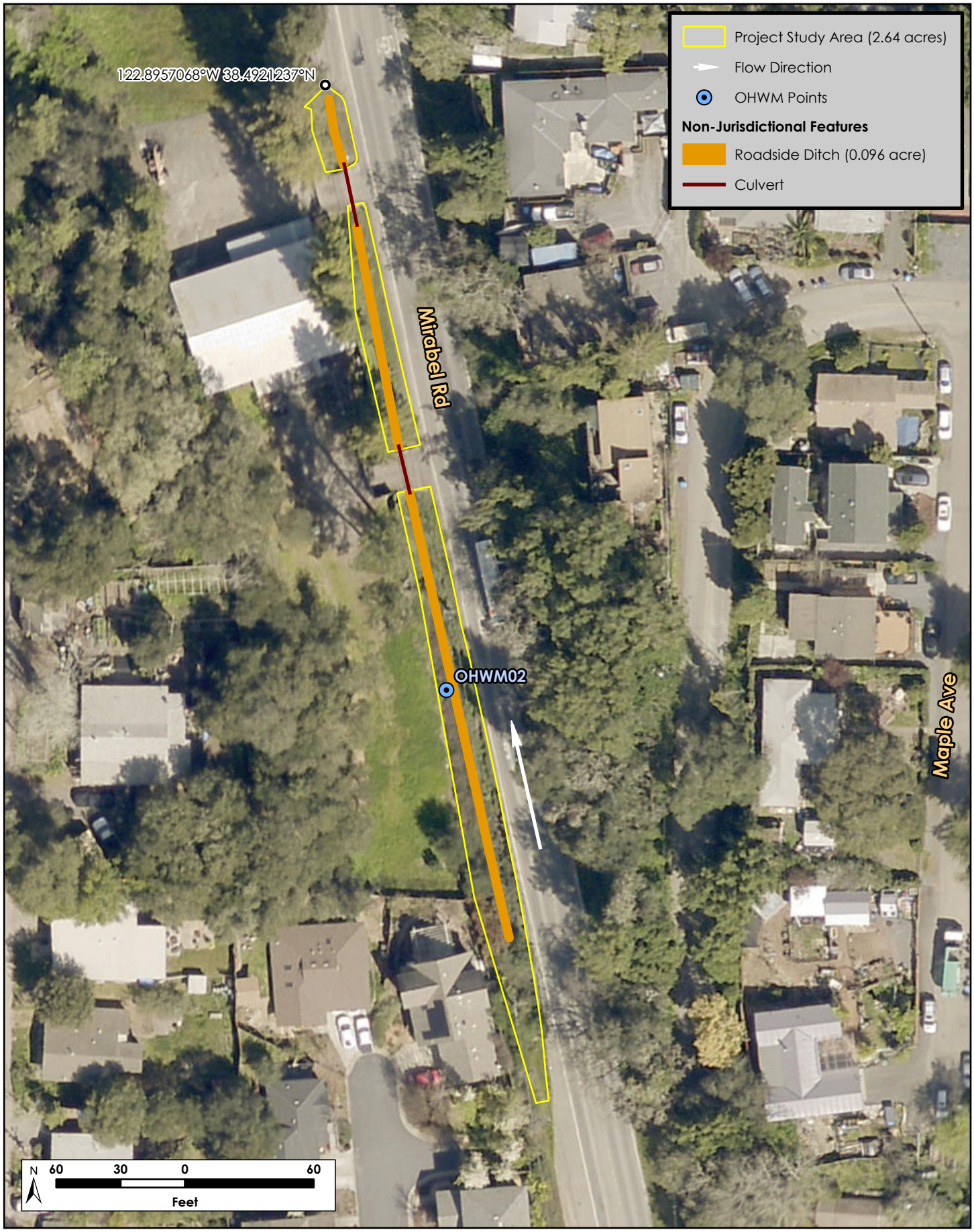
Figure 6k. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 6l. Biotic Habitats
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 7a. Preliminary Delineation of Waters of the U.S

Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 7b. Preliminary Delineation of Waters of the U.S

Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 7c. Preliminary Delineation of Waters of the U.S

Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 7d. Preliminary Delineation of Waters of the U.S

Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 7e. Preliminary Delineation of Waters of the U.S

Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025

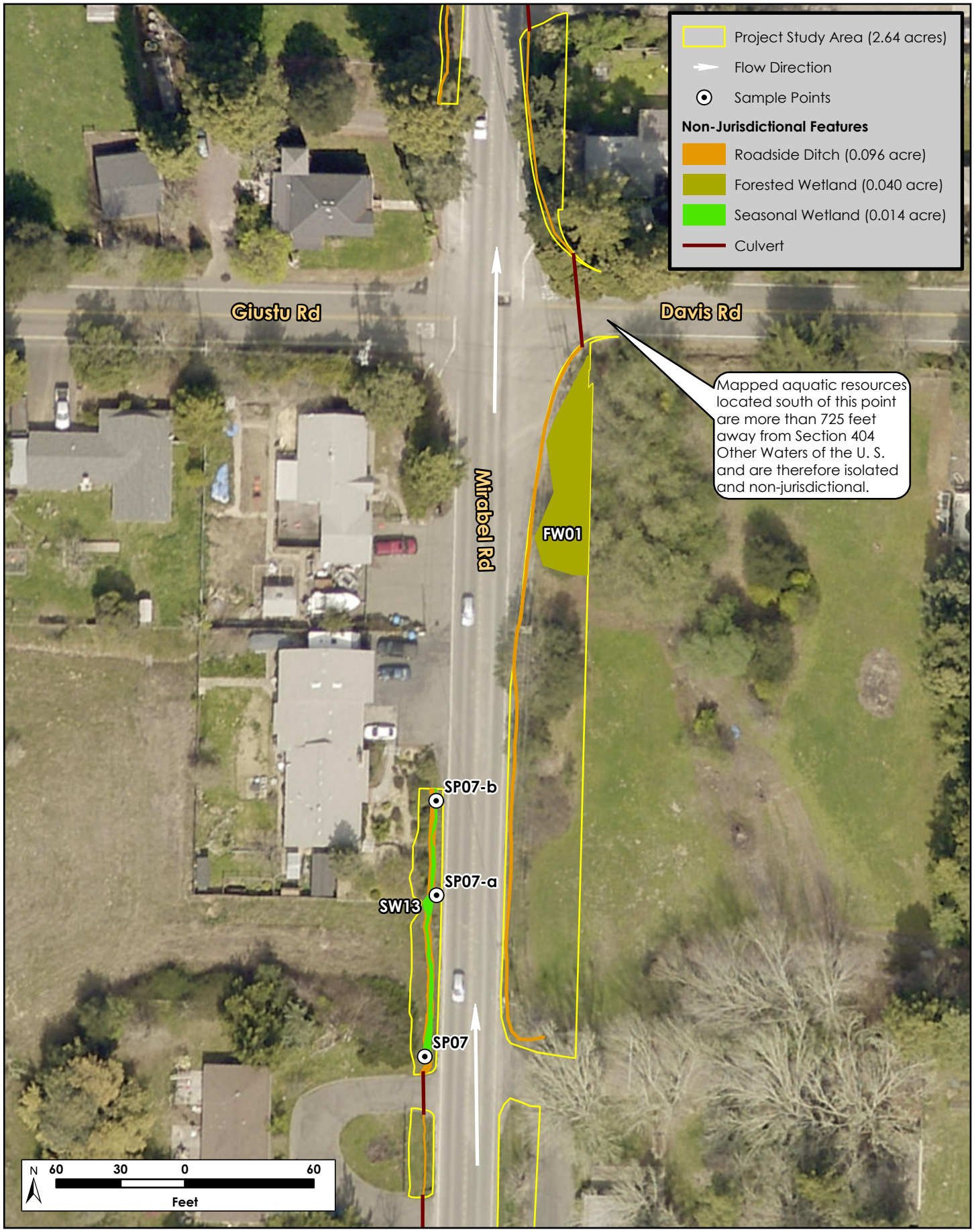


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Figure 7f. Preliminary Delineation of Waters of the U.S

Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025

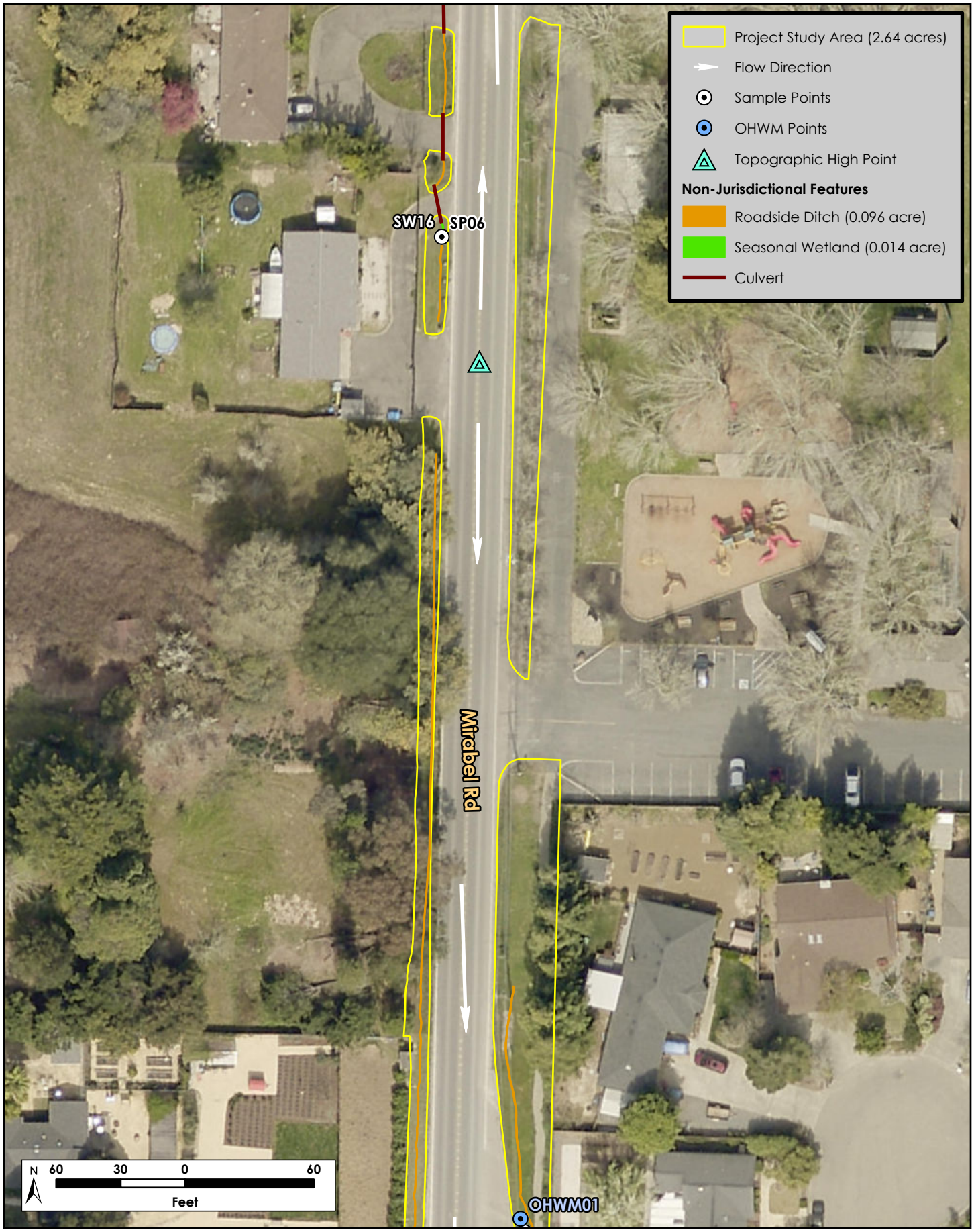


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Figure 7g. Preliminary Delineation of Waters of the U.S

Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025

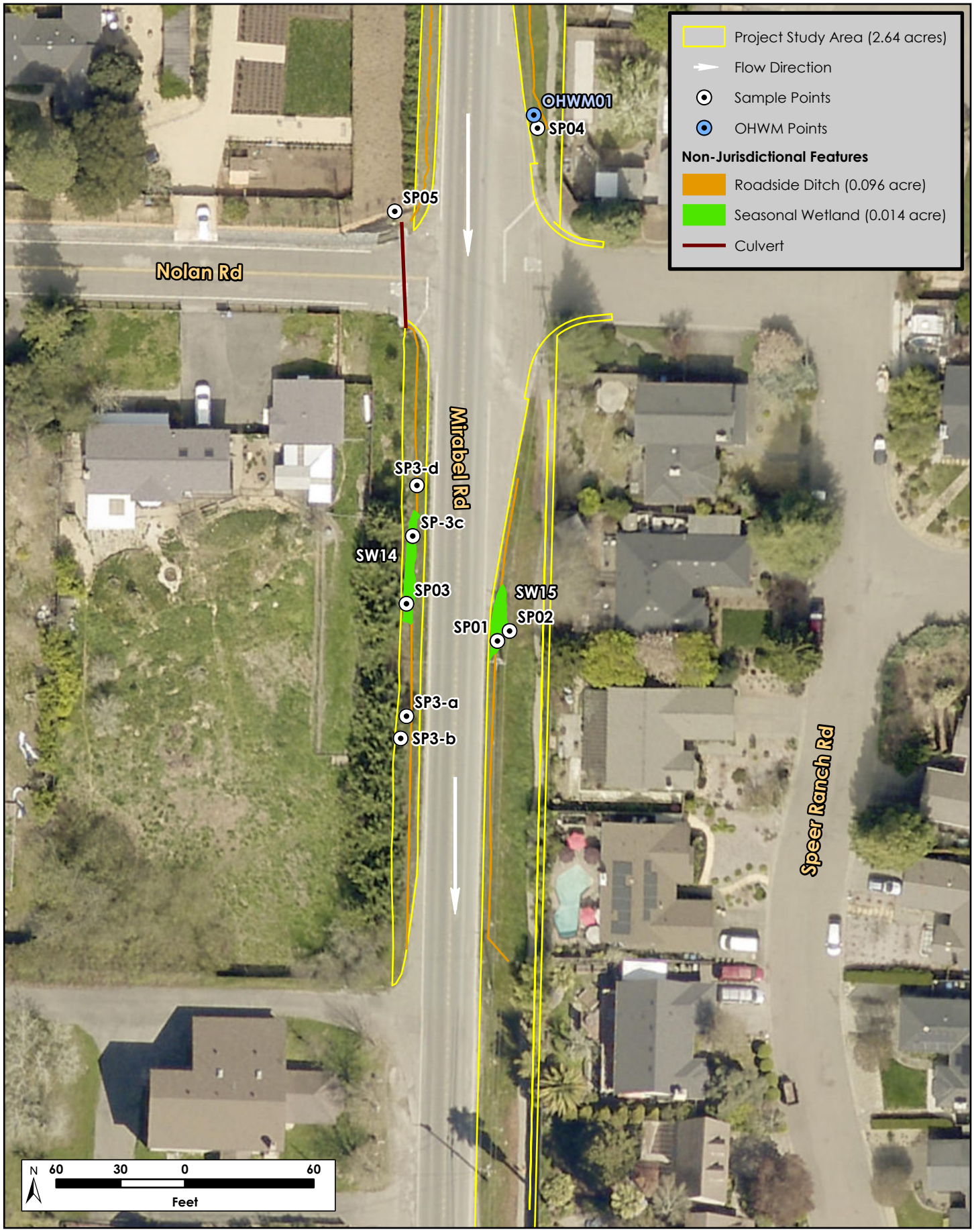


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Figure 7h. Preliminary Delineation of Waters of the U.S

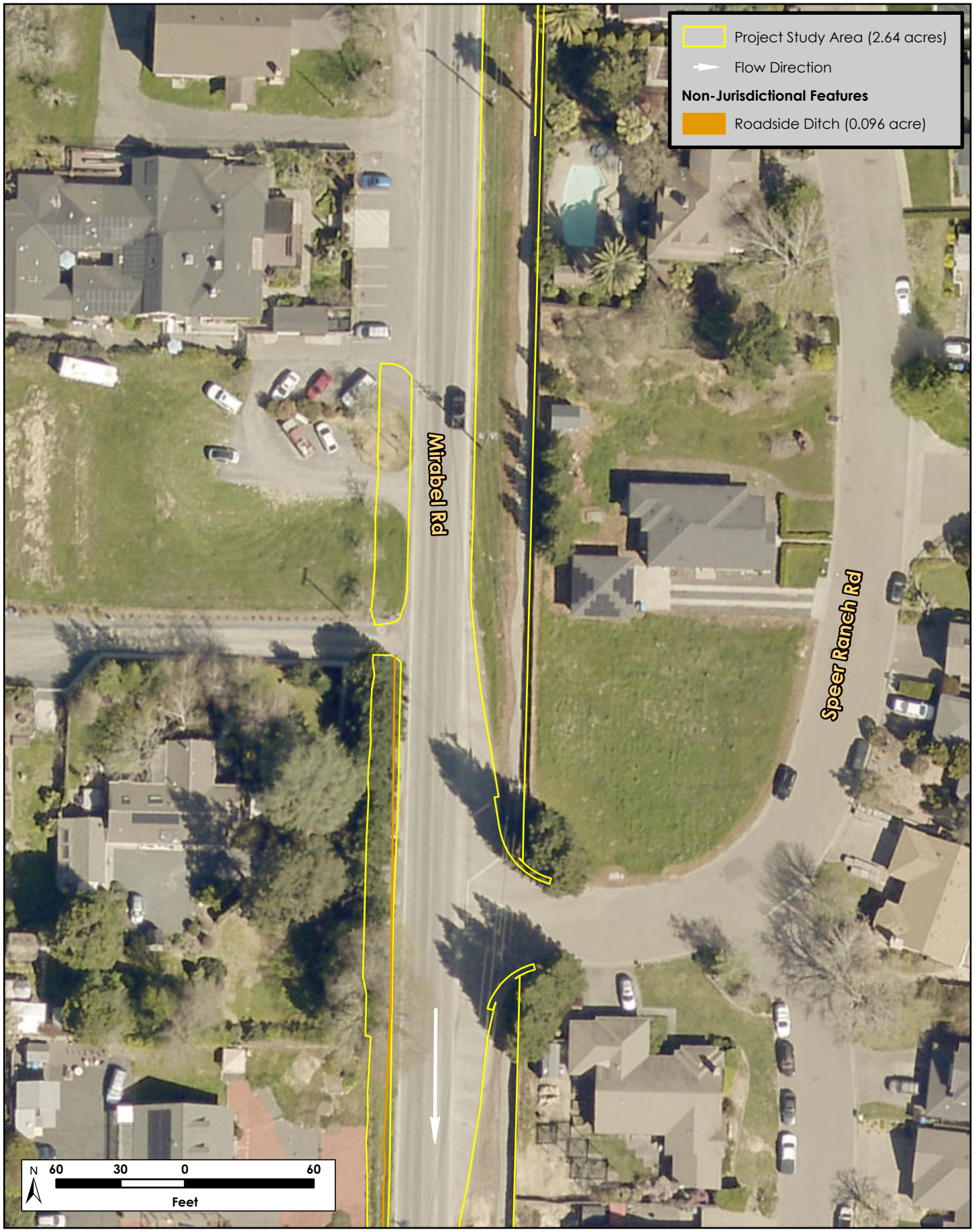
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 7i. Preliminary Delineation of Waters of the U.S
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 7j. Preliminary Delineation of Waters of the U.S
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 7k. Preliminary Delineation of Waters of the U.S

Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 7I. Preliminary Delineation of Waters of the U.S
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 8a. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 8b. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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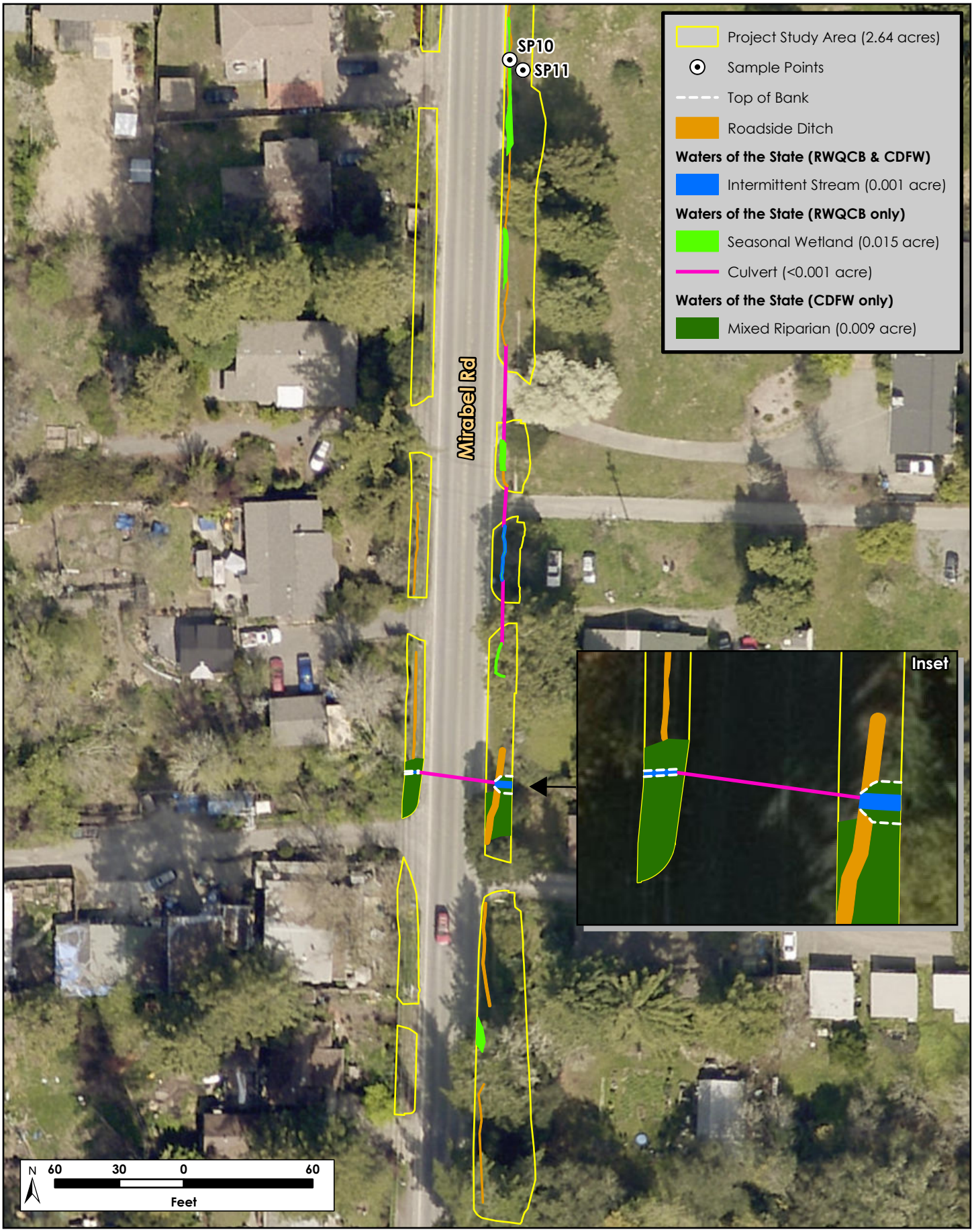
Figure 8c. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 8d. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 8e. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 8f. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 8g. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 8h. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 8i. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 8j. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
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Figure 8k. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025



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Figure 8I. Preliminary Delineation of Waters of the State
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025

Information assembled during this investigation and pertinent to the identification of jurisdictional wetlands and other waters is presented in Appendices A–E of this report. In addition, Appendix F is included as an electronic attachment in Microsoft Excel format, per USACE (2016b) guidelines.

- Appendix A—Plants observed in the Study Area
- Appendix B—NRCS Soil Survey Report for the Study Area
- Appendix C—USACE Arid West Wetland Data Forms
- Appendix D—USACE Ordinary High Water Mark Data Forms
- Appendix E—Photos of the Study Area
- Appendix F—Aquatic Resources Table

3.1 Observations, Rationales, and Assumptions

Site conditions observed during the delineation survey are reported here, along with pertinent background information and precipitation data.

3.1.1 Background Information

The preliminary delineation assumes that normal (i.e., non-drought) circumstances prevailed at the time of the survey effort (January 2025). Results are based upon the conditions present at the time of the survey. The survey was performed using the "Routine Method of Determination" using three parameters, as outlined in the Regional Supplement (USACE 2008).

Historical imagery from UCSB in 1952 and 1965 shows a stream bisecting the Study Area at the intersection of McMullen Lane and Mirabel Road and flowing northwestwards towards the Russian River. At the time of the site visit, this stream had been culverted under Mirabel Road and was fed by flows from both the roadside ditches running parallel to Mirabel Road. A blue line stream designated as "fluvial natural" on EcoAltlas confirms the presence of a stream here (SFEI 2025). This area is labeled as an intermittent stream (S1 and S2) in Figure 7e.

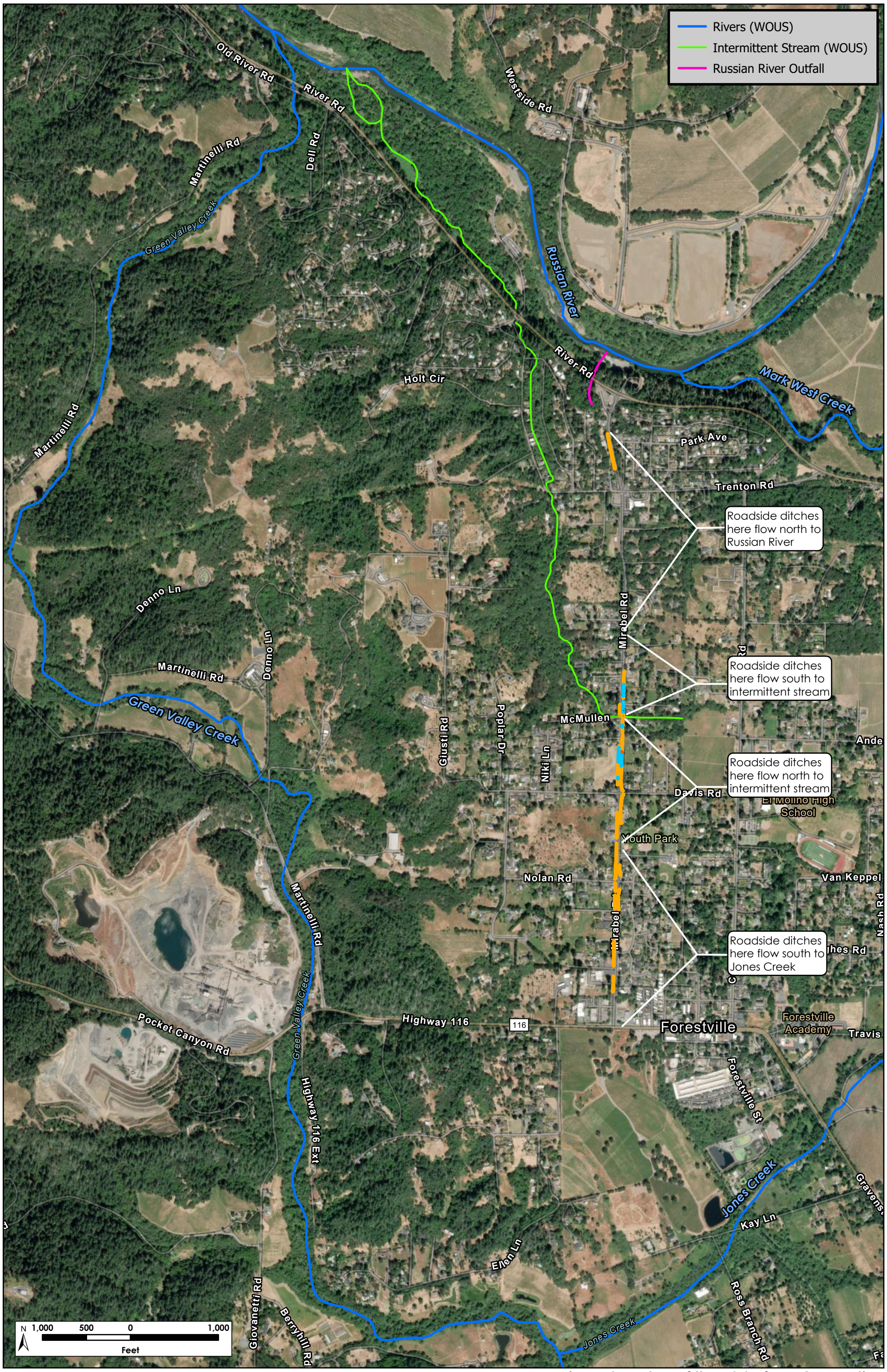
Elevations along the project alignment range from 80 feet above mean sea level at the northern end of the site to 225 feet above mean sea level at Forestville Youth Park in the central portion of the site, and 195 feet asl at the southern end of the site near Highway 116 (Google LLC 2025). The topography of the Study Area is gently sloped with two topographic highs represented as triangles in Figure 7. The first high point is located just north of the intersection of Clark Lane and Mirabel Road (Figure 7d). Waters north of this high point flow northward towards the Russian River and waters south of the high point flow southward towards the intermittent stream which bisects the Study Area. The second high point is located at the Forestville Youth Park (Figure 7h). Waters north of the park (but south of the intermittent stream) flow towards the intermittent stream, and the waters south of the park flow southwards towards Highway 116.

Relative to the 30-year climate normal for October through December (15.13 inches), precipitation in the Study Area was significantly higher than the normal range of precipitation leading up to the January 2025 delineation site visits. Total precipitation recorded in the area from October 2024 through December 2024 was 29.39 inches, approximately 194% of the 30-year average (1991-2020) for the similar annual time period (PRISM Climate Group 2025). The month leading up to the delineation, December 2024, recorded normal rain, with 9.68 inches falling when the 30-year average is 8.86 inches. These conditions were taken into account when assessing the biotic habitats present on the site during the 2025 site visit. However, circumstances were considered normal at the time of the survey.

3.1.2 Site Conditions and Observations

The entire Study Area follows a 1.3 mile stretch of Mirabel Road and contained mostly ruderal, weedy California annual grassland as well as landscaped areas adjacent to private property and residences (Figure 6). The study area is discontinuous and does not include all roadside areas within this 1.3-mile alignment. The grassland consisted of mostly non-native annual grasses such as wild oat (*Avena* spp.; Obligate Upland species [UPL]) and bromes (*Bromus* spp.; Facultative Upland species [FACU] or UPL) and non-native forbs such as prickly lettuce (*Lactuca serriola;* FACU), filarees (*Erodium moschatum*, E. *botrys*; FACU), geraniums (*Geranium molle*, *G. robusta*: NI), summer mustard (*Hirschfeldia incana*; NI), and wild radish (*Raphanus sativus*; NI). The entirety of the annual grassland appeared to be both regularly and frequently mowed by city maintenance. The landscaped areas varied throughout the Study Area but included ornamental trees, shrubs and groundcovers common to the region, including privet (*Ligustrum* sp.; FACU or UPL), acacia (*Acacia* spp.; NI), rose (*Rosa* sp.; FACU or UPL), and greater periwinkle (*Vinca major*; FACU). Trees persisted in the landscaped areas such as coast redwood (*Sequoia sempervirens*; UPL) and native coast live oak (*Quercus agrifolia*; NI). Scattered clusters of oak trees that amounted to at least 0.5 acre were categorized and mapped as oak woodland and consisted mostly of coast live oak and valley oak (*Q. lobata*; FACU). Developed areas consisted of roads (namely Mirabel Road), parking areas, driveways, and a pedestrian walkway.

The entirety of the Study Area is located in various sections on the eastern and western edges of Mirabel Road. The Study Area has been altered and contained non-native fill, presumably to accommodate the construction of the road. A large portion of the area conveyed water in roadside ditches that were excavated in uplands for road drainage and do not replace native streamcourses. Ditches that were well-defined with a rough trapezoid shape were mapped as roadside ditch. Some grassy roadside areas contained broad swales rather than trapezoidal ditches; we anticipate these areas to convey small volumes of stormflow. These areas were included in the larger California annual grassland habitat type.



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Figure 9. Waters of the US Surface Connection
Mirabel Road Widening Project
Preliminary Delineation of Wetlands and Other Waters (3328-25)
May 2025

Some portions of these ditches contain OHWMs, and others do not. The portions of ditches that contained OHWMs were characterized by breaks-in-slope, wrack, change in vegetation type from hydrophytes to upland grasses, and matted down and/or bent vegetation. Seasonal wetlands were located sporadically throughout the roadside ditches, and in only two cases (i.e., SW06 and FW01, Figure 7e), in standalone areas where ponding occurred. These wetlands had standing water at the time of the site visit and contained hydric soils and hydrophytic vegetation such as watercress (*Nasturtium officinale*; Obligate wetland species [OBL]). The wetlands have formed over time in lower areas where water collects in the roadside ditches that were created to accommodate stormwater from the construction of Mirabel Road. Section 404 wetlands were connected to waters of the U.S. within the unnamed intermittent stream through culverts, ditches, and sometimes shallow roadside swales that did not have a trapezoidal shape or defined bed and banks.

Historical imagery for this region goes back to the year 1952, after Mirabel Road was constructed, and shows that area was historically used for agricultural purposes. It appears that at least one naturally occurring stream crossed Mirabel Road to convey water (S1 and S2, Figure 7e). This stream was located at McMullen Lane, and crossed Mirabel Road where it flowed northwesterly towards the Russian River. The stream was culverted under Mirabel Road and had flowing surface water at the time of the site visit (Figure 9).

3.1.3 Rationale for Sample Point Choice

Eleven sample points and two OHWM transects were selected to document conditions in representative jurisdictional and non-jurisdictional areas (Figure 7 and 8) (Appendix C, Appendix D). Rationale and findings for wetland data form sample point locations are summarized below in Table 4.

Table 4. Summary of Sample Point Locations and Results

Name	Sampling Rationale	Hydrophytic Vegetation?	Hydric Soil?	Wetland Hydrology?	Overall Wetland Assessment
SP01	Placed to investigate shallow depression within roadside ditch.	Yes	Yes	Yes	This area is a three parameter **wetland**.
SP02	Upland paired point to SP01	No	No	No	This area does not meet the three parameter wetland criteria.
SP03	Placed to investigate prevalence of FAC vegetation within a saturated roadside ditch.	Yes	Yes	Yes	This area is a three parameter **wetland**.
SP04	Placed to investigate low point within a roadside ditch containing FAC vegetation.	Yes	No	Yes	This area does not meet the three parameter wetland criteria.
SP05	Placed to investigate low point within a roadside ditch that had ponded.	No	Yes	Yes	This area does not meet the three parameter wetland criteria.

Name	Sampling Rationale	Hydrophytic Vegetation?	Hydric Soil?	Wetland Hydrology?	Overall Wetland Assessment
SP06	Placed to investigate low point within a roadside ditch that had ponded.	Yes	No	Yes	This area does not meet the three parameter wetland criteria due to problematic soils but is still considered a **wetland**.
SP07	Placed to investigate low point within a roadside ditch with a prevalence of FAC vegetation.	Yes	Yes	Yes	This area is a three parameter **wetland**.
SP08	Placed to investigate wetland vegetation within flowing roadside ditch	Yes	Yes	Yes	This area is a three parameter **wetland**.
SP09	Upland paired point to SP08.	No	Yes	No	This area does not meet the three parameter wetland criteria.
SP10*	Placed to investigate wetland vegetation within flowing roadside ditch	Yes	No	Yes	This area does not meet the three parameter wetland criteria due to problematic soils but is still considered a **wetland**.
SP11	Upland paired point to SP10.	No	No	No	This area does not meet the three parameter wetland criteria

*This sample point appears to contain non-native imported soils.

OHWM-1 was placed within a roadside ditch adjacent to SP04, just north of the intersection of Mirabel Road and Nolan Road (Photo 10, Figure 7i). This feature contained a distinct OHWM and is a representative example of the roadside ditches mapped with OHWM in the Study Area. OHWM-2 was placed in a channel located approximately 0.06-mile south of River Road, and 0.13-mile south of the Russian River. This roadside ditch at this location was concrete lined and contained a distinct OHWM (Photo 11, Figure 7i). The OHWM forms are provided in Appendix D.

3.1.4 Photo Points

Photo point labels, coordinates, and rationales for photo documentation are presented in Table 5 and mapped in Figure 6. Photos are presented in Appendix E.

Table 5. Coordinates and Rationale for Photo Points

Label	Decimal Degrees, 5 places	Depiction
Photo 1 (PP01)	38.491385, -122.89548	Facing south. January 9, 2025. Representative photograph of mixed riparian biotic habitat type.
Photo 2 (PP02)	38.48327, -122.89486	Facing east. Imagery from March 2024. Showing the intermittent stream on site.
Photo 3 (PP03)	38.48303, -122.89484	Facing north. January 9, 2025. Representative photograph of oak woodland biotic habitat type.
Photo 4 (PP04)	38.48224, -122.894851	Facing south. January 9, 2025. Representative photograph of perennial emergent wetland habitat type.
Photo 5 (PP05)	38.48206, -122.89495	Facing south. January 9, 2025. Representative photograph of seasonal wetland habitat type.
Photo 6 (PP06)	38.48143, -122.89493	Facing south. January 9, 2025. Representative photograph of roadside ditches.
Photo 7 (PP07)	38.48080, -122.89483	Facing east. January 9, 2025. Representative photograph of forested wetland biotic habitat type.
Photo 8 (PP08)	38.47938, -122.89484	Facing northeast. Imagery from April 2024 (Google LLC 2025). Representative photograph of landscaped biotic habitat type.
Photo 9 (PP09)	38.47773, -122.89477	Facing north. January 9, 2025. Representative photograph of developed land cover.
Photo 10 (OHWM 1)	38.47847, -122.89478	OHWM 1 facing north. January 9, 2025. Cross section of vegetated roadside ditch in the southern portion of the Study Area.
Photo 11 (OHWM 2)	38.49125, - 122.89543	OHWM 2 facing northwest. January 9, 2025. Cross section of concrete-lined roadside ditch with an OHWM.

3.2 Off-site Connectivity Study

An off-site desktop survey was conducted to determine connectivity of wetlands within the Study Area to relatively permanent, standing, or continuously flowing bodies of water downstream. Drainage flow paths and connectivity of features within the Study Area were determined through communication with Sonoma County staff and consultation with historical aerials (NETR 2025, UCSB 2025, USGS 2021), wetland mapping databases (SFEI 2025, NWI 2025), and Google Earth imagery (Google LLC 2025). The wetlands within the Study Area are located in roadside ditches on either side of Mirabel Road localized in the central portion of the Study Area (Figures 7 and 8). The topography within the Study Area includes two gradual hills bisecting Mirabel Road at Forestville Youth Park and at Clark Lane, at points labeled on Figure 7. Flow lines in those figures depict the direction of the flow of water. The northern third of the Study Area flows north and the southern third of the Study Area flows south. The middle third of the Study Area flows towards the intermittent stream, which in turn flows into the Russian River off-site (Figure 9).

The aquatic features that flow in the northerly direction (all features north of the topographic high at Clark Lane) are hydrologically connected to the Russian River via an outfall at River Road to the north of the Study Area (Figure 9).

The intermittent stream that bisects Mirabel Road at McMullen Road (S1 and S2, Figures 7e and 8e) flows to the northwest and eventually connects to the Russian River. Topography ranges from around 200 feet asl east of the intersection of Mirabel and Mc Mullen Roads, 170 feet asl west of the intersection of Mirabel and Mc Mullen Roads, and gradually declines to around 70 feet asl at the intersection of the Russian River northwest of Mirabel Road. Features at the topographic high points, south of Clark Lane and north of the Forestville Youth Park, drain into the intermittent stream. The stream is shown on USGS maps and EcoAtlas, but it was not accessible at the time of the field survey due to it flowing through multiple private properties. It appears to contain no less than three culverts to reach the Russian River (at Trenton Road, Marianna Drive, and River Road). Features within the Study Area that flow into the intermittent stream with a continuous surface (e.g., roadside ditch or culvert) connection of no more than 725 linear feet are considered to be hydrologically connected to the Russian River.

Drainage flow paths and connectivity of the features in the southern portion of the Study Area were determined to be hydrologically isolated from other waters. Local topography isolates the area south of Mirabel Road from the closest waterbody, Green Valley Creek. Green Valley Creek flows in the northwesterly direction and is 0.63 miles south of the Study Area at the intersection of Mirabel Road and Highway 116. A topographic high (of around 200 feet asl) creates a basin around Mirabel Road and just south of Highway 116 (Figure 3).

A review was conducted to determine the presence or absence of a continuous surface connection (i.e., jurisdictional pursuant to the conforming rule), including underground culverts, for wetlands and other waters in the Study Area (Figure 9). All features concluded to have a continuous surface connection of less than 725 feet through non jurisdictional features such as ditches and ditch-culverts to relatively permanent waters were determined to be jurisdictional pursuant to the conforming rule. Areas may still be considered jurisdictional even if they are not connected through a culvert if they have no restrictions to sheet flows such as across driveways or grasslands.

A summary of waters determined to be jurisdictional waters of the U.S. pursuant to the conforming rule are provided in Table 6.

Table 6. Potential Waters of the U.S. Pursuant to September 2023 Conforming Rule

Habitat Type	Acres	Connectivity Notes
SW01-SW05, C1-C3	0.007	SW01 through SW05 are connected via a series of culverts, swales, and roadside ditches that flow southwards to the intermittent stream and eventually into the Russian River. They are located no more than 725 feet from the unnamed intermittent stream.
SW06-SW12 and PEW01	0.01	SW06 through SW12 and PEW01 are connected via a series of culverts, swales, and roadside ditches that flow northwards to the intermittent stream and eventually into the Russian River. They are located no more than 725 feet from the unnamed intermittent stream.
Intermittent Stream, S1 and S2, C4	0.002	The intermittent stream flows towards the northwest and is connected to the Russian River to the north.

3.3 Identification of Potential Section 404 Wetlands

Approximately 0.016 acre of potential USACE jurisdictional wetlands occupy the Study Area, consisting of two wetland types: seasonal wetland and perennial emergent wetland (Figure 7). These features conformed to the physical definition of three-parameter wetlands SW01-SW12 and are connected to navigable waters via roadside ditches and intermittent stream S1-S2 (Figure 7e). Although the ditches themselves were excavated in uplands and are not jurisdictional, they convey water to and from jurisdictional wetlands. A summary of the wetland data form results is presented in Table 6. Completed data forms are provided in Appendix C.

Because of the Sackett vs. Environmental Protection Agency Supreme Court ruling, areas that are defined as wetlands will only be jurisdictional through Section 404 if they have a continuous surface connection to a waters of the U.S. or traditional navigable waterway. The descriptions of the seasonal wetlands below refer to wetlands that are potentially jurisdictional through the RWQCB and the USACE. Seasonal Wetland 13 through SW16 and FW01 are potentially jurisdictional through the RWQCB but not through the USACE and are described in Section 3.5 Waters Expected to be Disclaimed by USACE Due to Lack of Continuous Surface Connection. These wetlands are very ecologically similar to the wetlands that are described below in Section 3.3.1

3.3.1 Potential Section 404 Wetlands

Seasonal wetlands generally result from spring rain and typically occur in slight depressions in open fields, or at the base of hillslopes. Surface water may be lacking during the summer and fall, but seasonal wetlands typically support hydrophytic plants year-round. Twelve seasonal wetland features (SW01-SW12) and perennial emergent wetland (PEW01) were mapped within the Study Area. The PEW01 contained emergent vegetation, such as cattails (*Typha* sp.) and sedges, and the forested wetland was dominated by willows (*Salix* sp.) and was

located outside of the roadside ditch. Because the hydrology, soils, and vegetation were fairly consistent among these three wetland features, for the purposes of the report, information on all three are included in this section.

Seasonal Wetlands (SW01 through SW12) and Perennial Emergent Wetland (PEW01). Twelve seasonal wetlands and one perennial emergent wetland were mapped within low points and shallow depressions within the roadside ditches adjacent to Mirabel Road in the Study Area. The construction of Mirabel Road and associated culverts from adjacent properties have resulted in the formation of ditches that convey water. Shallow depressions have formed within the ditches that have created the conditions for seasonal wetlands. Additionally, construction of the road has also likely resulted in non-native scattered gravel and sandy masses found throughout the soil profile in several soil pits. Paired upland pits were investigated for SP01 (paired with SP02), SP08 (paired with SP09), and SP10 (paired with SP11) to ensure that wetland characteristics observed in the lowland sample points were different from those in the upland paired pits.

Vegetation. The seasonal wetlands (representative conditions depicted in Photo 5 in Appendix E) that was observed on the site at SW01-12 was dominated by watercress (OBL), contained non-dominant percentages of curly dock (*Rumex crispus*), and nearly zero cover of any other plant species. These wetlands were located within the roadside ditches with running water in areas that contained sediment that had accumulated overtime.

The perennial emergent wetland (representative conditions depicted in Photo 4 in Appendix E) that was observed on the site was fully inundated with deeper water than the other wetlands in the Study Area. This wetland category contained cattail (OBL) and tall flatsedge (*Cyperus eragrostis,* facultative wetland species [FACW]), with a few scattered willow saplings (FACW).

Soils. Hydric soil indicators observed in several soil pits include distinct redoximorphic concentrations in the top 12 to 16 inches of soil which had a dark surface layer with soil colors commonly of 10 YR 3/2 and one with soil color 10 YR 4/1 (SP03) This corresponds to the F6 – *Redox dark surface*, hydric soil indicator. Non-native fill and imported gravel frequently appear in soil pits. This fill was often tan to gray with orange mottled throughout. Most of the soils within the site are mapped as Goldridge fine sandy clay loam, with the exception of the northeastern most section which is Josephine loam. Goldridge fine sandy loam, 2 to 9 percent slopes, is in the central portion of the Study Area between Nolan Road and McMullen Road and between Tovah Lane and River Road. This is the only soil type on the National Hydric Soils List as hydric (NRCS 2025b). Other wetlands that did not meet an F6 indicator met the A4 – *Hydrogen Sulfide* indicator. SP10 was taken in a wet area that contained hydrophytic vegetation and had wetland hydrology. The soils were saturated at the time of the site visit, and the water table was 4 inches below the ground surface. At 10 inches, the soil changed from dark brown to gray with orange mottled throughout. This area (SW10) was deemed to have problematic soils as redox was not visible and there was a clear layer of non-native fill below the native soil. These soils can be defined as problematic hydric soils: Recently Developed Wetlands in the Arid West/Western Mountain Valleys and Coast. Because hydrology and vegetation met the indicators, the landform was in a ponded depression, and the ditches had been recently dug in uplands, that area is still to be considered a wetland.

Hydrology. Primary indicators of wetland hydrology such as standing water, saturation, and a high water table were observed during the 2025 site visits. Not all wetland sample points contained all three; however many did. Additionally, because the roadside ditches were conveying water at the time of the site visit, some areas that were not considered to be wetlands also contained wetland hydrology. For example, some roadside ditches with ponding met the hydrology indicators parameter, but did not meet the vegetation or soils parameter, and therefore, were not considered wetlands.

3.4 Identification of Potential Section 404 Other Waters

Approximately 0.001 acre of potential USACE jurisdictional section 404 "other waters" were observed within the Study Area. These other waters include the intermittent stream at Mirabel Road (S1 and S2, Figure 7e).

The intermittent stream within the Study Area is located where an unnamed natural stream crosses Mirabel Road. This stream is mapped on the 2021 USGS 7.5 minute quadrangle map as an intermittent stream and flows northwest as a tributary to the Russian River. The stream has a distinct bed and bank, but a small portion of it on the west side of the road (S1) has a concrete bed as it is culverted under Mirabel Road. Approximately six inches of water was flowing west within the stream at the time of the survey, which occurred soon after a rain event. However, this stream was considered to be intermittent because the surrounding vegetation included coast live oak (UPL), willow (FACW), Himalayan blackberry (*Rubus armeniacus*, facultative species [FAC]), and greater periwinkle (FACU), mostly wetland species that require a substantial amount of water throughout the growing season. The OHWMs on the banks are approximately 2-feet-wide and identified by a break in slope and change in vegetation. The area below the OHWM lacks vegetation within the study area. A culvert feature (C4) routes the intermittent stream under Mirabel Road.

OHWM-1 and 2 were indicative of the field indicators in the majority of the roadside ditches on the Study Area. Geomorphic indicators include a break in slope above OHWM. Vegetation indicators include a change in vegetation type from hydrophytic to less hydrophytic and matted down/bent vegetation. Other physical indicators include sediment accumulation and leaf litter deposits. Multiple roadside ditches are found throughout the Study Area and have been excavated in uplands alongside Mirabel Road to convey stormflows. These features, labeled as "roadside ditches" are not considered other waters. In addition to the roadside ditches, the culverts that connect these ditches are also not expected to be jurisdictional.

Most driveways in the Study Area have culverts under them that connect roadside ditches (or roadside swales) and were typically one foot in diameter, although a few were smaller. These were only considered potential Section 404 other waters if they directly drained or connected Section 404 features (C1-C4). The culvert under Mirabel Road that connects two reaches of the intermittent stream (C4) was roughly two feet in diameter. These culverts provide continuous surface connection between the wetlands located within the roadside ditches to Traditional Navigable Waters. Not all driveways had culverts under them; these areas are presumed to convey less stormflow volume than driveways with culverts, due to topographical position, and support sheet flows from ditches that are at the same level of the road.

3.5 Waters Expected to be Disclaimed by USACE due to Lack of Continuous Surface Connection

All wetland features that conform to the physical definition of three-parameter wetlands but lack a continuous surface connection to navigable waters or their tributaries are not expected to be jurisdictional waters of the U.S. under the conforming rule. Most of the wetlands within the Study Area are connected to waters of the U.S. via roadside ditches excavated in uplands or by underground culverts (Figure 7). These features, which flow into the intermittent stream, would be potentially jurisdictional. Of the 0.069 acre of potential jurisdictional wetlands meeting the physical definition of three-parameter wetlands, 0.054 acre is not expected to meet the definition of waters of the U.S. under the conforming rule. The features that would be expected to be disclaimed are described below.

Four seasonal wetlands (SW13-16) (Figure 7g and 7i) occupying 0.014 acre have sufficient three-parameter characteristics to meet the physical definition of waters of the U.S. but lack connectivity (either they flow south away from the intermittent stream, or they are more than 725 feet away from the intermittent stream) to be considered potentially jurisdictional. These features are represented by SP01, SP02, SP06, and SP07.

SW13-16 were dominated by Italian rye grass (*Festuca perennis*, FAC) or annual blue grass (*Poa annua*) with occasional common velvet grass (*Holcus lanatus*, FAC) and curly dock (FAC), and nearly zero cover of upland species, and in some cases, bare ground likely due to ponding. The vegetation outside this category of wetland was also dominated by Italian rye grass or annual blue grass, but also contained higher cover of other upland species such as sheep sorel (*Rumex acestosella*, FACU), whitestem filaree (*Erodium moschatum*, not indicated [NI]), big heron bill (*Erodium botrys,* FACU), and prickly lettuce (FACU). The boundary between the two vegetation types was clear, but there was a transitional zone between the depression and the upland. Although the hydrophytic vegetation cover in these wetlands was dominated by only FAC-rated species, these areas still met the Dominance Test. Therefore, vegetation within the depressions are considered hydrophytic.

The forested wetland (FW01) (Figure 7g) (representative conditions depicted in Photo 7 in Appendix E) occupying 0.040 acre has sufficient three-parameter characteristics to meet the physical definition of waters of the U.S. but lack connectivity to be considered potentially jurisdictional. This feature does not contain a sample point as it was inaccessible at the time of the site visit. All vegetation in the forested wetland is rooted above the top of the bank of the roadside ditch and is therefore considered not hydrologically connected to the other features. The area is dominated by well established willows (FACW) with no understory vegetation.

3.6 Identification of Section 401 Potentially Jurisdictional Waters of the State

Approximately 0.080 acre of potential waters of the state (RWQCB jurisdiction) occupy the Study Area that are expected to be considered jurisdictional by the RWQCB. Section 401 waters of the state in the Study Area include all of the features identified as potential waters of the U.S. described in the sections above. An additional 0.062 acres of seasonal wetland, forested wetland, and mixed riparian habitat, including the seasonal wetland

and forested wetland expected to be disclaimed by the USACE as described in Section 3.5, is considered potential waters of the state but not potential waters of the U.S. Section 401 jurisdiction extends beyond OHWM to top of bank or the riparian canopy dripline (rooted below top of bank), whichever is greater.

Mixed riparian habitat occupies 0.009 acre of the Study Area and is situated along the bed and banks of the intermittent stream. The mixed riparian habitat is dominated by willow, coast live oak, and Himalayan blackberry.

The forested wetland (FW01) and seasonal wetlands (SW13-16) are described in Section 3.5. The forested wetland was dominated by willows and was situated above the top of bank of the drainage ditch and is, therefore, not hydrologically connected to the other features. The seasonal wetlands are situated in the southern portion of the Study Area and are either connected to waters that drain to the south, or they drain to the intermittent stream but are over 725 feet from the Section 404 other waters. The wetlands are not connected to the waters of the U.S. via the conforming rule, but they are all three-parameter wetlands and are therefore jurisdictional through the RWQCB.

3.7 Identification of CDFW Potentially Jurisdictional Habitats

Approximately 0.010 acre of CDFW potentially jurisdictional habitats occupy the Study Area, consisting of intermittent stream and mixed riparian habitat along the stream, and culvert C4 (Figure 8). These habitats are described above in Section 3.4 and 3.6.

3.8 Areas Not Meeting the Regulatory Definition of Waters of the U.S./State/CDFW

The remainder of the Study Area does not meet the regulatory definitions of Section 404 or 401 wetlands or other waters. Non-jurisdictional uplands include the following land cover types: (1) California annual grassland; (2) landscaped; (3) developed; and (4) oak woodland. In addition, ditches excavated in uplands and carrying primarily roadside or irrigation runoff occur in upland landscape positions and do not meet the USACE or RWQCB criteria for wetlands and waters, or the CDFW criteria for riparian areas.

The area investigated by SP04 contained marginal wetland characteristics. The vegetation was marginally hydrophytic, containing a mix of upland species and facultative species that grew contiguously in the upland areas as well. The wetland hydrology was strong with a high water table and saturation, but given that the field visit occurred in the wet season, shortly after several large storm events, the wetland hydrology could be presumed to be ephemeral, i.e., not containing saturation for 5-10% of the growing season. Lastly, the soils contained no evidence of anaerobic activity or indication of problematic conditions. Given that these sample points weakly meet the hydrophytic vegetation and wetland hydrology criteria and that the soils were null, we presumed these areas were not wetland or other waters of the U.S. or waters of the state.

Broad grassy swales without a defined trapezoidal shape along the roadsides are anticipated to convey small volumes of stormflows. When trapezoidal roadside ditches appear to taper off, they likely convey their flows into these swales. Like the ditches, these features were excavated in uplands for the purpose of conveying stormwater and road runoff, and therefore were not considered jurisdictional unless they contained connected wetlands. Similarly, culverts connecting only non-jurisdictional ditches and swales were not considered jurisdictional themselves.

Features not expected to be jurisdictional wetlands include the wetlands south of the second topographic high, as they flow south towards Jones Creek, but do not have tributaries that connect to it (Figure 9). Additionally, features that flow towards the intermittent stream but are over 725 away from it were discounted as being hydrologically isolated. This number comes from a recent unrelated verification in which the USACE deemed that features over 725 feet away from a potential Section 404 waters of the U.S. were considered hydrologically isolated from a waters of the U.S. Finally, the forested wetland on site is an isolated wetland and is not connected to any other water feature. Therefore, of the 0.069 acre of potential jurisdictional wetlands meeting the physical definition of 3-parameter wetlands, only 0.016 acre is expected to meet the definition of waters of the U.S. under the conforming rule.

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Appendix A. Plants Observed in the Study Area

Family	Scientific Name	Common Name	Wetland Indicator Status[1]
GYMNOSPERMS			
CUPRESSACEAE – CYPRESS FAMILY			
	Juniperus sp.*	juniper	--
	Sequoia sempervirens	coast redwood	NL
EUDICOTS			
APIACEAE – CARROT FAMILY			
	Daucus pusillus	small daucus	NL
	*Foeniculum vulgare**	fennel	NL
APOCYNACEAE – DOGBANE FAMILY			
	*Vinca major**	greater periwinkle	FACU
ASTERACEAE – SUNFLOWER FAMILY			
	Carduus pycnocephalus ssp. *pycnocephalus**	Italian thistle	NL
	*Dittrichia graveolens**	stinkwort	NL
	Erigeron canadensis	horseplant	FACU
	*Helminthotheca echioides**	bristly ox-tongue	FAC
	*Hypochaeris radicata**	rough cat's-ear	FACU
	*Lactuca serriola**	prickly lettuce	FACU
	*Senecio vulgaris**	common groundsel	FACU
	*Sonchus oleraceus**	common sow thistle	NL
	*Taraxacum officinale**	common dandelion	FACU
BORAGINACEAE – BORAGE FAMILY			
	Amsinckia intermedia	Common fiddleneck	NL
BRASSICACEAE – MUSTARD FAMILY			
	*Hirschfeldia incana**	Summer mustard	NL
	Lepidium nitidum	shining peppergrass	FAC
	Nasturtium officinale	water cress	OBL
	*Raphanus sativus**	wild radish	NL
CHENOPODIACEAE – GOOSEFOOT FAMILY			
	Chenopodium sp.	amaranth	--
FABACEAE – LEGUME FAMILY			
	Acacia sp.*	acacia	--
	*Genista monspessulana**	French broom	NL

Family	Scientific Name	Common Name	Wetland Indicator Status[1]
	*Medicago polymorpha**	variable burclover	FACU
	Trifolium sp.	clover	--
	*Vicia sativa**	garden vetch	FACU
FAGACEAE – OAK FAMILY			
	Quercus agrifolia	coast live oak	NL
	Quercus lobata	valley oak	FACU
	Quercus rubra	Northern red oak	NL
GERANIACEAE – GERANIUM FAMILY			
	*Erodium botrys**	big heron bill	FACU
	*Erodium moschatum**	whitestem filaree	NL
	*Geranium molle**	soft geranium	NL
	*Geranium robertianum**	Robert's geranium	FACU
LAMIACEAE – MINT FAMILY			
	*Mentha pulegium**	pennyroyal	OBL
MALVACEAE – MALLOW FAMILY			
	Malva sp.*	mallow	--
MONTIACEAE – MINER'S–LETTUCE FAMILY			
	Claytonia perfoliata	miner's lettuce	FAC
MYRSINACEAE – MYRSINE FAMILY			
	*Lysimachia arvensis**	scarlet pimpernel	FAC
MYRTACEAE – MYRTLE FAMILY			
	*Eucalyptus globulus**	blue gum	NL
OLEACEAE – OLIVE FAMILY			
	Ligustrum sp.*	privet	--
OXALIDACEAE – OXALIS FAMILY			
	*Oxalis pes-caprae**	Bermuda buttercup	NL
PAPAVERACEAE – POPPY FAMILY			
	Eschscholzia californica	California poppy	NL
PLANTAGINACEAE – PLANTAIN FAMILY			
	*Kickxia elatine**	sharp-leaved kickxia	NL
	*Plantago lanceolata**	English plantain	FAC
	*Veronica persica**	Persian speedwell	NL
POLYGONACEAE – BUCKWHEAT FAMILY			
	*Rumex acetosella**	acidic dock	FACU
	*Rumex crispus**	curly dock	FAC
ROSACEAE – ROSE FAMILY			

Family	Scientific Name	Common Name	Wetland Indicator Status[1]
	Rosa sp.*	rose	--
	*Rubus armeniacus**	Himalayan blackberry	FAC
RUBIACEAE – COFFEE FAMILY			
	Galium porrigens	climbing bedstraw	NL
SALICACEAE – WILLOW FAMILY			
	Salix sp.	willow	FACW
SAPINDACEAE – SOAPBERRY FAMILY			
	Aesculus californica	California buckeye	NL
MONOCOTS			
CYPERACEAE – SEDGE FAMILY			
	Cyperus eragrostis	tall flatsedge	FACW
JUNCACEAE – RUSH FAMILY			
	Juncus sp.	rush	--
POACEAE – GRASS FAMILY			
	*Avena barbata**	slender wild oat	NL
	Avena sp.*	oat	NL
	Bromus sp.	brome	--
	*Cynodon dactylon**	Bermuda grass	FACU
	*Festuca perennis**	Italian rye grass	FAC
	*Holcus lanatus**	common velvet grass	FAC
	Paspalum distichum	knot grass	FACW
	*Poa annua**	annual blue grass	FAC
TYPHACEAE – CATTAIL FAMILY			
	Typha sp.	cattail	OBL

* Non-Native

[1] Wetland Indicator Status Key: Wetland Indicator Status obtained from USACE (2020)

OBL = Obligate wetland species, occur almost always in wetlands (>99% probability).

FACW = Facultative Wetland species, usually occur in wetlands (67 to 99% probability), but occasionally found in non-wetlands.

FAC = Facultative species, equally likely to occur in wetlands or non-wetlands (34 to 66% probability).

FACU = Facultative Upland, usually occur in non-wetlands (67% to 99%), but occasionally found in wetlands.

UPL = Obligate Upland species, occur almost always in non-wetlands (>99% probability).

NL=No status assigned, generally refers to upland species

-- = Species could not be identified; therefore indicator status was not assigned

Appendix B. NRCS Soil Survey Report for the Study Area

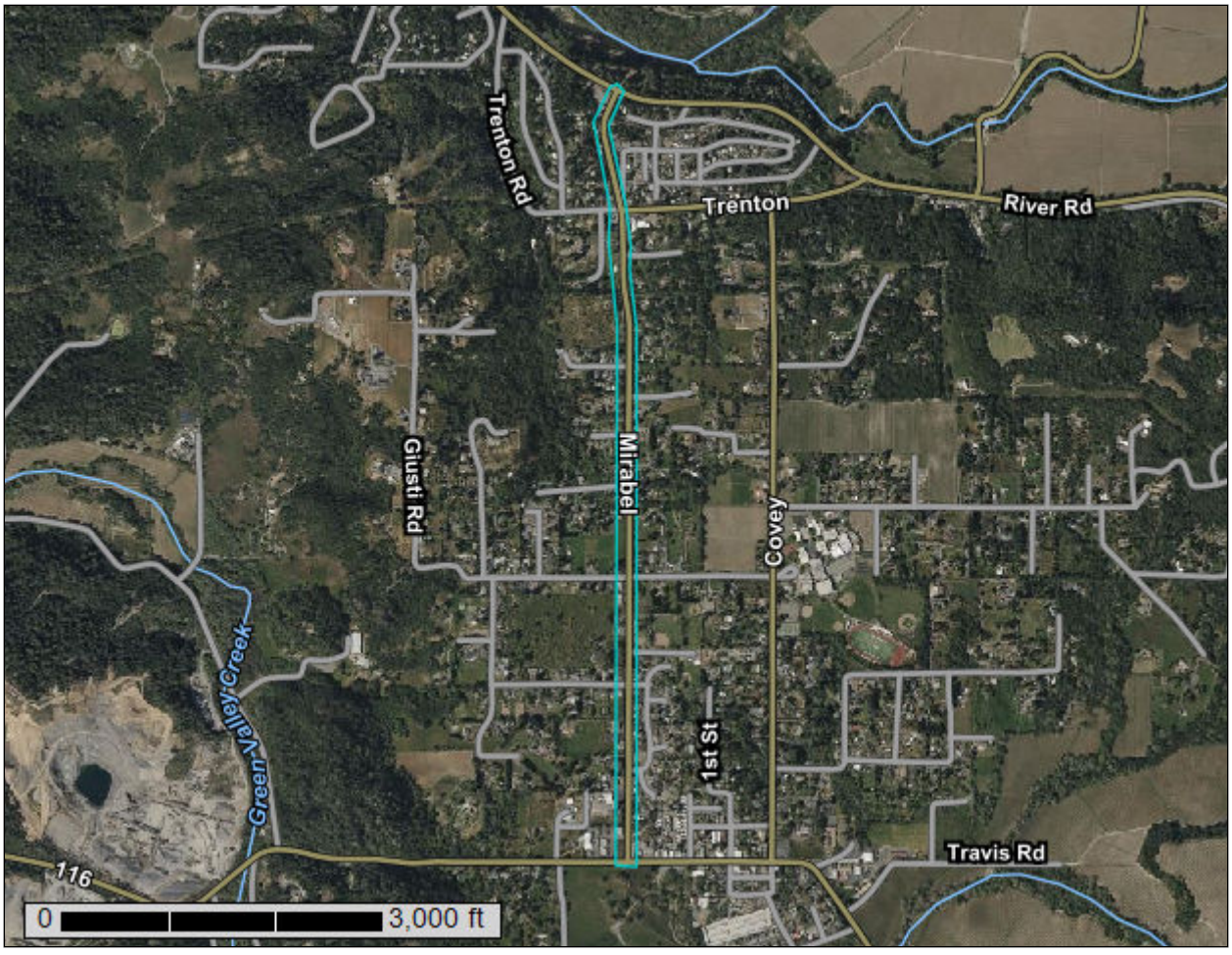
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Sonoma County, California



November 27, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

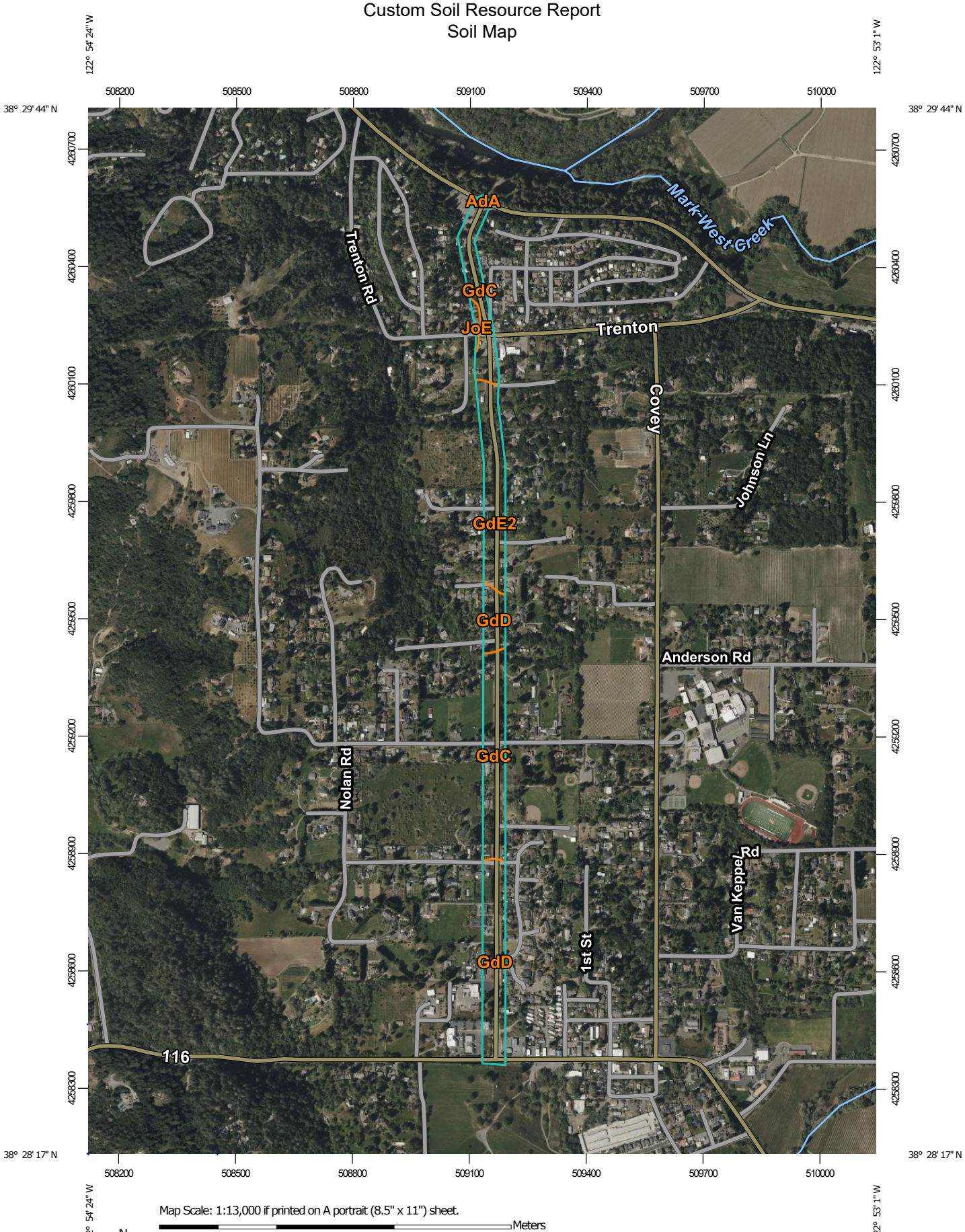
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:13,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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: Sonoma County, California
Survey Area Data: Version 18, Sep 8, 2024

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

Date(s) aerial images were photographed: Mar 26, 2022—Apr 25, 2022

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
AdA	Alluvial land, sandy	0.2	0.6%
GdC	Goldridge fine sandy loam, 2 to 9 percent slopes	12.6	41.6%
GdD	Goldridge fine sandy loam, 9 to 15 percent slopes	9.9	32.6%
GdE2	Goldridge fine sandy loam, 15 to 30 percent slopes, eroded	7.2	23.9%
JoE	Josephine loam, 9 to 30 percent slopes	0.4	1.3%
Totals for Area of Interest		**30.3**	**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, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sonoma County, California

AdA—Alluvial land, sandy

Map Unit Setting

National map unit symbol: hf9s
Elevation: 200 to 800 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Alluvial land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alluvial Land

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 10 inches: gravelly sand
H2 - 10 to 60 inches: stratified very gravelly coarse sand to sand

Properties and qualities

Slope: 0 to 5 percent
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Frequency of flooding: Occasional
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydric soil rating: Yes

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

GdC—Goldridge fine sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hfcy
Elevation: 200 to 2,000 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 225 to 240 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Goldridge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goldridge

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 24 inches: fine sandy loam
H2 - 24 to 28 inches: sandy clay loam
H3 - 28 to 72 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F004BK103CA - Upper slopes and higher elevation mountains
Hydric soil rating: No

Minor Components

Blucher
Percent of map unit: 4 percent
Hydric soil rating: No

Cotati
Percent of map unit: 4 percent
Hydric soil rating: No

Sebastopol
Percent of map unit: 3 percent
Hydric soil rating: No

Steinbeck
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

GdD—Goldridge fine sandy loam, 9 to 15 percent slopes

Map Unit Setting
National map unit symbol: hfcz
Elevation: 200 to 2,000 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 225 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Goldridge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goldridge

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile
H1 - 0 to 24 inches: fine sandy loam
H2 - 24 to 28 inches: sandy clay loam

H3 - 28 to 72 inches: sandy clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F004BK103CA - Upper slopes and higher elevation mountains
Hydric soil rating: No

Minor Components

Cotati

Percent of map unit: 5 percent
Hydric soil rating: No

Blucher

Percent of map unit: 5 percent
Hydric soil rating: No

Sebastopol

Percent of map unit: 5 percent
Hydric soil rating: No

GdE2—Goldridge fine sandy loam, 15 to 30 percent slopes, eroded

Map Unit Setting

National map unit symbol: hfd2
Elevation: 200 to 2,000 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 225 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Goldridge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goldridge

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 15 inches: fine sandy loam
H2 - 15 to 19 inches: sandy clay loam
H3 - 19 to 35 inches: sandy clay loam
H4 - 35 to 45 inches: sandy clay loam
H5 - 45 to 59 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R014XG924CA - Loamy Upland
Hydric soil rating: No

Minor Components

Steinbeck

Percent of map unit: 5 percent
Hydric soil rating: No

Cotati

Percent of map unit: 5 percent
Hydric soil rating: No

Sebastopol

Percent of map unit: 5 percent
Hydric soil rating: No

JoE—Josephine loam, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: hffs
Elevation: 1,200 to 5,000 feet
Mean annual precipitation: 50 inches
Mean annual air temperature: 55 degrees F
Frost-free period: 125 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Josephine and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Josephine

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 13 inches: gravelly loam
H2 - 13 to 35 inches: gravelly clay loam
H3 - 35 to 45 inches: gravelly fine sandy loam
H4 - 45 to 59 inches: weathered bedrock

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F004BK103CA - Upper slopes and higher elevation mountains
Hydric soil rating: No

Minor Components

Laughlin

Percent of map unit: 5 percent
Hydric soil rating: No

Hugo

Percent of map unit: 5 percent
Hydric soil rating: No

Mendocino

Percent of map unit: 5 percent
Hydric soil rating: No

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Appendix C. USACE Arid West Wetland Data Forms

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/08/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP01
Investigator(s): Katie Tyree, Katie Gallagher | Section, Township, Range:
Landform (hillslope, terrace, etc): Depression | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): C | Lat: 38.47767583333334 | Long: -122.8948041666667 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation No, Soil No, or Hydrology No 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 X No ___
Wetland Hydrology Present? Yes X No ___

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

Remarks: The sample point is located in a ponded depressional area within a linear roadside ditch. Paired with upland SP02.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 2-ft by 6-ft)			
1. *Lolium perenne* / Perennial rye grass	25	Yes	FAC
2. *Rumex crispus* / Curly dock	5	No	FAC
3. *Holcus lanatus* / Common velvetgrass, Common velvet gras	2	No	FAC
4.			
5.			
6.			
7.			
8.			
	32	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 68 | % Cover of Biotic Crust 60

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	32	x 3 =	96
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	32 (A)		96 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
X Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ___

Remarks:
The biotic crust ercentage is referring to algae that is located on top of leaf detritus. The bare ground within the vegetation plot is 8%

SOIL

Sampling Point: SP01

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/2	100					Sandy Clay	Detritus layer
1-12	10YR 3/2	75	5YR 5/8	20	C	M,PL	Sandy Clay	Redox in pore linings and matrix
			5YR 4/6	5	C	PL,M	Sandy Clay	Redox in pore linings and matrix

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Soil in the 1-12 inches layer had been graded, so there was no distinguishable soil horizon. Observations included heavy earthworm activity in the top couple inches of soil. Soil in the 1-12 inch layer had 2 redox colors, described above.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X 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 X No ___ Depth (inches): 4

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

Wetland Hydrology Present? Yes X No ___

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

Remarks: Algal matting is present within the wetland in addition to wetland hydrology.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/08/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP02
Investigator(s): Katie Tyree, Katie Gallagher | Section, Township, Range:
Landform (hillslope, terrace, etc): hillslope | Local relief (concave, convex, none): none | Slope (%): 1-3
Subregion (LRR): C | Lat: 38.47770933333334 | Long: -122.8947996666667 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No 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: This upland sample point is located on a slope outside of the wetland depression represented by SP01. This sample point is paired with SP01 to determine the extent of the wetland boundaries as well as to compare soils between the two points.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5-ft by 5-ft)			
1. *Lolium perenne* / Perennial rye grass	50	Yes	FAC
2. *Holcus lanatus* / Common velvetgrass, Common velvet gras	38	Yes	FAC
3. *Geranium molle* / Crane's bill geranium	1	No	NI
4. *Rumex crispus* / Curly dock	1	No	FAC
5.			
6.			
7.			
8.			
	90	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	89	x 3 =	267
FACU species	0	x 4 =	0
UPL species	1	x 5 =	5
Column Totals:	90 (A)		272 (B)

Prevalence Index = B/A = 3.02

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

The bare ground precentage corresponds to leaf litter within the vegetation plot. The vegetation passes the dominance test, and hydrophytic vegetation is present. However, Lolium perenne (now Festuca perennis) is a weak indicator of hydrophytic vegetation. It is located in Calfornia in upland areas (and observed in upland areas within the Study Area). As such, this sample point is within an area with hydrophytic vegetation.

SOIL

Sampling Point: SP02

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/2	100						Detritus
1-12	10YR 3/2	60					Sandy Loam	No redox 2 matrix colors present in this
1-12	10YR 4/2	40					Sandy Loam	No redox layer.

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Throughout the soil profile, there are inconsistent pockets of sand and mixed non-native gravel; presumably from path above. This soil is graded mixed with no natural horizons. There are no redox concentrations present Soils in the layer between 1 and 12 inches had 2 matrix colors, described above..

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks: Hydrology indictors are not present

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/08/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP03
Investigator(s): Katie Tyree, Katie Gallagher | Section, Township, Range:
Landform (hillslope, terrace, etc): Depression | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): C | Lat: 38.47774 | Long: -122.8949653333333 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation No, Soil No, or Hydrology No 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 X No
Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

Remarks: This sample point was taken in a depression within a roadside ditch adjacent to Mirabel Road. Additional informal sample points were dug to observe if hydric soils were present throughout areas with similar vegetation and hydrology. SPa, SPb, and SPd did not have redoximorphic features within the soil, and were considered uplands. SP03c had the same vegetation, hydrology, and soils and was considered a wetland point.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 15-ft by 6-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juniperus sp.* / Juniper	50	Yes	NI
2.			
3.			
4.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 8-ft by 3-ft)			
1. *Holcus lanatus* / Common velvetgrass, Common velvet gras	45	Yes	FAC
2. *Paspalum dilatatum* / Dallis grass	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: 15-ft by 6-ft)			
1. *Rubus armeniacus* / Himalayan blackberry	60	Yes	FAC
2.			
	60	= Total Cover	

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	110	x 3 =	330
FACU species	0	x 4 =	0
UPL species	50	x 5 =	250
Column Totals:	160 (A)		580 (B)

Prevalence Index = B/A = 3.62

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks:
The bare ground percentage is dominated by leaf detritus from the surrounding trees and from dried grass from the last growing season. The vegetation passed the dominace test; hydrophytic vegetation is present.

SOIL

Sampling Point: SP03

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1								Detritus
1-8	10YR 4/1	100					Sandy Loam	Non native fill throughout
8-10	10YR 4/1	98	7.5YR 5/8	2	C	M	Sandy Loam	Non native fill within matrix

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Non-native fill is present throughout matrix, there are redox concentrations starting at 8 inches, and there was a strong sulfide odor when the soil pit was dug.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water Table Present?	Yes	X	No	___	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 2

Wetland Hydrology Present? Yes X No ___

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

Remarks: Hydrology is present with a high water table and saturated soils.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date:
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP04
Investigator(s): Katie Tyree, Katie Gallagher | Section, Township, Range:
Landform (hillslope, terrace, etc): Ditch with gradual slope | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): C | Lat: 38.47836083333333 | Long: -122.8947666666667 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation No, Soil No, or Hydrology No 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	**Is the Sampled Area within a Wetland?** Yes No X
Wetland Hydrology Present?	Yes	X	No		

Remarks: This sample point was taken in a depressional feature within a ditch with a gradual slope.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5-ft by 3-ft)			
1. *Holcus lanatus* / Common velvetgrass, Common velvet grass	53	Yes	FAC
2. *Lolium perenne* / Perennial rye grass	35	Yes	FAC
3. *Anagallis arvensis* / Scarlet pimpernel	5	No	NI
4. *Erodium moschatum* / Whitestem filaree, Greenstem filaree	2	No	NI
5. *Lactuca serriola* / Prickly lettuce	2	No	FACU
6. *Kickxia elatine* / Sharp point fluellin	1	No	UPL
7.			
8.			
	98	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 2 % Cover of Biotic Crust

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	88	x 3 =	264
FACU species	2	x 4 =	8
UPL species	8	x 5 =	40
Column Totals:	98 (A)		312 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks:
Vegetation passed the dominance test. However, hydrophytic vegetation is not strong due to upland plants growing within the plot. Additionaly, Festuca perennis (Lolium perenne) is an unreliable dominant here as it was also growing within upland areas adjacent to SP04.

SOIL

Sampling Point: SP04

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					Sandy Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks: Sandy soil non-mottled throughout the matrix.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water Table Present?	Yes	X	No	___	Depth (inches): 5
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 3

Wetland Hydrology Present? Yes X No ___

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

Remarks: Wetland hydrology was present at the time of survey, however this is thought to be a seasonal, post storm phenomenon based on upland vegetation and lack of hydric soil indicators.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/08/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP05
Investigator(s): Katie Tyree, Katie Gallagher | Section, Township, Range:
Landform (hillslope, terrace, etc): Lowest point in ditch | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): C | Lat: 38.4782455 | Long: -122.8949811666667 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation No, Soil No, or Hydrology No 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	X	
Hydric Soil Present?	Yes	X	No	___	**Is the Sampled Area**
Wetland Hydrology Present?	Yes	X	No	___	**within a Wetland?** Yes ___ No X

Remarks: Sample point is located in a ponded area within the lowest point within a roadside ditch near a culvert and immediately adjacent to straw wattle.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5-ft by 2-ft)			
1. *Lolium perenne* / Perennial rye grass	55	Yes	FAC
2. *Rumex acetosella* / Sheep sorrel	40	Yes	FACU
3. *Erodium moschatum* / Whitestem filaree, Greenstem filaree	1	No	NI
4. *Anagallis arvensis* / Scarlet pimpernel	1	No	NI
5. *Erodium botrys* / Big heron bill	1	No	FACU
6.			
7.			
8.			
	98	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 2 % Cover of Biotic Crust ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	41	x 4 =	164
UPL species	2	x 5 =	10
Column Totals:	98 (A)		339 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:
Vegetation failed to meet the dominance test or prevalence index. Hydrophytic vegetation is not present within the vegetation plot.

SOIL

Sampling Point: SP05

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Sandy Loam	
4-10	10YR 3/2	85	10YR 3/6	15	C	PL,M	Sandy Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Redox concentrations in the pore linings and matrix, but these are only just meeting the F6 requirements as the concentrations were barely distinct. The shovel was hitting a gravel layer at 10 inches.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 3-4

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 2-3

Wetland Hydrology Present? Yes X No ___

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

Remarks: Wetland hydrology is present at the time of survey, however this is thought to be a seasonal, post storm phenomenon based on upland vegetation and lack of hydric soil indicators.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/08/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP06
Investigator(s): Katie Tyree, Katie Gallagher | Section, Township, Range:
Landform (hillslope, terrace, etc): Ditch | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): C | Lat: 38.47962966666667 | Long: -122.8949525 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation No, Soil No, or Hydrology No 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	**Is the Sampled Area within a Wetland?** Yes X No ___
Wetland Hydrology Present?	Yes X	No ___	

Remarks: Sample point located on margin of surface water in a roadside ditch. A blocked culvert at the downstream terminus of the surface water could be causing the recent ponding. While the blockage may be temporary, there's no indication of when it formed. It is possible that anaerobic conditions have developed since the blockage formed, which may not be sufficient time for hydric soils to have formed.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5-ft by 3-ft)			
1. *Poa annua* / Annual blue grass	50	Yes	FAC
2. *Geranium molle* / Crane's bill geranium	5	No	NI
3. *Veronica persica* / Bird's eye speedwell, Persian speedwell	5	No	FAC
4. *Erodium moschatum* / Whitestem filaree, Greenstem filaree	1	No	NI
5.			
6.			
7.			
8.			
	61	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 39 % Cover of Biotic Crust ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	0	x 4 =	0
UPL species	6	x 5 =	30
Column Totals:	61 (A)		195 (B)

Prevalence Index = B/A = 3.2

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

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

Hydrophytic Vegetation Present? Yes X No ___

Remarks:
The bare ground percentage is standing water. Vegetation meets the dominance test, but it is weak.

SOIL

Sampling Point: SP06

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Sandy Loam	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks: Stops at 6 inches because of a gravel layer

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):		
Water Table Present?	Yes X	No ___	Depth (inches):	3	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	2	**Wetland Hydrology Present?** Yes X No ___

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

Remarks: Wetland hydrology is present. Surface water is adjacent to sample point.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/08/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP07
Investigator(s): Katie Tyree, Katie Gallagher | Section, Township, Range:
Landform (hillslope, terrace, etc): Drainage | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): C | Lat: | Long: | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation No, Soil No, or Hydrology No 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 X No
Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

Remarks: This sample point is located within a depressional ponded area within a roadside ditch. Informal points dug at SP7a and SP7b were dug to inform the extent of the wetland.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 6-ft by 2-ft)			
1. *Lolium perenne* / Perennial rye grass	65	Yes	FAC
2. *Plantago lanceolata* / Ribwort, English plantain	5	No	FAC
3. *Rumex acetosella* / Sheep sorrel	5	No	FACU
4.			
5.			
6.			
7.			
8.			
	75	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	75 (A)		230 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks:
Vegetation is dense throughout the plot. Hydrophytic vegetation is present because it meets the dominance test.

SOIL

Sampling Point: SP07

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Sandy Loam	
4-8	10YR 3/2	72	7.5YR 5/8	8	C	M	Sandy Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Redox concentrations are present within the matrix in the lower 4 inches of soil. Hydric soil is present.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 3-4

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 2-3

Wetland Hydrology Present? Yes X No ___

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

Remarks: THydrology is present.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/09/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP08
Investigator(s): Katie Tyree | Section, Township, Range:
Landform (hillslope, terrace, etc): Drainage | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): C | Lat: 38.4820075 | Long: -122.894971 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation No, Soil No, or Hydrology No 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 X No ___
Wetland Hydrology Present? Yes X No ___

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

Remarks: Sample point located within a drainage with flowing water on side of road. There are sections with sediment deposits and vegetation cover. This sample point was paired with upland point SP09 because vegetation here is different than in the other wetlands within the study area.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 3-ft by 5-ft)			
1. *Nasturtium officinale* / Watercress, Water cress	85	Yes	OBL
2. *Holcus lanatus* / Common velvetgrass, Common velvet gras	8	No	FAC
3. *Juncus sp.* / Rush	3	No	NI
4.			
5.			
6.			
7.			
8.			
	96	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 4 | % Cover of Biotic Crust ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	85	x 1 =	85
FACW species	0	x 2 =	0
FAC species	8	x 3 =	24
FACU species	0	x 4 =	0
UPL species	3	x 5 =	15
Column Totals:	96 (A)		124 (B)

Prevalence Index = B/A = 1.29

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
X Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ___

Remarks:
The bare ground precentage referes to: 2% running water and 10% leaf litter drift deposits. Hydrophytic vegetation passes the dominance test and the prevalence index.

SOIL

Sampling Point: SP08

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-4	10YR 3/2	100					Sandy Loam	Cobbles obstructing the shovel from diggin

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Obstruction from cobbles in the roadside ditch restricted digging to 4 inches. There is a strong hydrogen sulfide odor, so the A4 indicator is met. Faint redox were found along the roots, but were not distict enough to indentify.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

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

Remarks: Surface water is present, flowing north.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/09/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP09
Investigator(s): Katie Tyree | Section, Township, Range:
Landform (hillslope, terrace, etc): Berm outside drainage ditch | Local relief (concave, convex, none): convex | Slope (%): 2
Subregion (LRR): C | Lat: 38.48196798007794 | Long: -122.8949509934735 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No 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	X	
Hydric Soil Present?	Yes	X	No	____	**Is the Sampled Area**
Wetland Hydrology Present?	Yes	____	No	X	**within a Wetland?** Yes ____ No X

Remarks: Paired with wetland point SP08, this point is located adjacent to a wetland on a man-made berm.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 3-ft by 5-ft)			
1. *Trifolium sp.* / Clover	15	Yes	NI
2. *Cynodon dactylon* / Bermuda grass	10	Yes	FACU
3. *Bromus sp.* / Brome	10	Yes	NI
4. *Holcus lanatus* / Common velvetgrass, Common velvet grass	5	No	FAC
5.			
6.			
7.			
8.			
	40	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 60 | % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	10	x 4 =	40
UPL species	25	x 5 =	125
Column Totals:	40 (A)		180 (B)

Prevalence Index = B/A = 4.5

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
Vegetation does not meet the dominance test or the prevalence index. The grass has been recently mowed, so the remainder of the vegetation is mowed grass (most likely upland non native species).

SOIL

Sampling Point: SP09

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1		100						Organic material
1-4	10YR 3/2	100					Sandy Loam	
4-12	10YR 3/2	85	7.5YR 4/4	15	C	M,PL	Sandy Loam	Redox qualifies as distinct

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Soils meet F6 indicator. The redox is light, and possibly remnant from the adjacent sloped property.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ___ No X

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

Remarks: Hydrology indicators absent.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/09/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP10
Investigator(s): Katie Tyree | Section, Township, Range:
Landform (hillslope, terrace, etc): Ditch | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): C | Lat: 38.48429131790854 | Long: -122.8948084173006 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation No, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation No, Soil No, or Hydrology No 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	**Is the Sampled Area within a Wetland?** Yes X No ___
Wetland Hydrology Present?	Yes X	No ___	

Remarks: Sample point located within vegetated ditch with no running water. Paired with upland point SP11. Paired points taken here to show the difference in vegetation throughout the seasonal wetlands on site.

The area is considered a wetland without the presence of hydric soils because the soils missed indicator A11 and F6 marginally and the evidence points to the area containing water to support hydrophytic vegetation and a topographical position that would encourage ponding.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5-ft by 3-ft)			
1. *Lolium perenne* / Perennial rye grass	70	Yes	FAC
2. *Rumex crispus* / Curly dock	15	No	FAC
3. *Geranium molle* / Crane's bill geranium	3	No	NI
4.			
5.			
6.			
7.			
8.			
	88	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 12 | % Cover of Biotic Crust ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	85	x 3 =	255
FACU species	0	x 4 =	0
UPL species	3	x 5 =	15
Column Totals:	88 (A)		270 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ___

Remarks:
Vegetation meets the dominance test. The bare ground precentage is comprised of leaf detritus in the form of wrack.

SOIL

Sampling Point: SP10

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Sandy Loam	Very wet, could contain redox, but was not visible
8-10	10 YR 3/2	85	5YR 5/6	5	C	M	Sandy Loam	2 matrix colors in this soil horizon.
	2.5Y 7/2	10					Clay Loam	considered depletions and redox.
10-12	2.5Y 7/2	70	5YR 5/6	30	C	M	Clay Loam	Could be the native soil.

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks: Soils here are disturbed from road construction and grading. The area has had sufficient time to produce redox features, but the presence of 8 inches of soil without redox may be evidence of recent fill soil or runoff and deposition from adjacent properties. The biologist did not dig deep enough to meet indicator A11. Depleted Below Dark Surface, which requires a layer of 6 inches with a depleted matrix. It is likely that the layer extends to 16 inches, but we do not know at this time. The middle layer 8-10 is not thick enough to meet indicator F6. Redox Dark Surface, which requires a layer at least 4 inches thick with reodx features and a dark matrix.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 4

Saturation Present? Yes X No ___ Depth (inches): 2

(includes capillary fringe)

Wetland Hydrology Present? Yes X No ___

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

Remarks: Wetland hydrology is present

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET - Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 06/30/24
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Mirabel Road Widening Project | City/County: Forestville/Sonoma | Sampling Date: 01/09/2025
Applicant/Owner: County of Sonoma | State: California | Sampling Point: SP11
Investigator(s): Katie Tyree | Section, Township, Range:
Landform (hillslope, terrace, etc): Hillslope | Local relief (concave, convex, none): none | Slope (%): 10
Subregion (LRR): C | Lat: 38.48431126683809 | Long: -122.8947867081714 | Datum: WGS84
Soil Map Unit Name: Goldridge fine sandy loam | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation No, Soil No, or Hydrology No 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 X	**Is the Sampled Area within a Wetland?**	Yes	No X
Hydric Soil Present?	Yes	No X			
Wetland Hydrology Present?	Yes	No X			

Remarks: This sample point is paired with wetland point SP10. It is located on the upland slope adjacent to the wetland point.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5-ft by 2-ft)			
1. *Avena sp.* / Oat	40	Yes	NI
2. *Bromus sp.* / Brome	40	Yes	NI
3. *Lolium perenne* / Perennial rye grass	5	No	FAC
4. *Geranium molle* / Crane's bill geranium	2	No	NI
5. *Rumex crispus* / Curly dock	1	No	FAC
6.			
7.			
8.			
	88	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 12 | % Cover of Biotic Crust ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	6	x 3 =	18
FACU species	0	x 4 =	0
UPL species	82	x 5 =	410
Column Totals:	88 (A)		428 (B)

Prevalence Index = B/A = 4.86

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:
Vegetation does not meet the dominance test of the prevalence index. Hydrophytic vegetation is absent.

SOIL

Sampling Point: SP11

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/3	100					Sandy Loam	Small pebbles throughout matrix

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks: No hydric soils indicators met. Soil is not hydric.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ___ No X

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

Remarks: Ho hydrology indicators were met.

Appendix D. USACE Ordinary High Water Mark Data Forms

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: 3328-25	Site Name: Mirabel Road Widening Project	Date and Time: 1/8/25 3:05pm
Location (lat/long): GPS'ed	Investigator(s): KT, KG	

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [ ] land use maps
- [ ] aerial photos
- [ ] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?
Point taken in a roadside ditch.
Flow conditions normal following rainfall

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Rip-rap leading to culvert, excavated in upland. Gravel substrate (non-native soil).

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:* x
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** x

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [ ] *vegetation absent to:*
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [x] **Vegetation matted down and/or bent:** b
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:** x
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:
Physical indicator: sediment deposited on vegetation or structures

vegetation types are from more hydrophytic to less hydrophytic

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: 3328-25

Step 5 Describe rationale for location of OHWM

Bent vegetation with sediment deposits located and leaf litter below OHWM
More sediment accumulated on top of gravel in bed below OHWM
More forbs above OHWM, more annual grasses below OHWM
Break in slope at OHWM

Additional observations or notes

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☐ Yes ☒ No If no, explain why not: photos included in photo appendix

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?		Is there vegetation growing on the channel bed?	
Is there an easily identifiable top of bank?	Are there mudcracks present?	If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?			
Are the banks undercut?	Is there evidence of sediment sorting by grain size?	Where are the significant transitions in vegetation?	Is there large wood deposition?
Are the banks armored?			
Is the channel confined by the surrounding hillslopes?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there natural or man-made berms and levees?		Has any vegetation been flattened by flowing water?	
Are there fluvial terraces?			
Are there channel bars?			

Are the following features of fluvial transport present?

Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 Describe rationale for location of OHWM:

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: 3328-25	Site Name: Mirabel Road Widening Project	Date and Time: 1/9/25 10am
Location (lat/long): GPS'ed	Investigator(s): KT	

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [ ] land use maps
- [ ] aerial photos
- [ ] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?
Point taken in a roadside ditch with culverts flowing north.
Flow conditions normal following rainfall

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Rip-rap/concrete lined ditch with steep banks, riparian vegetation on banks. Sediment deposits at bed of channel.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [x] *on the bank:* a
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** a

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [x] *vegetation absent to:* woody shrubs
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [x] **Wracking/presence of organic litter:** b
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: 3328-25

Step 5 Describe rationale for location of OHWM

A distinct channel with wrack and sediment deposits. Break in slope largely due to the human made concrete banks.

Additional observations or notes

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☐ Yes ☒ No If no, explain why not: photos included in photo appendix

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?		Is there vegetation growing on the channel bed?	
Is there an easily identifiable top of bank?	Are there mudcracks present?	If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?			
Are the banks undercut?	Is there evidence of sediment sorting by grain size?	Where are the significant transitions in vegetation?	Is there large wood deposition?
Are the banks armored?			
Is the channel confined by the surrounding hillslopes?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there natural or man-made berms and levees?		Has any vegetation been flattened by flowing water?	
Are there fluvial terraces?			
Are there channel bars?			

Are the following features of fluvial transport present?

Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

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Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 Describe rationale for location of OHWM:

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

Appendix E. Photos of the Study Area



Photo 1. **Photo Point 01 (PP01) depicts the mixed riparian biotic habitat. Himalayan blackberry (*Rubus armeniacus*) grows below the top of the bank on this roadside ditch. Photo is oriented south.**



Photo 2. **Photo Point 02 (PP02) depicts the ephemeral (intermittent) drainage which conveys water from a historic stream. The stream is culverted under Mirabel Road and continues northwest. Google Earth imagery from March 2024, oriented east (Google LLC 2025).**



Photo 3. Photo Point 03 (PP03) depicts the oak woodland habitat, with a roadside ditch in the foreground. Most oak woodlands extended into private residences and mixed with other species of trees. Photo is oriented north.



Photo 4. Photo Point 04 (PP04) depicts the perennial emergent wetland habitat. Photo is oriented south.



Photo 5. Photo Point 05 (PP05) depicts the seasonal wetland habitat, within a longer roadside ditch. Photo is oriented south.



Photo 6. Photo Point 06 (PP06) depicts an example of the non-jurisdictional roadside ditches on site. Photo is oriented south.



Photo 7. Photo Point 07 (PP07) depicts the forested wetland. Photo is oriented east.



Photo 8. Photo Point 08 (PP08) depicts the landscaped areas, which include these deciduous trees and gravel/mulch landcover. Photo is taken from Google Earth imagery from 4/2024 and oriented northeast (Google LLC 2025).



Photo 9. Photo Point 09 (PP09) depicts the developed path, Mirabel Road, and California annual grassland. Photo is oriented north.



Photo 10. Photo Point 10 (PP10). Sample Point for Ordinary High Water Mark (OHWM) 1 taken in a vegetated roadside ditch adjacent to the developed pathway and Mirabel Road. Photo is oriented south.



Photo 11. Photo Point 11 (PP11). Sample point for OHWM 2 taken in a concrete lined roadside ditch on the northern end of the Study Area. Photo is oriented northwest.



Photo 12. Sample Point 1 (SP01). Wetland point located in a ponded depressional area within a linear roadside ditch. Paired with upland SP02.



Photo 13. Sample Point 2 (SP02). This upland sample point is located on a slope outside of the wetland depression represented by SP01.



Photo 14. Sample Point 3 (SP03). This sample point was taken in a depression within a roadside ditch adjacent to Mirabel Road. Additional informal sample points (SP03a-d) were dug to observe if hydric soils were present throughout areas with similar vegetation and hydrology.



Photo 15. Sample Point 4 (SP04). This sample point was taken in a depressional feature within a ditch with a gradual slope.



Photo 16. Sample Point 5 (SP05). Sample point is located in a ponded area within the lowest point within a roadside ditch near a culvert and immediately adjacent to straw wattle.



Photo 17. Sample Point 6 (SP06). Sample point located in the lowest point in a roadside ditch. A blocked culvert adjacent to the ditch could be causing the recent ponding.



Photo 18. Sample Point 8 (SP08). Sample point located within a drainage with flowing water on side of road. There are sections with sediment deposits and vegetation cover. This sample point was paired with upland point SP09.



Photo 19. Sample Point 9 (SP09). Paired with wetland point SP08, this point is located adjacent to a wetland on a man-made berm.



Photo 20. Sample Point 10 (SP10). Sample point located within vegetated ditch with no running water. Paired with upland point SP11.



Photo 21. Sample Point 11 (SP11). This sample point is paired with wetland point SP10. It is located on the upland slope adjacent to the wetland point.

Appendix E. Aquatic Resources Table

Waters Name	Cowardin Code	HGM Code	Measurement Type	Amount	Units	Waters Type	Latitude	Longitude	Local Waterway
FW01	PSS	DEPRESS	Area	1729	SQ FT	NON-WOTUS-TRIB.NEGATIVE.A3	38.480703	-122.894735	Russian River
PEW01	PEM2	DEPRESS	Area	49	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.482161	-122.894826	Russian River
SW01	PEM2	DEPRESS	Area	92	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.484203	-122.894821	Russian River
SW02	PEM2	DEPRESS	Area	46	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.484011	-122.894821	Russian River
SW03	PEM2	DEPRESS	Area	36	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.483754	-122.894817	Russian River
SW04	PEM2	DEPRESS	Area	14	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.483627	-122.894812	Russian River
SW05	PEM2	DEPRESS	Area	19	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.483490	-122.894816	Russian River
SW06	PEM2	DEPRESS	Area	43	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.483011	-122.894830	Russian River
SW07	PEM2	DEPRESS	Area	33	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.482311	-122.894952	Russian River

Waters Name	Cowardin Code	HGM Code	Measurement Type	Amount	Units	Waters Type	Latitude	Longitude	Local Waterway
SW08	PEM2	DEPRESS	Area	128	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.482170	-122.894949	Russian River
SW09	PEM2	DEPRESS	Area	70	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.482013	-122.894956	Russian River
SW10	PEM2	DEPRESS	Area	7	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.481907	-122.894957	Russian River
SW11	PEM2	DEPRESS	Area	143	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.481942	-122.894827	Russian River
SW12	PEM2	DEPRESS	Area	11	SQ FT	A4-2.ADJ.WET.A2&A3-404	38.481391	-122.894955	Russian River
SW13	PEM2	DEPRESS	Area	206	SQ FT	NON-WOTUS-TRIB.NEGATIVE.A3	38.480102	-122.894942	Russian River
SW14	PEM2	DEPRESS	Area	219	SQ FT	NON-WOTUS-TRIB.NEGATIVE.A3	38.477792	-122.894954	Jones Creek
SW15	PEM2	DEPRESS	Area	176	SQ FT	NON-WOTUS-TRIB.NEGATIVE.A3	38.477729	-122.894808	Jones Creek
SW16	PEM2	DEPRESS	Area	8	SQ_FT	NON-WOTUS-TRIB.NEGATIVE.A3	38.479632	-122.894941	Russian River
C1	R4	RIVERINE	Linear	44	Linear FT	A4-2.ADJ.WET.A2&A3-404	38.483834	-122.894816	Russian River
C2	R4	RIVERINE	Linear	18	Linear FT	A4-2.ADJ.WET.A2&A3-404	38.483689	-122.894812	Russian River
C3	R4	RIVERINE	Linear	29	Linear FT	A4-2.ADJ.WET.A2&A3-404	38.483553	-122.894811	Russian River

Waters Name	Cowardin Code	HGM Code	Measurement Type	Amount	Units	Waters Type	Latitude	Longitude	Local Waterway
C4	R4	RIVERINE	Linear	38	Linear FT	A3.TRIB-404	38.483340	-122.894875	Russian River
S1	R4SB7	RIVERINE	Area	24	SQ FT	A3.TRIB-404	38.483333	-122.894803	Russian River
S2	R4SB7	RIVERINE	Area	7	SQ FT	A3.TRIB-404	38.483346	-122.894952	Russian River

* SQ FT = square feet