BIOLOGICAL AND REGULATORY CONSTRAINTS REPORT
4485 D STREET PROJECT
SONOMA COUNTY, CALIFORNIA

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1.0 INTRODUCTION

At the request of Villa Vanto LLC, Huffman-Broadway Group, Inc. (HBG) conducted a biological resources assessment (BRA) for an agricultural project (Project) in Sonoma County, California.

1.1 Project Location

The 57.65-acre Project site (Project Site) is at 4485 D Street in Sonoma County, California which is west of US-101 (Redwood Highway) and southwest of the City of Petaluma (Appendix 1, Figures 1 - 3). The approximate center point of the Project Site is at Latitude 38.195137° north and Longitude 122.648778° west and is within Assessor's Parcel Number (APN) 020-130-037. The regional location of the Project Site is shown in Appendix 1, Figure 1. Appendix 1, Figure 2 shows the location of the site on 7.5-minute USGS quadrangle mapping. Appendix 1, Figure 3 shows an aerial photo of the Project Site and the surrounding area.

Note: Appendix H of the Aquatic Resources Delineation (Appendix 3 of this document) provides representative photos of the Project Site.

1.2 Project Description

The proposed Project is a request for a Zoning Permit for farm retail sales, and Zoning Permit to allow small-scale agricultural processing of 11.5-acres of lavender grown onsite, and a Use Permit to allow 28 annual agricultural promotional events to promote the lavender agricultural processing and other products produced on site. The project would include a two-story agricultural barn structure of 5,020 gross square feet in size. In addition, the surrounding existing lawn and patio areas will be used to accommodate a 3,575 square foot lavender processing area, a 215 square foot farm retail sales area, two restrooms, and 95 square feet of accessory storage area. A 690 square foot area on the second floor of the barn will continue to be used as a private office for the owner, an adjacent 85 square foot area with a bathroom and a new driveway leading from D Street to the agricultural barn and five new parking spaces plus one ADA-parking space. Appendix 2 provides scaled conceptual design plans. Pond expansion shall be accomplished through excavation to deepen and expand the pond margin.

In addition, the Applicant is proposing a new western driveway for event access, clear span stream crossing, new parking area, new entrance on D Street, agricultural planting and orchard areas, and a 25,700 square foot pond. Within the existing developed area off D Street, the applicant proposes grading for a 3,750 square foot horse barn structure; an artificial turf area (1,008 sq ft); gravel paving area (4,100 sq ft); and a pedestrian walkway (1,802 sq ft). Lastly, grading for a roadway to the east of the existing roadway which leads to the existing pond area is planned. The applicant also proposes to use the remaining property as pasture lands with oak woodland areas being preserved (Attachment 1, Figures 13, 14, 15, 16, and 17).

1.3 Purpose of this Biological Resources Assessment

The purpose of this BRA is to: (1) assess within the Project Site the potential for the occurrence of special-status plant and animal species and their habitats and sensitive natural communities, (2) analyze the potential for substantial adverse Project effects to special-status species and sensitive natural communities following the *California Environmental Quality Act (CEQA) Check List* questions regarding biological resources, and (3) provide mitigation recommendations based on a review of

existing literature, the results of the site reconnaissance, an aquatic resources delineation, pedestrian wildlife and rare plant surveys, and an evaluation of the impacts of the proposed project.

2.0 REGULATORY SETTING

The following is a description of relevant federal, state, and local environmental regulations and policies designed to protect sensitive plants and animals, their habitats and sensitive natural communities that may impact development planning and ultimate Project approval.

2.1 Federal Regulations

Clean Water Act-Section 404. The U.S. Army Corps of Engineers (USACE or Corps) regulates discharges of dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act (CWA). "Discharge of fill material" is defined as the addition of fill material into Waters of the U.S., including but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and sub-aqueous utility lines (33 C.F.R. §328.2(f)). In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

The USACE and the U.S. Environmental Protection Agency (US EPA) are responsible for implementing the Section 404 program. Section 404(a) authorizes the Corps to issue permits, after notice and opportunity for comment, for discharges of dredged or fill material into waters of United States (WOTUS). Section 404(b) requires that the Corps issue permits in compliance with EPA guidelines, known as the Section 404(b)(1) Guidelines. Specifically, Section 404(b)(1) guidelines require that the Corps only authorize the "least environmentally damaging practicable alternative" (LEDPA) and include all practicable measures to avoid and minimize impacts to the aquatic ecosystem. The guidelines also prohibit discharges that would cause significant degradation of the aquatic environment or violate state water quality standards.

Waters of the U.S. include both wetlands and "other waters of the U.S." Wetlands and other waters of the U.S. are described by US EPA and Corps regulations (40 CFR § 230.3(s) and 33 CFR § 328.3(a), respectively). US EPA and the Corps define wetlands as "…those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (US EPA regulations at 40 CFR § 230.3(t); Corps' regulations at 33 CFR § 328.3(b)). Both natural and manmade wetlands and other waters (not vegetated by a dominance of rooted emergent vegetation) are subject to regulation. Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows.

The geographic extent of wetlands is defined by the collective presence of a dominance of wetland vegetation, wetland hydrology conditions, and wetland soil conditions as determined following the Corps' 1987 Wetlands Delineation Manual (1987 Manual); the Corps' 2008 Regional Supplement to Corps of Engineers Wetland Delineation Manual: Arid West, Version 2.0 (Arid West Regional Supplement); and supporting guidance documents. The geographic extent of other waters of the U.S. is

defined by an ordinary high-water mark (OHWM) in non-tidal waters (33 CFR. §328.3(e)) and by the High Tide Line within tidal waters (33 CFR. §328.3(d)). The OHWM is defined by the Corps as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 C.F.R. §328.3(e)). Tidal waters are also under the jurisdiction of the Corps. The landward limits of jurisdiction in tidal waters extend to the high tide line…"or, when adjacent non-tidal waters of the United States are present, to the limits of jurisdiction for such non-tidal waters" (33 C.F.R.§328.4(b)) High tide is further defined to include the line reached by spring high tides and other high tides that occur with periodic frequency (33 C.F.R.§328.3(d)).

Clean Water Act-NPDES Requirements. In 1972, the Clean Water Act was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollution Discharge Elimination System (NPDES) permit. The 1987 amendments established a framework for regulating municipal, industrial, and construction-related storm water discharges under the NPDES Program. On November 16, 1990, the US EPA published final regulations that establish storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water from construction projects that encompass one or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit.

The California State Water Resource Control Board has developed a general construction storm water permit to implement the requirements for the federal NPDES permit. The permit requires submittal of a Notice of Intent to comply, fees, and the implementation of a Storm Water Pollution Prevention Plan that specifies Best Management Practices (BMPs) that will prevent construction pollutants from entering storm water and keep products of erosion from migrating off-site into downstream receiving waters. The Construction General Permit includes post-construction requirements that site design provides no increase in overall site runoff or the concentration of drainage pollutants and requires implementation of Low Impact Development ("LID") design features. The Construction General Permit is implemented and enforced by California's nine Regional Water Quality Control Boards.

The State Regional Water Quality Control Boards (SWQCB) have also adopted requirements for NPDES storm water permits for medium and large municipalities, and the State Water Resources Control Board has adopted a General Permit for the discharge of storm water from small municipal storm sewer systems. This General Permit requires projects to develop and implement a post-construction Storm Water Management Plan (SWMP) to reduce the discharge of pollutants to the maximum extent practicable.

Federal Endangered Species Act. The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. The FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend. The FESA establishes an official listing process for plants and animals considered to be in danger of extinction, requires development of specific plans of action for the recovery of listed species, and restricts activities perceived to harm or kill listed species or affect critical habitat (16 USC 1532, 1536).

The FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined as harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species, or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3). Taking can result in civil or criminal penalties. Federal regulation 50 CFR 17.3 further defines the term "harm" in the take definition to mean any act that actually kills or injures a federally listed species, including significant habitat modification or degradation. Additionally, FESA prohibits the destruction or adverse modification of designated critical habitat. In the Service's regulations at 50 CFR 402.2, destruction or adverse modification is defined as a "direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species.

Critical Habitat is defined in Section 3 of ESA as:

1. the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection; and
2. specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

For inclusion in a Critical Habitat designation, habitat within the geographical area occupied by the species at the time it was listed must first have features essential to the conservation of the species (16 USC 1533). Critical Habitat designations identify, to the extent known and using the best scientific data available, habitat areas that provide essential life cycle needs of the species (areas on which are found the primary constituent elements). Primary constituent elements are the physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These include but are not limited to the following:

1. Space for individual and population growth and for normal behavior
2. Food, water, air, light, minerals, or other nutritional or physiological requirements
3. Cover or shelter
4. Sites for breeding, reproduction, or rearing (or development) of offspring
5. Habitats that are protected from disturbance or are representative of the historic, geographical, and ecological distributions of a species.

The ESA also requires federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or adversely modify critical habitat (16 USC 1536). Therefore, the ESA is invoked when the property contains a federally listed threatened or endangered species that may be affected by a permit decision. If listed species are involved and a Corps permit is required for impacts to jurisdictional waters, the Corps must initiate consultation with US Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service, (NMFS) pursuant to Section 7 of the ESA (16 USC 1536; 40 CFR § 402). If formal consultation is required, USFWS or NMFS will issue a biological opinion stating whether the permit action is likely to jeopardize the continued existence of the listed species, recommending reasonable and prudent measures to ensure the continued existence of the species,

establishing terms and conditions under which the project may proceed, and authorizing incidental take of the species.

For discretionary permit actions by non-federal entities, Section 10 of the ESA provides a mechanism for obtaining take authorization through submittal and approval of a Habitat Conservation Plan that details species impacts, measures to minimize or mitigate such impacts, and funding mechanisms to implement mitigation requirements.

U.S. Fish and Wildlife Service Birds of Conservation Concern. The 1988 amendment to the Fish and Wildlife Conservation Act mandates USFWS "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under ESA." To meet this requirement, USFWS published a list of Birds of Conservation Concern (BCC) (USFWS 2008) for the United States. The list identifies the migratory and nonmigratory bird species (beyond those already designated as federally threatened or endangered) that represent USFWS' highest conservation priorities. Depending on the policy of the lead agency, projects that result in substantial impacts to BCC may be considered significant under CEQA.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (MBTA) implements international treaties devised to protect migratory birds and any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. The regulations governing migratory bird permits are in 50 CFR part 13 General Permit Procedures and 50 CFR part 21 Migratory Bird Permits. Most bird species within California fall under the provisions of the Act. Excluded species include nonnative species such as house sparrow, starling, and ring-necked pheasant and native game species such as quail.

On December 22, 2017, the U.S. Department of Interior's Office of the Solicitor issued Memorandum M-37050, which states an interpretation that the Migratory Bird Treaty Act does not prohibit the accidental or "incidental" taking or killing of migratory birds. In response to the Trump Administration's attempted changes to the MBTA, eight states, including California, filed suit in September of 2018, arguing that the new interpretation inappropriately narrows the MBTA and should be vacated. On August 11, 2020, the Southern District of New York ruled in favor of the long-standing interpretation of the MBTA to protect migratory birds, reinstating the historical ban on incidental take. Just days before leaving office, the Trump Administration finalized its pullback of MBTA regulations, despite the ruling of the federal court, and the elimination of protections pursuant to the MBTA went into effect in January of 2021. On his first day in office, new President Joe Biden placed the Trump Administration's changes to the MBTA on hold, pending further review. The Biden Administration announced the repeal of the January 2021 changes and the reinstatement of protections for migratory birds in December of 2021.

Fish and Wildlife Coordination Act. The USFWS also has responsibility for project review under the Fish and Wildlife Coordination Act. This statute requires that all federal agencies consult with USFWS, NMFS, and the state's wildlife agency (California Department of Fish and Wildlife, CDFW) for activities that affect, control, or modify streams and other water bodies. Under the authority of the Fish and Wildlife Coordination Act, USFWS, NMFS, and CDFW review applications for permits issued under Section 404 and provide comments to the Corps about potential environmental impacts.

2.2 State Regulations

Section 401 of the Federal Clean Water Act/Porter Cologne Water Quality Control Act. Pursuant to section 401 of the federal Clean Water Act, projects that require a Corps permit for the discharge of dredge or fill material must obtain water quality certification that confirms a project complies with state water quality standards before the Corps permit is valid. State water quality is regulated/administered by the State Water Resources Control Board and its nine Regional Water Quality Control Boards (Water Board). A water quality certification from a Water Board must be consistent with not only the Clean Water Act, but with the California Environmental Quality Act (CEQA), the California Endangered Species Act (CESA), and the SWRCB's requirement to protect beneficial uses of waters of the State.

The State also maintains independent regulatory authority over the placement of waste, including fill, into waters of the State under the Porter-Cologne Water Quality Control Act. Waters of the State are defined more broadly than "waters of the US" to mean "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code section 13050(e)). Examples include, but are not limited to, rivers, streams, lakes, bays, marshes, mudflats, unvegetated seasonally ponded areas, drainage swales, sloughs, wet meadows, natural ponds, vernal pools, diked baylands, seasonal wetlands, and riparian woodlands. Waters of the State include all waters within the state's boundaries, whether private or public, including waters in both natural and artificial channels. They include all "waters of the United States"; all surface waters that are not "waters of the United States, e.g., non-jurisdictional wetlands; groundwater; and the territorial seas.

The State Water Resources Control Board's State Wetland Definition and Procedures for Discharges of Dredge of Fill Material to Waters of the State adopted April 2, 2019 (the Procedures) along with the Implementation Guidance for the Procedures dated April 2020 (the Implementation Guidance) defines a wetland as an area that under normal circumstances, (1) has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation. The Procedures, along with the Implementation Guidance, states that the permitting authority (e.g. State Water Quality Control Board or Regional Water Quality Control Boards) shall rely on any wetland area delineation from a final aquatic resource report verified by the Corps. If the Corps does not require an aquatic resource delineation report, an applicant must submit a delineation of all waters to Water Board staff during application review.

The Procedures, along with the Interim Guidance, also include procedures for the submission, review, and approval of applications for activities that could result in the discharge of dredged or fill material to any Waters of the State and include elements of the Clean Water Act Section 404(b)(1) Alternatives Analysis Guidelines, thereby bringing uniformity to SWCQB's regulation of discharges of dredged or fill material to all waters of the state. Typically, the Corps requires a Clean Water Act 404(b)(1) Alternatives Analysis for wetland impacts greater than 0.50 acres. The Procedures require an alternatives analyses to be completed in accordance with a three-tier system. The level of effort

required for an alternatives analysis within each of the three tiers shall be commensurate with the significance of the impacts resulting from the discharge.

The California State Water Resource Control Board has also developed a general construction storm water permit to implement the requirements of the federal National Pollution Discharge Elimination System (NPDES) permit. Projects approved by a Water Board must, therefore, include the preconstruction requirement for a Stormwater Pollution Prevention Plan and the post-construction requirement for a Stormwater Management Plan.

California Endangered Species Act. The State of California enacted the California Endangered Species Act (CESA) in 1984. The CESA is similar to the FESA but pertains to state listed endangered and threatened species. CESA requires state agencies to consult with the CDFW when preparing CEQA documents to ensure that the state lead agency actions do not jeopardize the existence of listed species. CESA directs agencies to consult with CDFW on projects or actions that could affect listed species, directs CDFW to determine whether jeopardy would occur, and allows CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that 'overriding considerations" exist; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.

The CESA generally prohibits the taking of state listed endangered or threatened plant and wildlife species, however, for projects resulting in impacts to state listed species, CDFW may authorize take through issuance of an Incidental Take Permit (ITP) pursuant to Section 2081 of the California Fish and Game Code. Section 2081 requires that such projects implement an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy. CDFW requires preparation of mitigation plans in accordance with published guidelines that require, among other things, measures to fully mitigate impacts to State listed species. CDFW exercises authority over mitigation projects involving state listed species, including those resulting from CEQA mitigation requirements. No authorization of take under Section 2081 is permitted for species listed in state statutes as Fully Protected Species. Where Fully Protected Species are involved, projects must be designed to avoid all take of the species. CDFW cannot issue an ITP until the CEQA Lead Agency has provided documentation in the form of a Notice of Determination that the project has complied with CEQA.

California Department of Fish and Wildlife-Lake and Streambed Alteration Agreement. Section 1602 of the California Fish and Game Code requires any person, governmental agency, or public utility proposing any activity that will divert or obstruct the natural flow or change the bed, channel or bank of any river, stream, or lake, or proposing to use any material from a streambed, to first notify CDFW of such proposed activity. Based on the information contained in the notification form and a possible field inspection, CDFW may propose reasonable modifications in the proposed construction as would allow for the protection of fish and wildlife resources. Upon request, the parties may meet to discuss the modifications. If the parties cannot agree and execute a Lake and Streambed Alteration Agreement, then the matter may be referred to arbitration. CDFW cannot issue a Streambed Alteration Agreement

until the CEQA Lead Agency has provided documentation in the form of a Notice of Determination that the project has complied with CEQA.

CDFW's regulations implementing the Fish and Game Code define the relevant rivers, streams, and lakes over which the agency has jurisdiction to constitute "all rivers, streams, lakes, and streambeds in the State of California, including all rivers, streams and streambeds which have intermittent flows of water." (Title 14 *California Code of Regulations* [CCR] § 720). The CDFW takes jurisdiction under its Lake and Streambed Alteration Agreement Program for any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. CDFW does not have a methodology for the identification and delineation of the jurisdictional limits of streams except for the general guidance provided in *A Field Guide to Lake and Streambed Alteration Agreements, Section 1600-1607 California Fish and Game Code* (CDFG 1994). In making jurisdictional determinations, CDFW staff typically rely on field observation of physical features that provide evidence of water flow through a bed and channel such as observed flowing water, sediment deposits and drift deposits and that the stream supports fish or other aquatic life. Riparian habitat is not specifically defined by the Fish and Game Code but CDFW takes jurisdiction over areas within the flood plain of a body of water where the vegetation (grass, sedges, rushes, forbs, shrubs, and trees) is supported by the surface or subsurface flow.

California Fish and Game Code Special Protections for Birds. In addition to protections contained within the California ESA and California Fish and Game Code § 3511 described above, the California Fish and Game Code includes a number of sections that specifically protect certain birds.

- Section 3800 states that it is unlawful to take nongame birds, such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in accordance with regulations of the California Fish and Game Commission or a mitigation plan approved by CDFW for mining operations.
- Section 3503 prohibits the take, possession, or needless destruction of the nest or eggs of any bird.
- Section 3503.5 protects birds of prey (which includes eagles, hawks, falcons, kites, ospreys, and owls) and prohibits the take, possession, or destruction of any birds and their nests.
- Section 3505 makes it unlawful to take, sell, or purchase egrets, ospreys, and several exotic nonnative species, or any part of these birds.
- Section 3513 specifically prohibits the take or possession of any migratory nongame bird as designated in the MBTA.

California Department of Fish and Wildlife-Fish and Game Code Section 4150. Bats and other non-game mammals are protected in California. Section 4150 of the Fish and Game Code states that all non-game mammals or parts thereof may not be taken or possessed except as otherwise provided in the code or in accordance with regulations adopted by the Fish and Game Commission. Thus, destruction of an occupied, nonbreeding, bat roost, resulting in the death of bats, or disturbance that causes the loss of a maternity colony of bats (resulting in the death of young), is prohibited.

California Department of Fish and Wildlife Sensitive Plant Communities. CDFW has designated special status natural communities which are considered rare in the region, rank as threatened or very threatened, support special status species, or otherwise receive some form of regulatory protection. Sensitive plant communities are those natural plant communities identified in local or regional plans, policies, ordinances, regulations, or by the CDFW which provide special functions or values. Documentation pertaining to these communities, as well as special status species (including species of special concern), is kept by CDFW as part of the California Natural Diversity Data Base (CNDDB). All known occurrences of sensitive habitats are mapped onto 7.5-minute US Geological Survey (USGS) topographic quadrangle maps maintained by the CNDDB. Sensitive plant communities are also identified by CDFW on their List of California Natural Communities Recognized by the CNDDB. Impacts to sensitive natural communities must be considered and evaluated under CEQA.

California Department of Fish and Wildlife- Species of Special Concern. CDFW tracks species in California whose numbers, reproductive success, or habitat may be threatened. Species that may be considered for review are included on a list of "Species of Special Concern" developed by the CDFW. Even though these species may not be formally listed under FESA or CESA, such plant and wildlife species must be evaluated during the CEQA review of development projects, and mitigation should be developed to prevent significant impacts to such species.

California Department of Fish and Wildlife- Fully Protected Animal Species. The classification of Fully Protected was an effort by the State of California in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Most Fully Protected species have also been listed as threatened or endangered species under state endangered species laws and regulations. Species classified as Fully Protected Species by the CDFW may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock (as per California Fish and Game Code Section 3511(a)(1)).

Native Plant Protection Act. The NPPA of 1977 (California Fish and Game Code §§ 1900-1913) was established with the intent to "preserve, protect and enhance rare and endangered plants in this state." The NPPA is administered by CDFW. The Fish and Game Commission has the authority to designate native plants as "endangered" or "rare". The NPPA prohibits the take of plants listed under the NPPA, but the NPPA contains a number of exemptions to this prohibition that have not been clarified by regulation or judicial rule. In 1984, the California ESA brought under its protection all plants previously listed as endangered under NPPA. Plants listed as rare under NPPA are not protected under the California ESA but are still protected under the provisions of NPPA. The Fish and Game Commission no longer lists plants under NPPA, reserving all listings to the California ESA.

2.3 Local Regulations

Sonoma County

The Sonoma County General Plan includes the following biological resources protections:

Stream Setbacks for Structures (SCC §7-14.5) - All structures requiring a building permit or an agricultural exemption shall be set back from streams, as measured from the toe of the stream bank outward, a distance of 2.5 times the height of the stream bank plus 30 feet, or 30 feet outward from

the top of the stream bank, whichever distance is greater, unless a greater distance is established in the General Plan, Local Coastal Plan, and/or Zoning Code. If the top of the stream bank cannot be determined by visual analysis, it shall be determined by hydraulic analysis as the water surface elevation for the 100-year storm event plus 1.5 feet. Stream bank height is the change in elevation from the top of bank and the lowest toe of bank.

Stream Setbacks for Riparian Corridors (SCC §26.65.030) - The Riparian Corridor (RC) combining zone includes the stream bed, bank, and adjacent streamside conservation area on each side of a designated stream as measured from the top of the higher bank. Land uses and development, including grading, vegetation removal, agricultural cultivation, structures, roads, utility lines, and parking lots, is prohibited within the Riparian Corridor, except as allowed by SCC §26.65.030 and 26.65.040. The minimum setback for development and agricultural cultivation is indicated by the zoning for each property. For example, a parcel zoned "RC 100/50" indicates that there is a 100 feet setback for development and a 50 feet setback for agricultural cultivation.

Stream Setbacks for Septic Systems and Water Wells:

1. **Stream Setbacks for Septic Systems (Sonoma County Onsite Wastewater Treatment Systems Regulations and Technical Standards).** Septic systems shall be set back 50 feet from the top of ephemeral stream banks and 100 feet from the top of perennial stream banks.

2. **Stream Setbacks for Water Wells (SSC §25B-6.b).** Wells shall be set back 30 feet from the top of stream banks.

Stream and Water Feature Setbacks for Grading Work:

1. **Stream Setbacks for Grading Work (SCC §11.14.100).** Grading work and land disturbance shall be set back 25 feet from top of stream banks, unless a greater setback is required by general plan, local coastal plan, or zoning code.

2. **Setbacks for Grading Work near Lakes, Ponds, and Reservoirs (SCC §11.14.090).** Grading work and land disturbance shall be set back 50 feet from the high water mark of lakes, ponds, and reservoirs, unless a greater setback is required by general plan, local coastal plan, or zoning code.

3. **Setbacks for Grading Work near Wetlands (SCC §11.14.110).** Grading work and land disturbance shall be set back from wetlands in compliance with the county's requirements, unless a greater setback is required by general plan, local coastal plan, or zoning code. These setback requirements shall not apply where all necessary state and federal permits, approvals, authorizations to fill wetlands have been obtained.

   Existing vegetation shall be retained in setback areas to filter soil and other pollutants carried in storm water. Vegetative filter strips may be installed in setback

areas in compliance with Sonoma County's best management practices guide to enhance filtration.

Sec. 26-88-010 (m) Tree Protection Ordinance: The purpose of this ordinance is to ensure that all projects shall be designed to minimize the destruction of protected trees. See Appendix 3 for General Provisions and Construction Standards relevant to the Tree Protection Ordinance.

Valley Oak Habitat (VOH) Combining District: Purpose is to protect and enhance valley oaks and valley oak woodlands and to implement the provisions of Section 5.1 of the general plan resource conservation element.

Heritage or Landmark Trees: The purpose of the Sonoma County Heritage or Landmark Tree Ordinance is to ensure that no person, including county agencies, shall remove a heritage or landmark tree without obtaining a tree permit as outlined in Section 26D-5 and as exempted under Section 26D-6.

2.4 Other

California Native Plant Society

The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Plants of California (CNPS 2024: https://www.cnps.org/cnps/rareplants/inventory/).

Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review, especially for those plant species included in California Rare Plant Ranks 1 and 2 (see below).

CNPS Rank	Status
California Rare Plant Rank 1A	Plants presumed extirpated in California and either rare or extinct elsewhere.
California Rare Plant Rank 1B	Plants rare, threatened, or endangered in California and elsewhere.
California Rare Plant Rank 2A	Plants presumed extirpated in California, but more common elsewhere.
California Rare Plant Rank 2B	Plants rare, threatened, or endangered in California, but more numerous elsewhere.
California Rare Plant Rank 3	Plants about which more information is needed – a review list.
California Rare Plant Rank 4	Plants of limited distribution – a watch list.
Threat Code Extensions	
.1	Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2	Moderately threatened in California (20-80% of occurrences threatened / moderate degree and immediacy of threat)
.3	Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

The following link identifies the definitions of the CNPS listings:
https://www.cnps.org/cnps/rareplants/ranking.php

3.0 METHODS

Both desktop and field surveys were conducted. The following describes how special-status species and sensitive natural communities are defined, and methods used to assess their potential to be present on the Project Site.

3.1 Definitions

3.1.1 Special Status Species

CEQA requires that impacts to special status species be considered and evaluated under CEQA. Special status species include plants or animals that:

1. are listed, proposed for listing, or candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA).
2. are listed or are candidates for future listing as threatened or endangered under the California ESA.
3. meet the definitions of endangered or rare under § 15380 of the CEQA Guidelines.
4. are plants listed as rare under the California Native Plant Protection Act (NPPA) (California Fish and Game Code, § 1900 et seq.).
5. are considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California", “plants about which more information is needed”, or “plants of limited distribution – a watch list” (i.e., species with a California Rare Plant Rank [CRPR] of 1B, 2, 3, or 4).
6. are fully protected in California in accordance with the California Fish and Game Code, §§ 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes).
7. are identified as a species of special concern (SSC) by the California Department of Fish and Wildlife (CDFW).
8. are birds identified as birds of conservation concern (BCC) by the U.S. Fish and Wildlife Service (USFWS).

3.1.2 Sensitive Natural Communities

CEQA requires that impacts to sensitive natural communities be considered and evaluated under CEQA. Sensitive natural communities are plant communities which CDFW designates as sensitive which are either considered rare in the region, rank as threatened or very threatened, support special status species, or otherwise receive some form of regulatory protection. Sensitive plant communities also include those plant communities identified in local or regional plans, policies, ordinances, regulations, or by CDFW as those communities that provide special functions or values. CDFW identifies sensitive plant communities on their *List of California Natural Communities* and records their mapped presence as part of the information documented within the CNDDB. The mapped information in the CNDDB provides a general location of sensitive plant communities and sensitive natural community types.

3.2 Desktop Review

The following information sources were reviewed to develop relevant environmental and biological information for determining if special-status species, critical habitat, and sensitive natural communities that had been previously documented on or within a 5-mile vicinity of the Project Site:

- Aerial imagery available online from Google Earth Pro
- Watershed mapping National Hydrography Dataset (NHD) HUC 8 and HUC 12 available online from the US Geological Survey (USGS)
- National Wetlands Inventory mapping available online from the US Fish and Wildlife Service (USFWS)
- Custom Soil Resources Report available online from Natural Resources Conservation Service (NRCS)
- Flood Insurance Rate Map available online from the Federal Emergency Management Agency (FEMA)
- 1:24,000 scale topographic mapping available online from the USGS
- LIDAR data based topographic mapping for the Project Site available online from Sonoma County
- Vegetation Mapping available online from Sonoma County
-
- Precipitation and temperature data from NRCS *Climate Analysis for Wetlands Tables* based on the nearest NRCS WETS Station
- California Natural Diversity Database (CNDDB) search for the Project Site 7.5-minute quadrangle and the eight surrounding USGS quadrangles available online from the California Department of Fish and Wildlife (CDFW)
- Information for Planning and Consultation (IPaC) data base available online from the USFWS
- National Marine Fisheries Service (NMFS) list of species and other resources under NMFS jurisdiction that are known or expected to be on or near the Project area
- Electronic Inventory of Rare and Endangered Plants of California for the Project Site 7.5-minute quadrangle and the eight surrounding USGS quadrangles available online from the CNPS.

3.3 Field Surveys

The Project Site was visited on several occasions by professional biologists to develop information regarding general ecological conditions and potential presence / absence of special status plant and animal species and sensitive natural communities to include aquatic resources. These studies / biological surveys are summarized below.

Plant and Wildlife Surveys. Plant and wildlife species and habitat surveys were conducted on the Project Site by Dr. Terry Huffman and Greg Huffman of HBG on August 25 and September 1, 2023. To determine if native grasslands or coastal prairie occurs within the Project Area, a detailed floristic inventory was prepared based on CNPS relevé plot sampling. Wildlife observations in the Project Area were based on visual sightings as well as observations of tracks and scat.

Aquatic Resources Survey. Wetland Scientists Terry Huffman and Greg Huffman conducted a field investigation on September 1, 2023 to identify and map aquatic resources meeting the definition of Waters of the United States (WOTUS) (33 CFR § 328.3 (a)), including wetlands (33 CFR § 328.3 (a)(4)), potentially regulated by the Corps and USEPA under Section 404 of the CWA. Potential WOTUS were identified and delineated using the Corps' *1987 Wetlands Delineation Manual* (Corps Delineation Manual) and the Corps' *2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Regional Supplement) and supporting guidance documents. The Regional Supplement was followed when determining the presence or absence of vegetation, soil, and hydrology indicators. Ordinary High Water Mark identification and delineation followed the methods described in *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*.

HBG also assessed the Project Area on September 1, 2023 to determine the presence of Waters of the State (WOTS) in accordance with the April 2, 2019, *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State,* also referred to as the "*Procedures*" and, therefore, potentially regulated under the Porter-Cologne Water Quality Control Act by the State Water Resources Control Board and San Francisco Bay Regional Water Quality Control Board. Additionally, HBG evaluated the Project Area to determine the presence or absence of lakes or streams potentially subject to regulation under Fish and Game Code Section 1602 by CDFW's Lake and Streambed Alteration Agreement Program (LSAA Program).

The findings of these biological surveys have been incorporated into this BRA in Section 4.0.

3.4 Potential Presence Assessment

Based on species occurrence information provided by the CNDDB and IPaC databases, special plant and animal species and sensitive natural communities were summarized in table format (Appendix 2) with listing status information together with descriptions of macro and micro habitat requirements. Using the criteria listed below, each plant and animal species and community listed was then evaluated as to its potential for being present on the Project Site (Section 4.2). The evaluation was based on an assessment of information obtained relevant to the Project Site and vicinity which included: (1) general ecological information regarding land use, climate, topographic, soils, hydrology, and vegetation type and animal species typically associated with the existing Project Site; and (2) specific technical information regarding listed plant and animal species distribution range, habitat, and known threats together with onsite general level plant, wildlife, and aquatic resource surveys (Section 4.2.1 and 4.2.2).

> **No Potential**: Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
>
> **Unlikely**: Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
>
> **Moderate Potential**: Some of the habitat components meeting the species

requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential: All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present: Species is observed on the site or has been recorded (i.e., CNDDB, other reports) on the site recently.

If determined potentially present, the plant species, animal species, and / or sensitive natural community was evaluated to determine if the Project would have a substantial adverse effect, either directly or through habitat modifications and, if necessary, recommend action(s) either before or after proposed project approval, but prior to ground disturbing activities (also provided in Section 5.0).

4.0 RESULTS

4.1 Site Characteristics

4.1.1 Land Use

Agricultural and dispersed residential land uses are present on all sides of the Project Site. (Appendix 1, Figures 3 and 4). Detailed review of Google Earth Pro aerial photography and imagery from December 1985 to April 2022 shows that land use in the Project Site consists of a single farmhouse, livestock pens, barn, and stock pond with surrounding pastureland.

4.1.2 Topography and Soils

The APN of which the Project Site is located consists of gently rolling to hilly landscapes that surround the intermediate area outside the Project Site. The topography, which varies at elevations between approximately 184 to 630 feet msl, is shown in the Petaluma USGS 7.5-minute quadrangle topographic map in Appendix 1, Figure 2.

Soil survey information for the Review Area was obtained from the National Resources Conservation Service Web Soil Survey (NRCS 2023) (Appendix 1, Figure 5). Six (6) different soil types are mapped by NRCS within the Review Area as described in the table below.

Table 2. Summary of Pertinent Characteristics of Soils Mapped Onsite by NRCS

Soil Name	Landform/Parent Material	Typical Profile (inches)	Natural Drainage Class/Runoff Class	Depth to Water Table	Frequency of Flooding/Ponding
Los Osos clay loam, 2 to 15 percent slopes	Hills / Residuum weathered from sedimentary rock	H1 - 0 to 24 inches: clay loam H2 - 24 to 34 inches: clay H3 - 34 to 59 inches: weathered bedrock	Well drained / High	More than 80 inches	None/None
Los Osos clay loam, 15 to 30 percent slopes, very rocky, MLRA 15	Hillslopes / Residuum weathered from sedimentary rock	A - 0 to 6 inches: clay loam Bw - 6 to 16 inches: clay loam Bt1 - 16 to 28 inches: clay Bt2 - 28 to 34 inches: clay Cr - 34 to 44 inches: bedrock	Well drained / Very High	More than 80 inches	None/None
Los Osos clay loam, 30 to 50 percent slopes, eroded, MLRA 15	Mountain slopes, hillslopes / Residuum weathered from sandstone and shale	A - 0 to 10 inches: clay loam Bt1 - 10 to 20 inches: clay Bt2 - 20 to 32 inches: clay	Well drained/ Very high	More than 80 inches	None/ None

Table 2. Summary of Pertinent Characteristics of Soils Mapped Onsite by NRCS					
Soil Name	**Landform/Parent Material**	**Typical Profile (inches)**	**Natural Drainage Class/Runoff Class**	**Depth to Water Table**	**Frequency of Flooding/Ponding**
Los Osos clay loam, thin solum, 15 to 30 percent slopes, eroded	Hills / Residuum weathered from sedimentary rock	H1 - 0 to 10 inches: clay loam H2 - 10 to 20 inches: clay H3 - 20 to 59 inches: weathered bedrock	Well drained/ Very high	More than 80 inches	None/ None
Los Osos clay loam, thin solum, 30 to 50 percent slopes	Hills / Residuum weathered from sedimentary rock	H1 - 0 to 4 inches: clay loam H2 - 4 to 20 inches: clay H3 - 20 to 59 inches: weathered bedrock	Well drained/ Very high	More than 80 inches	None/ None
Zamora silty clay loam, moist, 0 to 8 percent slopes, MLRA 14	Stream terraces, alluvial fans / Alluvium derived from volcanic and sedimentary rock	A1 - 0 to 5 inches: silty clay loam A2 - 5 to 17 inches: clay loam A3 - 17 to 29 inches: clay loam Bt1 - 29 to 41 inches: clay loam Bt2 - 41 to 55 inches: sandy clay loam Bt3 - 55 to 60 inches: gravelly clay	Well drained / Medium	More than 80 inches	None/ None

4.1.3 Climate

Based on WETS Station "PETALUMA AIRPORT, CA" precipitation and temperature data for the period of record (1971 – 2022), the average annual precipitation amount received approximately 6.5 miles from the site is 24.67 inches received as rainfall and 0.00 inch received as snow. The average minimum and maximum precipitation amount ranges between 0.03 and 4.68 inches. The wettest months, in which average monthly rainfall exceeds 3.00 inches, are January, February, March, November, and December (4.67, 4.60, 3.51, 3.08, and 4.68 inches) with the lowest average amount occurring in July and August (0.03 and 0.05 inches). Record data also indicates that the annual average daily temperature is 58.2° F. Average high and low temperatures range between 70.8° F and 45.6° F with the coldest months typically including January and December where temperatures are in the upper 40s and the hottest months being July and August where temperatures are in the upper 60s. The annual growing season with a 50% probability of having days above 32° F is 269 days (March 2 to November 26), and, with a 70% probability of having days above 32° F, is 291 days (February 19 to December 7).

4.1.4 Hydrology

Watersheds. Review of the US Geological Survey (USGS) National Hydrography Dataset (NHD) Hydrologic Unit Code (HUC) data show that the Review Area lies within the 8-digit HUC (18050002) "San Pablo Bay" subbasin and the 12-digit HUC (180500020602) "San Antonio Creek" subwatershed.

Direction of Surface Water Flow. Surface water which flows within the Review Area is the direct result of precipitation and associated stormwater runoff. This stormwater is collected by an incised natural drainage which directs flows to the northwest edge of the Review Area. Streamflow from the Review Area stream travels west-southwesterly towards and into San Antonio Creek. San Antonio Creek surface flows run into the Petaluma River (Appendix 1, Figures 2, 3, and 9). Stormwater flow is also received by a stock pond that overflows to the stream in the Project Site during significant precipitation events. Water levels are maintained within the non-rainy season by wells situated on the hill slopes adjacent to the pond.

FEMA. FEMA Flood Insurance Rate Map for "Sonoma County" 06097C0984E (Effective Date: 12/2/2008) indicates the Review Area is outside of FEMA zoning associated with an annual chance flood hazard (Appendix 1, Figure 8).

4.1.5 Plant Communities

General Classification. Vegetation communities are assemblages of plant species growing in an area of similar biological and environmental factors. Vegetation communities and habitats at the project site were identified using the California Wildlife Habitat Relationships (CWHR) classification (Mayer and Laudenslayer 1988), which defines aquatic as well as terrestrial habitats including urban areas. The CWHR habitat classification scheme was developed to provide a systematic method for describing how habitats and structures support California's regularly occurring birds, mammals, reptiles and amphibians. At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated.

Wetland habitats potentially subject to federal or state jurisdiction were further classified using the U.S. Fish and Wildlife's Service's (USFWS) Classification System for Wetland and Deepwater Habitats (Cowardin et al. 1979, see wetland delineation discussion in Section 4.1.7).

Based on Sonoma County vegetation mapping and results of field surveys conducted by HBG, the Project Site contains eight plant communities or habitat types: (1) Annual Grassland (2) Coastal Oak Woodland, (3) Fresh Emergent Wetland, (4) Wet Meadow, (5) Riverine, (6) Urban, (7) Valley Foothill Riparian, and (8) Valley Oak Woodland. Summary descriptions of these plant communities / habitat types on the Project Site follows.

Structure. Annual Grassland habitat occurs mostly on flat plains to gently rolling foothills. Annual Grassland habitats are open grasslands composed primarily of annual plant species. Many of these species also occur as understory plants in woodlands and other habitats. Structure in Annual Grassland depends largely on weather patterns and livestock grazing. Dramatic differences in physiognomy, both between seasons and between years, are characteristic of this habitat. Fall rains cause germination of annual plant seeds. Plants grow slowly during the cool winter months, remaining low in stature until spring, when temperatures increase and stimulate more rapid growth. Large amounts of standing dead plant material can be found during summer in years of abundant rainfall and light to moderate grazing pressure. Heavy spring grazing favors the growth of summer-annual forbs and reduces the amount of standing dead material. Grasslands, in general, are of conservation concern nationwide due to the loss of these habitats with conversion to agriculture and urban development.

Composition. Introduced annual grasses are the dominant plant species present within the Annual Grassland on the Project Site. These include wild oat (*Avena fatua*), slender oat (*Avena barbata*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum*), Harding grass (*Phalaris aquatica),* and California fescue (*Festuca californica*). Common forbs include broadleaf filaree (*Erodium botrys*), redstem filaree (*Erodium cicutarium*), rose clover (*Trifolium hirtum*), hayfield tarweed (*Hemizonia congesta*), common tarweed (*Centromadia pungens*), field bindweed (*Convolvulus arvensis*), California buttercup (*Ranunculus californica*), and many others.

Wildlife Considerations. Many wildlife species use Annual Grasslands for foraging, while some require special habitat features such as cliffs, caves, ponds, or habitats with woody plants for breeding, resting, and escape cover. Characteristic reptiles that breed in Annual Grassland habitats include the western fence lizard (*Scoloperus occidentalis*), common garter snake (*Thamnophis sirtalis elegans*), and Pacific rattlesnake (*Crotalus oreganus*). Mammals typically found in this habitat include the black-tailed jackrabbit (*Lepus californicus),* California ground squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis),* California vole (*Microtus californicus*), American badger (*Taxidea taxus*), and coyote (*Canis latrans*). Common birds known to breed in Annual Grasslands include savannah sparrow (*Passerculus sandwichensis*), horned lark (*Eromophila alpestris*), and western meadowlark (*Sturnella neglecta*). This habitat also provides important foraging habitat for various species of raptor (birds of prey) such as turkey vulture (*Cathartes aura*), northern harrier (*Circus hudsonius*), red-tailed hawk (*Buteo jamaicensis),* red-shouldered hawk (*Buteo lineatus*), American kestrel (*Falco sparverius*), and white-tailed kite (*Elanus leucurus*).

Coastal Oak Woodland

Structure. The overstory of Coastal oak woodlands consists of deciduous and evergreen hardwoods (mostly oaks), sometimes mixed with scattered conifers. In mesic sites, the trees are dense and form a closed canopy. In drier sites, the trees are widely spaced, forming an open woodland or savannah. The understory is equally variable. In some instances, it is composed of shrubs from adjacent chaparral or coastal scrub which forms a dense, almost impenetrable, understory. More commonly, shrubs are scattered under and between trees. Where trees form a closed canopy, the understory varies from a lush cover of shade-tolerant shrubs, ferns, and herbs to sparse cover with a thick carpet of litter. When trees are scattered and form an open woodland, the understory is grassland, sometimes with scattered shrubs. The interrelationships of slope, soil, precipitation, moisture availability, and air temperature cause variations in structure of coastal oak woodlands. These factors vary along the latitudinal, longitudinal and elevational gradients over which coastal oak woodlands are found.

Composition. Tree canopy composition of Coastal oak woodlands on the Project Site is dominated by coast live oak (*Quercus agrifolia*). Typical understory plants in the coast live oak woodlands are shade tolerant shrubs such as California blackberry (*Rubus ursinus*). Other plants are present such as chicory (*Cichorium intybus),* sweet fennel (*Foeniculum vulgare*), Harding grass , black mustard (*Brassica nigra*), wild radish (*Raphanus sativa*), and other grasses and herbaceous plants found in the grasslands.

Wildlife Considerations. Coastal oak woodlands provide habitat for a variety of wildlife species, including over 60 species of mammals and over 110 species of birds. Species such as California quail

(*Callipepla californica*), wild turkey (*Meleagris gallopavo*), western gray squirrel (*Sciurus griseus*), and mule deer (*Odocoileus hemionus*) are dependent on the acorns from the oaks in fall and early winter. Breeding bird species in Coastal oak woodlands include species such as northern flicker *(Colaptes auratus*), California scrub-jay (*Aphelocoma californica*), Bewick's wren (*Thryomanes bewickii*), oak titmouse (*Baeolophus inornatus*), ash-throated flycatcher (*Myiarchus cinerascens)* and spotted towhee (*Pipilo maculatus*).

Fresh Emergent Wetland

Structure. Fresh Emergent Wetlands are characterized by erect, rooted herbaceous hydrophytes. Emergent wetlands are flooded frequently enough so that the roots of the vegetation prosper in an anaerobic environment. The vegetation may vary in size from small clumps to vast areas covering several kilometers. Fresh emergent wetlands are important in that they provide ecosystem functions such as removing contaminants in surface water, recharging of groundwater supplies, reducing flood risks, and providing fish and wildlife habitat, including habitat for endangered species. The acreage of Fresh Emergent Wetlands in California has decreased dramatically since the turn of the century due to drainage and conversion to other uses, primarily agriculture and urban development.

Composition. Fresh emergent marsh occurs along the edges of the on-site pond where soils are saturated or periodically flooded and support wetland species such as broadleaf cattail (*Typha latifolia*), tule bulrush (*Schoenoplectus acutus*), short-beak arrowhead (*Sagittaria brevirostra*), and tall flatsedge (*Cyperus eragrotis*).

Wildlife Considerations. Fresh emergent wetlands are among the most productive wildlife habitats in California. They provide food, cover, and water for more than 160 species of birds and numerous mammals, reptiles, and amphibians. Freshwater wetlands are important as breeding sites for many species of amphibian such as the common Pacific chorus frog (*Pseudacris regilla)* and the federally listed threatened California red-legged frog (*Rana draytonii*). Many species rely on Fresh Emergent Wetlands for their entire life cycle.

Wet Meadow

Structure. Wet Meadows at all elevations generally have a simple structure consisting of a layer of herbaceous plants. Shrub or tree layers are usually absent or very sparse; they may, however, be an important feature of the meadow edge. Within the herbaceous plant community, a microstructure is frequently present. Some species reach heights of only a few centimeters while others may grow a meter or more tall.

Composition. The Wet Meadow on the Project Site consists of herbaceous plants such as common spikerush (*Eleocharis palustris*), slender rush (*Juncus tenuis*), meadow barley (*Hordeum brachyantherum*), perennial ryegrass (*Festuca perennis*), pennyroyal (*Mentha pulegium*), rabbitsfoot grass (*Polypogon monspeliensis*), curly dock (*Rumex crispus*), bristly ox-tongue (*Helminthotheca echioides*), and spiny buttercup (*Ranunculus muricatus*), among others.

Wildlife Considerations. In late summer, small mammals may visit Wet Meadows that have dried. However, the meadows are generally too wet to provide suitable habitat for small mammals. Mule deer feed in Wet Meadows, seeking especially forbs and palatable grasses. Common Wet Meadow

species in Sonoma County include species such as mallards (*Anas platyrhynchos),* that frequent streams flowing through Wet Meadows, and red-winged blackbirds (*Agelaius phoeniceus*) that may occasionally nest in Wet Meadows with tall vegetation. Other species include amphibians such as Pacific chorus frog and western toad (*Anaxyrus boreas*), and reptiles such as common garter snake.

Riverine

Structure. Intermittent or continually running water distinguishes rivers and streams. A stream originates at some elevated source, such as a spring or lake, and flows downward at a rate relative to slope or gradient and the volume of surface runoff or discharge. Velocity generally declines at progressively lower altitudes, and the volume of water increases until the enlarged stream finally becomes sluggish. Over this transition from a rapid, surging stream to a slow, sluggish river, water temperature and turbidity will tend to increase, dissolved oxygen will decrease, and the bottom will change from rocky to muddy. Riverine systems are often lacking in vegetation.

Wildlife Considerations. Depending on the amount of water in a riverine system the stream provides suitable habitat for a variety of insects and amphibian species, and provides a source of water for reptiles, amphibians, and mammals, and foraging habitat for birds adapted to aquatic habitat such as herons and egrets. In areas of open water, insectivorous birds such swallows and some flycatchers will hawk for prey during the spring and summer.

Urban

Structure. The structure of urban vegetation varies, with five types of vegetative structure defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. Tree groves, common in city parks, green belts, and cemeteries, vary in height, tree spacing, crown shape, and understory conditions, depending upon the species planted and the planting design. The juxtaposition of urban vegetation types within cities produces a rich mosaic with considerable edge areas. The overall mosaic may be more valuable as wildlife habitat than the individual units in that mosaic.

Composition. The Urban habitat on the Project Site consists primarily of non-native grasses and species planted for purposes of landscaping. Non-native, weedy species that are present in these areas of the Project Site include scarlet pimpernel (*Anagalus arvensis*), bull thistle (*Cirsium vulgare*), prickly lettuce (*Lactuca serriola*), dandelion (*Taraxicum officinale*), cut-leaf geranium (*Geranium dissectum*), Kentucky bluegrass (*Poa pratensis*), English plantain (*Plantago lanceolata*), and many others.

Wildlife Considerations. Species richness and diversity is generally lower in urban areas than in native habitats with a high percentage of bird species consisting of non-native introduced species such as rock pigeon (*Columba livia*), Eurasian collared-dove (*Streptopelia decaocto*), house sparrow (*Passer domesticus*), and European starling (*Sturnus vulgarus*). Nevertheless, many bird species have adapted to urban environments in Sonoma County, including species such as mourning dove (*Zenaida macroura*), Anna's hummingbird(*Calypte anna),* Northern mockingbird (*Mimus polyglottos),* chestnut-backed chickadee (*Poecile rufescens),* white-crowned sparrow (*Zonotrichia leucophrys*), house finch (*Haemorhous mexicanus*), California towhee (*Melozone crissalis*), and Brewer's blackbird (*Euphagus cyanocephalus*). Animals generally present in urban residential areas include raccoon (*Procyon lotor*),

Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), Norway rat (*Rattus norvegicus*), and house mouse (*Mus musculus*). Other species such as Pacific chorus frog, California slender salamander (*Batrachoseps attenuatus*), western fence lizard, or common garter snake can be common.

Valley Foothill Riparian

Structure. Mature riparian ecosystems include canopy trees with a canopy cover of 20 to 80 percent, a subcanopy tree layer and an understory shrub layer. Generally, the understory is impenetrable and includes fallen limbs and other debris.

Composition. Dominant species in the canopy layer of the on-site riparian habitat include arroyo willow (*Salix lasiolepis*) and Fremont's cottonwood (*Populus fremontii*). The understory shrub layer consists of mostly California blackberry and includes other species such as common bedstraw (*Gallium aparine*), whitetop (*Lepidium draba*), and other grasses and herbaceous plants found in other onsite habitats.

Wildlife Considerations. Valley-foothill riparian habitats provide food, water, migration and dispersal corridors, and escape, nesting, and thermal cover for an abundance of wildlife. Riparian habitats generally provide shelter and cover for a variety of amphibians, reptiles, birds, and mammals. Riparian corridors provide significant wildlife habitat that includes a seasonal water source, serve as movement/migration corridors, and provide foraging and breeding habitat for a variety of aquatic and terrestrial wildlife species. Canopy riparian trees and other vegetation provide nesting substrates for a number of bird species as well as foraging areas for both migratory and resident species. Many bird species prefer riparian systems for nesting including western flycatcher (*Empidonax difficilus*), warbling vireo (*Vireo gilvus*), Swainson's thrush (*Catharus ustulatus*), Wilson's (*Cardellina pusilla*), and yellow (*Setophaga petechia*) warblers, and black-headed grosbeak (*Pheucticus melanocephalus*). Well-developed riparian canopies also provide significant habitat in support of neotropical migrant land birds during spring and fall migration. The canopy vegetation provides shading and inputs of leaves and woody material to stream channels that provides suitable conditions for many aquatic organisms, including fish, that in Sonoma County can include species of anadromous salmonids. As with many riparian systems, San Antonio Creek at this location provides a movement corridor for wildlife found in the project area.

Valley Oak Woodland

Structure. This habitat occurs in a wide range of physiographic settings but is best developed on deep, well-drained alluvial soils, usually in valley bottoms. Valley oak woodland varies from savanna-like to forest-like stands with partially closed canopies, comprised mostly of winter-deciduous, broad-leaved species. Denser stands typically grow in valley soils along natural drainages. Tree density decreases with the transition from lowlands to the less fertile soils of drier uplands. The shrub layer is best developed along natural drainages, becoming insignificant in the uplands with more open stands of oaks. Valley oak (*Quercus lobata*) stands with little or no grazing tend to develop a partial shrub layer with ground cover consisting of a well-developed carpet of annual grasses and forbs.

Composition. The Valley oak woodland on the Project site is dominated almost exclusively by valley oaks. The shrub understory consists of California blackberry and many of the plants found in the understory of the Coastal oak woodlands.

Wildlife Considerations. Valley oak woodlands provide food and cover for many species of wildlife. Oaks have long been considered important to some birds and mammals as a food resource (i.e., acorns and browse). Bird species that depend on the oak woodland include California quail, oak titmouse, white-breasted nuthatch (*Sitta carolinensis*), California scrub jay, spotted towhee, Bewick's wren, bushtit (*Psaltriparus minimus*), and acorn woodpecker (*Melanerpes formicivorus).* Mammals using Valley oak woodlands include species such as gray fox (*Urocyon cinereoargenteus*), western gray squirrels and mule deer.

4.1.6 Animal Populations

The habitats on site and in the surrounding area support many wildlife species, mostly those typically found in grassland and forested habitats in this part of Sonoma County. Trees and other vegetation on the property provide nesting and roosting sites for birds, and cover and foraging habitat for species of birds, mammals, reptiles, and amphibians. Many of the trees in the southwest portion of the site and east and west boundaries of the site are old enough to have significant cavities that could support cavity nesting birds or could serve as either winter or maternity roosts for various species of bat. The pond and upper portion of the unnamed tributary in the Project Site provides wildlife habitat that includes a water source that serves as a movement/migration corridor and foraging and breeding habitat for a variety of aquatic and terrestrial wildlife species. The grasslands and tributary serve as a corridor for movement of wildlife across much of the property.

One American bullfrog (*Rana* [*Lithobates*] *catesbeiana*) was heard on September 21, 2023. Other amphibians are undoubtedly present, particularly in wooded portions of the site, and would be expected to include species such as Pacific chorus frog, California slender salamander, arboreal salamander (*Aneides lugubris*), and western toad., among others. Despite the presence of the predatory American bullfrog, the pond within the Project Site is also suitable habitat for the California red-legged frog (*Rana draytonii*).

Several western pond turtles (*Emys marmorata*) were seen basking on a log in the middle of the pond on August 25 and September 21, 2023 and a western fence lizard was observed on a rock outcrop near the northeastern boundary of the Project Site on September 21, 2023. Other reptiles, although not

observed, but likely present, include southern alligator lizard (*Elgaria multicarinatus*), ringneck snake (*Diadophus punctatus*), Pacific gopher snake (*Pituophis catenifer),* and common garter snake.

Dens of Botta's pocket gopher were observed in the non-native grasslands on August 25 and September 21, 2023. Mule deer, coyote, and raccoon scat were also observed during these field surveys. Other expected mammals include Virginia opossum, deer mouse (*Peromyscus maniculatus*), California vole, black-tailed jackrabbit, striped skunk, and California ground squirrel. Larger mammals such as gray fox would also likely be present.

Avian species observed during visits by HBG in the Project Site on August 25 and September 21, 2023 included mallard ducks, wild turkey, red-tailed hawk, turkey vulture , northern flicker, Nuttall's woodpecker (*Dryobates muttallii*), and American crow (*Corvus brachyrhynchos*).

Common to abundant year-round resident bird species likely to occur in open areas and disturbed grasslands of the site would include species such as mourning dove, rock pigeon, killdeer (*Charadrius vociferous),* Anna's hummingbird, European starling, northern mockingbird, black phoebe (*Sayornis nigricans),* savannah sparrow, California towhee*,* western meadowlark, house finch, and house sparrow. Wintering species could include ruby-crowned kinglet (*Regulus calendula*), golden-crowned sparrow (*Zonotrichia atricapilla*), and yellow-rumped warbler (*Setophaga coronata*). During the spring and summer, barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota),* northern rough-winged swallow (*Stelgidopteryx serripennis*), tree swallow (*Tachycineta bicolor*) and violet-green swallow (*Tachycineta thalassina*) would be expected to be hawking for insects over the grasslands and pond.

The riparian corridor and scattered oaks would support common resident species such as California quail, great horned owl (*Bubo virginianus*), acorn woodpecker, California scrub-jay, western bluebird (*Sialia mexicanus*), American robin (*Turdus migratorius*), oak titmouse, chestnut-backed chickadee, white-breasted nuthatch, Bewick's wren, spotted towhee, California towhee, song sparrow (*Melospiza melodia),* purple finch (*Haemorhous purpureus*), and lesser goldfinch (*Spinus psaltria*). Neotropical migrants found during the breeding season in the riparian corridor and oaks would be expected to include species such as ash-throated flycatcher, western flycatcher, western kingbird (*Tyrannus verticalis*), warbling vireo, and Bullock's oriole (*Icterus bullockii).*

All of the species of birds mentioned above are common to abundant species in the region that are expected in the woodland and grassland habitats found at the site and, with a few exceptions, are birds that could nest somewhere on the site or nearby.

4.1.7 Wetlands

An area totaling 1.81 acres of aquatic resources was identified and delineated by HBG during field surveys conducted on September 21, 2023 (Appendix 3). More specifically, as defined by the USFWS classification system (Cowardin et al 1979), the aquatic resources consisted of Riverine Intermittent ("ephemeral") (0.12 acre), Palustrine Emergent (0.35 acre), and Palustrine Unconsolidated Bottom (1.34 acres) (Appendix 1, Figure 9). The latter Palustrine excavated pond aquatic resource was established by excavation and impoundment adjacent to an existing stream habitat. Based on review of Google Earth Pro aerial imagery this occurred between June 15, 1952 and May 1, 1965.

Mazor, R.D., et al. (2021) define ephemeral, intermittent, and perennial flows[1] as follows:

> Ephemeral streams are channels that flow only in direct response to precipitation. Water typically flows at the surface only during and/or shortly after large precipitation events, the streambed is always above the water table, and stormwater runoff is the primary water source.
>
> Intermittent reaches are channels that contain sustained flowing surface water for only part of the year, typically during the wet season, where the streambed may be below the water table and/or where the snowmelt from surrounding uplands provides sustained flow. The flow may vary greatly with stormwater runoff.
>
> Perennial reaches are channels that contain flowing surface water continuously during a year of normal rainfall, often with the streambed located below the water table for most of the year. Groundwater typically supplies the baseflow for perennial reaches, but the baseflow may also be supplemented by stormwater runoff and/or snowmelt.

None of the 1.81 acres of aquatic resources meet the definition of WOTUS (33 CFR § 328.3 (a)) and therefore are potentially not subject to Corps and USEPA jurisdiction under Section 404 of the CWA (Table 2). All 1.81 acres of aquatic resources (wetlands) meet the Water Board's definition of wetlands and are subject to jurisdiction as WOTS under the Porter-Cologne Water Quality Control Act (Table 3). The above-described aquatic resources would be considered as a stream (Riverine Intermittent ("ephemeral"), wetland (Palustrine Emergent), and pond (Palustrine Unconsolidated Bottom) under the CDFW's LSAA Program and subject regulation to Fish and Game Code Section 1602 (Table 3).

Table 2. Summary of the Types of Aquatic Resource Habitats Identified Within the Review Area and Analysis for Why They are Potentially Subject to CWA Section 404 Jurisdiction, Size, and Cowardin Classification 4485 D Street Project, Sonoma County, California

Aquatic Resource ID #	Aquatic Habitat Type	WOTUS Definition Met?	Description of Relevant 33 CFR 328.3 WOTUS Definition and Analysis	Size		Cowardin Classification[1]
				Acres	Linear Ft	
P1	Wetland (pond)	No	P1 – is not an (a)(4) Wetlands adjacent to the following waters: (i) Waters identified in paragraph (a)(1) of this section; or (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters; [i.e., Jurisdictional Adjacent Wetlands] **Analysis**: P1 is not adjacent to an (a)(1), (a)(2), or (a)(3) water.	1.34	n/a	Palustrine Unconsolidated Bottom
W1	Wetland	No	W1 – is not an (a)(4) Wetlands adjacent to the following waters: (i) Waters identified in paragraph (a)(1) of this section; or (ii) Relatively permanent, standing or continuously flowing bodies of water identified in	0.35	n/a	Palustrine Emergent

[1] National Hydrography Dataset (NHD) stream permanence classifications (SPC; perennial, intermittent, and ephemeral) are widely used for data visualization and applied science and have implications for resource policy and management. NHD SPC were assigned using a combination of topographic field surveys and interviews with local residents. However, previous studies indicate that non-NHD, in situ streamflow observations (NNO) frequently disagree with NHD SPC (Konrad Hafen, et. al., 2020).

Table 2. Summary of the Types of Aquatic Resource Habitats Identified Within the Review Area and Analysis for Why They are Potentially Subject to CWA Section 404 Jurisdiction, Size, and Cowardin Classification 4485 D Street Project, Sonoma County, California						
Aquatic Resource ID #	**Aquatic Habitat Type**	**WOTUS Definition Met?**	**Description of Relevant 33 CFR 328.3 WOTUS Definition and Analysis**	**Size**		**Cowardin Classification[1]**
				Acres	**Linear Ft**	
			paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters; [i.e., Jurisdictional Adjacent Wetlands] **Analysis**: W1 is not adjacent to an (a)(1), (a)(2), or (a)(3) water.			
R1, R2, R3, and R4	Tributary	No	R1, R2, R3, and R4 are ephemeral drainages/streams that do not meet the WOTUS definition of Jurisdictional Tributaries which are defined by 33 CFR 328.3 as *(a)(3) jurisdictional Tributaries of waters identified in paragraph (a)(1) or (a)(2) of this section that are relatively permanent, standing or continuously flowing bodies of water; [i.e., Jurisdictional Tributaries].* **Analysis**: R1, R2, R3 and R4 are not relatively permanent, standing or continuously flowing bodies of water. These tributaries have ephemeral flows resulting from stormwater flow generating precipitation events.	0.12	2,533.55	Riverine Intermittent "Ephemeral"
[1] Cowardin et al. 1979.						

Table 3. Summary of the Types of Aquatic Resources Identified Within the Review Area that are Potentially Subject to Water Board and CDFW Jurisdiction, 4485 D Street Project, Sonoma County, California					
Aquatic Resource ID #	Aquatic Resource Type		Size		Cowardin Classification[1]
	Water Board WOTS	CDFW	Acres	Linear Feet	
P1[2]	Wetland	Lake (Pond)	1.34	n/a	Palustrine Unconsolidated Bottom
W1	Wetland	Wetland	0.35	n/a	Palustrine Emergent
R1	Wetland	Streambed	0.104	1808	Riverine Ephemeral Streambed
R2	Wetland	Streambed	0.005	202	Riverine Ephemeral Streambed
R3	Wetland	Streambed	0.002	140	Riverine Ephemeral Streambed
R4	Wetland	Streambed	0.007	307	Riverine Ephemeral Streambed
[1] Cowardin et al. 1979. [2] P = Pond; R = Riverine drainage; W = Wetland. [3] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically, 3 months).					

4.2 Evaluation of Special-Status Species Identified

Based on species occurrence information from the literature review and field observations, and USFWS IPaC database review, a list of special-status and CNDDB-tracked plant and animal species considered to have the potential of occurring within the Project was generated and is summarized in Tables 2 and

3[2] of Appendix 3. Each species considered potentially occurring at the Project or in the vicinity was then evaluated based on the occurrence criteria provided in Section 3.4, above.

Based on a CNDDB search there are no special-status species documented within the Project Site boundaries, however 34 special-status species of plants, 38 special status animals, and 3 sensitive natural communities are known to occur within the vicinity of the Project Site. Appendix 3, Tables 2 and 3 provide lists of the plant and animal species and sensitive natural communities identified. Tables 2 and 3 also provide listing status, general and micro habitat descriptions, an evaluation of the species potential for occurring within the Project Site based on the criteria listed in Section 3.4, above, and recommended action if the proposed project is approved.

4.2.1 Special Status Plants

Based on the database search, literature review and habitat types found in the Project, five special-status plant species were identified as having a moderate to high potential to occur within the Project Site (Appendix 3, Table 2). These five species are: the presumed extinct Petaluma popcornflower (*Plagiobothrys mollis var. vestitus*)(CRPR 1A); Congested-headed hayfield tarplant (*Hemizonia congesta ssp. Congesta*)(CRPR 1B.2), Two-fork clover (*Trifolium amoenum*)(Federally listed endangered and CRPR 1B.1), Sanford's arrowhead (*Sagittaria sanfordii*)(CRPR 1B.2); and North Coast semaphore grass (*Pleuropogon hooverianus*)(State CESA listed threatened and CRPR 1B.2). All other plant species identified in the database search were determined to be absent due to the absence of potential habitat documented by the CNDDB database.

Focused rare plant surveys conducted by HBG on August 25 and September 21, 2023 found no special-status plants. It should be noted that the project as proposed avoids habitat (ponds, wetlands, and moist soil/wet meadow areas) where Petaluma popcornflower, Two-fork clover, Sanford's arrowhead, and North Coast semaphore grass would typically be found. Congested-headed hayfield tarplant typically occurs in grasslands and disturbed areas including roadsides. Similarly, Two-fork clover can be found in disturbed areas. Given the late season survey and approximately half of the Project Site's grassland and roadway areas had been burned over during the site survey a flowering period is recommended herein.

4.2.2 Special Status Animals

INVERTEBRATES

One special status insect was identified as potentially occurring at the Project Site.

Western bumble bee (*Bombus occidentalis*):
Range. This species has undergone severe declines in area of occupancy, number of occurrences, and relative abundance since the mid-20th century; previously, it was one of the most abundant bumble bees in the western United States and Canada.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.916920/Bombus_occidentalis

[2]It should be noted that the USFWS IPaC also included the California Least Tern (*Sterna antillarum browni*), Northern Spotted Owl (*Strix occidentalis caurina*), Green Sea Turtle (*Chelonia mydas*), and Tidewater Goby (*Eucyclogobius newberryi*). It was determined the Project Site lacks suitable habitat for these species and there is no potential for occurrence.

Listing Status. CESA Candidate Endangered.

Habitat. Found in a range of habitats, including mixed woodlands, farmlands, urban areas, montane meadows and into the western edge of the prairie grasslands (COSEWIC 2014b). Food plants include: *Ceanothus*, *Centaurea*, *Chrysothamnus*, *Cirsium*, *Geranium*, *Grindellia*, *Lupinus*, *Melilotus*, *Monardella*, *Rubus*, *Solidago*, and *Trifolium* (Williams et al. 2014b).

Threats. Ongoing threats to the species, particularly within the southern portions of its range, include pathogen spillover from commercially managed bumble bee colonies, increasingly intensive agricultural and livestock grazing and other land use practices, pesticide use, including neonicitinoid compounds), and habitat change.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.916920/Bombus_occidentalis

Project Site Occurrence. Not observed to be present. The Project Site has Moderate Potential for the Project Site to be used for episodic foraging as several nectar producing plant species are present which are known to be used by the western bumble bee. These include Geranium (*Geranium dissectum*), Bristly ox-tongue (*Helminthotheca echioides*), and Trifolium (*Trifolium hirtum).*

MOLLUSKS
No special-status mollusk species was identified as potentially occurring on the Project site.

FISH
No special-status Fish species was identified as potentially occurring on the Project site.

AMPHIBIANS
One special-status amphibian species was identified as potentially occurring on the Project site.

California red-legged frog (*Rana draytonii*):
Range. Native historical range extended from southern Mendocino County in northwestern California south (primarily west of the Cascade-Sierra crest) to northwestern Baja California (Shaffer et al. 2004).
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.105364/Rana_draytonii

Special-Status Listing. Federally listed as threatened, CDFW Species of Special Concern (CDFW 2024).

Habitat. California red-legged frogs (CRLF) have been observed in aquatic and terrestrial habitats, including marshes, streams, lakes, reservoirs, ponds and other permanent, or near permanent, sources of water. Although they occur in ephemeral streams or ponds, CRLF are expected to thrive in permanent deep-water pools with dense stands of overhanging willows and emergent vegetation, and suitable sites for basking. However, they have been observed in a variety of aquatic environments, including stock ponds and artificial pools with little to no vegetation. California red-legged frogs usually are observed near water, but can move long distances over land between water sources during the rainy season.

The life cycle and patterns of movement of the CRLF have evolved along with the local California climate of wet, cool winters and dry, warm summers. With the onset of the winter rains, CRLF move from dry-season refuges to ponds and streams that can support breeding and successful tadpole

development. Tadpoles generally take until late summer or early fall to complete metamorphosis, and then the maturing young frogs (metamorphs) move to aquatic areas to take cover from predators. Adult frogs often remain year-round at perennial ponds with deep water, but some depart for dry season refuges once breeding is over. Juveniles (frogs that are older than metamorphs but not yet sexually mature) disperse widely over the landscape during the first winter and will take residence in almost any water source. During the dry months of summer and fall, CRLF seek suitable dry season refuge sites that may include deep water holes in drying streams, springs and spring boxes, seeps, and small mammal burrows (especially in or near vegetation). However, CRLF need to hydrate at least every couple of days in order to survive. Thus, such small mammal refuge sites must be close to a permanent water source for frogs to rehydrate. To find these refuges, frogs will travel several hundred yards where suitable refuges are abundant and up to three miles in moist coastal areas. Often, long distance movements are in a relatively straight line over hills and drainages between the beginning and end points.

Threats. Factors contributing to local declines include wetland destruction and degradation or fragmentation, urbanization, residential development, reservoir construction, stream channelization, livestock grazing of riparian vegetation, off-road vehicle activity, drought, overharvesting, and exotic fishes (bass, mosquitofish) and possibly bullfrogs. Conversion of habitat to more permanent ponds is an important threat (as this allows breeding waters to be invaded by non-native predators). Habitat characteristics and good leaping ability may render these frogs vulnerable to bullfrog predation, although in many areas red-legged frogs coexist with bullfrogs.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.105364/Rana_draytonii

Project Site Occurrence. Habitats on the Project Site include shrubby and emergent riparian and pond vegetation, so suitable habitat for CRLF is present. The closest documented CRLF occurrence in the CNDDB is less than 350 feet from the Project Site and in the same watershed. This record consisted of two adult CRLF and 27 young frogs found in a series of seven ponds located at the nearby Neely Ranch in 2016. Although CRLF were not observed by HBG during the August 8 and September 21, 2023 wildlife surveys at the site, a breeding population has occurred in close proximity to the Project Site, and suitable habitat occurs at the site in terms of both breeding habitat within the on-site pond and upland dispersal and possibly aestivation habitat within the onsite grasslands. There is a Moderate to High potential that CRLF could occur on the Project Site.

REPTILES
One special-status reptile species was identified as potentially occurring on the Project site.

Western pond turtle (*Emys marmorata*):
Range. Range extends from Washington or British Columbia to central California.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.103571/Actinemys_marmorata

Special-Status Listing. CDFW Species of Special Concern (CDFW 2024). **Note**. that CNDDB uses the species scientific name *Emys marmorata* is synonymous with *Actinemys marmorata.*

Habitat. Western pond turtles occupy ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. The turtles prefer aquatic habitats with calm waters, vegetated banks and

emergent logs or rocks to use as basking sites. The turtles also rely on suitable upland areas of scrub and woodlands for aestival refugia and may use upland habitats up to 0.5 km from water for activities such as egg-laying. Pond turtles living in streams may vacate flood-prone areas during the rainy season. Western pond turtles occur broadly in suitable habitats throughout the state of California.

Threats. Distribution and abundance have declined as a result commercial exploitation for the pet trade, habitat loss and degradation, introduced species, and (locally) disease. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.103571/Actinemys_marmorata

Project Site Occurrence. Present. Three western pond turtles were observed basking on woody debris in the pond during both the August 25 and September 21, 2023 wildlife surveys.

BIRDS
Three special-status avian species were identified as potentially occurring at the Project site. These species are discussed below and include burrowing owl, white-tailed kite, and tricolored blackbird.

Note About Swainson's Hawk. The CNDDB contains a nesting record of the state listed threatened Swainson's hawk from the area around San Antonio Creek just south of the Project Site. This sighting of a nesting Swainson's hawk dates from 1856 and is from a general location determined to be somewhere south of Petaluma along San Antonio Creek. The information within the CNDDB correctly stipulates that this site is not within the known breeding range of Swainson's hawk. The nesting site is also undoubtedly extirpated, and this is acknowledged in the CNDDB. Although some records of Swainson's hawk are noted in the eBird database for Sonoma County, these are of birds on migration down the Pacific Flyway or could be among the few birds that winter in Northern California. There are no recent Sonoma County breeding records for this species that nests primarily in the Central Valley. There is virtually no potential that a nesting Swainson's hawk would provide a constraint to proposed development at the site.

Tricolored Blackbird *(Agelaius tricolor)*:
Range. Largely endemic to California. Most numerous in Central Valley and vicinity (CNDDB, 2023).

Special-Status Listing. CESA Threatened; CDFW Species of Special Concern (CDFW 2024).

Habitat. The tricolored blackbird is a highly colonial nesting species that breeds near freshwater, preferably in emergent wetlands with tall, dense growth of cattails or tules. Nesting sites require open water, protected nesting substrate, and foraging areas with insect prey within a few km of the colony. Even when the preferred nesting substrates are available, other vegetation may be used for nesting including sedges, nettles, willows, thistles, mustard, blackberry, wild rose, foxtail grass or barley. Since the 1970s with declines in populations, nesting in cereal crops and dairy silage has been documented. Tricolored blackbird foraging areas include rangeland, fields of alfalfa or cut hay, or irrigated pastures with an abundance of insects.

Threats. The species has undergone a long-term population decline, primarily due to losses and fragmentation of breeding and foraging habitats caused by urban and agricultural land conversions,

and water diversions (Tricolored Blackbird Working Group 2007).
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.101015/Agelaius_tricolor

Project Site Occurrence. Tricolored blackbird was observed to be present in cattail and tule stands along the pond margin during field reviews of the site on August 8 and September 21, 2023. Although this sighting was after the nesting season, it is possible that the species nested on the site during 2023 and could nest on the site in the future.

Burrowing Owl (*Athene cunicularia*)**:**
Range. Widespread distribution in North America.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.106553/Athene_cunicularia

Special-Status Listing. CDFW Species of Special Concern (CDFW 2024). CDFW adopted survey protocol and mitigation guidelines for burrowing owls as described in a March 7, 2012, Staff Report (CDFW 2012).

Habitat. Burrowing owls are small terrestrial owls commonly found in open grassland ranging from western Canada to portions of South America. Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Burrowing owls are a subterranean nester, and in California, burrowing owls most commonly use burrows of California ground squirrel, but they also may use man-made structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement. Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers during migration. While foraging, owls will perch on raised burrow mounds or other topographic relief such as rocks, tall plants, fence posts, and debris piles to attain better visibility. Occupancy of suitable burrowing owl habitat can be verified at a site by an observation of at least one burrowing owl, or, alternatively, presence of "decoration" at or near a burrow entrance which can include molted feathers, cast pellets, prey remains, eggshell fragments, or excrement.

Threats. Habitat alteration is causing population declines. The loss of grassland habitat and suitable burrows has been compounded by a reduction in prey populations, and concurrent increases in predation, vehicle collisions, expansion of renewable energy, and severe weather events.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.106553/Athene_cunicularia

Project Site Occurrence. Not observed to be present. Although the grasslands in Project Site are not highly disturbed and there is no evidence of ground squirrel burrows, there is a Moderate Potential for the site to be used for episodic foraging. Occupation of the site by burrowing owl and episodic foraging in the future cannot be ruled out, especially if future colonies of California ground squirrels locate to the Project Site.

White-tailed Kite (*Elanus hudsonius*):
Range. From southwestern Washington south to northwestern Baja California (mainly in Central Valley of California). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.105756/Elanus_leucurus

Special-Status Listing. CDFW Fully Protected Species (CDFW 2024).

Habitat. The white-tailed kite occurs in grasslands, agricultural fields, wetlands, oak woodland and oak savannah habitats in coastal foothills and valleys and throughout the Central Valley into the Sierra Foothills. They nest in a variety of trees and shrubs and prefer rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Winter foraging areas consist of open grasslands, meadows, or marshes close to isolated, dense-topped trees for nesting and perching. The main source of food consists of voles.

Threats. The species was extirpated throughout much of its range in the early 1900s due to habitat loss and hunting, but conservation efforts allowed a recovery by the 1980s. Habitat alteration / fragmentation of breeding and foraging habitats caused by urban and agricultural land conversions, and water diversions remain as threats.

Project Site Occurrence. Not observed to be present, however, trees on and adjacent to the Project Site are suitable for nesting and grasslands provide suitable foraging areas. There is a Moderate Potential for white-tailed kite to be found on the site.

Birds Protected by the MBTA and Fish and Game Code Kite

The Project Site and adjacent areas support potential nesting habitat for birds protected under the MBTA and California Fish and Game Code. These could include common species such as northern mockingbird (*Mimus polyglottos*) and house finch (*Haemorhous mexicanus*), special status species like tricolored blackbird, or raptors such as red-tailed hawk.

MAMMALS
Three special-status mammal species were identified as potentially occurring in the Project site.

Pallid Bat (*Antrozous pallidus*):
Range. Range includes western North America from south-central British Columbia (Okanagan Valley; small resident population) south through the western United States to southern Baja California, central Mexico, southern Kansas, and southern Texas; and also Cuba.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.106431/Antrozous_pallidus

Special-Status Listing. CDFW Species of Special Concern (CDFW 2024)

Habitat. Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites (CNDDB 2024).

Threats. On a range-wide basis, no major threats are known. Locally, some maternity colonies and hibernacula are susceptible to disturbance, and they may be negatively affected or destroyed as a result of vandalism, mine closures or reactivation, or other activities. Tree-roosting populations may be detrimentally affected by timber harvest and other forestry practices. Roosts in buildings may be lost as a result of demolition, bat exclusion, or other alterations. Some populations undoubtedly have been negatively affected by loss or extensive modification of primary foraging habitat caused by agricultural expansion (including orchards and vineyards), cheatgrass invasion, fire, urban development, excessive

livestock grazing, and pesticide use, but the degree of impact of these threats on the affected populations is not well known. As of mid-2012, this species was not known to be affected by white-nose syndrome
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.106431/Antrozous_pallidus.

Project Site Occurrence. Moderate Potential. Site subject to disturbance by various farm related activities.

Townsend's Big-Eared Bat (*Corynorhinus townsendii*):
Range. Range includes western North America from southern British Columbia south to the Isthmus of Tehuantepec (Mexico), west to the Pacific coast, eastward to the Black Hills of South Dakota and Edwards Plateau of Texas, with isolated populations in the gypsum caves of northeastern Texas, Oklahoma, and Kansas, and in limestone regions of Arkansas, Missouri, Illinois, Indiana, Ohio, Kentucky, Virginia, and West Virginia. Elevational range extends from near sea level to at least 3,300 meters in some
areas.https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.103228/Corynorhinus_townsendii

Special-Status Listing. CDFW Species of Special Concern (CDFW 2024)

Habitat. Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance (CNDDB 2024).

Threats. Threats are similar to those described above for the Pallid bat.

Project Site Occurrence. Moderate Potential for occurrence. Site subject to disturbance by various farm related activities.

American Badger (*Taxidea taxus*):
Range. Large range in the western and central U.S., southern Canada, and northern and central Mexico; relatively common over much of range.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.101705/Taxidea_taxus

Special-Status Listing. CDFW Species of Special Concern (CDFW 2024).

Habitat. The CNDDB indicates that suitable habitat for American badger includes the drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. American badgers need sufficient food, friable soils, and open uncultivated ground. American badgers dig their own burrows and prey on burrowing rodents. American badger can create a burrow over the course of a day and can, therefore, inhabit a site quickly.

Threats. American badger has declined substantially in areas converted from grassland to intensive agriculture and where colonial rodents such as ground squirrels have been reduced or eliminated. The species is also threatened by collisions with vehicles and by direct persecution.
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.101705/Taxidea_taxus

Project Site Occurrence. Not observed to be present, however, suitable habitat for American badger occurs on the Project Site. American badger has a Moderate Potential for occurrence.

4.2.3 Sensitive Natural Communities

Three sensitive natural communities occur within the 5-mile CNDDB database search radius. These include Coastal Brackish Marsh, Northern Coastal Salt Marsh, and Northern Vernal Pool communities. None of these community types was found to occur in the Project Site during HBG's field investigation on August 25, and September 21, 2033. However, the marsh (aka Palustrine emergent wetland; freshwater emergent marsh; wet meadow), riparian scrub woodland (aka Valley Foothill Riparian), and valley oak woodlands plant communities found within the Project Site are also considered CDFW Sensitive Natural Plant Communities. In addition, the pond, wetland, and stream / tributary communities found during these field investigations are considered important aquatic resources subject to regulation by the Water Board under both Section 401 of the CWA and the Porter-Cologne Act, and CDFW under Section 1602 of the California Fish and Game Code (Appendix 1, Figures 9, 10, and 11). No aquatic resources meeting the Corps' definition of Waters of the US were found to be present (Appendix 1, Figure 9). The pond, adjacent wetlands, and tributaries are connected during significant stormwater flow events to an unnamed tributary and San Antonio Creek which are nearby by the Project Site. Both the unnamed tributary and San Antonio Creek are designated as streams protected by the County of Sonoma's Riparian Corridor Ordinance.

4.2.4 Wildlife Movement/Corridors

Wildlife use and wildlife movements through the Project is expected. The pond, unnamed drainages, riparian scrub woodland and riparian community, in particular, provide a movement corridor for local wildlife (insect, amphibian, reptile, bird, and mammal species).

4.2.5 Critical Habitat

There is no ESA Critical Habitat designated within the Project Site.

5.0 PROJECT IMPACTS AND MITIGATION MEASURES

Review of project plans and biological information obtained during preparation of this Biological Resources report indicate that impacts to aquatic resources (pond, adjacent wetlands, and tributaries (streams) will be largely avoided except for temporary impacts resulting from the construction of a stream clear span crossing (< 0.2 acre) and permanent impacts to stream habitat (<0.0007 acre) resulting from construction of a 0.59-acre new pond and a farm road culvert crossing (Tributary Riverine habitats R1 and R4; see Appendix 1, Figure 16). Impacts to the riparian scrub woodland (a sensitive natural community) will be avoided. Impacts to the Valley Oak Woodland sensitive natural community found within the Project Site consists of four valley oak trees proposed for removal as part of planned roadway construction (Appendix 1, Figure 16). The remaining project impacts are primarily associated with ground disturbing impacts to non-native grasslands and urban areas (Table 4).

Table 4. Summary of Proposed Project Impacts

Existing Land Cover	Impacted	Unimpacted	Total
Coastal Oak Woodland	0.0	0.04	**0.04**
Developed: Urban areas adjacent to structures	1.83	1.58	**3.42**
Developed: Existing Structures	0.04	0.18	**0.21**
Non-Native Grassland	14.26	34.63	**48.89**
Landscaping	0.00	0.33	**0.33**
Road (In non-native grassland & developed urban)	0.69	1.30	**1.99**
Road Shoulder (In Non-native grassland & developed urban)	0.20	0.12	**0.32**
Water Tank	0.00	0.01	**0.01**
Upper Riverine Bank Margin	0.01	0.51	**0.52**
Valley Oak Woodland	0.07	0.00	**0.07**
Riparian Scrub Woodland	0.00	0.32	**0.32**
Total	**17.09**	**38.70**	**55.79**

An application has been submitted to the County for a Use Permit for 28 scheduled daytime agricultural promotional events ranging from 50-200 people. No more than 1 event will be scheduled per week. These events are designed to promote lavender agricultural farming and processing together with other products produced on the site. All event guests will be shuttled using the western access road to a constructed event center on the south end of the Project Site. Busses will be used to transport event guests. Assuming maximum attendance using two 50-person buses there would be two round trips per event.

Sections 5.1 and 5.2 below provide recommended measures to avoid, minimize, or compensate for potential impacts to biological resources that may result from the proposed Project construction and

post construction operations. The measures recommended may be revised based on the CEQA analysis and project authorization.

5.1 Preconstruction Impacts and Mitigation Recommendations

5.1.1 Special-Status Plants

The Project Site was found to have potential habitat for up to five special status plants: Petaluma popcornflower, Sanford's arrowhead, North Coast semaphore grass, Two-fork clover, and Congested-headed hayfield tarplant. The project as proposed would avoid moist grassland soils, marsh, and open water habitats associated with a pond found on the Project Site. This area provides potential habitat for Petaluma popcornflower, Sanford's arrowhead, North Coast semaphore grass, and Two-fork clover. Although considered marginal habitat due to the dense growth of non-native grasses, proposed road construction has the potential to impact Congested-headed hayfield tarplant and Two-fork clover, if present. These plants were not found during focused plant surveys conducted during the late season portion of their flowering period.

> **Mitigation Measure #1, Preconstruction Rare Plant Survey:** Although considered unlikely to be found, a focused spring survey (April-May) by a Qualified Biologist for Congested-headed hayfield tarplant and Two-fork clover is recommended given the presence of potential habitat. It should also be noted that approximately half of the Project Site had been burned when previous plant surveys were conducted. If either of these plants are found, an adjustment(s) to the alignment of new roadways and/or lands to be cultivated would be warranted to avoid populations of either species. If populations cannot be avoided then transplantation is recommended as a mitigation strategy to avoid impact to either of these plant species. If any special-status plant species are observed, the applicant will coordinate with the County, CDFW and USFWS, as appropriate, to prepare a plant salvage and mitigation plan on-site. No work will be conducted until the County, CDFW and USFWS provide written approval of the plan.

5.1.2 Special Status Insects

Several nectar producing plant species known to be used by the Western bumble bee for episodic foraging occur on the Project Site. Removal of plant species used by Western bumble bee could impact the species, if found to be present, by eliminating nectar sites.

> **Mitigation Measure #2: Preconstruction Western Bumble Bee Survey.** A preconstruction clearance survey shall be conducted for the Western bumble bee by a qualified biologist within 48 hours of the start of ground disturbing activities, including mowing. A qualified biologist shall also be present during vegetation mowing and/or removal activities associated with construction. If Western bumble bee is observed, the bee or bees shall be allowed to disperse out of the construction area prior to continuing construction.

5.1.3 Special-Status Amphibians

Suitable aquatic and upland habitat for one special-status amphibian species, the California red-legged frog, is present within the Project Site. Suitable habitat includes a potentially suitable breeding site in the onsite pond, dispersal sites in the drainages, and upland dispersal and possibly aestivation sites in

the onsite grasslands. The project proposes to avoid the existing pond and drainage area except for temporary impacts needed to construct a bridge that will clear span over the drainage. No permanent impacts would occur to the stream channel and banks. However, any ground disturbance conducted at the site during construction activities has the potential to encounter and possibly harm a California red-legged frog.

Mitigation Measure #3, California red-legged Frog: The following measures are recommended to minimize potential impacts to California red-legged frog:

1. A Qualified Biologist with experience in the identification of all life stages of the California red-legged frog, and its critical habitat, will survey the Project Site no more than 48 hours before the onset of work activities. If any life stage of the California red-legged frog is detected, the Project Developer shall notify the USFWS and the CDFW prior to the start of construction. If the USFWS or CDFW determines that adverse effects to the California red-legged frog cannot be avoided, the proposed project will not commence until the appropriate level of consultation with these agencies occurs.

2. The Project Developer will conduct work activities between May 1 and October 31 to avoid the breeding season of the California red-legged frog, when activities would be most disruptive to the species.

3. Before work begins on any proposed project, a Qualified Biologist will conduct a training session for all construction personnel, which will include a description of the California red-legged frog, its critical habitat, and specific measures that are being implemented to avoid adverse effects to the species and critical habitat during the proposed project.

4. A Qualified Biologist monitor will be present during all authorized construction activities involving ground disturbance. If the Qualified Biologist detects any life stage of the California red-legged frog on the Project Site during construction, work will cease immediately and the Project Developer or Qualified Biologist will notify the USFWS and CDFW via telephone and electronic mail. If the USFWS or CDFW determines that adverse effects to California red-legged frogs cannot be avoided, construction activities will remain suspended until these agencies complete the appropriate level of consultation.

5. During project activities, the Project Developer will ensure that all trash that may attract predators will be properly contained and removed from the work site and disposing of regularly. Following construction, the Project Developer will ensure that all trash and construction debris is removed from work areas.

6. Prior to the onset of work, the Project Developer will have a plan in place for prompt and effective response to any accidental spills. The plan will include informing all

workers of the importance of preventing spills and of the appropriate measures to implement should a spill occur.

7. The Project Developer will ensure that all refueling, maintenance, and staging of equipment and vehicles be conducted at least 60 feet from aquatic or riparian habitat and not in a location from where a spill would drain directly toward aquatic habitat. The Qualified Biologist will ensure contamination of aquatic or riparian habitat does not occur during such operations by implementing the spill response plan described in measure 6, above.

8. The Project Developer will ensure that all habitat contours are restored to their original configuration at the end of project activities in all areas that have been temporarily disturbed by activities associated with the project, unless it is determined that it is not feasible, or modification of original contours would benefit the California red-legged frog.

9. The Project Developer will ensure the project site is revegetated with an assemblage of native riparian, wetland, and upland vegetation suitable for the area. The Project Developer will ensure locally collected plant materials are used to the extent practicable. The applicant will control invasive, exotic plants to the maximum extent practicable.

10. The Project Developer will ensure that the number of access routes, size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goals.

11. The Project Developer will ensure that Environmentally Sensitive Areas are delineated to confine access routes and construction areas to the minimum area necessary to complete construction and minimize the impact to habitat for the California red-legged frog. This goal includes locating access routes and construction areas outside of aquatic habitat and riparian areas to the maximum extent practicable. To control sedimentation during and after project implementation, the Project Developer will ensure that best management practices are implemented as outlined by the County. If best management practices are ineffective, as determined by the Qualified Biologist, the Project Developer will attempt to remedy the situation immediately, in coordination with the County.

12. The Qualified monitor will inspect all holes and trenches each morning. If the USFWS-and CDFW approved biological monitor finds a California red-legged frog in a hole or trench, the procedures from measure 4 above will apply.

13. If a work site is to be temporarily dewatered by pumping, the applicant will screen the intake with wire mesh not larger than 0.2 inch to prevent any California red-legged frogs not initially detected from entering the pump system. If California red-legged frogs are detected during dewatering, the applicant will halt work activities

and will contact the USFWS and the CDFW to determine what measures may be necessary to avoid "take" of California red-legged frogs.

14. Upon completion of construction activities, the applicant will remove any diversions or barriers to flow in a manner that would allow flow to resume with the least disturbance to the substrate. The applicant will minimize alteration of the creek bed to the maximum extent possible and remove any imported material from the stream bed upon completion of the project.

15. Unless approved by the USFWS and CDFW, the applicant will not impound water in a manner that may attract California red-legged frogs.

16. A USFWS-and CDFW approved biologist will permanently remove any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes from the project area to the maximum extent possible. The Qualified Biologist will be responsible for ensuring that his or her activities are in compliance with the California Fish and Game Code requirements.

5.1.4 Special Status Reptiles

Western pond turtle (a special status species of reptile) is known to be present on the Project Site, as individuals were observed during field reviews conducted for this study. Suitable habitat on the site consists of an existing pond and adjacent foothill grasslands which provide potentially suitable nesting habitat. Grading/ground disturbance at the site could disrupt nesting sites and could harm an individual pond turtle if present during the construction period, if either was present during the construction period. The following measures are recommended to minimize potential impacts to the western pond turtle:

> **Mitigation Measure #4, Preconstruction Western Pond Turtle Survey**: A Qualified Biologist shall conduct a preconstruction survey for the western pond turtle and their nests within 48 hours of the commencement of Project activities. If western pond turtle or their nests are detected at any time, CDFW shall be notified immediately, and the Qualified Biologist shall relocate the turtle to appropriate habitat within the Project Site. Turtle nests shall be avoided. The Permittee shall prepare and implement a Western Pond Turtle Habitat Improvement Plan, if western pond turtle or their nests are found, if required and approved by CDFW.

5.1.5 Special-Status Birds and MBTA-Protected Birds

Nesting Birds. Habitats within the project site were shown to support a number of bird species during field surveys conducted by HBG. If active nests were present in vegetation or other areas of the site during construction operations on the project site, direct or indirect impacts could occur to nesting bird species protected by the Migratory Bird Treaty Act or the California Fish and Game Code as a result of construction activity. CDFW generally considers the nesting season to be from February 1 to August 31 for most bird species. Work related to construction, especially involving the removal of vegetation during the February 1 to August 31 breeding season of birds, could result in mortality of nesting avian species if they are present. Many species of raptors (birds of prey) are sensitive to human incursion and construction activities, and it is necessary to ensure that nesting raptor species are not

present in the vicinity of construction sites. To ensure compliance with the MBTA and the California Fish and Game Code, bird nesting surveys are generally required if construction work requires vegetation removal during the bird nesting season. Required setbacks to protect active nests from construction activity are usually in the order of about 500 feet for large raptors such as buteos, 250 feet for small raptors such as accipiters, and 100 feet for passerines (songbirds) and other bird species. The following measure is recommended to minimize potential impacts to nesting bird species protected by the MBTA and California Fish and Game Code.

> **Mitigation Measure #5, Preconstruction Nesting Bird Survey** A preconstruction nesting bird survey shall be conducted if construction occurs during the bird nesting season (February 1-August 31). The survey should be conducted within 5 days prior to the start of work. The survey should include the entire project footprint and areas immediately adjacent to the project work area. The survey should include the trees and shrubs on and immediately adjacent to the project work area. Other large trees in the project vicinity are on the opposite sides of major roads; birds nesting in these trees are unlikely to be impacted by the proposed project; however, a qualified biologist conducting surveys shall determine the appropriate survey area.
>
> If the survey indicates the potential presence of nesting birds, a buffer should be placed around the nest and marked with orange construction fencing within which no work will be allowed until the young have successfully fledged or the nest has otherwise become inactive. The size of the nest buffer will be determined by a qualified biologist and will be based to a large extent on the nesting species, its sensitivity to disturbance, and the context of the nest location. In general, typical buffer widths range from 500 feet for large raptors such as buteos, 250 feet for small raptors such as accipiters, and 100 feet for passerines (songbirds) and other bird species. Buffers may be increased or decreased, as appropriate, with approval from CDFW. No construction or earth-moving activity shall occur within the established buffer zone until it is determined by the biologist that the young have fledged or that the nesting cycle is otherwise determined to be complete based on monitoring of the active nest. A copy of the nesting bird survey report shall be provided to the County prior to construction.

Burrowing Owl. Grassland habitat is present at the site that could support burrowing owl, but burrowing owl is currently not present on the Project Site primarily due to the lack of suitable burrow sites in the form of California ground squirrel burrows. Future occupation by the species on the property cannot be ruled out, especially if the property were to be occupied by a greater number of California ground squirrels in the future. If the species was present at the time of construction, disturbances to either nesting or wintering burrowing owl are possible during grading or vegetation removal during construction. Preconstruction surveys for this species are warranted.

> **Mitigation Measure #6, Preconstruction Burrowing Owl Survey.** Prior to any ground disturbance, pre-construction surveys for burrowing owl shall be conducted within the project and a minimum of 150 meters from the project site to the extent properties are accessible. The preconstruction surveys shall be conducted within 2 weeks prior to the onset of any ground-disturbing activities. Surveys shall be conducted by a qualified Biologist following the CDFW staff report (CDFW 2012), including survey methods and Biologist qualifications, to establish the

status of burrowing owl on the project site. If no burrowing owls are detected during the pre-construction survey, no further action is necessary. If construction is delayed or suspended for more than 30 days after the survey, the area shall be resurveyed in accordance with previously described methods.

If burrowing owl is found to occupy the project site during the nonbreeding season (September 1 to January 31), occupied burrows shall be avoided by establishing a no-disturbance buffer zone marked by orange construction fencing a minimum of 100 feet around the burrow. Buffers may be increased to address site-specific conditions using the impact assessment approach described in the CDFW 2012 staff report. If a qualified Biologist determines that the location of an occupied burrow(s) may be impacted even with a 100-foot buffer, or the burrow(s) are in a location(s) on the project site where a buffer cannot be established without preventing the proposed project from moving forward, then a passive relocation effort may be instituted to relocate the individual(s) out of harm's way pursuant to a Burrowing Owl Exclusion Plan prepared in accordance with the CDFW 2012 staff report. The applicant will coordinate the Burrowing Owl Exclusion Plan with CDFW and provide habitat mitigation consistent with the 2012 CDFW Staff Report.

If burrowing owl is found to be present during the breeding season (February 1 to August 31), the proposed project ground-disturbing activities shall follow the CDFW 2012 staff report recommended avoidance protocol whereby occupied burrows shall be avoided with a no-disturbance buffer of between 50 meters and 500 meters depending on time of year and disturbance level, as described in the 2012 CDFW staff report. This breeding season buffer zone shall remain until the young have fledged or an unsuccessful nesting attempt is documented.

Tricolored Blackbird. Suitable habitat for a tricolored nesting colony occurs on the site in the form of cattails and other wetland vegetation found along the edges of the onsite pond. Tricolored blackbirds were observed in this habitat by HBG biologists during both the August 8 and September 21, 2023 visits to the site. Because these visits were conducted late in the nesting season, it is unknown whether the birds nested on the site in 2023, but nesting in this part of the site is certainly possible. Prior to initiation of construction activities for the project, a preconstruction survey for a tricolored blackbird nesting colony is warranted.

Mitigation Measure #7, Tricolored Blackbird: A preconstruction survey should be conducted of suitable habitats within the development area and immediately adjacent areas to determine if nesting by tricolored blackbird occurs in close proximity to project construction. CDFW typically requires a buffer zone of no construction activity within 300 feet of an active tricolored blackbird nesting colony. If a tricolored blackbird nesting colony is found in the vicinity of project construction a setback distance from the nesting colony should be developed in consultation with CFDW staff and marked with orange construction fencing that would allow successful nesting (fledging of young birds). No construction or earthmoving activity shall occur within the established buffer zone until it is determined by a qualified biologist that the young

have fledged or that the nesting cycle is otherwise determined to complete based on monitoring of the active nesting colony.

White-tailed Kite. Valley oaks to be removed and other large trees in the vicinity of the Project Site are of suitable stature to serve as nesting trees for California Fully Protected white-tailed kite. Direct impacts to nests of white-tailed kite would be possible if white-tailed kites were nesting in trees to be removed and indirect impacts could result to a white-tailed kite nest if construction activities were to take place in close proximity to a nest of this species.

> **Mitigation Measure #8, White-tailed Kite:** If construction is proposed during the nesting season, a qualified biologist will conduct a bird nesting survey of the project site and adjacent areas pursuant to Mitigation Measure #5 that will include a search for raptor nests within the Project Site and areas adjacent to the Project Site. The preconstruction survey will be conducted within 5 days prior to ground disturbance and will include a search for nests of white-tailed kite. If an active white-tailed kite nest is detected during the survey, the nest site shall be protected by implementing a minimum 500-foot buffer zone around the nest marked with orange construction fencing. If an active nest is located outside of the Project Site, the buffer shall be extended onto the project site and demarcated with orange construction fencing where it intersects the Project Site. The qualified biologist, in consultation with CDFW, may modify the size of buffer zone based on the type of construction activity, physical barriers between the construction site and the active nest, behavioral factors, and the extent the white-tailed kite may have acclimated to disturbance. No construction or earthmoving activity shall occur within the established buffer zone until it is determined by a qualified biologist that the young have fledged or that the nesting cycle is otherwise determined to complete based on monitoring of the active nest.

5.1.6 Special-Status Mammals

There are three special-status mammals that could potentially occur within the Project Area. These include the Pallid bat, Townsend's big-eared bat, and American badger.

Pallid and Townsend's Big-eared Bats. The proposed project has the potential to affect special status and common roosting bat species during either the removal of trees or demolition of existing structures. Bats have the potential to roost in existing vacant or underutilized buildings, other man-made structures, and could be present within structures. Mature trees may show evidence of cavities and/or exfoliating bark that could serve as roost sites for populations of bats or could harbor solitary bats.

Significant impacts to bats prohibited under the Fish and Game Code could result from disruption of an occupied non-breeding bat roost or the loss of a maternity colony of bats. This may occur through direct disturbance from destruction of a roost site during removal or pruning of trees or an indirect disturbance causing behavioral alterations due to construction noise or vibration, or by increased human activity in the area. A bat habitat assessment conducted by a bat biologist prior to construction could determine if suitable habitat for bats is found in trees to be removed or trimmed and allow development of mitigation strategies to achieve humane removal of bat populations if present.

Mitigation Measure #9, Preconstruction Bat Measures. To reduce to impacts to special status bat or other protected species of bat, the following mitigation measures will be followed:

Structure Removal:

a. A qualified bat biologist shall conduct a habitat assessment and surveys for special status species of bats prior to any structure removal. The survey methodology shall include an initial habitat assessment and survey several months before project construction, to facilitate sufficient time to implement the exclusion plan described below, and the types of equipment used for detection.

b. A bat exclusion plan shall be submitted to CDFW for approval if bats are detected within structures during the above survey. The plan shall be implemented prior to project construction and allow bats to leave the structures unharmed. The plan shall: (1) recognize that both the maternity and winter roosting seasons are vulnerable times for bats and require exclusion outside of these times, generally between March 1 and April 15 or September 1 and October 15 when temperatures are sufficiently warm, and (2) identify suitable areas for excluded bats to disperse or require installation of appropriate dispersal habitat, such as artificial bat houses, prior to project construction, and include an associated management and monitoring plan with implementation funding.

Tree Removal. Prior to any tree removal, a qualified bat biologist shall conduct a habitat assessment for bats. The habitat assessment shall be conducted a minimum of 30 days prior to tree removal and shall include a visual inspection of potential roosting features (e.g., cavities, crevices in wood and bark, or exfoliating bark for colonial species, and suitable canopy for foliage-roosting species). Trees without suitable habitat for bats can be removed. If suitable habitat trees are found, they shall be flagged or otherwise clearly marked, CDFW shall be notified immediately, and tree trimming or removal shall not proceed without approval in writing from CDFW. Trees may be removed only if: a) presence of bats is presumed, or documented during the surveys described below, in trees with suitable bat habitat, and removal using the two-step removal process detailed below occurs only during seasonal periods of bat activity from approximately March 1 through April 15 and September 1 through October 15, or b) after a qualified bat biologist, under prior written approval of the proposed survey methods by CDFW, conducts night emergence surveys or complete visual examination of roost features that establish absence of roosting bats.

If a two-step removal is used, two-step tree removal shall be conducted over two consecutive days, as follows: 1) the first day (in the afternoon), under direct supervision and instruction by a qualified bat biologist with experience conducting a two-step methodology, tree removal limbs and branches shall be removed by a tree cutter using chainsaws only. Limbs with cavities, crevices or deep bark fissures shall be avoided, and 2) the second day the entire tree shall be removed. If construction occurs during the non-breeding period (typically from June through February).

American Badger. Although American badger has not been observed on the property during field reviews conducted by HBG, the grassland habitat found on the property may be suitable to support American badger, a California Species of Special Concern. If American badger were to occupy the area

proposed for construction, potential impacts to this species could occur. Preconstruction surveys for American badger are warranted to ensure that construction activities do not result in impacts to individuals of this species.

Mitigation Measure #10, Preconstruction American Badger Survey: The following measures shall be implemented to avoid or minimize direct and indirect impacts on American badger within or immediately adjacent to the proposed project:

a. No sooner than seven (7) days, prior to ground disturbance activities associated with initial project construction, a qualified biologist, familiar with badger life history and who possesses experience with identification of active badger burrows and badger activity patterns shall conduct a preconstruction survey to determine the locations of any active winter or natal American badger dens within 100 feet of proposed ground disturbance areas. Potential badger dens located during the surveys shall be evaluated (typically with remote cameras) to determine activity status.

b. Any natal dens determined to be used by American badger, as identified from the surveys, shall be avoided and a 100-foot buffer marked with orange construction fencing shall be established around the dens during ground disturbance activities until it is determined by the qualified biologist that the den is no longer active, and the young are no longer dependent upon the den for survival.

c. If construction occurs during the non-breeding period (typically from June through February) and an individual badger is determined to be using a non-natal den within 50-feet of the construction footprint construction shall be halted until the badger has left the den on its own accord, as determined by the biologist through monitoring of the den and/or the use of motion-detection cameras. Once it is determined that the den is vacant, the den can be excavated and upon confirmation that the den is not occupied, the den can be collapsed and construction can continue.

5.1.7 Sensitive Natural Communities

Although no CDFW designated natural communities occur within the Project Site, aquatic resources including wetlands, open water ponds, and tributary drainages were identified and delineated during field surveys. These aquatic areas are subject to the jurisdiction of the Water Board and CDFW (Appendix 1, Figures 10 and 11) (Section 6.0, Table 4). No aquatic resources meeting the Corps' definition of Waters of the US were found to be present (Appendix 1, Figure 9). No work will be conducted until the County, RWQCB, CDFW, and USACE provide written approval that work in aquatic resources to include wetlands and streams is authorized or the agency has determined they have no jurisdiction regarding the proposed project impact to aquatic resources.

The project as proposed will avoid permanent fill impacts to the existing pond (P1; see Attachment 1, Figure 16) and downstream drainage (R-1). Temporary impacts, to construct a bridge that will clear span over the R-1 drainage and avoid permanent impacts to the stream channel and banks, may occur. The clear span bridge impact over the drainage by shading is considered not significant. Portions of minor drainages R-2 and R-3 will be permanently impacted by the construction of an earth lined

agricultural pond (acre). Impacts to these drainages is negligible (< 0.0004 acre). A portion of R-4 will also be permanently impacted by culvert construction for a roadway crossing. Impact to this drainage is also considered to be negligible (<0.0003 acre). The new pond will expand the area of aquatic resources on the Project site by 0.74 acres (Attachment 1, Figure 16).

No mitigation is anticipated being required by the Water Board and CDFW for the clear span bridge crossing by the Water Board and CDFW other than stream enhancement plantings along the banks of the main tributary (R-1) which is downstream from the pond and the minor tributary drainages R-2 and R-3 (Attachment 1, Figure 16). A planting plan will be submitted prior to impacts associated with tributary drainages.

Mitigation Measure #11, Temporary Construction Impacts: Recommended mitigation measures to minimize temporary construction impacts include:

1. Ground disturbing work to be conducted during dry or low-flow periods; if water happens to be present during the period of construction, temporary coffer dams will be used to redirect any surface water flows around the construction work area with any water from the interior of the coffer dam area discharged through a filter bag or straw bale siltation basin located in uplands.
2. Equipment working in streams will work from wood or steel mats to minimize soil disturbance.
3. Post-construction temporarily filled areas will be restored to original ground surface elevation with fill material off hauled and disposed of at a suitable upland location.
4. To prevent erosion and sediment transport Cori (coconut), jute, or sterile straw erosion control blankets and logs, and/ or loose sterile straw, will be used as appropriate following seed bed preparation of bare soil areas.
5. Project will not use erosion control materials containing plastic monofilament netting (erosion control matting) or similar material containing netting within the Project area due to documented evidence of birds, amphibians, and reptiles becoming entangled or trapped in such material. Acceptable substitutes include erosion materials contained with burlap netting, burlap tubes filled with natural fiber material, rolls of coconut coir matting or similar.
6. Hydroseeding will follow the installation of natural fiber matting, rolls, and/or loose straw BMPs.
7. Hydroseed mix will include native grass seed that produce dense fibrous root system, organic mulch, slow-release fertilizer, mycorrhiza, and organic tackifier.

5.1.8 Wildlife Movement/Corridors

As stated in Section 4.2.4, Wildlife use and wildlife movements through the Project is expected. The pond, adjacent wetland (aka Palustrine emergent wetland; freshwater emergent marsh; wet meadow), unnamed drainages, riparian scrub woodland (aka Valley Foothill Riparian), collectively provide a movement corridor for local insects, and amphibian, reptile, bird and mammal species. In addition to the above mitigation measures in Sections 5.2 – 5.6, the following mitigation measures are recommended to minimize impacts to sensitive plants and animals during construction.

> **Mitigation Measure #12, Environmental Training:** A Qualified Biologist shall conduct an education program for all persons employed on the Project prior to performing ground disturbing activities. Instruction shall consist of a presentation by the Qualified Biologist that includes a discussion of the biology and general behavior of any sensitive species that may be in the area, how they may be encountered within the work area, and procedures to follow when they are encountered. Training will include such information about California red-legged frog, western pond turtle, burrowing owl, tricolored blackbird, white-tailed kite, pallid and Townsend's big-eared bats, and American badger. Interpretation shall be provided for non-English speaking workers, and the same instruction shall be provided for any new workers prior to on-site Project activity. Qualified Biologist shall prepare and distribute wallet-sized cards or a factsheet handout containing this information for workers to carry on-site. Upon completion of the program, employees shall sign an affidavit stating they attended the program and office and be available to County upon request.

5.1.9 Tree/Riparian Impacts

Four Valley oak trees within the valley oak woodlands will be impacted by the roadway alignment development within the southwest portion of the Project Site (Appendix 1, Figure 17). Valley oaks are Protected Trees of Special Significance by the County of Sonoma. No riparian trees will be removed by the Project.

> **Mitigation Measure #13, Tree Mitigation:** Mitigation shall involve replacement plantings of Valley oak within the Project Site and payment of an in-lieu fee to the County. All trees to be replaced shall be the same native species as that removed unless specific approval has been granted by the Planning Director. Planted trees shall be monitored for five years and replaced, if needed. The Project Developer shall implement measures to ensure that plant stock is avoid that may be infected with the plant pathogen *Phytophthora sp.* Measures to avoid contamination with *Phytophthora sp.,* may include, but are not limited to, avoiding collection of propagules from 1) known or likely infected areas; 2) during wet conditions; 3) when soil is muddy; or 4) from within 1.6 feet of the soil surface. Measures may also include implementing heat or chemical treatments to collected seeds prior to installation.

5.2 Postconstruction Impacts and Mitigation Measures

Light, noise, traffic, sedimentation, and event activity impacts resulting from project operations may result from the project's 28 annual events. Mitigation measures are designed to prevent harm to the sensitive animal species including western pond turtle and California red-legged frog, as well as other animal species.

Mitigation Measure #14, Post Construction:

Light. Artificial light causes disruption of the behavior of insects, amphibians, mammals, and invertebrates. Unnecessary outdoor lighting should be turned off from dusk to dawn. If outdoor lighting is necessary, amber lighting along all outdoor areas including roadways should be used (Amber/Orange nm range 587 - 592 Peak Wavelength 590). Where practicable fixtures should be used that shield lamps or glowing lenses from being directly visible.

Traffic. No off-road event vehicle parking and driving along the western access roads is allowed. All parking will be on constructed areas with compacted soils with graveled or paved surfaces. No oil or mineral salts will be applied to roadway or parking areas for dust control. Maximum vehicle speed limits are restricted to 10 mph. A mowed 30-foot margin, where feasible, will be maintained along both sides of the western access road for visibility and fire control. Vehicles will stop if animals are observed within the mowed roadway until the animal clears the area. Speed limit and informational species protection signs will be posted along the western roadway and all farm access roadways.

Noise. Where feasible electric power-driven equipment and vehicles should be used. If feasible, a linear berm should be constructed along the margin of the western roadway adjacent to the pond area to reduce road noise. Maximum vehicle speed should be restricted to 10 mph on all roads.

Sedimentation. To avoid the potential for sediment being transported into aquatic resource areas along event access points all areas found that are barren of vegetation resulting from pedestrian or vehicle access, associated event activities, or animal use shall be restored by seeding with a blend of native erosion control grass seed. Seeded areas shall be mulched. Landscape fabric shall not be used. Revegetation shall be completed as soon as possible bare soil area(s) are discovered. Seeding placed after October 15 must be covered with broadcast straw, jute netting, coconut fiber blanket or similar erosion control blanket.

Event Activity. Signs shall be located along the pond-marsh-wetland and tributary perimeters indicating that these areas are set aside for conservation purposes and visitors should not access. If unauthorized access becomes a persistent issue fencing should be erected.

6.0 ENVIRONMENTAL REGULATORY AUTHORIZATIONS

The proposed Project as described will require authorizations from the San Francisco Bay Regional Water Quality Control Board (Water Board) will be required for the stream clear span crossing and the culvert crossings where placement of fill material into Waters of the State (drainages R-1 and R-4 (Appendix 1, Figure 16) will occur within the Project Area. County authorization for these drainage crossings (Appendix 1, Figure 16) will also be required. The table below provides a summary of these agencies' regulatory authority, geographical reach of Jurisdiction, and types of impacts requiring authorization. Appendix 1, Figures 9, 10, and 11 provide mapping showing the potential geographical extent of Water Board and CDFW jurisdiction within the Project Site. These agencies will be contacted to obtain project authorizations. The Project could potentially be authorized in phases by the County, with the major portion of the Project being authorized first and the bridge and culvert crossing construction being approved once the necessary Water Board and CDFW authorizations are obtained.

Table 5. Regulatory Authorizations Potentially Required for the 4485 D Street Project

Agency	Regulatory Authority	Geographical Reach of Jurisdiction	Impacts Requiring Authorization
San Francisco Bay Regional Water Quality Control Board	Section 401 of the CWA and Porter-Cologne Act	Wetlands & Other Waters of the State	All ground disturbance
California Department of Fish and Wildlife	Section 1602 of the California Fish and Game Code	Stream channel bed, bank, and dependent adjacent vegetation within stream zone.	All ground and overhead disturbance
County of Sonoma	Stream Setbacks for Structures (SCC §7-14.5)	Stream habitat	All activities which may disturb the current nature of Stream Corridor.
County of Sonoma	Stream Setbacks for Riparian Corridors (SCC §26.65.030)	Stream habitat	All activities which may disturb the current nature of riparian habitat along and adjacent to stream boundaries.
County of Sonoma	Stream Setbacks for Septic Systems and Water Wells	Stream habitat	All ground disturbing activities which may discharge pollutants to streams in Sonoma County
County of Sonoma	Stream and Water Feature Setbacks for Grading Work	Stream habitat	All ground disturbing activities which may discharge pollutants to streams in Sonoma County
County of Sonoma	Tree Protection Ordinance (Sec. 26-88-010 (m))	Protected tree species	All ground disturbing activities which may impact protected trees in Sonoma County

7.0 REFERENCES

16 USC 703-712 Migratory Bird Treaty Act. https://www.fws.gov/law/migratory-bird-treaty-act-1918

33 U.S.C. 403. *Rivers and Harbors Appropriation Act of 1899.*

33 U.S.C. 1344. *Permits for Dredged or Fill Material.*

33 CFR, Title 33, Part 328. *Definition of Waters of the United States*. https://www.ecfr.gov/cgi-bin/text-idx?node=pt33.3.328&rgn=div5

33 CFR Part 329. *Definition of Navigable Waters of the United States*. http://www.ecfr.gov/cgibin/text-idx?tpl=/ecfrbrowse/Title33/33cfr329_main_02.tpl

40 CFR Part 230. *Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material*. http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr230_main_02.tpl

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APPENDIX 1
FIGURES

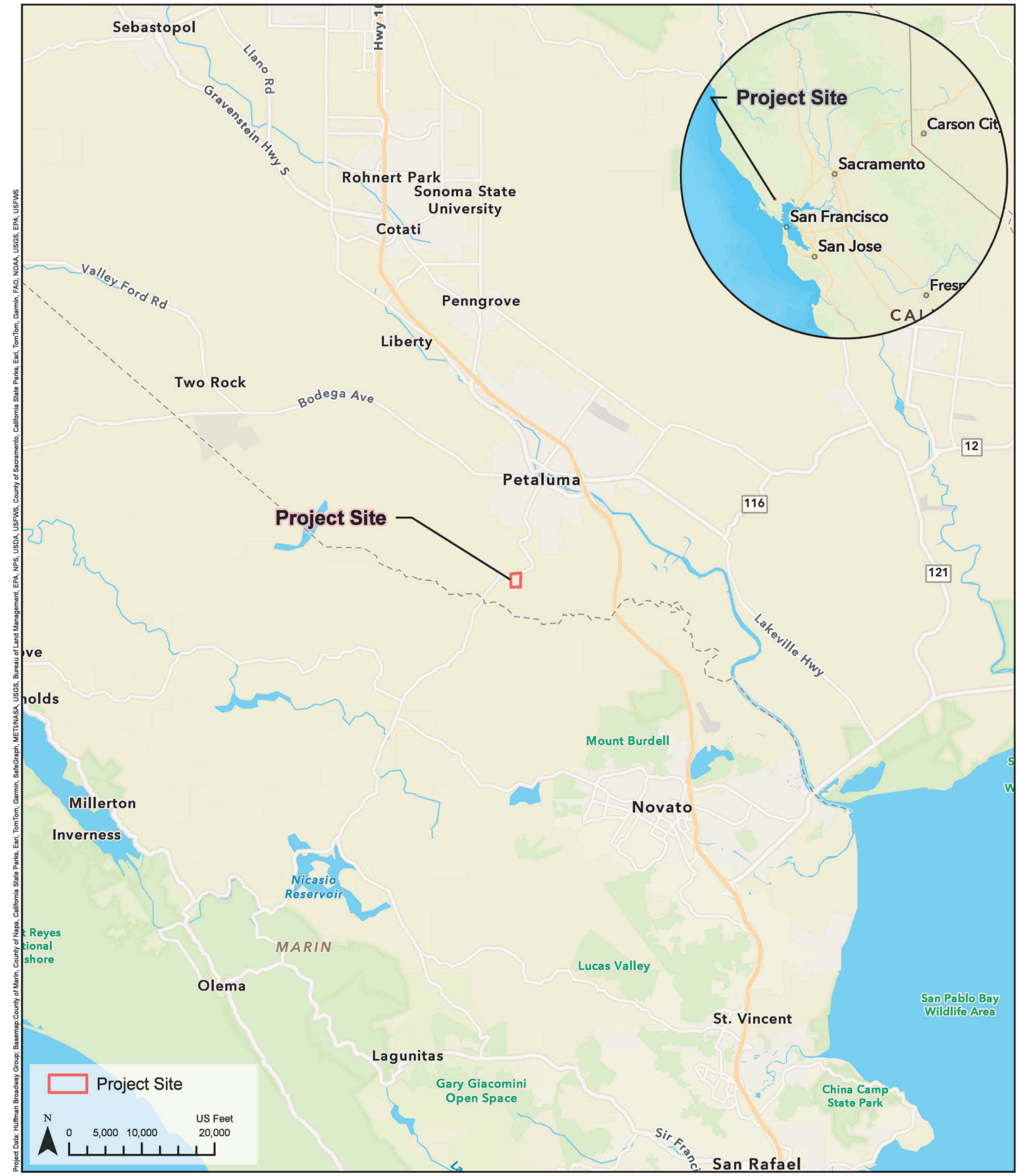

Figure 1. Project Site Location

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:200,000
Date Map Created: 1/4/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

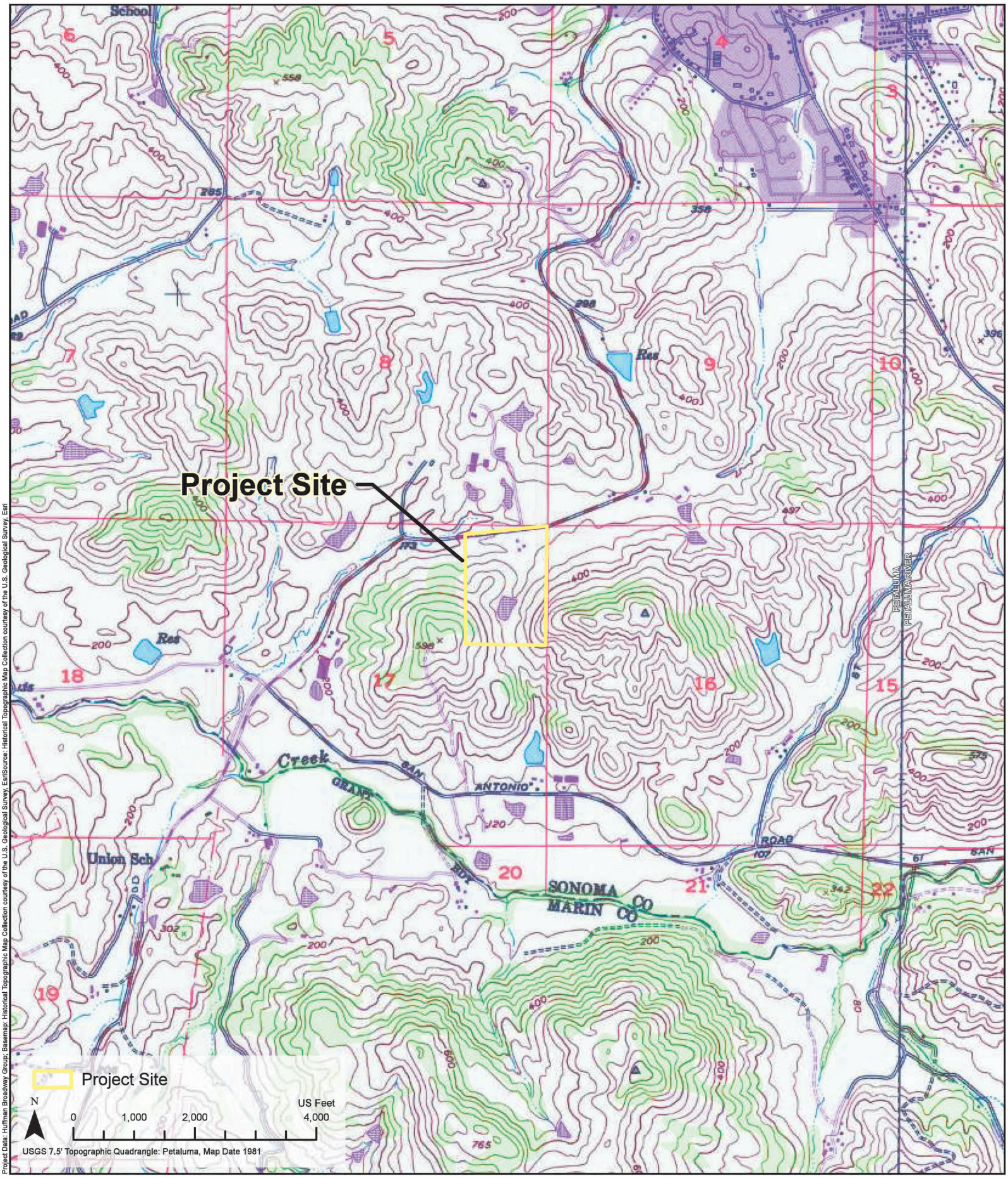

Figure 2. USGS Topographic Map of the Project Site

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:24,000
Date Map Created: 1/4/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

Figure 3. Aerial Image of the Project Site

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
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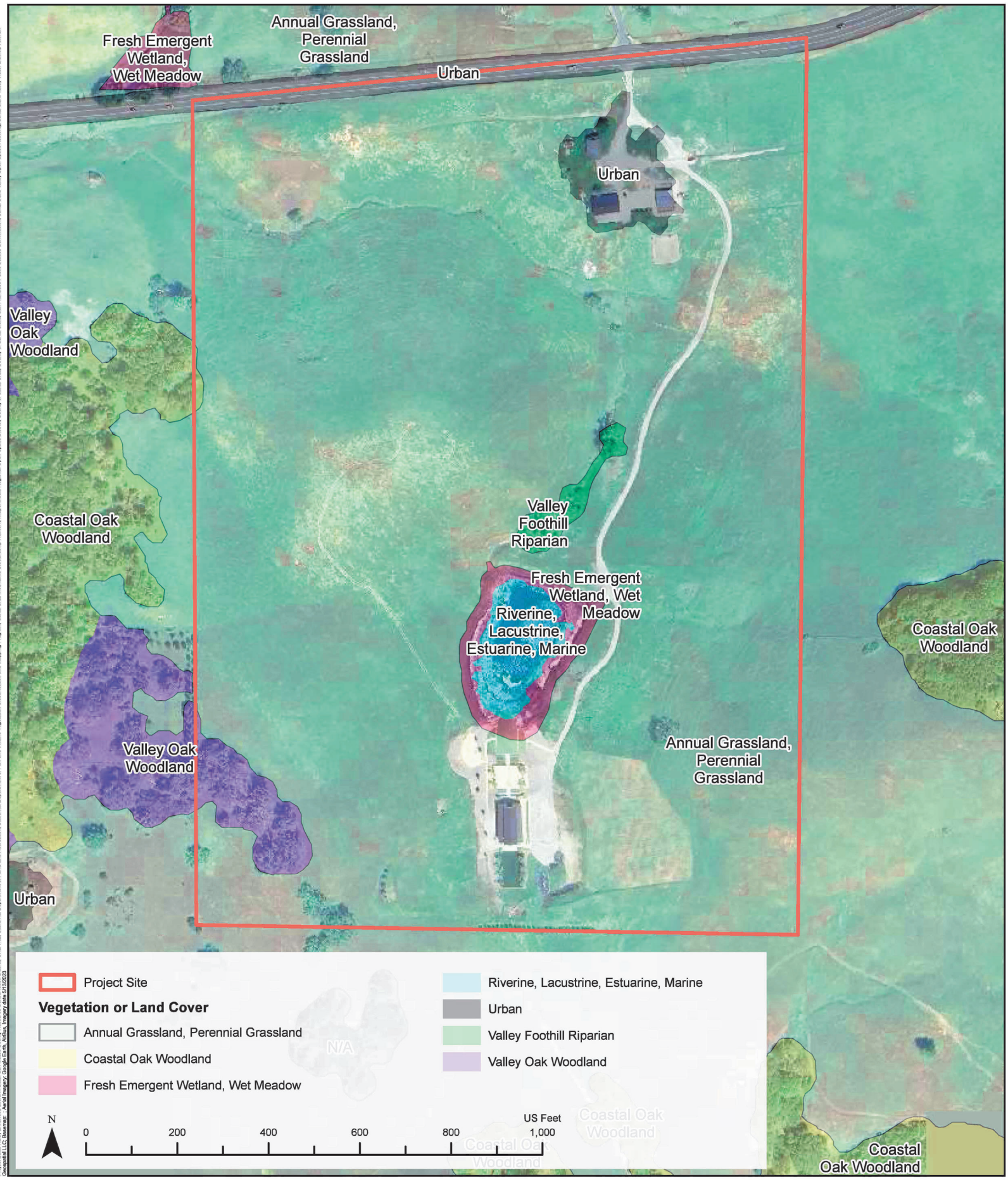
Date Map Created: 1/10/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD



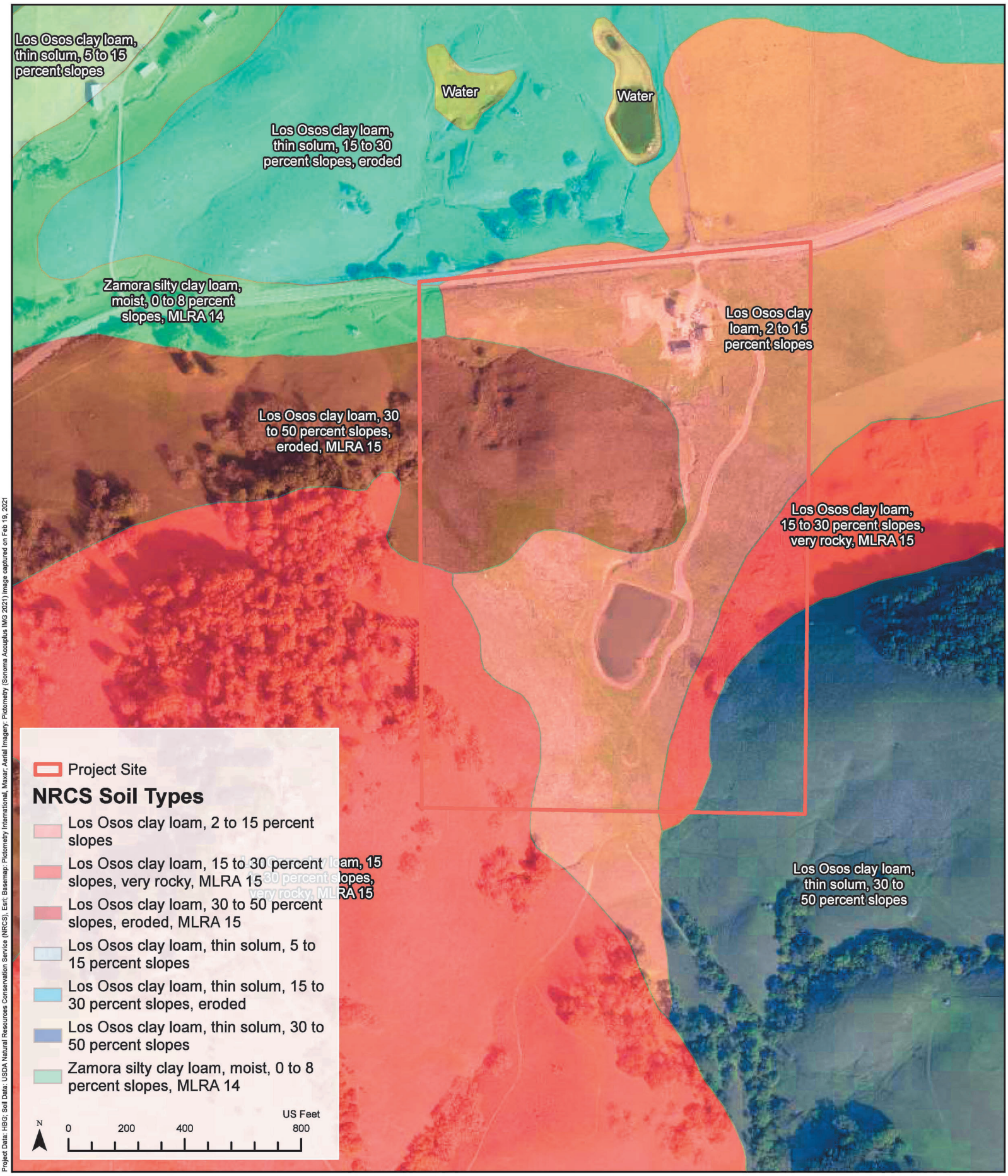
Project Data: HBG; Enhanced Lifeform Data: San Mateo County Resource Conservation District, CALFIRE, California Department of Parks and Recreation, California Department of Fish and Wildlife Vegetation Classification and Mapping Program, Santa Cruz Mountains Stewardship Network, Midpeninsula Regional Open Space District, County of Santa Cruz, County of Santa Clara, San Francisco Public Utilities Commission, Santa Clara Valley Open Space Authority, Santa Clara Valley Water District, Tulman Geospatial LLC; Basemap - Aerial Imagery: Google Earth, ArcGIS, Imagery date 3/16/2023

Figure 4. Vegetation Map

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:3,200
Date Map Created: 1/10/2024
HBG GIS Analyst: Agie Gilmore & Deland Wing
HBG PM: Terry Huffman, PhD



Project Data: HBG; Soil Data: USDA Natural Resources Conservation Service (NRCS), Esri; Basemap: Pictometry International, Maxar; Aerial Imagery: Pictometry (Sonoma Accuplus IMG 2021) Image captured on Feb 19, 2021

Figure 5. NRCS Soils Map

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
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HBG PM: Terry Huffman, PhD

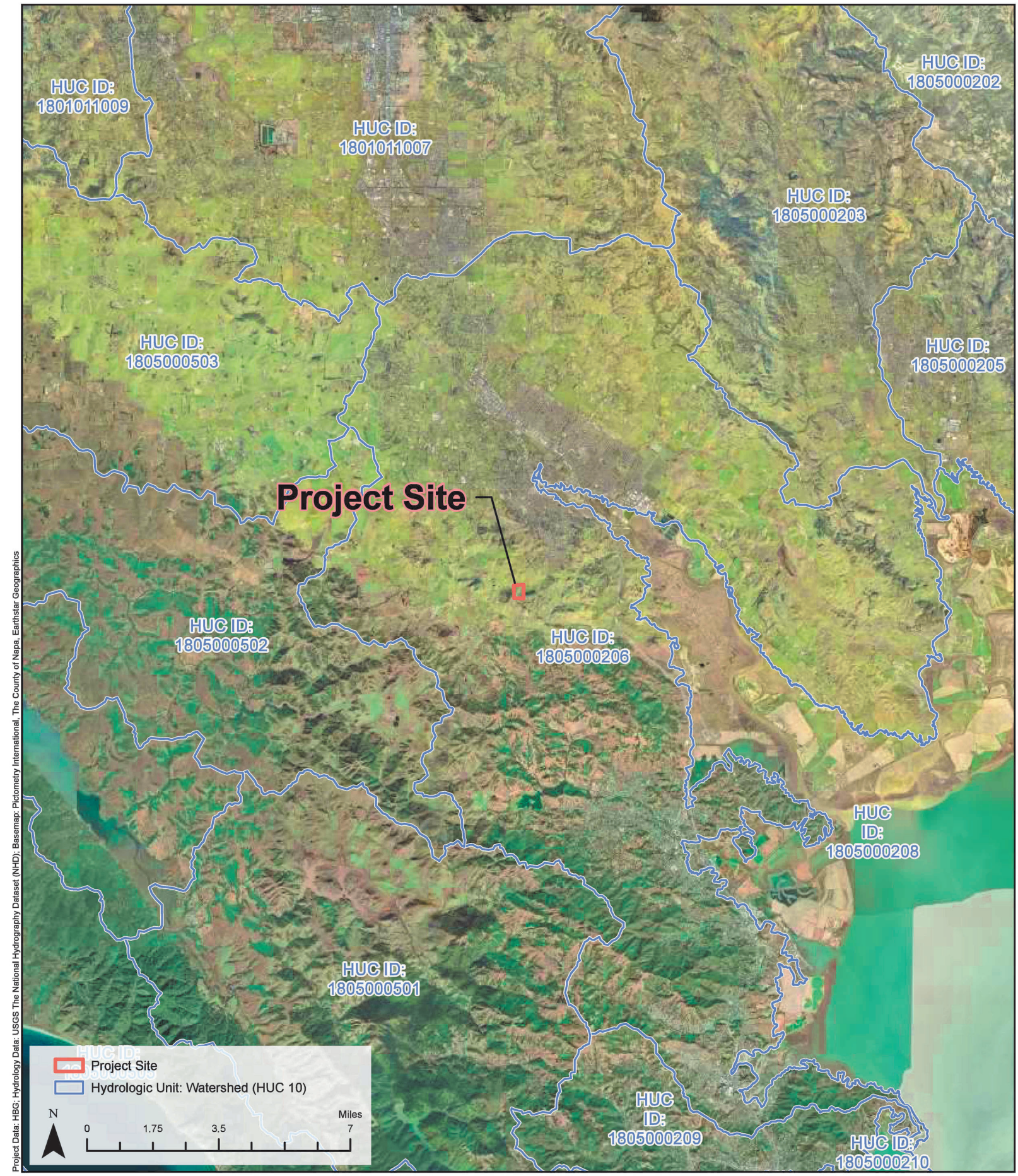

Figure 6. USGS NHD HUC 10 Watershed Boundaries

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
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HBG PM: Terry Huffman, PhD

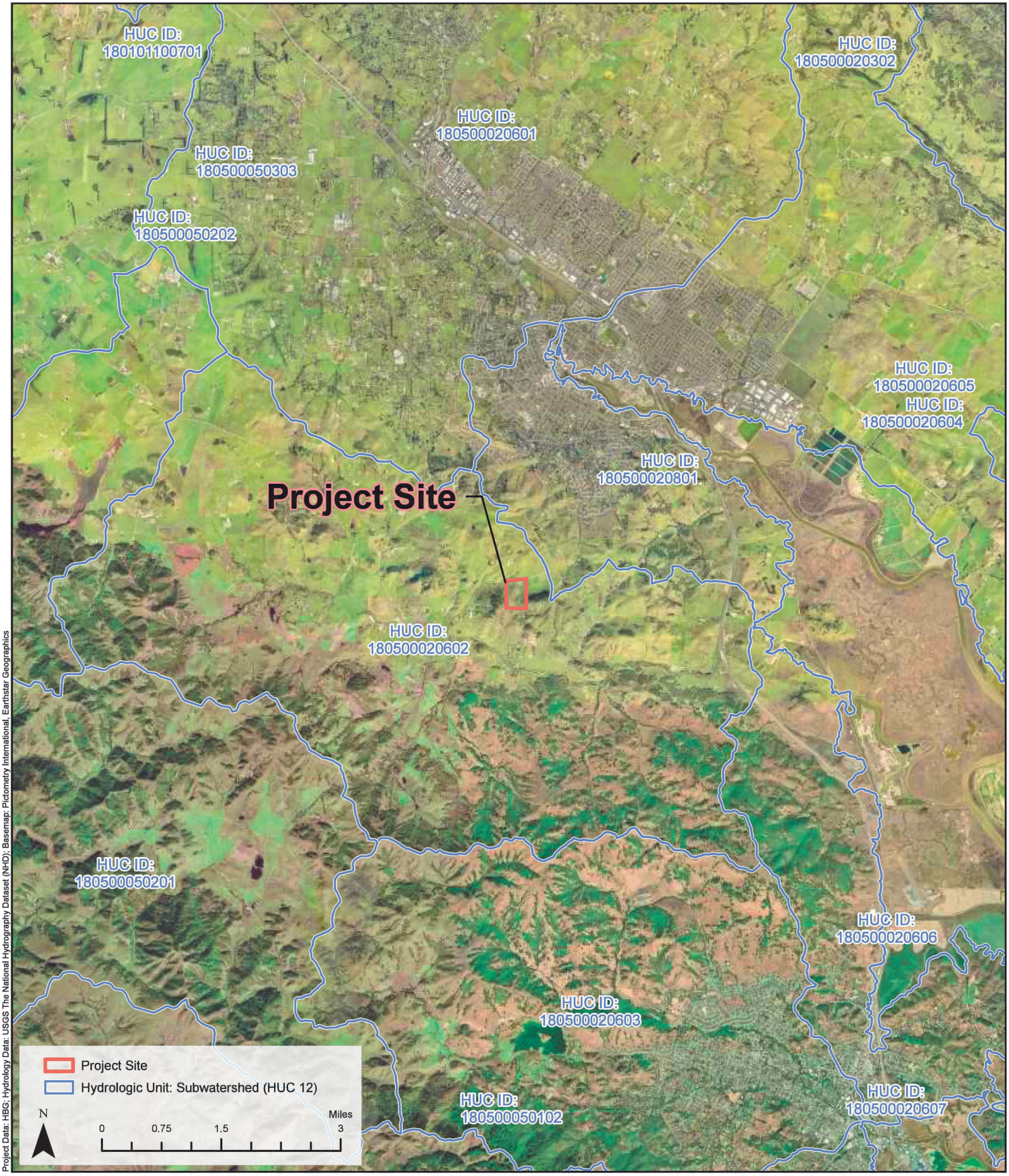

Figure 7. USGS NHD HUC 12 Watershed Boundaries

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
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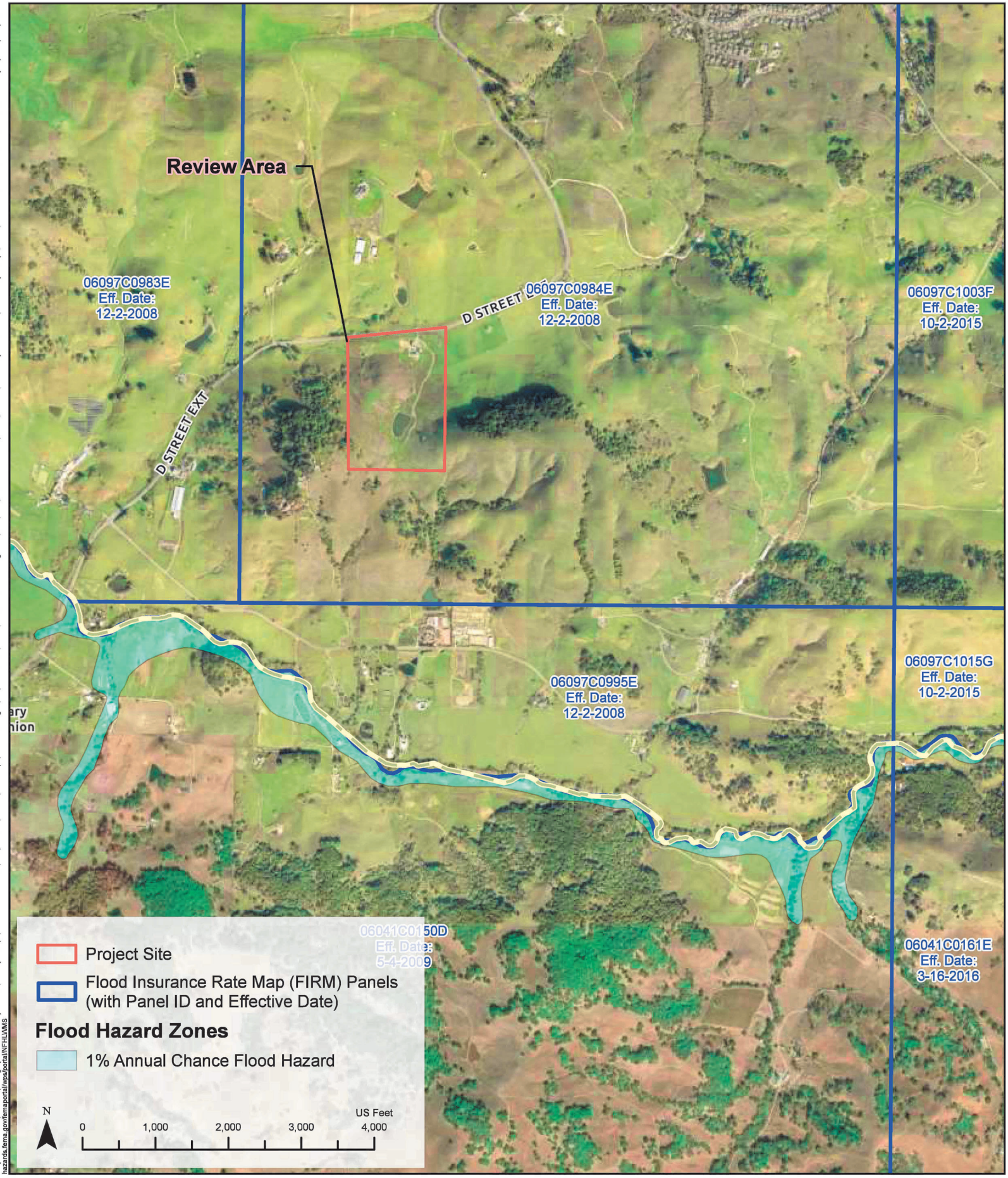

Figure 8. FEMA Flood Zone Mapping

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:20,000
Date Map Created: 1/4/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

Figure 9. Corps/USEPA Clean Water Act Section 404 Aquatic Resources Delineation

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:3,000
Map Created Date: 1/11/2024
GIS Specialists: Agie Gilmore & Deland Wing
HBG Project Manager: Greg Huffman

Figure 10. California Department of Fish and Wildlife Aquatic Resources Delineation

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:3,000
Map Created Date: 1/8/2024
GIS Analyst: Agie Gilmore & Deland Wing
HBG PM: Greg Huffman

Project Data: HBG; Basemap Imagery Credits: Pictometry International, The County of Napa, Maxar, Microsoft; Aerial Imagery: Google Earth, AirBus, Imagery date 5/13/2023

Figure 11. San Francisco Bay Regional Water Quality Control Board Aquatic Resources Delineation

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
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Map Created Date: 1/8/2024
GIS Analyst: Agie Gilmore & Deland Wing
HBG PM: Greg Huffman

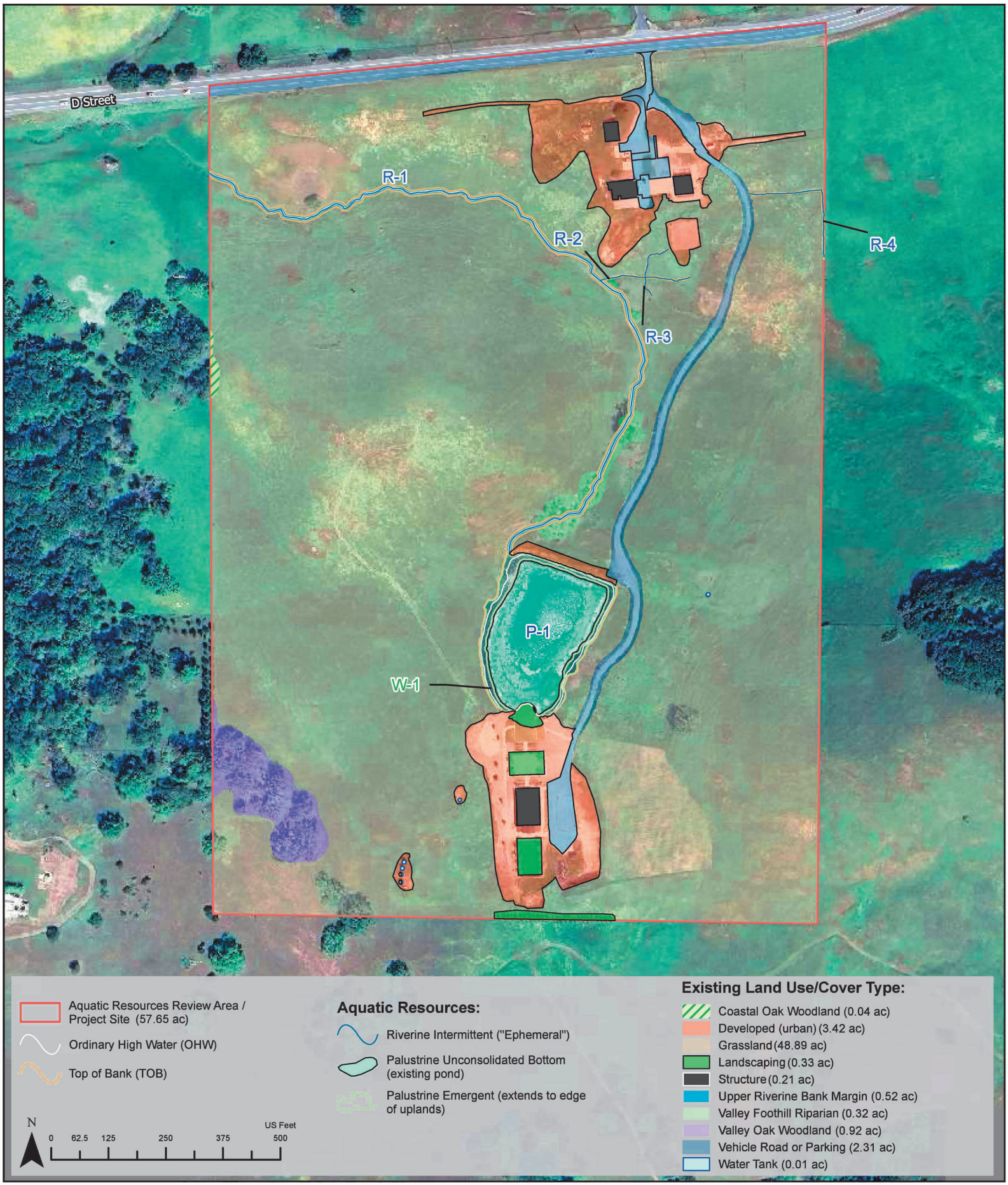


Figure 12. Existing Conditions

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 StatePlane California II FIPS 0402 Feet (2011)
Scale: 1:3,200
Map Created Date: 1/24/2024
GIS Specialists: Agie Gilmore & Deland Wing
HBG Project Manager: Greg Huffman

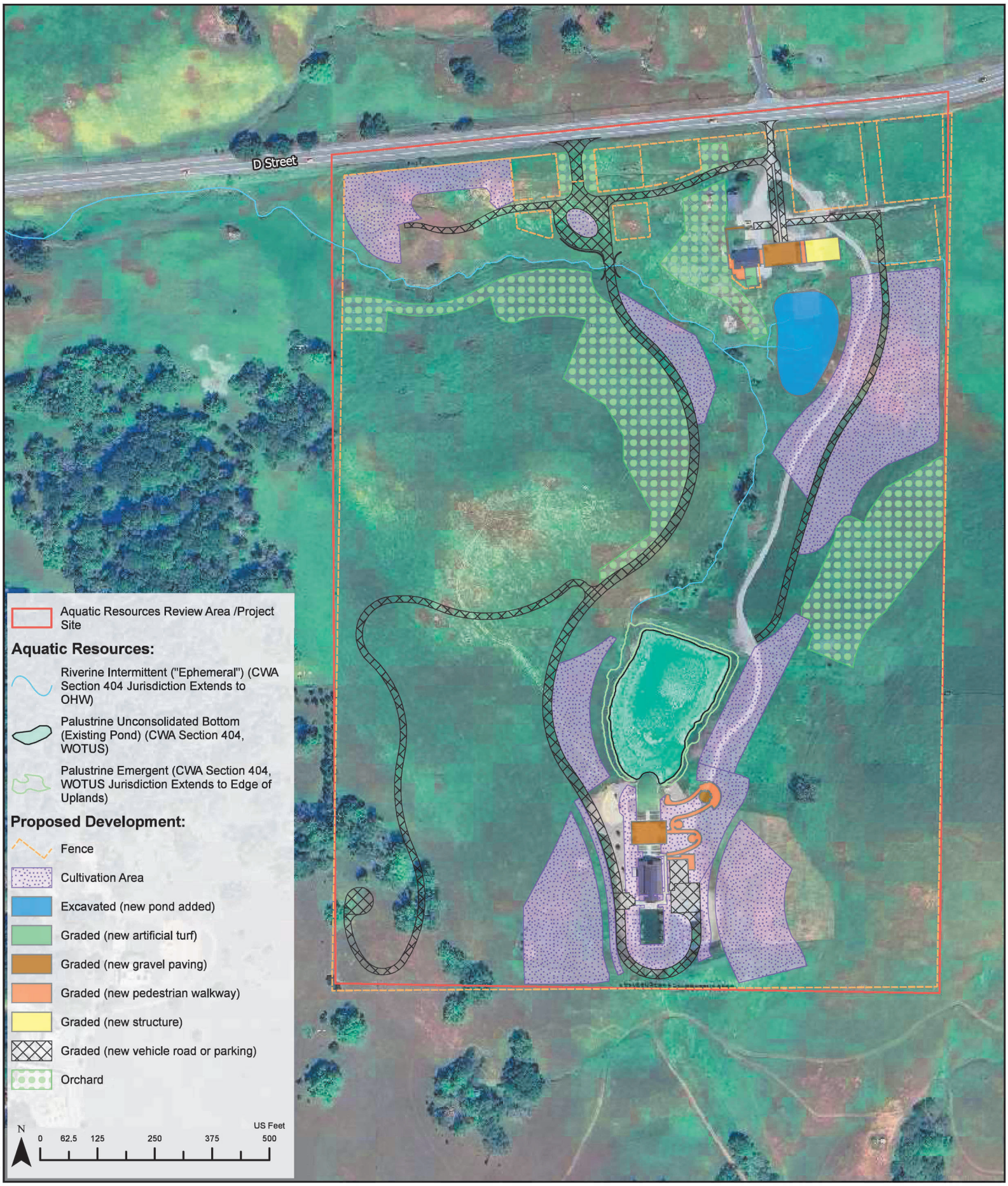


Figure 13. Proposed Development and Aquatic Resources

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 StatePlane California II FIPS 0402 Feet (2011)
Scale: 1:3,200
Map Created Date: 1/24/2024
GIS Specialists: Agie Gilmore & Deland Wing
HBG Project Manager: Greg Huffman

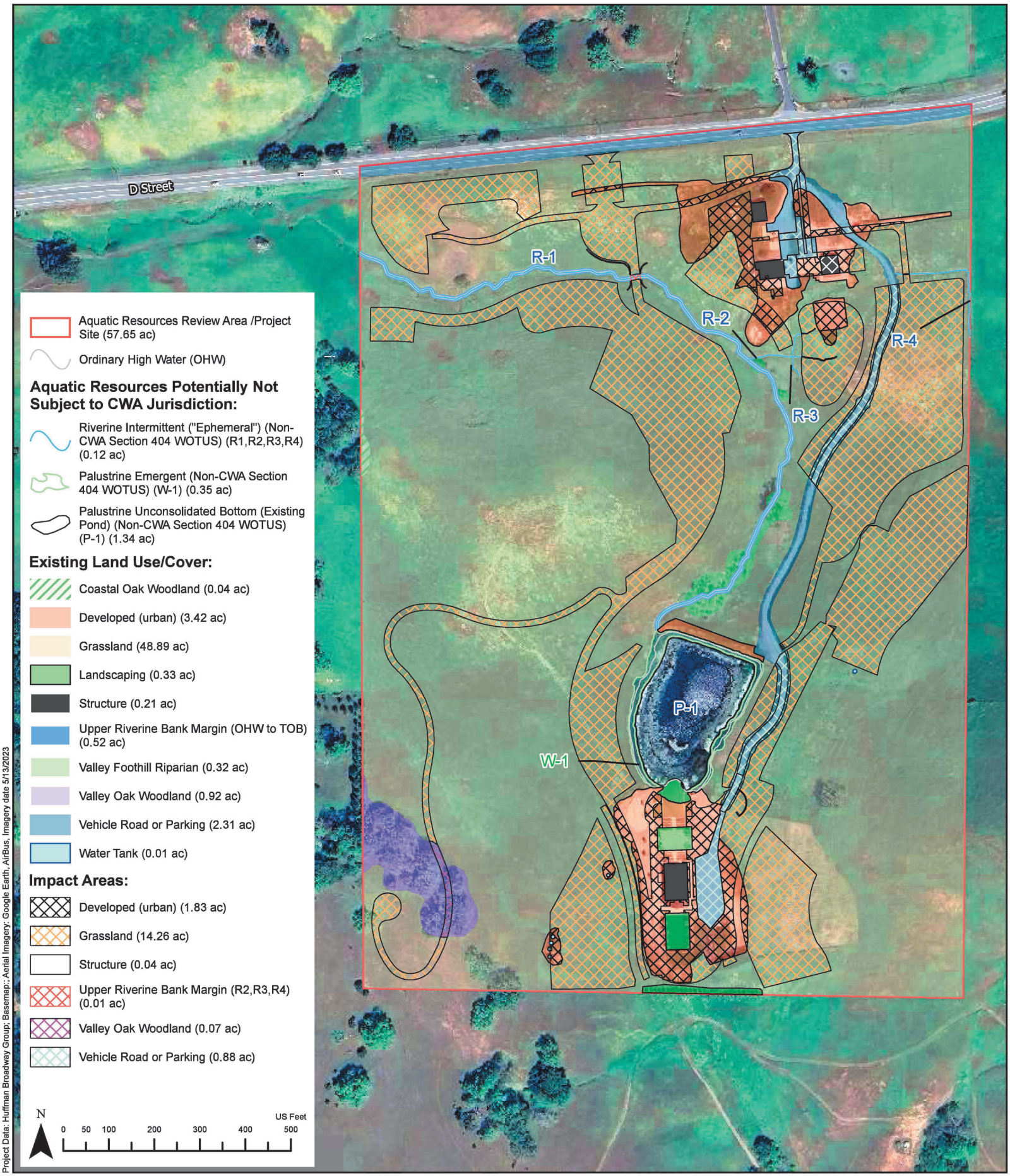


Figure 14. Impacts to Existing Land Use/Cover and Aquatic Resources Subject to Corps/USEPA Clean Water Act Section 404 Jurisdiction

4885 D-Street

Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.

ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 StatePlane California II FIPS 0402 Feet (2011)
Scale: 1:3,200
Map Created Date: 1/24/2024
GIS Specialists: Agie Gilmore & Deland Wing
HBG Project Manager: Greg Huffman

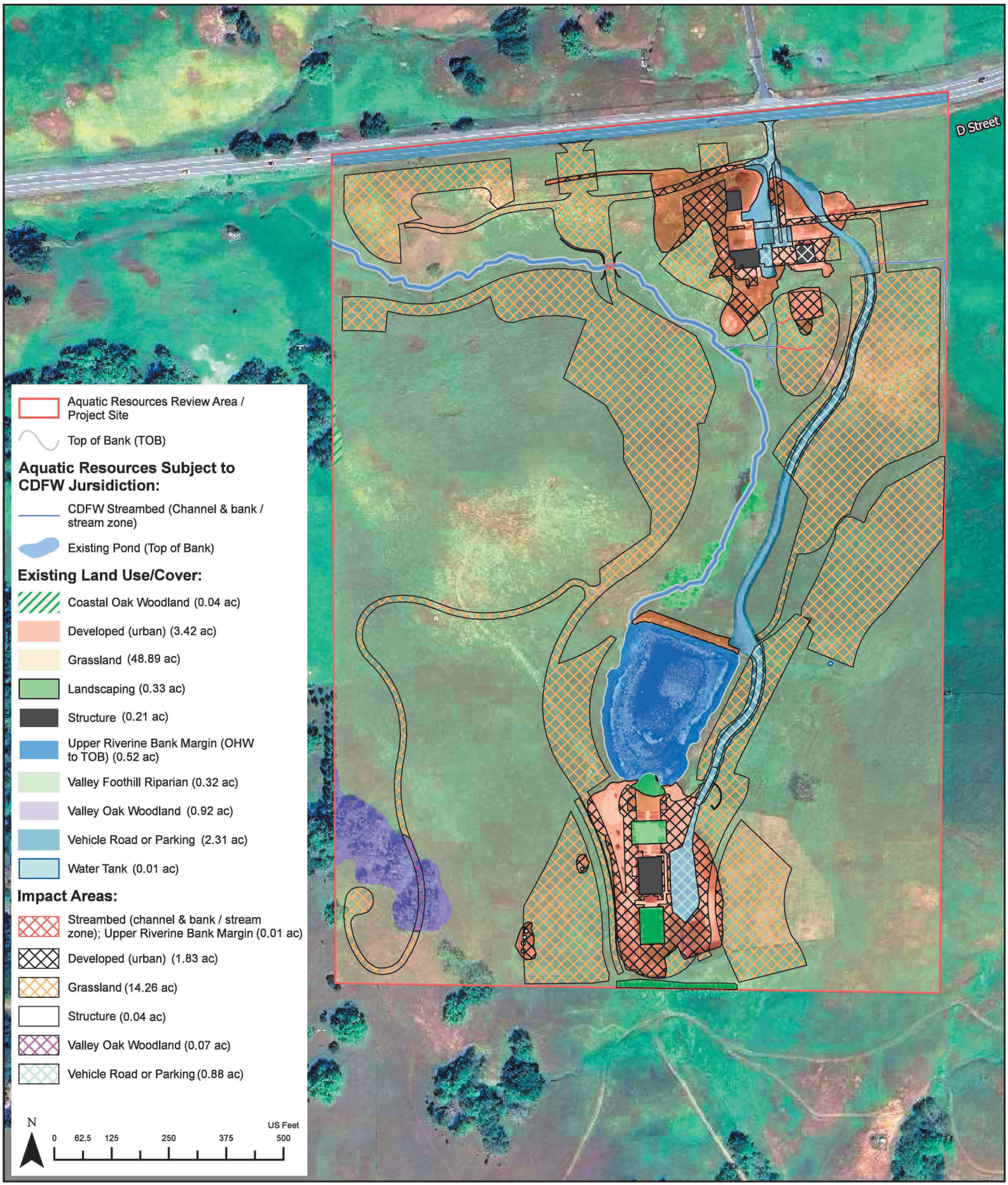


Figure 15. Impacts to Existing Land Use/Cover and Aquatic Resources Subject to California Department of Fish and Wildlife Jurisdiction

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 StatePlane California II FIPS 0402 Feet (2011)
Scale: 1:3,200
Map Created Date: 1/24/2024
GIS Specialists: Agie Gilmore & Deland Wing
HBG Project Manager: Greg Huffman

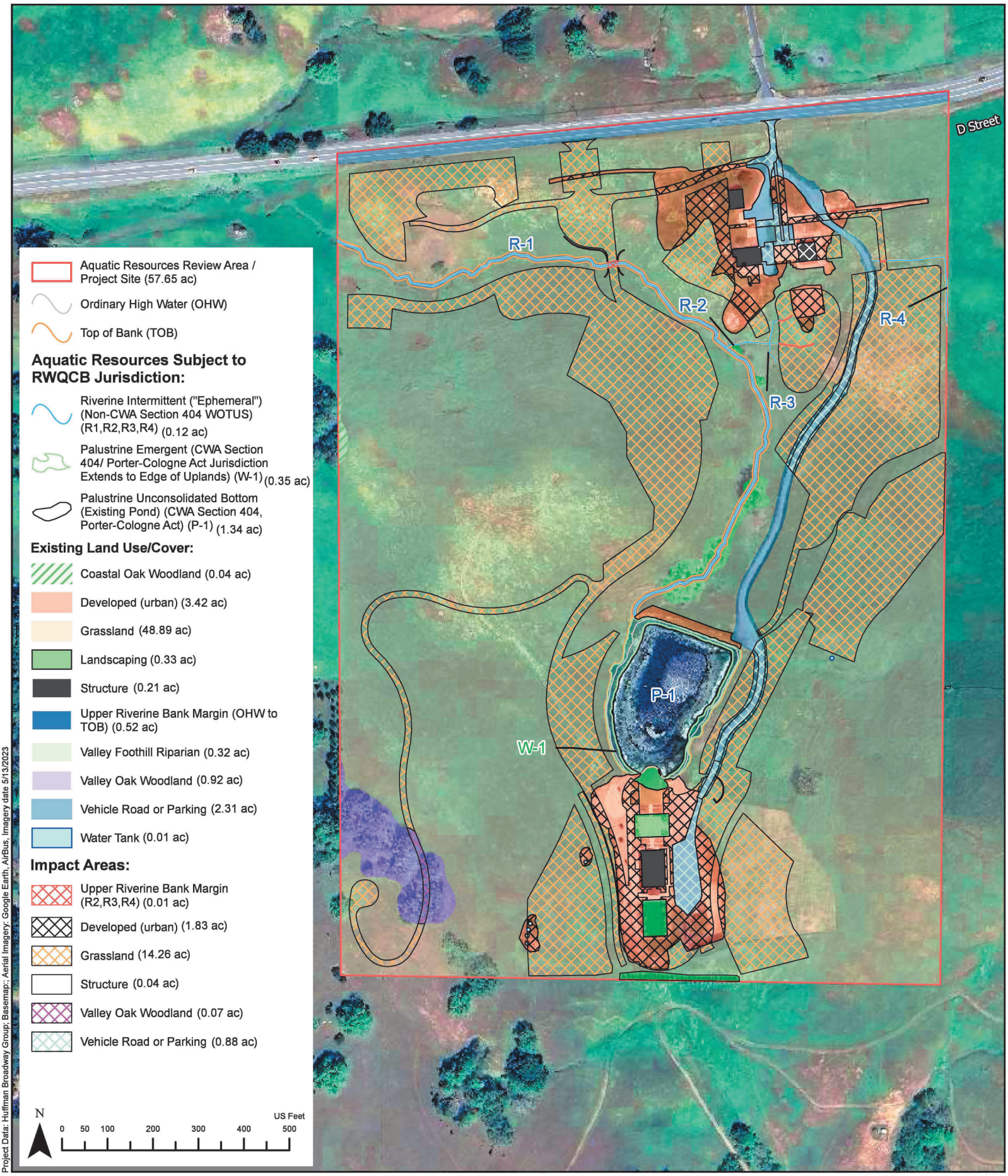
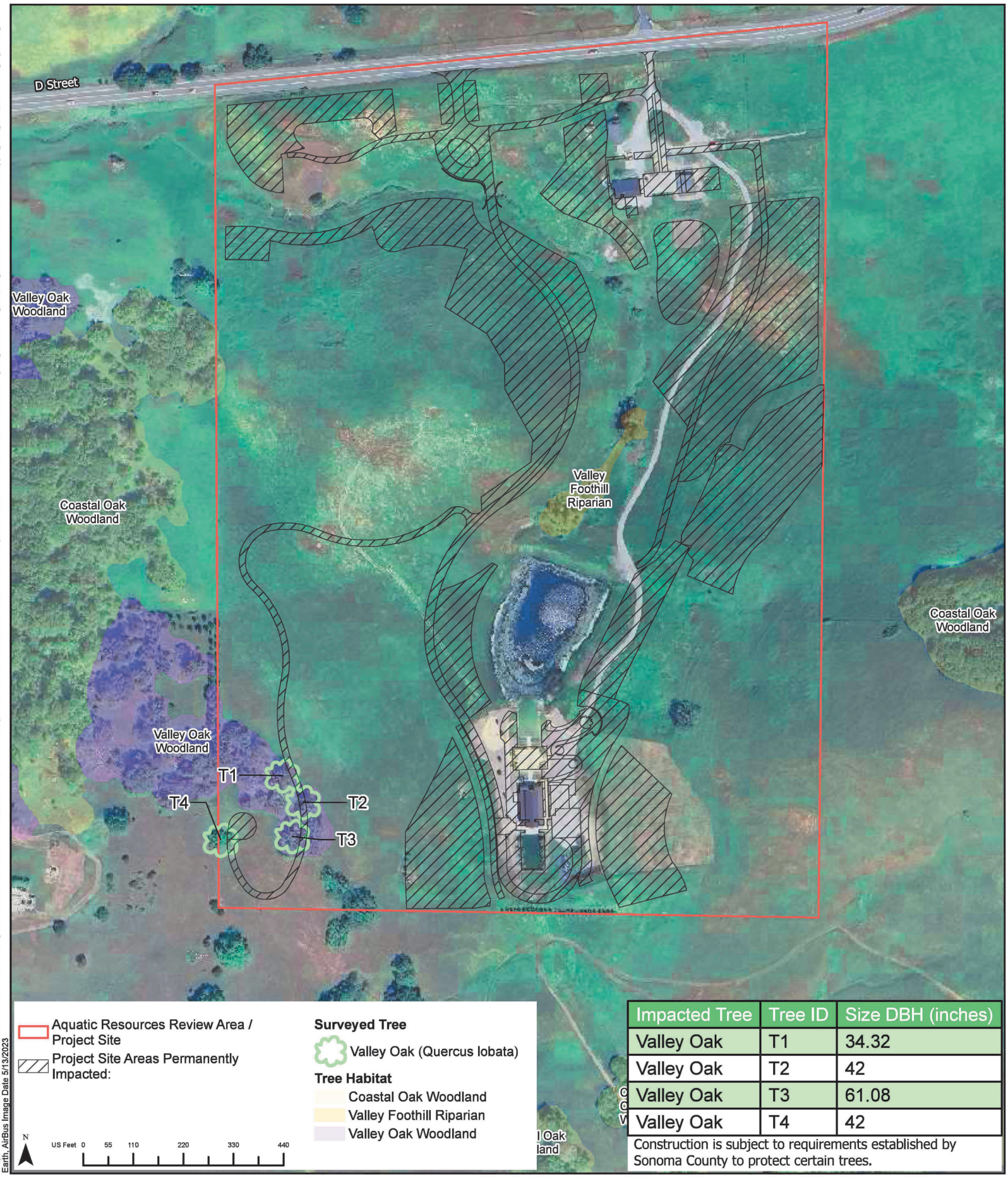


Figure 16. Impacts to Existing Land Use/Cover and Aquatic Resources Subject to San Francisco Bay Regional Water Quality Control Board Jurisdiction
4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 StatePlane California II FIPS 0402 Feet (2011)
Scale: 1:3,200
Map Created Date: 1/24/2024
GIS Specialists: Agie Gilmore & Deland Wing
HBG Project Manager: Greg Huffman



Impacted Tree	Tree ID	Size DBH (inches)
Valley Oak	T1	34.32
Valley Oak	T2	42
Valley Oak	T3	61.08
Valley Oak	T4	42

Construction is subject to requirements established by Sonoma County to protect certain trees.

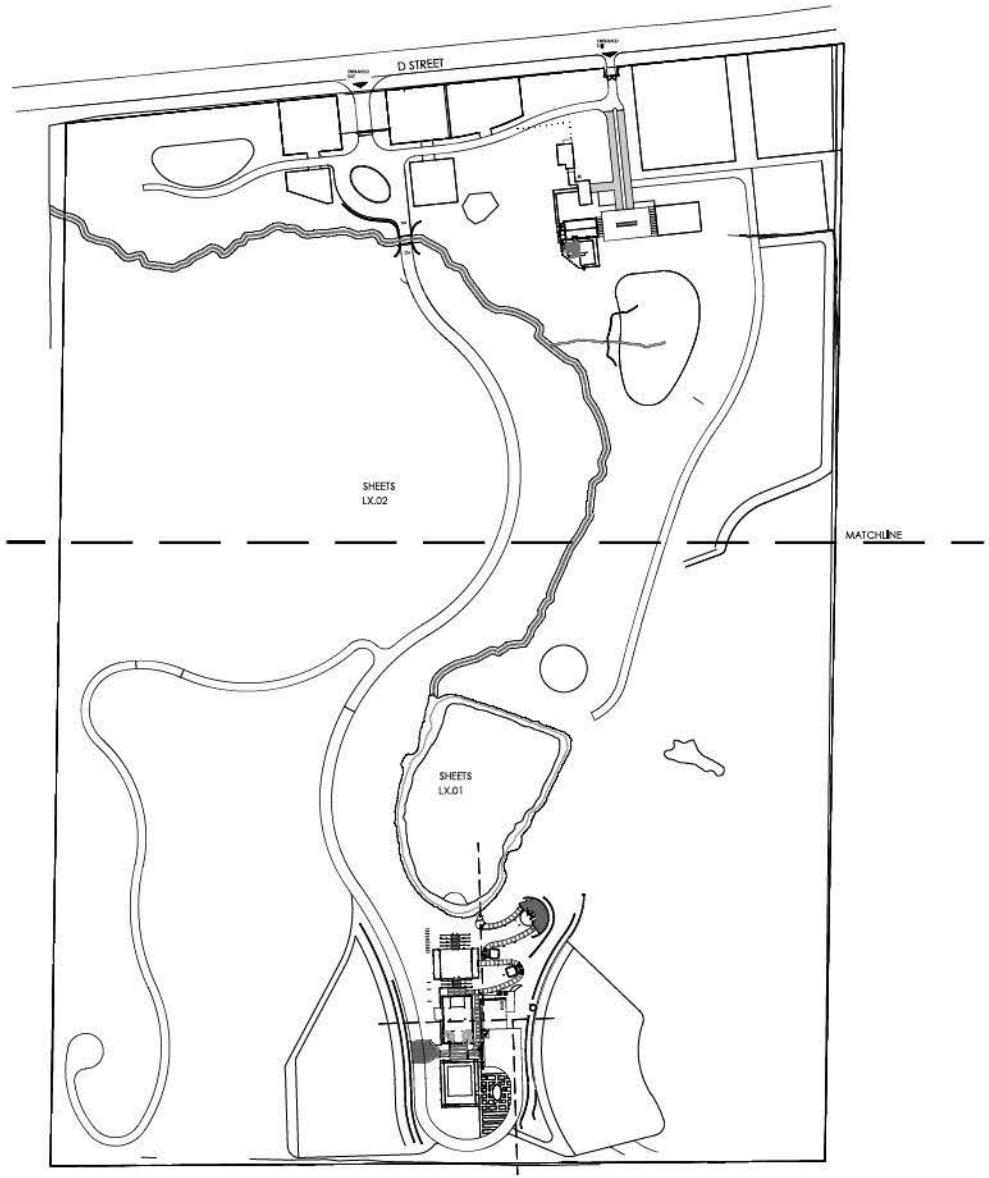
Figure 17. Project Tree Impacts

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 StatePlane California II FIPS 0402 Feet (2011)
Scale: 1:3,200
Map Created Date: 1/24/2024
GIS Specialists: Agie Gilmore & Deland Wing
HBG Project Manager: Greg Huffman

APPENDIX 2
PROJECT DEVELOPMENT PLANS REVIEWED



LEGEND

- EXISTING TREE TO REMAIN
- PROPERTY LINE
- LIMIT OF WORK
- MATCH LINE

N

SCALE: 1" = 100

0 50 100 200

FOR PRICING AND REVIEW ONLY- NOT FOR CONSTRUCTION

Sovi Scapes

801, Lake carolyn Parkway,
2100, Irving,
Texas 75039

469.237.8962

VILLA VANTO FARM IMPROVEMENTS

MASTERPLAN

4485 D STREET, PETALUMA, CALIFORNIA

INTERIM REVIEW ONLY

These documents are incomplete, and are released for interim review only and may not be used construction purposes.

REVISION NO.	DESCRIPTION	DATE

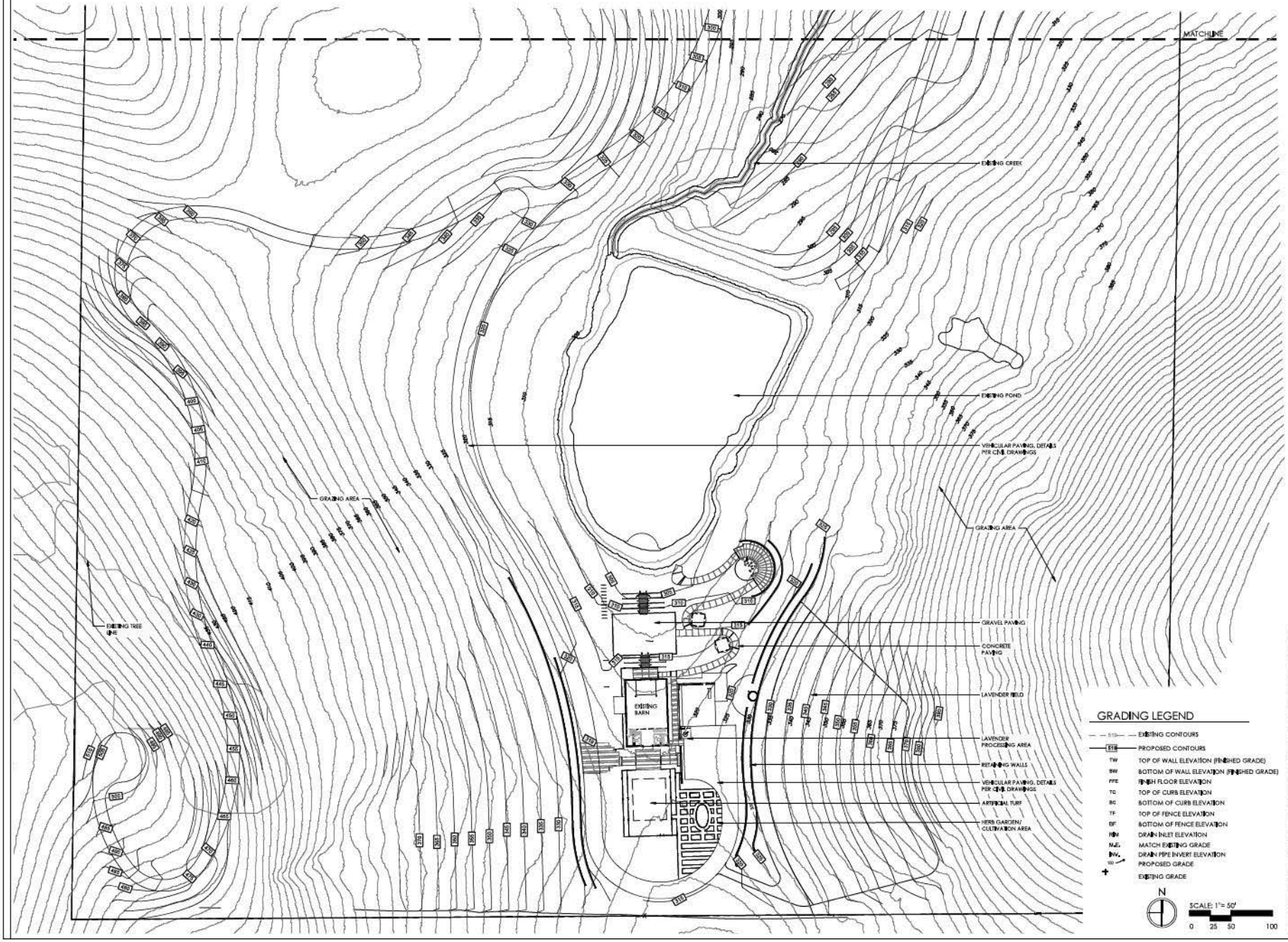
PROJECT NUMBER
SLA 2318

DATE
23 January, 2024

ISSUE
DESIGN DEVELOPMENT

SHEET TITLE
ORIENTATION PLAN

SHEET NO.
L0.01



FOR PRICING AND REVIEW ONLY- NOT FOR CONSTRUCTION

Sovi Scapes

801, Lake carolyn Parkway,
2100, Irving,
Texas 75039

469.237.8962

VILLA VANTO FARM IMPROVEMENTS
MASTERPLAN
4485 D STREET, PETALUMA, CALIFORNIA

INTERIM REVIEW ONLY
These documents are incomplete, and are released for interim review only and may not be used construction purposes.

REVISION NO.	DESCRIPTION	DATE

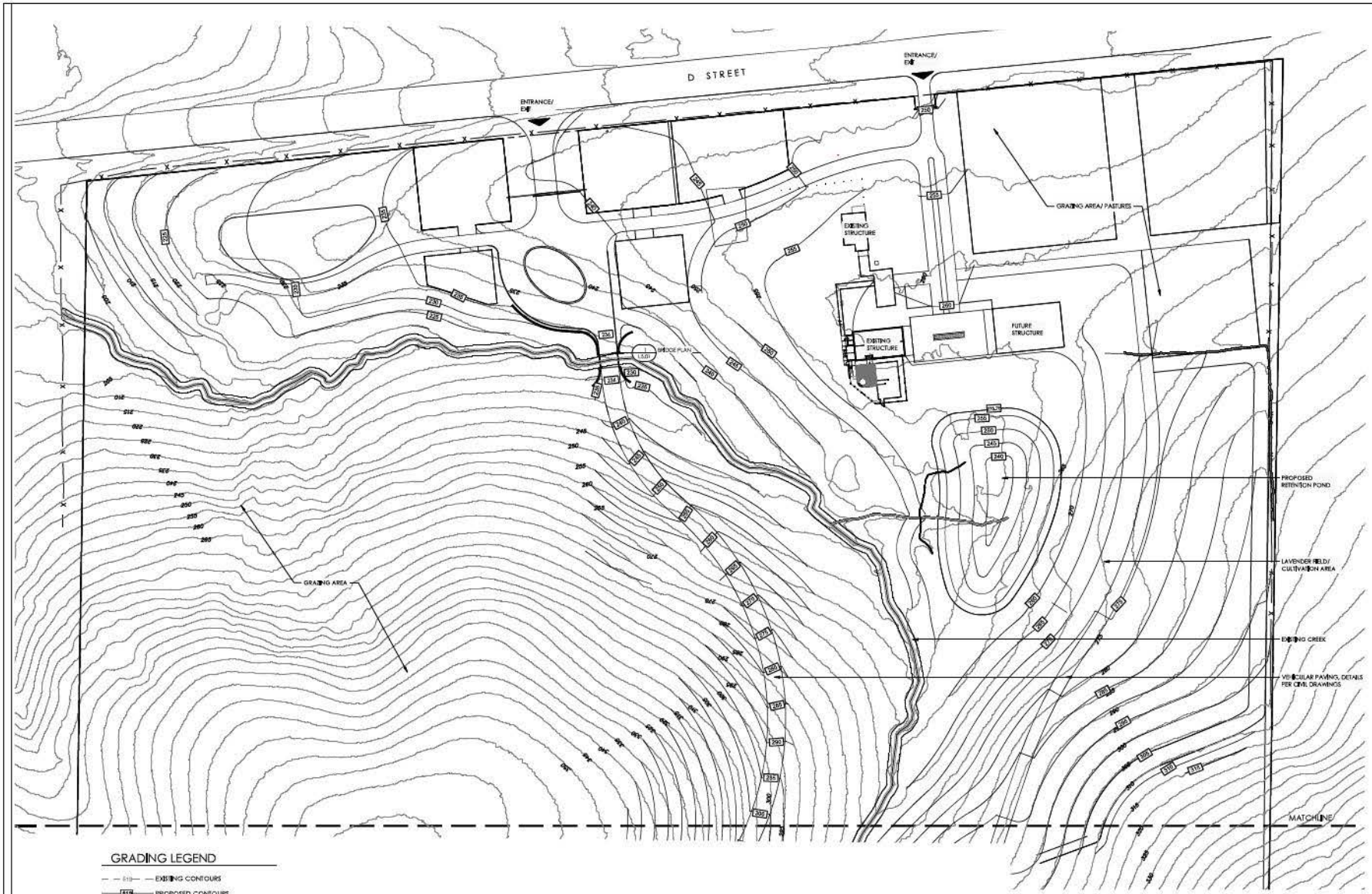
PROJECT NUMBER
SLA 2318

DATE
23 January, 2024

ISSUE
DESIGN DEVELOPMENT

SHEET TITLE
GRADING PLAN

SHEET NO.
L2.01



GRADING LEGEND

618	EXISTING CONTOURS
618	PROPOSED CONTOURS
TW	TOP OF WALL ELEVATION (FINISHED GRADE)
BW	BOTTOM OF WALL ELEVATION (FINISHED GRADE)
FFE	FINISH FLOOR ELEVATION
TC	TOP OF CURB ELEVATION
BC	BOTTOM OF CURB ELEVATION
TF	TOP OF FENCE ELEVATION
BF	BOTTOM OF FENCE ELEVATION
RIM	DRAIN INLET ELEVATION
MJE	MATCH EXISTING GRADE
INV.	DRAIN PIPE INVERT ELEVATION
100	PROPOSED GRADE
+	EXISTING GRADE

N

SCALE: 1"= 50'

0 25 50 100

FOR PRICING AND REVIEW ONLY- NOT FOR CONSTRUCTION

Sovi Scapes

801, Lake carolyn Parkway,
2100, Irving,
Texas 75039

469.237.8962

VILLA VANTO FARM IMPROVEMENTS
MASTERPLAN
4485 D STREET, PETALUMA, CALIFORNIA

INTERIM REVIEW ONLY
These documents are incomplete, and are released for interim review only and may not be used construction purposes.

REVISION NO.	DESCRIPTION	DATE

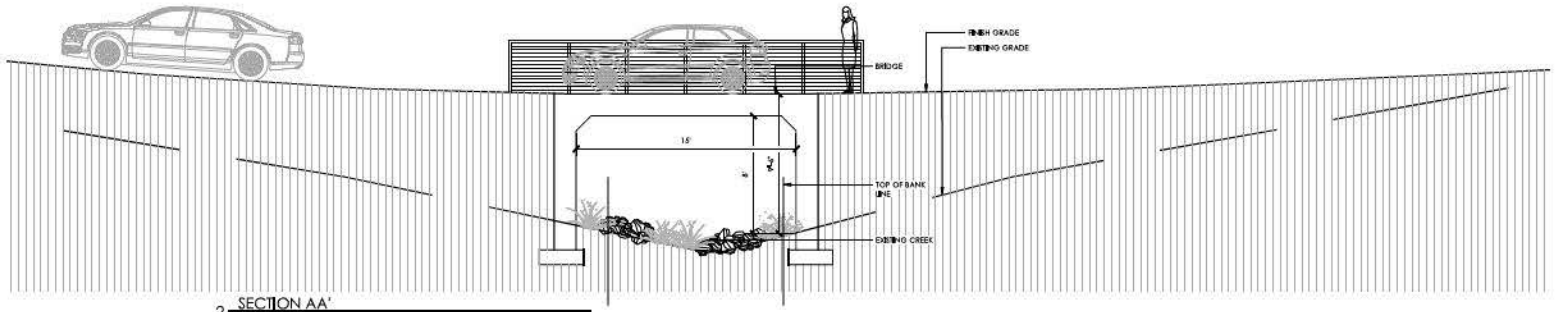
PROJECT NUMBER
SLA 2318

DATE
23 January, 2024

ISSUE
DESIGN DEVELOPMENT

SHEET TITLE
GRADING PLAN

SHEET NO.
L2.02



2 SECTION AA'
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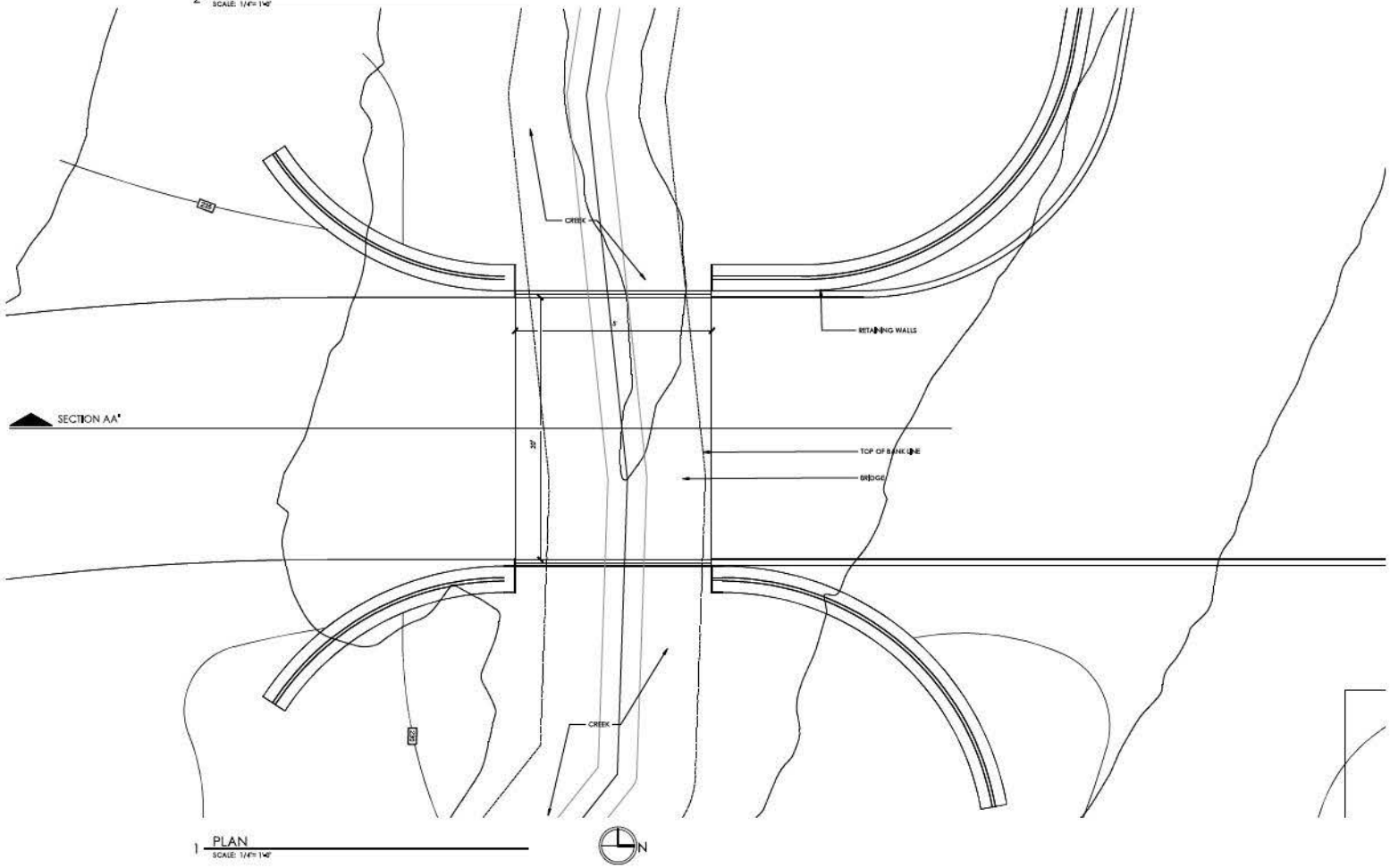

1 PLAN
SCALE: 1/4"= 1'-0"

FOR PRICING AND REVIEW ONLY- NOT FOR CONSTRUCTION

Sovi Scapes
801, Lake carolyn Parkway,
2100, Irving,
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DETAILS
SHEET NO.
L5.01

APPENDIX 3
BIOLOGICAL SPECIES TABLES AND IPaC INFORMATION

TABLE 1. VASCULAR PLANT SPECIES OBSERVED IN THE STUDY SITE DURING 2023 PLANT SURVEYS	
Scientific Name	**Common Name**
Anagalus arvensis	Scarlet pimpernel
Anthemis cotula	Mayweed
Avena barbata	Slender oat
Avena fatua	Wild oat
Brassica nigra	Black mustard
Bromus diandrus	Ripgut brome
Bromus hordeaceus	Soft chess
Centromadia pungens	Common tarweed
Cichorium intybus	Chicory
Cirsium occidentale	Western thistle
Cirsium vulgare	Bull thistle
Convolvulus arv Eucalyptus globulus ensi,	Field bindweed
Cyperus eragostis	Tall flatsedge
Eleocharis palustris	Common spikerush
Elymus glaucus	Blue wildrye
Erodium botrys	Broad-leaf filaree
Eschscholzia californica	California poppy
Festuca californica	California fescue
Festuca perennis	Perennial ryegrass
Foeniculum vulgare	Fennel
Galium aparine	Common bedstraw
Geranium dissectum	Wild geranium
Helminthotheca echioides	Bristly ox-tongue
Hemizonia congesta	Hayfield tarweed
Hordeum brachyantherum	Meadow barley
Hordeum marinum ssp. gussoneanum	Mediterranean barley
Hordeum murinum	Foxtail barley
Hypochaeris glabra	Smooth cats ear
Juncus tenuis	Slender rush
Lactuca serriola	Prickly lettuce
Lemna minor	Smaller duckweed
Lepidium draba	Whitetop
Lotus corniculatus	Bird’s foot trefoil
Mentha pulegium	Pennyroyal
Phalaris aquatica	Harding grass
Plantago lanceolata	English plantain
Poa pratensis	Kentucky blue grass
Polygonum aviculare	Prostrate knotweed
Polypogon monspeliensis	Rabbitsfoot grass

TABLE 1. VASCULAR PLANT SPECIES OBSERVED IN THE STUDY SITE DURING 2023 PLANT SURVEYS	
Scientific Name	**Common Name**
Populus fremontii	Fremont cottonwood
Quercus agrifolia	Coast live oak
Quercus lobata	Valley oak
Ranunculus californicus	California buttercup
Ranunculus muricatus	Spiny buttercup
Raphanus sativus	Wild radish
Rubus ursinus	California Blackberry
Rumex crispus	Curly dock
Sagittaria brevirostra	Shortbeak arrowhead
Salix lasiolepis	Arroyo willow
Schoenoplectus acutus	Hardstem bulrush
Taraxicum officinale	Dandelion
Trifolium hirtum	Rose clover
Typha latifolia	Broadleaf cattail
Taxonomic Source: Jepson Flora Project (eds.) 2023. Jepson eFlora, https://ucjeps.berkeley.edu/eflora/ [accessed on Nov 27, 2023].	

Table 2. Special Status Plants Known to Occur in the Vicinity of the Project Site, Sonoma County, California

Species		Status			General Habitat	Micro Habitat	Potential For Occurance	Recommended Action
SciName	ComName	Federal	State	CNPS				
Allium peninsulare var. franciscanum	Franciscan onion	None	None	1B.2	Cismontane woodland, valley and foothill	Clay soils; often on serpentine; sometimes on volcanics. Dry	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Amorpha californica var. napensis	Napa false indigo	None	None	1B.2	Broadleafed upland forest, chaparral, cismontane	Openings in forest or woodland or in chaparral. 30-735 m	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Amsinckia lunaris	bent-flowered fiddleneck	None	None	1B.2	Cismontane woodland, valley and foothill grassland, coastal bluff scrub.	Gravelly slopes, grassland, openings in woodland, often serpentine. 3-795 m.	**Unlikely**: Foohill grassland. Lacks serpentine soils. Not found during plant surveys conducted 08/25/23 and 09/21/23. Approximate north half of site had been burned over.	No action necessary
Astragalus tener var. tener	alkali milk-vetch	None	None	1B.2	Alkali playa, valley and foothill grassland, vernal pools.	Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 0-170 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Blennosperma bakeri	Sonoma sunshine	Endangered	Endangered	1B.1	Vernal pools, valley and foothill grassland.	Vernal pools and swales. 10-290 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Ceanothus masonii	Mason's ceanothus	None	Rare	1B.2	Chaparral.	Serpentine ridges or slopes in chaparral or transition zone. 180-460 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Centromadia parryi ssp. parryi	pappose tarplant	None	None	1B.2	Chaparral, coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland.	Vernally mesic, often alkaline sites. 1-500 m.	**Unlikely**. Foohill grassland. Lacks alkaline soils. Not found during plant surveys conducted 08/25/23 and 09/21/23. Approximate north half of site had been burned over.	No action necessary
Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak	None	None	1B.2	Coastal salt marsh.	Usually in coastal salt marsh with Salicornia, Distichlis, Jaumea, Spartina, etc. 0-115 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Chloropyron molle ssp. molle	soft salty bird's-beak	Endangered	Rare	1B.2	Coastal salt marsh.	In coastal salt marsh with Distichlis, Salicornia, Frankenia,	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Chorizanthe valida	Sonoma spineflower	Endangered	Endangered	1B.1	Coastal prairie.	Sandy soil. 5-50 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Delphinium bakeri	Baker's larkspur	Endangered	Endangered	1B.1	Broadleafed upland forest, coastal scrub, valley and foothill grassland.	Only site occurs on NW-facing slope, on decomposed shale. Historically known from grassy areas along fencelines too.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Delphinium luteum	golden larkspur	Endangered	Rare	1B.1	Chaparral, coastal prairie, coastal scrub.	North-facing rocky slopes. 5-100 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Downingia pusilla	dwarf downingia	None	None	2B.2	Valley and foothill grassland (mesic sites), vernal	Vernal lake and pool margins with a variety of associates. In	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Entosthodon kochii	Koch's cord moss	None	None	1B.3	Cismontane woodland.	Moss growing on soil on river banks. 185-365 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Eriogonum luteolum var. caninum	Tiburon buckwheat	None	None	1B.2	Chaparral, valley and foothill grassland, cismontane woodland, coastal prairie.	Serpentine soils; sandy to gravaelly sites. 60-640 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Fritillaria lanceolata var. tristulis	Marin checker lily	None	None	1B.1	Coastal bluff scrub, coastal scrub, coastal prairie.	Occurrences reported from canyons and riparian areas as well as rock outcrops; often on serpentine. 5-305 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Fritillaria liliacea	fragrant fritillary	None	None	1B.2	Coastal scrub, valley and foothill grassland, coastal prairie, cismontane woodland.	Often on serpentine; various soils reported though usually on clay, in grassland. 3-385 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Gilia capitata ssp. tomentosa	woolly-headed gilia	None	None	1B.1	Coastal bluff scrub, valley and foothill grassland,	Rocky outcrops, sometimes serpentine. 6-290 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	None	None	1B.2	Valley and foothill grassland.	Grassy valleys and hills, often in fallow fields; sometimes along roadsides. 5-520 m.	**High Potential**: Foohill grassland. Lacks fallow fields. Grasslands dominated by dense non-native grass growth. Not found during plant surveys conducted 08/25/23 and 09/21/23. Approximate north half of site had been burned over.	Preconstruction survey recommended during flowering period in disturbed areas and proposed project areas where ground disturbing activities will occur. Blooms April thru November.
Hesperolinon congestum	Marin western flax	Threatened	Threatened	1B.1	Chaparral, valley and foothill grassland.	In serpentine barrens and in serpentine grassland and chaparral. 60-400 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Lasthenia conjugens	Contra Costa goldfields	Endangered	None	1B.1	Valley and foothill grassland, vernal pools, alkaline playas, cismontane woodland.	Vernal pools, swales, low depressions, in open grassy areas. 1-450 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	Endangered	Endangered	1B.1	Cismontane woodland, meadows and seeps,	Saturated, sandy soils with grasses and shrubs. 45-65 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Microseris paludosa	Marsh microseris	None	None	1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland.	Moist grassland, open woodland. 3-610 m.	**Moderate Potential.** Foothill grassland. Man made pond area with adjacent adjacent moist grassland. Not found during plant surveys conducted 08/25/23 and 09/21/23. Approximate north half of site had been burned. Pond area with moist grassland not burned.	No action necessary. Proposed project avoids potential habitat. However, if project changes and there are potential impacts to pond and wetland fringe preconstruction surveys recommended. Blooms April thru June.
Navarretia leucocephala ssp. bakeri	Baker's navarretia	None	None	1B.1	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane	Vernal pools and swales; adobe or alkaline soils. 3-1680 m.	**No Potential.** Lacks soil conditions known as potential for this species.	No action necessary
Plagiobothrys mollis var. vestitus	Petaluma popcornflower	None	None	1A	Valley and foothill grassland, marshes and swamps.	Wet sites in grassland, possibly coastal marsh margins. 10-50 m.	**Moderate Potential.** Presumed extinct. Last observed 1880. Foothill grassland w/ man made pond with adjacent adjacent moist grassland. Not found during plant surveys conducted 08/25/23 and 09/21/23. Approximate north half of Project Site had been burned. Pond area with moist grassland not burned.	No action necessary. Proposed project avoids potential habitat. However, if project changes and there are potential impacts to pond and wetland fringe preconstruction surveys recommended. Blooms June thru July.
Pleuropogon hooverianus	North Coast semaphore grass	None	Threatened	1B.1	Broadleafed upland forest, meadows and seeps, north coast coniferous forest.	Wet grassy, usually shady areas, sometimes freshwater marsh; associated with forest environments. 45-1160 m.	**Moderate Potential.** Man made pond with emerget wetland edge and adjacent wet grasses. Not found during plant surveys conducted 08/25/23 and 09/21/23. Approximate north half of Project Site had been burned. Pond area not burned.	No action necessary. Proposed project avoids potential habitat. However, if project changes and there are potential impacts to pond and wetland fringe preconstruction surveys recommended. Blooms April thru June.

Table 2. Special Status Plants Known to Occur in the Vicinity of the Project Site, Sonoma County, California

Species		Status			General Habitat	Micro Habitat	Potential For Occurance	Recommended Action
SciName	ComName	Federal	State	CNPS				
Polygonum marinense	Marin knotweed	None	None	3.1	Marshes and swamps.	Coastal salt marshes and brackish marshes. 0-10 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	Proposed project avoids potential habitat. However, if project changes and there are potential impacts to pond and wetland fringe preconstruction surveys recommended. Blooms April thru June.
Sagittaria sanfordii	Sanford's arrowhead	None	None	1B.2	Marshes and swamps.	In standing or slow-moving freshwater ponds, marshes, and ditches. 0-605 m.	**Moderate Potential.** Man made pond. Not found during plant surveys conducted 08/25/23 and 09/21/23. Approximate north half of Project Site had been burned. Pond area not burned.	No action necessary. Proposed project avoids potential habitat. However, if project changes and there are potential impacts to pond and wetland fringe preconstruction surveys recommended. Blooms May thru October.
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	None	None	1B.2	Marshes and swamps.	Freshwater marshes near the coast.5-95 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Streptanthus anomalus	Mount Burdell jewelflower	None	None	1B.1	Cismontane woodland.	Grassy openings, serpentinite. 50-150 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Streptanthus glandulosus ssp. pulchellus	Mt. Tamalpais bristly jewelflower	None	None	1B.2	Chaparral, valley and foothill grassland.	Serpentine slopes. 125-670 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Trifolium amoenum	two-fork clover	Endangered	None	1B.1	Valley and foothill grassland, coastal bluff scrub.	Moist, heavy soils, disturbed areas. Sometimes on serpentine soil, open sunny sites, swales. Most recently cited on roadside and eroding cliff face. 5-310 m.	**High Potential.** Wetland and wet grassland areas adjacent to man made pond aqrea. Not found during plant surveys conducted 08/25/23 and 09/21/23. Approximate north half of Project Site had been burned. Pond area not burned.	Proposed project avoids moist soil habitat. Preconstruction survey recommended during flowering period in disturbed areas and proposed project areas where ground disturbing activities will occur. Recommend spring survey in disturbed areas. Blooms May thru October.
Trifolium buckwestiorum	Santa Cruz clover	None	None	1B.1	Coastal prairie, broadleafed upland forest,	Moist grassland. Gravelly margins. 30-805 m.	**No Potential.** Lacks conditions known as potential habitat for this species.	No action necessary
Trifolium polyodon	Pacific Grove clover	None	Rare	1B.1	Closed-cone coniferous forest, meadows and seeps, coastal prairie, valley and foothill grassland.	Along small springs and seeps in grassy openings. 5-260 m.	**No Potential.** Lacks conditions known as potential habitat for this species. No springs or seeps. Seeps may have hostorically occurred but dried up due to installation of shallow wells adjacent to potential seep areas.	No action necessary

Determination of Occurrence Potential. Following the desktop review and field surveys, HBG assessed the potential for the occurrence of special status species on the Project site. Biological conditions (vegetation communities, wildlife habitats, disturbances, etc.) and the habitat and life cycle requirements of special status species identified for analysis in the desktop review were considered. "Recent" occurrences are defined as observed within the past 30 years. Based on these considerations, species were assigned to the following categories:

No Potential: Habitat on and adjacent to the site is clearly unpotential for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely: Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unpotential or of very poor quality. The species is not likely to be found on the site.

Moderate Potential: Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unpotential. The species has a moderate probability of being found on the site.

High Potential: All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly potential. The species has a high probability of being found on the site.

Present: Species is observed on the site or has been recorded (i.e., CNDDB, other reports) on the site recently.

NOTE: The potential for bird species were further distinguished into those that may: 1) nest within or near the Project site; 2) forage within or near the Project site; and/or 3) occur on or near the Project site only as transients during migratory flights or other dispersal events.

1. Source: *California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Wildlife for the Mountain View7.5 Minute Quadrangle Map and surrounding areas, information dated May 2023.*

2. California Rare Plant Ranks

1A - Presumed extirpated in California and either rare or extinct elsewhere

1B - Rare or Endangered in California and elsewhere

2A - Presumed extirpated in California, but more common elsewhere

2B - Rare or Endangered in California, but more common elsewhere

3 - Plants for which we need more information – Review list

4 - Plants of limited distribution – Watch list

3. Threat Code Extensions:

.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2 – Moderately threatened in California (20-80% of occurrences threatened / moderate degree and immediacy of threat)

.3 – Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Table 3. Special Status Animal Species that have been Reported in the Vicinity of the Project Site, Sonoma County, California

Species		Status						
SciName	ComName	FedList	CalList	Other State/Federal Status	General Habitat	Micro Habitat	Potential For Occurance	Recommended Action
Ambystoma californiense pop. 3	California tiger salamander - Sonoma County DPS	Endangered	Threatened	CDFW_WL-Watch List | IUCN_VU-Vulnerable	Lives in vacant or mammal-occupied burrows throughout most of the year; in grassland, savanna, or open woodland habitats.	Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	**Unlikely.** Outside of known range. Closest documented CTS occurance is approximately 2.2 miles from the site. Low numbers of fossorial animal burrows found. Lacks evidence of ground squirrel burrows. CTS data in Sonoma County indicate breeding ponds can be no more that 1.4 miles to support CTS breeding population.	No action necessary
Dicamptodon ensatus	California giant salamander	None	None	CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened	Known from wet coastal forests near streams and seeps from Mendocino County south to Monterey County, and east to Napa County.	Aquatic larvae found in cold, clear streams, occasionally in lakes and ponds. Adults known from wet forests under rocks and logs near streams and lakes.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Rana boylii pop. 1	foothill yellow-legged frog - north coast DPS	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Northern Coast Ranges north of San Francisco Bay Estuary, Klamath Mountains, and Cascade Range including watershed subbasins (HU 8) Lower Pit, Battle Creek, Thomes Creek, and Big Chico Creek in Lassen, Shasta, Tehama, and Butte Counties.	Partly shaded shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying and at least 15 weeks to attain metamorphosis.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Rana draytonii	California red-legged frog	Threatened	None	CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation.	Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	**High Potential.** Documented breeding site located in ponds found 350 feet from the project site in the same watershed. Suitable breeding habitat in onsite pond and suitable upland dispersal habitat in onsite grasslands. Adjacent foothill grasslands provide aestivation habitat. Not observed during 08/25/23 and 09/21/23wildlife surveys.	Mitigation program recommended that includes preconstruction surveys, environmentlal training of construction wrokers, use of biological monitors, post-construction avoidance measures, and other recommendations. .
Taricha rivularis	red-bellied newt	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Coastal drainages from Humboldt County south to Sonoma County, inland to Lake County. Isolated population of uncertain origin in Santa Clara County.	Lives in terrestrial habitats, juveniles generally underground, adults active at surface in moist environments. Will migrate over 1 km to breed, typically in streams with moderate flow and clean, rocky substrate.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Calicina diminua	Marin blind harvestman	None	None		Known only from the type locality, Mount Burdell, Novato, Marin County. Known only from the type series.	Serpentine endemic.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Talanites ubicki	Ubick's gnaphosid spider	None	None		Known only from the type locality, Mount Burdell, Novato, Marin County.	Serpentine endemic.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Agelaius tricolor	tricolored blackbird	None	Threatened	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_EN-Endangered | USFWS_BCC-Birds of Conservation Concern	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California.	Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	**Present.** Birds of this species were observed during 08/25/23 and 09/21/23 wildlife surveys. Suitable habitat for a breeding colony is present.	Preconstruction survey recommended.
Aquila chrysaetos	golden eagle	None	None	BLM_S-Sensitive | CDF_S-Sensitive | CDFW_FP-Fully Protected | CDFW_WL-Watch List | IUCN_LC-Least Concern	Rolling foothills, mountain areas, sage-juniper flats, and desert.	Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Athene cunicularia	burrowing owl	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	**Moderate Potential**. Suitable habitat could be present with future occupation by California ground squirrels.	Preconstruction survey recommended.
Buteo regalis	ferruginous hawk	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats.	Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary.
Buteo swainsoni	Swainson's hawk	None	Threatened	BLM_S-Sensitive | IUCN_LC-Least Concern	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees.	Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	**No Potential.** Lacks conditions known as suitable habitat for this species. Project Site is outside of the known breeding range of this species.	Pre-Construction survey recommended.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Threatened	Endangered	BLM_S-Sensitive | USFS_S-Sensitive	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Elanus leucurus	white-tailed kite	None	None	BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_LC-Least Concern	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	**Moderate Potential.** Trees on and adjacent to site are suitable for nesting . Potential for area to be used as an episodic foraging site.	Preconstruction survey recommended.
Eremophila alpestris actia	California horned lark	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills.	Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Geothlypis trichas sinuosa	saltmarsh common yellowthroat	None	None	CDFW_SSC-Species of Special Concern | USFWS_BCC-Birds of Conservation Concern	Resident of the San Francisco Bay region, in fresh and salt water marshes.	Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Laterallus jamaicensis coturniculus	California black rail	None	Threatened	BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_EN-Endangered	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays.	Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Melospiza melodia samuelis	San Pablo song sparrow	None	None	CDFW_SSC-Species of Special Concern | USFWS_BCC-Birds of Conservation Concern	Resident of salt marshes along the north side of San Francisco and San Pablo bays.	Inhabits tidal sloughs in the Salicornia marshes; nests in Grindelia bordering slough channels.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Rallus obsoletus obsoletus	California Ridgway's rail	Endangered	Endangered	CDFW_FP-Fully Protected	Salt water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay.	Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Riparia riparia	bank swallow	None	Threatened	BLM_S-Sensitive | IUCN_LC-Least Concern	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Acipenser medirostris pop. 1	green sturgeon - southern DPS	Threatened	None	AFS_VU-Vulnerable | IUCN_EN-Endangered	Spawning site fidelity. Spawns in the Sacramento, Feather and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. Delta Estuary is important for rearing juveniles.	Spawning occurs primarily in cool (11-15 C) sections of mainstem rivers in deep pools (8-9 meters) with substrate containing small to medium sized sand, gravel, cobble, or boulder.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Eucyclogobius newberryi	tidewater goby	Endangered	None	AFS_EN-Endangered | IUCN_NT-Near Threatened	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Hesperoleucus venustus subditus	southern coastal roach	None	None	CDFW_SSC-Species of Special Concern	Found in the drainages of Tomales Bay and northern San Francisco Bay in the north, and drainages of Monterey Bay in the south.		**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Oncorhynchus mykiss irideus pop. 8	steelhead - central California coast DPS	Threatened	None	AFS_TH-Threatened	DPS includes all naturally spawned populations of steelhead (and their progeny) in streams from the Russian River to Aptos Creek, Santa Cruz County, California (inclusive). Also includes the drainages of San Francisco and San Pablo Bays.		**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Pogonichthys macrolepidotus	Sacramento splittail	None	None	AFS_VU-Vulnerable | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay and associated marshes.	Slow moving river sections, dead end sloughs. Requires flooded vegetation for spawning and foraging for young.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Northern Vernal Pool	Northern Vernal Pool	None	None				**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary

Table 3. Special Status Animal Species that have been Reported in the Vicinity of the Project Site, Sonoma County, California

Species		Status						
SciName	ComName	FedList	CalList	Other State/Federal Status	General Habitat	Micro Habitat	Potential For Occurance	Recommended Action
Adela oplerella	Opler's longhorn moth	None	None		From Marin County and the Oakland area on the inner coast ranges south to Santa Clara County. One record from Santa Cruz County.	All but Santa Cruz site is on serpentine grassland. Larvae feed on Platystemon californicus.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Andrena blennospermatis	Blennosperma vernal pool andrenid bee	None	None		This bee is oligolectic on vernal pool Blennosperma.	Bees nest in the uplands around vernal pools.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Bombus occidentalis	western bumble bee	None	Candidate Endangered	IUCN_VU-Vulnerable | USFS_S-Sensitive	Once common and widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease.	This widespread and once common species could occur almost anywhere in the general area of the site and is included in the CNDDB due to a general decline in bee populations in recent years. The western bumble bee has three basic habitat requirements: (1) suitable nesting sites for the colonies, (2) nectar and pollen from floral resources available throughout the duration of the colony period (spring, summer, and fall), and (3) suitable overwintering sites for the queens. Nests occur primarily in underground cavities such as old squirrel or other animal nests and in open west-southwest slopes bordered by trees, although a few nests have been reported from above-ground locations such as in logs among railroad ties. (Jepson et al. 2014)	**Moderate Potential.** Some plant species present know to be used for nectar. Potential for area to be used as an episodic foraging site.	Preconstruction survey recommended.
Speyeria zerene sonomensis	Sonoma zerene fritillary	None	None		Restricted to low elevation grasslands of the Sonoma Mountains. This subspecies apparently flies from mid May to early July, with a peak flight period in early to mid June.	Essential component of the Speyeria zerene habitat is the blue violet, or Viola adunca; it is used for the food and shelter of the early stages of a larva's life.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Antrozous pallidus	pallid bat	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	**Moderate Potential.** Structures or trees could accommodate a bat roost.	Preconstruction survey recommended.
Corynorhinus townsendii	Townsend's big-eared bat	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	**Moderate Potential.** Structures could accommodate a bat roost.	Preconstruction survey recommended.
Erethizon dorsatum	North American porcupine	None	None	IUCN_LC-Least Concern	Forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges.	Wide variety of coniferous and mixed woodland habitat.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Lasiurus cinereus	hoary bat	None	None	IUCN_LC-Least Concern	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding.	Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**Moderate Potential.** Trees could accommodate a bat roost.	Prrconstruction survey recommended.
Reithrodontomys raviventris	salt-marsh harvest mouse	Endangered	Endangered	CDFW_FP-Fully Protected | IUCN_EN-Endangered	Only in the saline emergent wetlands of San Francisco Bay and its tributaries.	Pickleweed is primary habitat, but may occur in other marsh vegetation types and in adjacent upland areas. Does not burrow; builds loosely organized nests. Requires higher areas for flood escape.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Taxidea taxus	American badger	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**Moderate Potential.** Grasslands on the site provide suitable habittat for this species.	Preconstruction survey recommended.
Coastal Brackish Marsh	Coastal Brackish Marsh	None	None				**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	None	None				**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Tryonia imitator	mimic tryonia (=California brackishwater snail)	None	None	IUCN_DD-Data Deficient	Inhabits coastal lagoons, estuaries and salt marshes, from Sonoma County south to San Diego County.	Found only in permanently submerged areas in a variety of sediment types; able to withstand a wide range of salinities.	**No Potential.** Lacks conditions known as suitable habitat for this species.	No action necessary
Emys marmorata	western pond turtle	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	**Present.** Observed basking on woody debris in pond during during 08/25/23 and 09/21/23 wildlife surveys.	Preconstruction survey recommended. Mitigation to include post construction avoidance measures Worker environmental awarness education.

Determination of Occurrence Potential. Following the desktop review and field surveys, HBG assessed the potential for the occurrence of special status species on the Project site. Biological conditions (vegetation communities, wildlife habitats, disturbances, etc.) and the habitat and life cycle requirements of special status species identified for analysis in the desktop review were considered. "Recent" occurrences are defined as observed within the past 30 years. Based on these considerations, species were assigned to the following categories:

No Potential: Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
Unlikely: Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
Moderate Potential: Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
High Potential: All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
Present: Species is observed on the site or has been recorded (i.e., CNDDB, other reports) on the site recently.
NOTE: The potential for bird species were further distinguished into those that may: 1) nest within or near the Project site; 2) forage within or near the Project site; and/or 3) occur on or near the Project site only as transients during migratory flights or other dispersal events.
1. Source: California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Wildlife for the Mountain View7.5 Minute Quadrangle Map and surrounding areas, information dated May 2023.
2. Status Codes:

Federal	State
FE = Federally listed Endangered	SE = California State-listed Endangered
FT = Federally listed Threatened	ST = California State-listed Threatened
FPE = Federally Proposed Endangered	SR = California State Rare
FPT = Federally Proposed Threatened	SCE = California State Candidate Endangered
FC = Federal Candidate Species	SCT = California State Candidate Threatened
BCC = USFWS Bird Species of Conservation Concern	CFP = California Fully Protected
	SSC = CDFW Species of Special Concern
	WL = CDFW Watch List Species

Project Site

- Review Area
- 1 Mile Buffer
- 1.5 Mile Buffer
- 5 Mile Buffer
- 10 Mile Buffer
- USGS 7.5' Quadrangle

CNDDB Elements

- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Plant (circular)
- Animal (80m)
- Animal (specific)
- Animal (non-specific)
- Animal (circular)
- Terrestrial Comm. (specific)
- Terrestrial Comm. (circular)
- Multiple (80m)
- Multiple (specific)
- Multiple (non-specific)
- Multiple (circular)
- Sensitive EO's (Commercial only)

Plants

1	*Allium peninsulare var. franciscanum*	Franciscan onion
2	*Amorpha californica var. napensis*	Napa false indigo
3	*Amsinckia lunaris*	bent-flowered fiddleneck
4	*Astragalus tener var. tener*	alkali milk-vetch
5	*Blennosperma bakeri*	Sonoma sunshine
6	*Ceanothus masonii*	Mason's ceanothus
7	*Centromadia parryi ssp. parryi*	pappose tarplant
8	*Chloropyron maritimum ssp. palustre*	Point Reyes salty bird's-beak
9	*Chloropyron molle ssp. molle*	soft salty bird's-beak
10	*Chorizanthe valida*	Sonoma spineflower
11	*Delphinium bakeri*	Baker's larkspur
12	*Delphinium luteum*	golden larkspur
13	*Downingia pusilla*	dwarf downingia
14	*Entosthodon kochii*	Koch's cord moss
15	*Eriogonum luteolum var. caninum*	Tiburon buckwheat
16	*Fritillaria lanceolata var. tristulis*	Marin checker lily
17	*Fritillaria liliacea*	fragrant fritillary
18	*Gilia capitata ssp. tomentosa*	woolly-headed gilia
19	*Hemizonia congesta ssp. congesta*	congested-headed hayfield tarplant
20	*Hesperolinon congestum*	Marin western flax
21	*Lasthenia conjugens*	Contra Costa goldfields
22	*Lilium pardalinum ssp. pitkinense*	Pitkin Marsh lily
23	*Microseris paludosa*	marsh microseris
24	*Navarretia leucocephala ssp. bakeri*	Baker's navarretia
25	*Plagiobothrys mollis var. vestitus*	Petaluma popcornflower
26	*Pleuropogon hooverianus*	North Coast semaphore grass
27	*Polygonum marinense*	Marin knotweed
28	*Sagittaria sanfordii*	Sanford's arrowhead
29	*Sidalcea calycosa ssp. rhizomata*	Point Reyes checkerbloom
30	*Streptanthus anomalus*	Mount Burdell jewelflower
31	*Streptanthus glandulosus ssp. pulchellus*	Mt. Tamalpais bristly jewelflower
32	*Trifolium amoenum*	two-fork clover
33	*Trifolium buckwestiorum*	Santa Cruz clover
34	*Trifolium polyodon*	Pacific Grove clover

Amphibians

35	*Ambystoma californiense pop. 3*	California tiger salamander - Sonoma County DPS
36	*Dicamptodon ensatus*	California giant salamander
37	*Rana boylii pop. 1*	foothill yellow-legged frog - north coast DPS
38	*Rana draytonii*	California red-legged frog
39	*Taricha rivularis*	red-bellied newt

Arachnids

40	*Calicina diminua*	Marin blind harvestman
41	*Talanites ubicki*	Ubick's gnaphosid spider

Birds

42	*Agelaius tricolor*	tricolored blackbird
43	*Aquila chrysaetos*	golden eagle
44	*Ardea herodias*	great blue heron
45	*Athene cunicularia*	burrowing owl
46	*Buteo regalis*	ferruginous hawk
47	*Buteo swainsoni*	Swainson's hawk
48	*Coccyzus americanus occidentalis*	western yellow-billed cuckoo
49	*Elanus leucurus*	white-tailed kite
50	*Eremophila alpestris actia*	California horned lark
51	*Geothlypis trichas sinuosa*	saltmarsh common yellowthroat
52	*Laterallus jamaicensis coturniculus*	California black rail
53	*Melospiza melodia samuelis*	San Pablo song sparrow
54	*Rallus obsoletus obsoletus*	California Ridgway's rail
55	*Riparia riparia*	bank swallow

Fish

56	*Acipenser medirostris pop. 1*	green sturgeon - southern DPS
57	*Eucyclogobius newberryi*	tidewater goby
58	*Hesperoleucus venustus subditus*	southern coastal roach
59	*Oncorhynchus mykiss irideus pop. 8*	steelhead - central California coast DPS
60	*Pogonichthys macrolepidotus*	Sacramento splittail

Herbaceous

61	*Northern Vernal Pool*	Northern Vernal Pool

Insects

62	*Adela oplerella*	Opler's longhorn moth
63	*Andrena blennospermatis*	Blennosperma vernal pool andrenid bee
64	*Bombus occidentalis*	western bumble bee
65	*Speyeria zerene sonomensis*	Sonoma zerene fritillary

Mammals

66	*Antrozous pallidus*	pallid bat
67	*Corynorhinus townsendii*	Townsend's big-eared bat
68	*Erethizon dorsatum*	North American porcupine
69	*Lasiurus cinereus*	hoary bat
70	*Reithrodontomys raviventris*	salt-marsh harvest mouse
71	*Taxidea taxus*	American badger

Marsh

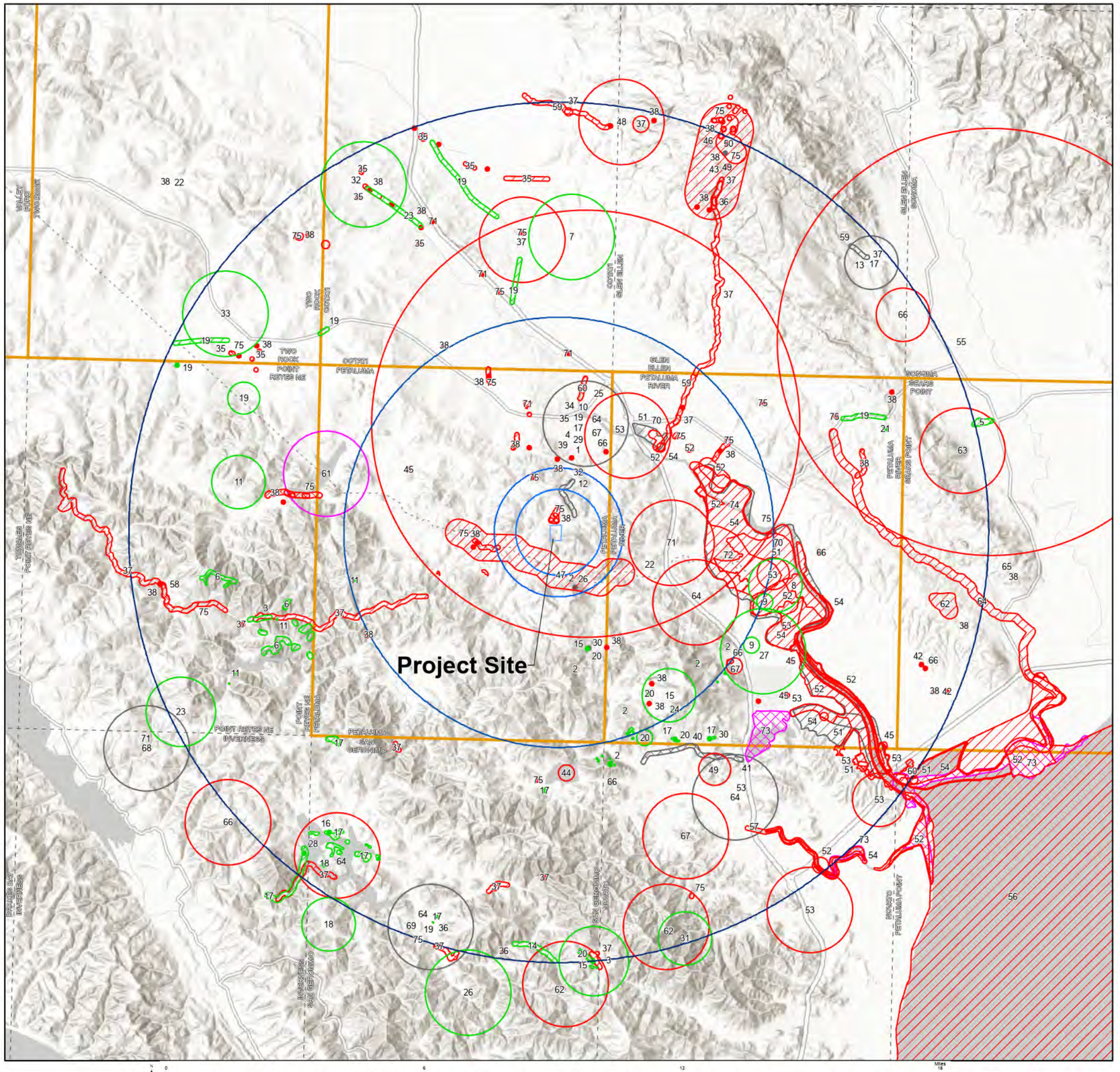
72	*Coastal Brackish Marsh*	Coastal Brackish Marsh
73	*Northern Coastal Salt Marsh*	Northern Coastal Salt Marsh

Mollusks

74	*Tryonia imitator*	mimic tryonia (=California brackishwater snail)

Reptiles

75	*Emys marmorata*	western pond turtle



D-Street CNDDB Elements Intersecting 10-Mile Radius: Plants, Animals, and Sensitive Natural Communities

4885 D-Street
Petaluma, Sonoma County, California

Project Data: Huffman Broadway Group; Plant, Animal & Community Data: CDFW CNDDB 9/5/2023; Basemap: Esri, NASA, NGA, USGS, County of Marin, County of Napa, California State Parks, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

Spatial Reference:
Name: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US
Scale: 1:150,000
Date Exported: 11/19/2023
GIS Analyst: Agie Gilmore
HBG PM: Terry Huffman, PhD

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Project Site
- Review Area
- 1 Mile Buffer
- 1.5 Mile Buffer
- 5 Mile Buffer
- 10 Mile Buffer
- USGS 7.5' Quadrangle

Plant
Rare Plant Rank
- 1A
- 1B.1
- 1B.2
- 1B.3
- 2B.2
- 3.1

Federal Status, California Status
- Endangered,Endangered
- Endangered,Rare
- Endangered,None
- Threatened,Threatened
- None,Threatened
- None,Rare
- None,None

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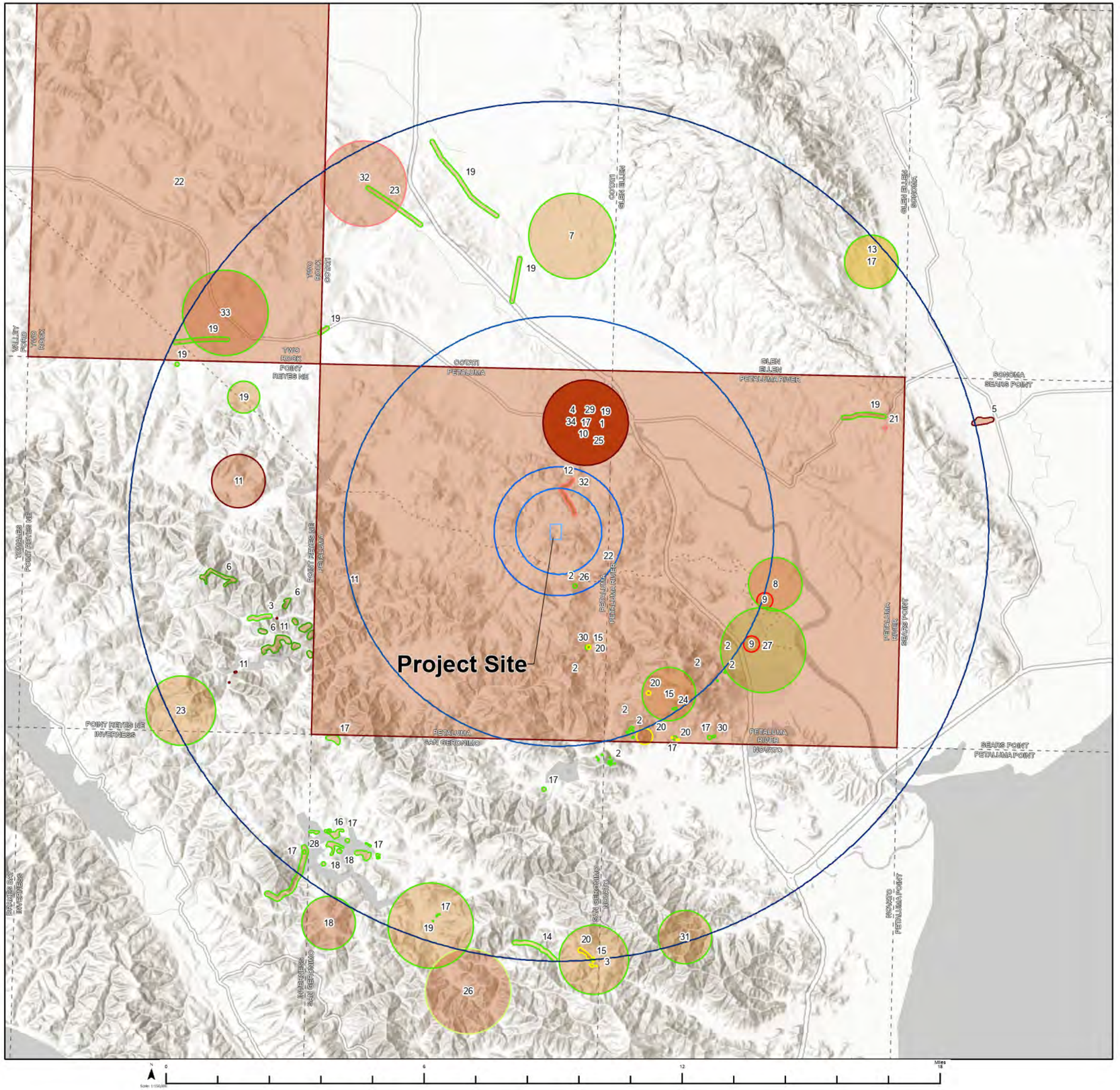

D-Street CNDDB Elements Intersecting 10-Mile Radius: Plants

4885 D-Street
Petaluma, Sonoma County, California

Project Data: Huffman Broadway Group; Plant, Animal & Community Data: CDFW CNDDB 9/5/2023; Basemap: Esri, NASA, NGA, USGS, County of Marin, County of Napa, California State Parks, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

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Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Project Site

- Review Area
- 1 Mile Buffer
- 1.5 Mile Buffer
- 5 Mile Buffer
- 10 Mile Buffer
- USGS 7.5' Quadrangle

Animal

FED List

- Endangered
- Threatened
- None

CAL List

- Endangered
- Candidate Endangered
- Threatened
- None

Plants

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17	*Fritillaria liliacea*	fragrant fritillary
18	*Gilia capitata ssp. tomentosa*	woolly-headed gilia
19	*Hemizonia congesta ssp. congesta*	congested-headed hayfield tarplant
20	*Hesperolinon congestum*	Marin western flax
21	*Lasthenia conjugens*	Contra Costa goldfields
22	*Lilium pardalinum ssp. pitkinense*	Pitkin Marsh lily
23	*Microseris paludosa*	marsh microseris
24	*Navarretia leucocephala ssp. bakeri*	Baker's navarretia
25	*Plagiobothrys mollis var. vestitus*	Petaluma popcornflower
26	*Pleuropogon hooverianus*	North Coast semaphore grass
27	*Polygonum marinense*	Marin knotweed
28	*Sagittaria sanfordii*	Sanford's arrowhead
29	*Sidalcea calycosa ssp. rhizomata*	Point Reyes checkerbloom
30	*Streptanthus anomalus*	Mount Burdell jewelflower
31	*Streptanthus glandulosus ssp. pulchellus*	Mt. Tamalpais bristly jewelflower
32	*Trifolium amoenum*	two-fork clover
33	*Trifolium buckwestiorum*	Santa Cruz clover
34	*Trifolium polyodon*	Pacific Grove clover

Amphibians

35	*Ambystoma californiense pop. 3*	California tiger salamander - Sonoma County DPS
36	*Dicamptodon ensatus*	California giant salamander
37	*Rana boylii pop. 1*	foothill yellow-legged frog - north coast DPS
38	*Rana draytonii*	California red-legged frog
39	*Taricha rivularis*	red-bellied newt

Arachnids

40	*Calicina diminua*	Marin blind harvestman
41	*Talanites ubicki*	Ubick's gnaphosid spider

Birds

42	*Agelaius tricolor*	tricolored blackbird
43	*Aquila chrysaetos*	golden eagle
44	*Ardea herodias*	great blue heron
45	*Athene cunicularia*	burrowing owl
46	*Buteo regalis*	ferruginous hawk
47	*Buteo swainsoni*	Swainson's hawk
48	*Coccyzus americanus occidentalis*	western yellow-billed cuckoo
49	*Elanus leucurus*	white-tailed kite
50	*Eremophila alpestris actia*	California horned lark
51	*Geothlypis trichas sinuosa*	saltmarsh common yellowthroat
52	*Laterallus jamaicensis coturniculus*	California black rail
53	*Melospiza melodia samuelis*	San Pablo song sparrow
54	*Rallus obsoletus obsoletus*	California Ridgway's rail
55	*Riparia riparia*	bank swallow

Fish

56	*Acipenser medirostris pop. 1*	green sturgeon - southern DPS
57	*Eucyclogobius newberryi*	tidewater goby
58	*Hesperoleucus venustus subditus*	southern coastal roach
59	*Oncorhynchus mykiss irideus pop. 8*	steelhead - central California coast DPS
60	*Pogonichthys macrolepidotus*	Sacramento splittail

Herbaceous

61	*Northern Vernal Pool*	Northern Vernal Pool

Insects

62	*Adela oplerella*	Opler's longhorn moth
63	*Andrena blennospermatis*	Blennosperma vernal pool andrenid bee
64	*Bombus occidentalis*	western bumble bee
65	*Speyeria zerene sonomensis*	Sonoma zerene fritillary

Mammals

66	*Antrozous pallidus*	pallid bat
67	*Corynorhinus townsendii*	Townsend's big-eared bat
68	*Erethizon dorsatum*	North American porcupine
69	*Lasiurus cinereus*	hoary bat
70	*Reithrodontomys raviventris*	salt-marsh harvest mouse
71	*Taxidea taxus*	American badger

Marsh

72	*Coastal Brackish Marsh*	Coastal Brackish Marsh
73	*Northern Coastal Salt Marsh*	Northern Coastal Salt Marsh

Mollusks

74	*Tryonia imitator*	mimic tryonia (=California brackishwater snail)

Reptiles

75	*Emys marmorata*	western pond turtle

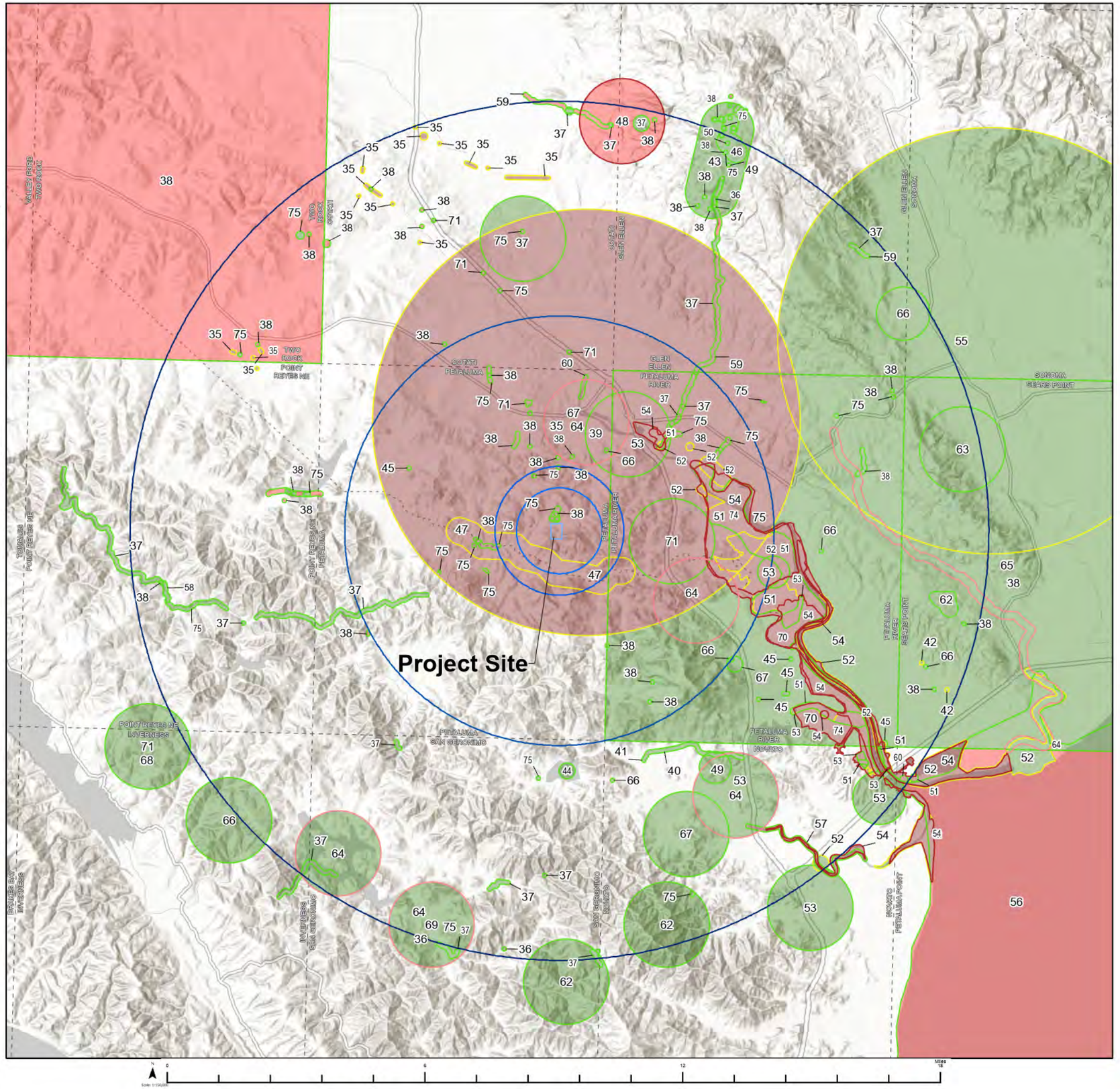
D-Street CNDDB Elements Intersecting 10-Mile Radius: Animals

4885 D-Street
Petaluma, Sonoma County, California

Project Data: Huffman Broadway Group; Plant, Animal & Community Data: CDFW CNDDB 9/5/2023; Basemap: Esri, NASA, NGA, USGS, County of Marin, County of Napa, California State Parks, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

Spatial Reference:
Name: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US
Scale: 1:150,000
Date Exported: 11/19/2023
GIS Analyst: Agie Gilmore
HBG PM: Terry Huffman, PhD

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS



Project Site

- Review Area
- 1 Mile Buffer
- 1.5 Mile Buffer
- 5 Mile Buffer
- 10 Mile Buffer
- USGS 7.5' Quadrangle

Sensitive Natural Communities

- Herbaceous
- Marsh

Plants

1	*Allium peninsulare var. franciscanum*	Franciscan onion
2	*Amorpha californica var. napensis*	Napa false indigo
3	*Amsinckia lunaris*	bent-flowered fiddleneck
4	*Astragalus tener var. tener*	alkali milk-vetch
5	*Blennosperma bakeri*	Sonoma sunshine
6	*Ceanothus masonii*	Mason's ceanothus
7	*Centromadia parryi ssp. parryi*	pappose tarplant
8	*Chloropyron maritimum ssp. palustre*	Point Reyes salty bird's-beak
9	*Chloropyron molle ssp. molle*	soft salty bird's-beak
10	*Chorizanthe valida*	Sonoma spineflower
11	*Delphinium bakeri*	Baker's larkspur
12	*Delphinium luteum*	golden larkspur
13	*Downingia pusilla*	dwarf downingia
14	*Entosthodon kochii*	Koch's cord moss
15	*Eriogonum luteolum var. caninum*	Tiburon buckwheat
16	*Fritillaria lanceolata var. tristulis*	Marin checker lily
17	*Fritillaria liliacea*	fragrant fritillary
18	*Gilia capitata ssp. tomentosa*	woolly-headed gilia
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Reptiles

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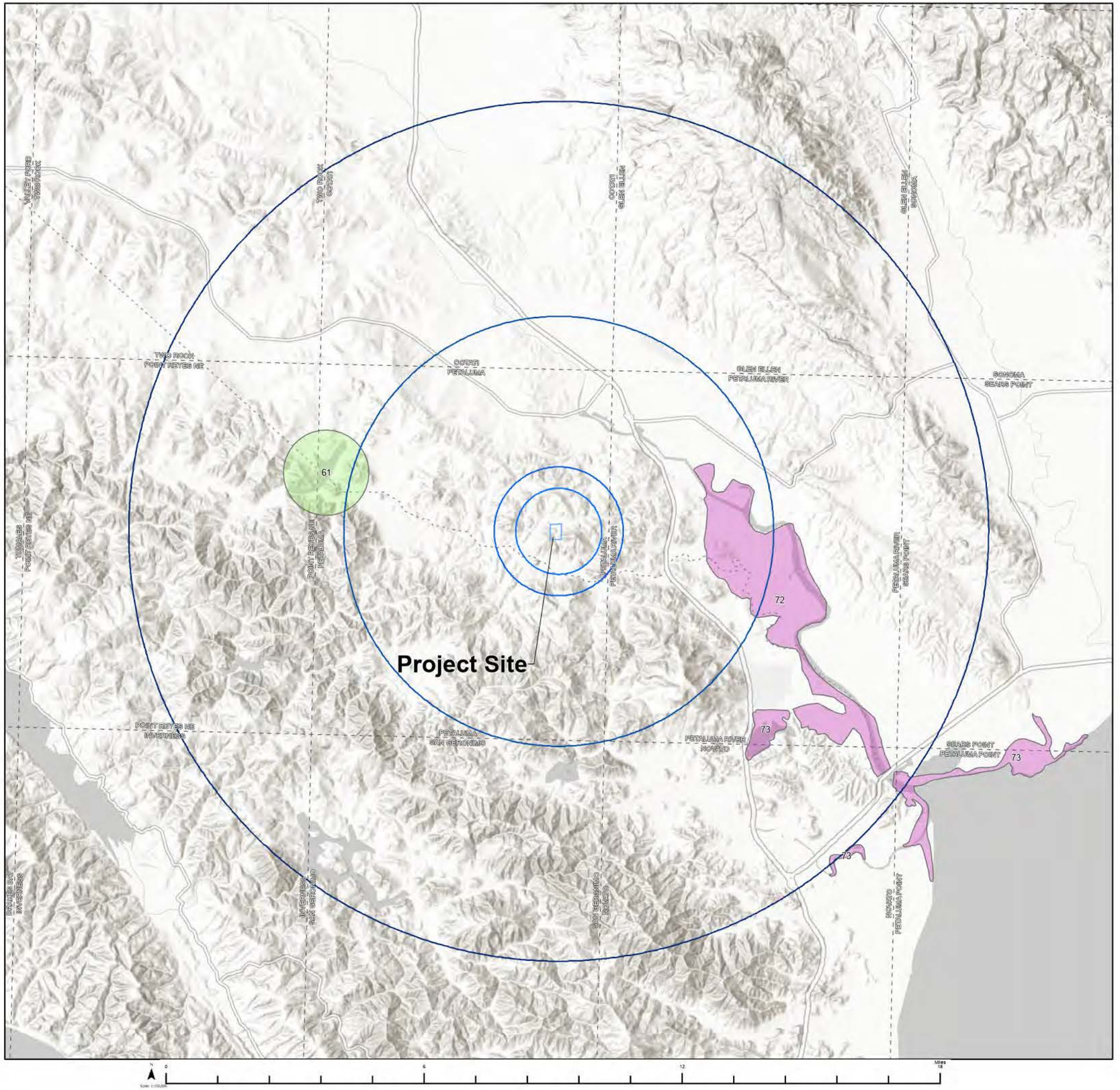

D-Street CNDDB Elements Intersecting 10-Mile Radius: Sensitive Natural Communities

4885 D-Street
Petaluma, Sonoma County, California

Project Data: Huffman Broadway Group; Plant, Animal & Community Data: CDFW CNDDB 9/5/2023; Basemap: Esri, NASA, NGA, USGS, County of Marin, County of Napa, California State Parks, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

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Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

APPENDIX 4
Aquatic Resources Delineation Report 4485 D Street Project Sonoma County, California

Aquatic Resources Delineation Report
4485 D Street Project
Sonoma County, California

Prepared for

VILLA VANTO LLC
Contact: Mario Ghilotti
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Prepared by

Huffman-Broadway Group, Inc.
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January 2024

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

Citation: Huffman-Broadway Group, Inc. 2024. *Aquatic Resources Delineation Report*, *4485 D Street Project, Sonoma County, California.* Prepared for Villa Vanto, LLC, Petaluma, California. January. 30 pages plus Appendices.

EXECUTIVE SUMMARY

At the request of Villa Vanto, LLC (Applicant), Huffman-Broadway Group, Inc. (HBG) conducted an Aquatic Resources Delineation (ARD) within the 4485 D Street property (Review Area) for the purpose of determining whether aquatic resources are present and, if present, potentially subject to US Army Corps of Engineers (Corps) and US Environmental Protection Agency (US EPA) jurisdiction under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344) and/or Corps jurisdiction under Section 10 of the Rivers and Harbors Act (RHA) (33 U.S.C. 403).

The Review Area for the ARD is west of US-101 (Redwood Highway) and southwest of the City of Petaluma (Appendix A, Figures 1 - 3). The northern portion of the Review Area is accessible from D Street. The approximate center point of the Review Area is Latitude 38.195137° north and Longitude 122.648778° west.

Data collection, analysis, identification, and delineation of aquatic resources potentially subject to CWA was conducted consistent with the August 29, 2023 WOTUS Rule and supporting Corps and US EPA guidance document including the Corps' 1987 Wetlands Delineation Manual (Corps Delineation Manual) and the Corps' 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (Regional Supplement).

Aquatic resources were found within the Review Area. Appendix A, Figure 6 shows the aquatic resources identified and delineated which are potentially subject to Corps and USEPA Section 404 CWA jurisdiction.

Summary of the Types of Aquatic Resource Habitats Identified Within the Review Area and Analysis for Why They are Potentially Subject to CWA Section 404 Jurisdiction, Size, and Cowardin Classification, 4485 D Street Project, Sonoma County, California

Aquatic Resource ID #	Aquatic Habitat Type	WOTUS Definition Met?	Description of Relevant 33 CFR 328.3 WOTUS Definition Met or Why Not Met	Size		Cowardin Classification[1]
				Acres	Linear Ft	
P1	Wetland (pond)	No	P1 – is not an (a)(4) Wetlands adjacent to the following waters: (i) Waters identified in paragraph (a)(1) of this section; or (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters; [i.e., Jurisdictional Adjacent Wetlands] **Analysis**: P1 is not adjacent to an (a)(1), (a)(2), or (a)(3) water.	1.34	n/a	Palustrine Unconsolidated Bottom
W1	Wetland	No	W1 – is not an (a)(4) Wetlands adjacent to the following waters: (i) Waters identified in paragraph (a)(1) of this section; or (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters; [i.e., Jurisdictional Adjacent Wetlands] **Analysis**: W1 is not adjacent to an (a)(1), (a)(2), or (a)(3) water.	0.35	n/a	Palustrine Emergent

Summary of the Types of Aquatic Resource Habitats Identified Within the Review Area and Analysis for Why They are Potentially Subject to CWA Section 404 Jurisdiction, Size, and Cowardin Classification, 4485 D Street Project, Sonoma County, California

Aquatic Resource ID #	Aquatic Habitat Type	WOTUS Definition Met?	Description of Relevant 33 CFR 328.3 WOTUS Definition Met or Why Not Met	Size		Cowardin Classification[1]
				Acres	Linear Ft	
R1, R2, R3, and R4	Tributary	No	R1, R2, R3, and R4 are ephemeral drainages/streams that do not meet the WOTUS definition of Jurisdictional Tributaries which are defined by 33 CFR 328.3 as *(a)(3) jurisdictional Tributaries of waters identified in paragraph (a)(1) or (a)(2) of this section that are relatively permanent, standing or continuously flowing bodies of water; [i.e., Jurisdictional Tributaries].* **Analysis**: R1, R2, R3 and R4 are not relatively permanent, standing or continuously flowing bodies of water.	0.12	2,533.55	Riverine Intermittent "Ephemeral"

[1] Cowardin et al. 1979.

It was also determined that the aquatic resources listed above are not subject to RHA Section 10 jurisdiction because they are not associated with the ebb and flow of tidal waters listed on the San Francisco District's Section 10 waters list.

1.0 INTRODUCTION

1.1 Background

At the request of Villa Vanto, LLC (Applicant), Huffman-Broadway Group, Inc. (HBG) conducted an Aquatic Resources Delineation (ARD) within the 4485 D Street property (Review Area) for the purpose of determining whether aquatic resources are present and, if present, potentially subject to US Army Corps of Engineers (Corps) and US Environmental Protection Agency (US EPA) jurisdiction under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344) and/or Corps jurisdiction under Section 10 of the Rivers and Harbors Act (RHA) (33 U.S.C. 403).

This delineation will be utilized by the Applicant for planning potential development within the Review Area. The delineation is viewed as an initial step to support planning efforts which would avoid and minimize impacts to jurisdictional aquatic resources where practicable following US EPA guidelines (40 CFR Part 230). Additionally, a Corps verified delineation is required by the San Francisco Bay Regional Water Quality Control Board if CWA jurisdictional waters are impacted.

1.2 Review Area Location

The Review Area for the ARD is west of US-101 (Redwood Highway) and southwest of the City of Petaluma (Appendix A, Figures 1 - 3). The northern portion of the Review Area is accessible from D Street. The approximate center point of the Review Area is Latitude 38.195137° north and Longitude 122.648778° west.

1.3 Directions to the Review Area

See Appendix B for driving directions.

1.4 Contact Information

Table 1. Contact Information

Applicant	Wetland Consultants
VILLA VANTO LLC **Contact:** Mario Ghilotti 204 G ST., STE 201 Petaluma, CA 94952 Telephone: 415.760.1936 Email: mario@vero-west.com	**Huffman-Broadway Group, Inc.** ATTN: Greg Huffman 523 4th St., Suite 224 San Rafael, California 94901 Telephone: 415.999.0802 Email: ghuffman@h-bgroup.com

1.5 Environmental Setting

This section presents background environmental information on the Review Area from published sources, which is augmented with observations made during the initial site reconnaissance.

1.5.1 Land Use

Current Zoning. The Review Area is zoned as Land Extensive Agriculture District, Accessory Dwelling Unit Exclusion Combining District, VOH Valley Oak Habitat Combining District, and SR Scenic Resources Combining District (Sonoma County, November 2023).

Current and Past Land Uses. Detailed review of Google Earth Pro aerial photography and imagery from December 1985 to April 2022 shows that land use in the Review Area consists of a single farm house, livestock pens, and barn with surrounding pastureland.

Surrounding Land Uses. Surrounding land uses include farm/ranchlands, to the north, east, south and west.

1.5.2 Topography

The topographic relief on the majority of the Review Area is gently sloped to hilly, ranging between 184 and 630 feet MSL[1] with slopes ranging between 0 and 50 percent (USGS 7.5' Petaluma Quadrangle).

1.5.3 Geology

The Review Area consists of residuum weathered from sedimentary rock, sandstone, and shale; and alluvium derived from volcanic and sedimentary rock (NRCS 2023) (see Table 2).

1.5.4 Vegetation

Vegetation communities are assemblages of plant species growing in an area of similar biological and environmental factors. Vegetation communities and habitats at the project site were identified using the California Wildlife Habitat Relationships (CWHR) classification (Mayer and Laudenslayer 1988), which defines aquatic as well as terrestrial habitats including urban areas. The CWHR habitat classification scheme was developed to provide a systematic method for describing how habitats and structures support California's regularly occurring birds, mammals, reptiles and amphibians. At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated.

Based on Sonoma County vegetation mapping, the Review Area contains eight plant communities or habitat types: (1) Annual Grassland (2) Coastal Oak Woodland, (3) Fresh Emergent Wetland, (4) Wet Meadow, (5) Riverine, (6) Urban, (7) Valley Foothill Riparian, and (8) Valley Oak Woodland.

Structure. Annual Grassland habitats are open grasslands composed primarily of annual plant species. Many of these species also occur as understory plants in Valley Oak Woodland (VOW) and other habitats. Structure in Annual Grassland depends largely on weather patterns and livestock grazing. Dramatic differences in physiognomy, both between seasons and between years, are characteristic of this habitat. Fall rains cause germination of annual plant seeds. Plants grow slowly during the cool winter months, remaining low in stature until spring, when temperatures increase and stimulate more rapid growth. Large amounts of standing dead plant material can be found during summer in years of abundant rainfall and light to moderate grazing pressure. Heavy spring grazing favors the growth of summer-annual forbs, such as tarweed and turkey mullein, and reduces the amount of standing dead material. On good sites, herbage yield may be as high as 4900 kg/ha (4400 lb/ac) (Garrison et al. 1977).

Composition. Introduced annual grasses are the dominant plant species in this habitat. These include wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), red brome

[1] MSL =Mean Sea Level

(*Bromus rubens*), wild barley (*Hordeum spp.*), and foxtail fescue (*Festuca myuros*). Common forbs include broadleaf filaree (*Erodium botrys*), redstem filaree (*Erodium cicutarium*), turkey mullein (*Croton setiger*), true clovers (*Trifolium* spp.), bur clover (*Medicago polymorpha*), popcorn flower (*Plagiobothrys chorisianus*), and many others. California poppy (*Eschscholzia californica*), the State flower, is found in this habitat. Perennial grasses, found in moist, lightly grazed, or relic prairie areas, include purple needlegrass (*Stipa pulchra*) and Idaho fescue (*Festuca idahoensis*). Vernal pools, found in small depressions with a hardpan soil layer, support downingia (*Downingia spp.*), meadowfoam (*Limnanthes spp.*), and other species (Parker and Matyas 1981). Species composition is also related to precipitation (Bartolome et al. 1980). Perennial grasses are more common on northern sites with mean annual rainfall greater than 150 cm (60 in). Soft chess and broadleaf filaree are common in areas with 65-100 cm (25-40 in) of rainfall, and red brome and redstem filaree are common on southern sites with less than 25 cm (10 in) of precipitation (Bartolome et al. 1980).

Wildlife Considerations. Many wildlife species use Annual Grasslands for foraging, but some require special habitat features such as cliffs, caves, ponds, or habitats with woody plants for breeding, resting, and escape cover. Characteristic reptiles that breed in Annual Grassland habitats include the western fence lizard, common garter snake, and western rattlesnake (Basey and Sinclear 1980). Mammals typically found in this habitat include the black-tailed jackrabbit, California ground squirrel, Botta's pocket gopher, western harvest mouse, California vole, badger, and coyote (White et al.1980). The endangered San Joaquin kit fox is also found in and adjacent to this habitat (U.S. Fish and Wildlife Service 1983). Common birds known to breed in Annual Grasslands include the burrowing owl, short-eared owl, horned lark, and western meadowlark (Verner et al. 1980). This habitat also provides important foraging habitat for the turkey vulture, northern harrier, American kestrel, black-shouldered kite, and prairie falcon.

Physical Setting. Annual Grassland habitat occurs mostly on flat plains to gently rolling foothills. Climatic conditions are typically Mediterranean, with cool, wet winters and dry, hot summers. The length of the frost-free season averages 250 to 300 days (18 to 21 fortnights) (Garrison et al. 1977).

Coastal Oak Woodland

Structure. Coastal oak woodlands are extremely variable. The overstory consists of deciduous and evergreen hardwoods (mostly oaks 4.5-21 m (15 to 70 ft tall), sometimes mixed with scattered conifers. In mesic sites, the trees are dense and form a closed canopy. In drier sites, the trees are widely spaced, forming an open woodland or savannah. The understory is equally variable. In some instances, it is composed of shrubs from adjacent chaparral or coastal scrub which forms a dense, almost impenetrable, understory. More commonly, shrubs are scattered under and between trees. Where trees form a closed canopy, the understory varies from a lush cover of shade-tolerant shrubs, ferns, and herbs to sparse cover with a thick carpet of litter. When trees are scattered and form an open woodland, the understory is grassland, sometimes with scattered shrubs. The interrelationships of slope, soil, precipitation, moisture availability, and air temperature cause variations in structure of coastal oak woodlands. These factors vary along the latitudinal, longitudinal, and elevational gradients over which coastal oak woodlands are found.

Composition. Composition of both overstory trees and understory of coastal oak woodland varies and

reflects the environmental diversity over which this habitat occurs. In the North Coast Range south to Sonoma County, coast live oak (*Quercus agrifolia*) often does not dominate. Where Oregon white oak (*Quercus garryana*), California black oak (*Quercus kelloggii*), canyon live oak (*Quercus chrysolepis*), madrone (*Arbutus menziesii*) and interior live oak (*Quercus wislizeni*) dominate, the habitat is generally considered Montane Hardwood (MHW). From Sonoma County south, the coastal oak woodlands are usually dominated by coast live oak. In many coastal regions, coast live oak is the only overstory species. In mesic sites, trees characteristic of mixed evergreen forests mix with coast live oak, such as California bay (*Umbellularia californica*), madrone, tanbark oak (*Notholithocarpus densiflorus*), and canyon live oak. On drier, interior sites, coast live oak mixes with valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), and foothill pine (*Pinus sabiniana*).

Typical understory plants in dense coast live oak woodlands are shade tolerant shrubs such as California blackberry (*Rubus ursinus*), creeping snowberry (*Gaultheria hispidula*), toyon (*Heteromeles arbutifolia*), and herbaceous plants such as bracken fern (*Pteridium aquilinum*), California polypody (*Polypodium californicum*), fiesta flower (*Pholistoma auritum*), and miner's lettuce (*Claytonia perfoliata*). In drier areas where oaks are more widely spaced, the understory may consist almost entirely of grassland species with few shrubs, although a diversity of shrubs can occur under and between the trees with a sparse herbaceous cover. Where coast live oak woodlands intergrade with chaparral, species such as greenleaf manzanita (*Arctostaphylos patula*), chamise (*Rosaceae spp.*), gooseberries (*Ribes spp.*), currants (*Ribes spp.*), and *ceanothus* species form the understory. Where the habitat intergrades with coastal scrub, typical understory species are bush monkeyflower (*Diplacus aurantiacus*), coyote brush (*Baccharis pilularis*), black sage (*Salvia mellifera*), and California sagebrush (*Artemisia californica*).

Wildlife Considerations. Coastal oak woodlands provide habitat for a variety of wildlife species. Barrett (1980) reports that at least 60 species of mammals may use oaks in some way. Verner (1980) reports 110 species of birds observed during the breeding season in California habitats where oaks form a significant part of the canopy or subcanopy. Quail, turkeys, squirrels, and deer may be so dependent on acorns in fall and early winter that a poor acorn year can result in significant declines in their populations (Shields and Duncan 1966, Graves 1977, Schitoskey and Woodmansee 1978). Therefore, many wildlife managers are concerned over the continuing loss of coastal oak woodland habitats as a result of man's activities.

Physical Setting. Coastal oak woodlands occupy a variety of Mediterranean type climates that vary from north to south and west to east. (The climate becomes hotter and drier toward the south and east.) Precipitation occurs in the milder winter months, almost entirely as rainfall, followed by warm to hot, dry summers. Near the coast, the summers are tempered by fogs and cool, humid sea breezes. Mean annual precipitation varies from about 100 cm (40 in) in the north to about 38 cm (15 in) in southern and interior regions. Mean minimum winter temperatures are 2 to 7 °C (29 to 44 °F), and the mean maximum summer temperatures are 24 to 36 °C (75 to 96 °F). The growing season ranges from six months (180 frost-free days) in the north to the entire year in mild coastal regions to the south. The soils and parent material on which coastal oak woodlands occur are extremely variable. In San Luis Obispo County alone they are found on over fifteen different parent materials ranging from

unconsolidated siliceous sand to diatomaceous earth to serpentinite to volcanic ash and basalt (Wells 1962). Coastal oak woodlands generally occur on moderately to well-drained soils that are moderately deep and have low to medium fertility.

Fresh Emergent Wetland

Structure. Fresh Emergent Wetlands are characterized by erect, rooted herbaceous hydrophytes. Dominant vegetation is generally perennial monocots to 2 m (6.6 ft) tall (Cheatham and Haller 1975, Cowardin et al. 1979). All emergent wetlands are flooded frequently, enough so that the roots of the vegetation prosper in an anaerobic environment (Gosselink and Turner 1978). The vegetation may vary in size from small clumps to vast areas covering several kilometers. The acreage of Fresh Emergent Wetlands in California has decreased dramatically since the turn of the century due to drainage and conversion to other uses, primarily agriculture (Gilmer et al. 1982).

Composition. On the upper margins of Fresh Emergent Wetlands, saturated or periodically flooded soils support several moist soil plant species including big leaf sedge (*Carex amplifolia*), baltic rush (*Juncus balticus*), redroot nutgrass (*Cyperus erythrorhizos*) and on more alkali sites, saltgrass (*Distichlis spicata*). On wetter sites, common cattail (*Typha latifolia*), tule bulrush (*Schoenoplectus acutus*), river bulrush (*Bolboschoenus fluviatilis*), and arrowhead (*Sagittaria sanfordii*) are potential dominant species (Cheatham and Haller 1975, U.S. Army Corps of Engineers 1978, Wentz 1981).

Wildlife Considerations. Fresh emergent wetlands are among the most productive wildlife habitats in California. They provide food, cover, and water for more than 160 species of birds (U.S. Comptroller General 1979), and numerous mammals, reptiles, and amphibians. Many species rely on Fresh Emergent Wetlands for their entire life cycle. The endangered Santa Cruz long toed salamander and rare black toad require pond water for breeding, while the rare giant garter snake use these wetlands as its primary habitat. The endangered Aleutian Canada goose, bald eagle, and peregrine falcon use Fresh Emergent Wetlands as feeding areas and roost sites (Calif. Dept. Fish Game 1980).

Physical Setting. Fresh emergent wetland habitats occur on virtually all exposures and slopes, provided a basin or depression is saturated or at least periodically flooded. However, they are most common on level to gently rolling topography. They are found in various landscape depressions or at the edge of rivers or lakes (Wentz 1981). Fresh emergent wetland vegetation zones characteristically occur as a series of concentric rings which follow basin contours and reflect the relative depth and duration of flooding. If the bottom of the wetland is very uneven, vegetation zones may be present in a patchy configuration rather than the classic concentric ring pattern (Millar 1976). Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed (Cowardin et al. 1979). In some areas organic soils (peat) may constitute the primary growth medium (U.S. Army Corps of Engineers 1978).

Wet Meadow

Structure. Wet Meadows at all elevations generally have a simple structure consisting of a layer of herbaceous plants. Shrub or tree layers are usually absent or very sparse; they may, however, be an important feature of the meadow edge. Within the herbaceous plant community, a microstructure is frequently present. Some species reach heights of only a few centimeters while others may grow a

meter or more tall (> 3 ft). Except where broken by boulders, canopy cover is dense (60-100%). At the substrate surface, distances between individual shoots may vary from 1 or 2 mm (0.04-0.08 in) to as much as 2 or 3 cm (0.81.2 in) depending upon the species present.

Composition. Wet Meadows occur with a great variety of plant species; therefore, it is not possible to generalize species composition. Species may differ, but several genera are common to Wet Meadows throughout the State. They include *Agrostis*, *Carex*, *Danthonia*, *Juncus*, *Salix*, and *Scirpus*. Important grass and grasslike species include thingrass, abruptbeak sedge (*Carex abrupta*), beaked sedge (*Carex utriculata*), Nebraska sedge (*Carex nebrascensis*), tufted hairgrass (*Deschampsia cespitosa*), needle spikerush (*Eleocharis acicularis*), fewflowered spikerush (*Eleocharis quinqueflora*), common spikerush (*Eleocharis palustris*), baltic rush (*Juncus balticus*), Nevada rush (*Juncus nevadensis*), iris-leaf rush (*Juncus xiphioides*), pullup muhly (*Muhlenbergia filiformis*), and panicled bulrush (*Scirpus microcarpus*). Important forbs include Anderson aster (*Oreostemma alpigenum var. andersonii*), Jeffrey shootingstar (*Dodecatheon jeffreyi*), trailing Saint-Johnswort (*Hypericum*), hairy pepperwort (*Marsilea vestita ssp. vestita*), primrose monkeyflower (*Mimulus primuloides*), western cowbane (*Oxypolis occidentalis*), American bistort (*Bistorta bistortoides*), cows clover (*Trifolium wormskioldii*), and small white violet (*Viola macloskeyi*). Willow and bilberry are the only shrubs found in much abundance. Fewer species occur as surface water depth increases during spring runoff.

Wildlife Considerations. In late summer, small mammals may visit Wet Meadows that have dried. However, the meadows are generally too wet to provide suitable habitat for small mammals. Mule deer and elk may feed in Wet Meadows, seeking especially forbs and palatable grasses. Waterfowl, especially mallard ducks, frequent streams flowing through Wet Meadows. Yellow-headed and red-winged blackbirds occasionally nest in Wet Meadows with tail vegetation and with adequate water to discourage predators (Storer and Usinger 1963). The striped racer is the common snake of Wet Meadows in the Sierra Nevada and Cascade Range. Various frog species are abundant in Wet Meadows throughout California.

Physical Setting. Wet Meadows occur where water is at or near the surface most of the growing season, following spring runoff. Hydrologically, they occupy lotic, sunken concave, and hanging sites (Ratliff 1985). Lotic sites (Gosselink and Turner 1978) are those with main input flow (other than precipitation) from upstream sources; at least early in the growing season, water flows across them at depths of 10 to 20 cm (4-8 in). Downstream runoff is the principal output flow. Lotic sites are topographic basins but have a slight slope, which permits drainage of surface water. Percolation is nil due to the saturated or slowly permeable nature of underlying materials. Sunken concave sites also receive water input from upstream sources, but evapotranspiration is the main output flow. Percolation is slowed by heavy-textured soils and/or shallow bedrock; however, in contrast to lotic and hanging sites, soil of sunken concave sites may dry to considerable depth by fall. Hanging sites are watered by hydrostatic flows as springs or seeps. They frequently occur on rather steep slopes, and downstream runoff is the main output flow. Surface flows, although constant, are usually no more than 1 cm (0.4 in) deep.

Riverine

Structure. Intermittent or continually running water distinguishes rivers and streams. A stream

originates at some elevated source, such as a spring or lake, and flows downward at a rate relative to slope or gradient and the volume of surface runoff or discharge. Velocity generally declines at progressively lower altitudes, and the volume of water increases until the enlarged stream finally becomes sluggish. Over this transition from a rapid, surging stream to a slow, sluggish river, water temperature and turbidity will tend to increase, dissolved oxygen will decrease, and the bottom will change from rocky to muddy (McNaughton and Wolf 1973).

Composition. The majority of fast stream inhabitants live in riffles, on the underside of rubble and gravel, sheltered from the current. Characteristic of the riffle insects are the nymphs of mayflies, caddisflies, alderflies, stoneflies; and the larva and pupae of true flies. In pools, the dominant insects are burrowing mayfly nymphs, dragonflies, damselflies and water striders. Water moss and heavily branched filamentous algae are held to rocks by strong holdfasts and align with the current. Other algae grow in spheric, or cushionlike colonies with smooth, gelatinous surfaces. Algae growth in streams often exhibits zonation on rocks, which is influenced by depth and current.

With increasing temperatures, decreasing velocities and accumulating bottom sediment, organisms of the fast water are replaced by organisms adapted to slower moving water. Mollusks and crustaceans replace the rubble-dwelling insect larvae. Backswimmers, water boatmen and diving beetles inhabit sluggish stretches and backwaters. Emergent vegetation grows along river banks, and duckweed (*Lemna sp.*) floats on the surface. Abundant decaying matter on the river bottom promotes the growth of plankton populations that are not usually found in fast water.

Wildlife Considerations. The open water zones of large rivers provide resting and escape cover for many species of waterfowl. Gulls, terns, osprey and bald eagle hunt in open water. Near-shore waters provide food for waterfowl, herons, shorebirds, belted kingfisher and American dipper. Many species of insectivorous birds (swallows, swifts, flycatchers) hawk their prey over water. Some of the more common mammals found in riverine habitats include river otter, mink, muskrat and beaver.

Physical Setting. Streams begin as outlets of ponds or lakes (lacustrine), or rise from spring or seepage areas. All streams at some time experience very low flow and nearly dry up. Some streams, except for occasional pools, dry up seasonally every year.

The temperature of the riverine habitat is not constant. In general, small, shallow streams tend to follow, but lag behind air temperatures, warming and cooling with the seasons. Rivers and streams with large areas exposed to direct sunlight are warmer than those shaded by trees, shrubs and high, steep banks.

The constant swirling and churning of high-velocity water over riffles and falls result in greater contact with the atmosphere and thus have a high oxygen content. In polluted waters, deep holes or low velocity flows, dissolved oxygen is lower (Smith 1974).

Urban

Structure. The structure of urban vegetation varies, with five types of vegetative structure defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. Tree groves, common in city parks, green belts, and cemeteries, vary in height, tree spacing, crown shape, and understory conditions,

depending upon the species planted and the planting design. However, they have a continuous canopy. Mature tree groves in San Francisco vary in height from 19.3 m (64 ft) (eucalyptus) to 14.5 m (48 ft) (Monterey cypress). Ground cover in these groves ranges from 0 to 90 percent (McBride and Froehlich 1 984). Street tree strips show variation in spacing of trees, depending upon species and design considerations. Both continuous and discontinuous canopies are observed. Most street tree strips are planted in grass, but other ground covers are not uncommon. Shade trees and lawns are typical of residential areas and reminiscent of natural savannas. Structural variation in the shade tree/lawn type is typical when a large number of species are incorporated in the landscape. Lawns are structurally the most uniform vegetative units of the California urban habitat. A variety of grass species are employed, which are maintained at a uniform height and continuous ground cover. Biomass productivity is greater than natural grasslands because of irrigation and fertilization (Falk 1977). Shrub cover is more limited in distribution than the other structural types. Hedges represent a variation of the urban shrub cover type. Species, planting design, and maintenance control the structural characteristics of these types. Height ranges from 10 cm (4 in) tall to tree height.

The juxtaposition of urban vegetation types within cities produces a rich mosaic with considerable edge areas. The overall mosaic may be more valuable as wildlife habitat than the individual units in that mosaic.

Composition. Species composition in urban habitats varies with planting design and climate. Monoculture is commonly observed in tree groves and street tree strips.

A distinguishing feature of the urban wildlife habitat is the mixture of native and exotic species. Both native and exotic species are valuable, with exotic species providing a good source of additional food in the form of fruits and berries.

Wildlife Considerations. Three urban categories relevant to wildlife are distinguished: downtown, urban residential, and suburbia. The heavily-developed downtown is usually at the center, followed by concentric zones of urban residential and suburbs. There is a progression outward of decreasing development and increasing vegetative cover. Species richness and diversity is extremely low in the inner cover. Rock dove, house sparrow, and starling comprise over 90 percent of all avian density and biomass (Emlen 1974).

The urban residential zone is characterized by a denser and more varied mosaic of vegetation shade trees, lawns, hedges and planted gardens; approximately 40 percent of the land's surface is covered by impervious material. This region is characterized by a variety of bird species including scrub jay, mockingbird, house finch, (Jaeger and Smith 1966, Smith 1968, Guthrie 1974, Sproul 1975, Williams and Monroe 1976). Associates in the urban residential areas include the raccoon, opossum, striped skunk, (Berry and Berry 1959) and California slender salamander (Stebbins 1972). Suburban areas with mature vegetation closely approximate the natural environment. In addition to landscaped gardens and lawns, relatively large tracts of adjacent natural vegetation such as chaparral, grasslands, and oak woodland abound. Wildlife diversity increases while species density decreases (Thomas and DeGraaf 1975) and proportionately greater numbers of native species occur. Bird species include wrentits, bushtits, plain titmouse, chestnut-backed chickadee, California quail, (Jaeger and Smith 1966, Smith 1968, Guthrie 1974, Sproul 1975, Williams and Monroe 1976). Common mammals are black-tailed

deer, ringtail, black-tailed jackrabbit, (Berry and Berry 1959, Jaeger and Smith 1966, Williams and Monroe 1976). Gopher snake and western fence lizard also occur in this zone.

Physical Setting. Urban habitats are not limited to any particular physical setting. The first California cities were situated along coastline or major rivers providing marine or riparian habitats which continue to influence wildlife diversity in these cities.

Urban climate varies in temperature and wind velocity from the surrounding countryside (Lowry 1967). Heat islands, warmer zones in the most densely developed portions or cities, often show temperatures that are 3 to 5 C warmer than the undeveloped landscape. Wind velocities are reduced in urban areas except where highrise construction has occurred. Tall structures can funnel wind through man-made canyons to velocities well above those found over undeveloped landscape.

Valley Foothill Riparian

Structure. Canopy height is approximately 30 m (98 ft) in a mature riparian forest, with a canopy cover of 20 to 80 percent. Most trees are winter deciduous. There is a subcanopy tree layer and an understory shrub layer. Lianas (usually wild grape) frequently provide 30 to 50 percent of the ground cover and festoon trees to heights of 20 to 30 m (65 to 98 ft). Herbaceous vegetation constitutes about one percent of the cover, except in openings where tall forbs and shade-tolerant grasses occur (Conard et al.1977). Generally, the understory is impenetrable and includes fallen limbs and other debris.

Composition. Dominant species in the canopy layer are cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*) and valley oak (*Quercus lobata*). Subcanopy trees are white alder (*Alnus rhombifolia*), boxelder (*Acer negundo*) and Oregon ash (*Fraxinus latifolia*). Typical understory shrub layer plants include wild grape (*Vitis californica*), wild rose (*Rosa californica*), California blackberry (*Rubus ursinus*), blue elderberry (*Sambucus cerulea*), poison oak (*Toxicodendron pubescens*), buttonbrush (*Cephalanthus occidentalis*), and willows (*Salix*). The herbaceous layer consists of sedges, rushes, grasses, miner's lettuce (*Claytonia perfoliata*), Douglas sagewort (*Artemisia douglasiana*), poison-hemlock (*Conium maculatum*), and hoary nettle (*Urtica dioica*).

Wildlife Considerations. Valley-foothill riparian habitats provide food, water, migration and dispersal corridors, and escape, nesting, and thermal cover for an abundance of wildlife. At least 50 amphibians and reptiles occur in lowland riparian systems. Many are permanent residents; others are transient or temporal visitors (Brode and Bury 1985). In one study conducted on the Sacramento River, 147 bird species were recorded as nesters or winter visitants (Laymon 1985). Additionally, 55 species of mammals are known to use California's Central Valley riparian communities (Trapp et al. 1985).

Physical Setting. Valley-foothill riparian habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high water table. The substrate is coarse, gravelly or rocky soils more or less permanently moist, but probably well aerated (Cheatham and Haller 1975). Average precipitation ranges from 15 to 76 cm (6-30 in), with little or no snow. The growing season is 7 to 11 months. Frost and short periods of freezing occur in winter (200 to 350 frost-free days). Mean summer maximum temperatures are 24 to 39 °C (75 to 102 °F), mean winter minima are 2 to 7 °C (29 to 44 °F) (Munz and Keck 1973). VRI habitats are

characterized by hot, dry summers, mild and wet winters. Coastal areas have a more moderate climate than the interior and receive some summer moisture from fog (Bailey 1980). Potential evaporation during the warmest months is often greater than precipitation. Low rainfall and streamflow result in water scarcity in many parts of the area.

Valley Oak Woodland

Structure. This habitat varies from savanna-like to forest-like stands with partially closed canopies, comprised mostly of winter-deciduous, broad-leaved species. Denser stands typically grow in valley soils along natural drainages. Tree density decreases with the transition from lowlands to the less fertile soils of drier uplands. Exceptions to this pattern are known, especially in the central coastal counties (N. H. Pillsbury, pers. comm.). Similarly, the shrub layer is best developed along natural drainages, becoming insignificant in the uplands with more open stands of oaks. Valley oak (*Quercus lobata*) stands with little or no grazing tend to develop a partial shrub layer of bird disseminated species, such as poison-oak (*Toxicodendron pubescens*), toyon (*Heteromeles arbutifolia*), and coffeeberry (*Frangula californica*) (J. R. Griffin, pers. comm.). Ground cover consists of a well-developed carpet of annual grasses and forbs. Mature valley oaks with well-developed crowns range in height from 15 to 35 m (49 to 115 ft) (Cheatham and Haller 1975, Conard et al. 1977).

Composition. Canopies of these woodlands are dominated almost exclusively by valley oaks (Conard et al. 1977). Tree associates in the Central Valley include California sycamore (*Platanus racemosa*), Hinds black walnut (*Juglans hindsii*), interior live oak (*Quercus wislizeni*), boxelder (*Acer negundo*), and blue oak (*Quercus douglasii*). The shrub understory consists of poison-oak, blue elder (*Sambucus mexicana*), California wild grape (*Vitis californica*), toyon (*Heteromeles arbutifolia*), California coffeeberry (*Rhamnus californica*), and California blackberry (*Rubus ursinus*). Various sorts of wild oats, brome, barley, ryegrass, and needlegrass dominate the ground cover. Foothill pine and coast live oak are associated with VOWs along the Coast Range (Parker and Matyas 1979).

Wildlife Considerations. These woodlands provide food and cover for many species of wildlife. Oaks have long been considered important to some birds and mammals as a food resource (i.e., acorns and browse). Verner (1980a) reported that 30 bird species known to use oak habitats in California include acorns in their diet. An average of 24 species of breeding birds were recorded on a study plot at Ancil Hoffman Park, near Carmichael, in Sacramento County from 1971 to 1973 (Gaines 1977). The study plot was dominated by valley oaks but included some cottonwood in the canopy. Probably the most significant breeding bird species recorded was red-shouldered hawk. In decreasing order, the most common species were European starling, California quail, plain titmouse, scrub jay, rufous-sided towhee, Bewick's wren, bushtit, and acorn woodpecker. Barrett (1980) indicates that the ranges of about 80 species of mammals in California show substantial overlap with the distribution of valley oaks, and several, such as fox and western gray squirrels and mule deer, have been documented using valley oaks for food and shelter.

Physical Setting. This habitat occurs in a wide range of physiographic settings but is best developed on deep, well-drained alluvial soils, usually in valley bottoms. Most large, healthy valley oaks are probably rooted down to permanent water supplies (Griffin 1973). Stands of valley oaks are found in deep sills on broad ridge-tops in the southern Coast Range. Where this type occurs near the coast, it is usually

found away from the main fog zone (Griffin 1976). The climate is Mediterranean, with mild, wet winters and hot, dry summers.

1.5.5 Soils

Soil survey information for the Review Area was obtained from the National Resources Conservation Service Web Soil Survey (NRCS 2023) (Appendix 1, Figure 5). Six (6) different soil types are mapped by NRCS within the Review Area as described in the table below.

Table 2. Summary of Pertinent Characteristics of Soils Mapped Onsite by NRCS

Soil Name	Landform/Parent Material	Typical Profile (inches)	Natural Drainage Class/Runoff Class	Depth to Water Table	Frequency of Flooding/Ponding
Los Osos clay loam, 2 to 15 percent slopes	Hills / Residuum weathered from sedimentary rock	H1 - 0 to 24 inches: clay loam H2 - 24 to 34 inches: clay H3 - 34 to 59 inches: weathered bedrock	Well drained / High	More than 80 inches	None/None
Los Osos clay loam, 15 to 30 percent slopes, very rocky, MLRA 15	Hillslopes / Residuum weathered from sedimentary rock	A - 0 to 6 inches: clay loam Bw - 6 to 16 inches: clay loam Bt1 - 16 to 28 inches: clay Bt2 - 28 to 34 inches: clay Cr - 34 to 44 inches: bedrock	Well drained / Very High	More than 80 inches	None/None
Los Osos clay loam, 30 to 50 percent slopes, eroded, MLRA 15	Mountain slopes, hillslopes / Residuum weathered from sandstone and shale	A - 0 to 10 inches: clay loam Bt1 - 10 to 20 inches: clay Bt2 - 20 to 32 inches: clay	Well drained/ Very high	More than 80 inches	None/ None
Los Osos clay loam, thin solum, 15 to 30 percent slopes, eroded	Hills / Residuum weathered from sedimentary rock	H1 - 0 to 10 inches: clay loam H2 - 10 to 20 inches: clay H3 - 20 to 59 inches: weathered bedrock	Well drained/ Very high	More than 80 inches	None/ None

Table 2. Summary of Pertinent Characteristics of Soils Mapped Onsite by NRCS					
Soil Name	**Landform/Parent Material**	**Typical Profile (inches)**	**Natural Drainage Class/Runoff Class**	**Depth to Water Table**	**Frequency of Flooding/Ponding**
Los Osos clay loam, thin solum, 30 to 50 percent slopes	Hills / Residuum weathered from sedimentary rock	H1 - 0 to 4 inches: clay loam H2 - 4 to 20 inches: clay H3 - 20 to 59 inches: weathered bedrock	Well drained/ Very high	More than 80 inches	None/ None
Zamora silty clay loam, moist, 0 to 8 percent slopes, MLRA 14	Stream terraces, alluvial fans / Alluvium derived from volcanic and sedimentary rock	A1 - 0 to 5 inches: silty clay loam A2 - 5 to 17 inches: clay loam A3 - 17 to 29 inches: clay loam Bt1 - 29 to 41 inches: clay loam Bt2 - 41 to 55 inches: sandy clay loam Bt3 - 55 to 60 inches: gravelly clay	Well drained / Medium	More than 80 inches	None/ None

1.5.6 Climate

Based on WETS Station “PETALUMA AIRPORT, CA” precipitation and temperature data for the period of record (1971 – 2022), the average annual precipitation amount received approximately 6.5 miles from the site is 24.67 inches received as rainfall and 0.00 inch received as snow. The average minimum and maximum precipitation amount ranges between 0.03 and 4.68 inches. The wettest months, in which average monthly rainfall exceeds 3.00 inches, are January, February, March, November, and December (4.67, 4.60, 3.51, 3.08, and 4.68 inches) with the lowest average amount occurring in July and August (0.03 and 0.05 inches). Record data also indicates that the annual average daily temperature is 58.2° F. Average high and low temperatures range between 70.8° F and 45.6° F with the coldest months typically including January and December where temperatures are in the upper 40s and the hottest months being July and August where temperatures are in the upper 60s. The annual growing season with a 50% probability of having days above 32° F is 269 days (March 2 to November 26), and, with a 70% probability of having days above 32° F, is 291 days (February 19 to December 7).

1.5.7 Hydrology

Watersheds. Review of the US Geological Survey (USGS) National Hydrography Dataset (NHD) Hydrologic Unit Code (HUC) data show that the Review Area lies within the 8-digit HUC (18050002) "San Pablo Bay" subbasin and the 12-digit HUC (180500020602) "San Antonio Creek" subwatershed.

Direction of Surface Water Flow. Surface water which flows within the Review Area is the direct result of precipitation and associated stormwater runoff. This stormwater is collected by an incised natural drainage which directs flows to the northwest edge of the Review Area. Streamflow from the Review Area travels west-southwesterly towards and into San Antonio Creek. San Antonio Creek surface flows run into the Petaluma River.

1.5.8 FEMA Flood Zone

FEMA Flood Insurance Rate Map for "Sonoma County" 06097C0984E (Effective Date: 12/2/2008) indicates the Review Area is outside of FEMA zoning associated with an annual chance flood hazard (Appendix 1, Figure 5).

1.5.9 Aquatic Resources

National Wetlands Inventory. Appendix A, Figure 4a U.S. Fish and Wildlife Service National Wetlands Inventory Mapping shows Riverine Intermittent and Palustrine (unconsolidated bottom/emergent) wetlands within the Review Area.

1.6 Disclaimer

Huffman-Broadway Group, Inc., and the Applicant have made a good-faith effort herein to thoroughly describe and document the presence of potential factors that the Corps may consider in asserting jurisdiction pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Nevertheless, the Applicant, reserves the right to challenge or seek revision to any areas over which the Corps may assert such jurisdiction, should such jurisdiction be further clarified or altered through formal guidance, assertions, or disclaimers of jurisdiction over other properties, court decisions, or other relevant actions.

2.0 DELINEATION METHOD

2.1 Overview of Sampling Methodology

HBG's investigation focused on the identification and delineation of the landward geographical reach of Waters of the US (WOTUS) as defined under Section 404 of the Clean Water Act (33 CFR § 328.3 (a)) and Navigable Waters under Section 10 of the Rivers and Harbors Act of 1899 (33 CFR § 329.4). Delineation methods used to identify and delineate these waters are described in the following Sections. The regulatory definitions of these jurisdictional aquatic resources or waters are as follows:

WOTUS

Waters of the United States means:

(1) Waters which are:
  (i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
  (ii) The territorial seas; or
  (iii) Interstate waters;
(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;
(3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;
(4) Wetlands adjacent to the following waters:
  (i) Waters identified in paragraph (a)(1) of this section; or
  (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(2) of this section and with a continuous surface connection to those waters;
(5) Intrastate lakes and ponds not identified in paragraph (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section. (33 CFR § 328.3 (a))

Navigable Waters

Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity. 33 CFR § 329.4.

2.2 Field Investigations

2.2.1 Preparation

In preparation for detailed field investigations, HBG identified existing landforms within the Review Area that would likely contain aquatic resources which may potentially meet the definition of WOTUS (wetlands and non-wetlands) and/or Navigable Waters by reviewing available on-line information sources to include: Google Earth Pro and ESRI most current and historical aerial photography and imagery; USGS National Hydrography Dataset watershed mapping; FEMA mapping; National Wetlands Inventory mapping; a NRCS Custom Soil Resources Report; and most current and historical USGS topographic mapping. Review Area specific LIDAR topographic mapping was also reviewed.

2.2.2 Field Work

Field investigations were conducted on September 21, 2023 with the following objectives:

1. Determine the presence or absence of vegetation, hydric soil, and hydrology indicators of wetland conditions as defined by the Corps methodology;
2. Determine if field indicators of wetland conditions may be "significantly disturbed" or "naturally problematic;" and
3. Determine the presence of either an Ordinary High Water Mark (OHWM) and/or a High Tide Line based on hydrology indicators as defined by the Corps' definitions and methodology.

2.2.3 CWA Wetlands Definition and Delineation Methodology

Wetlands are defined at 33 CFR § 328.3 (c)(1) as:

The term *wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

HBG identified and delineated aquatic resources following the methodology described in the Corps' Delineation Manual, Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (Regional Supplement), to determine the presence or absence of vegetation, soil, and hydrology indicators. If there was uncertainty regarding application of the delineation methodology or interpretation of field data, the Corps' 1987 Delineation Manual and guidance memorandums were referred to.

Vegetation, soil, and hydrology observations were made at sampling locations determined to be representative of landform areas where the soils may potentially flood, pond, and/or saturate. Vegetation was sampled first. Depending on the size of the vegetation community in relationship to a different abutting plant community or non-vegetated zone, dominant vegetation and the presence or absence of dominant wetland vegetation were determined based on approximately 5 x 5-foot sampling plots. Soil observations were made within soil pits dug using a shovel or holes dug with a hand auger. The soil pits and/or auger holes were dug to a depth of at least 10 inches (most often to 22 inches)

where permissible. Where one or more hydric soil indicator(s) were encountered, a minimum of one soil pit was dug on the inside low-lying edge of a potential wetland area and one soil pit was dug on the outside upland margin of the potential wetland area. Observations for wetland hydrology indicators were made within the same sampling plot. Soil, vegetation, and hydrology observations were recorded on Corps data forms (*Wetland Determination Data Form – Arid West Region*; Version 2.0) (Appendix E). Wetland/upland sample point locations were documented as polygonal and point features, respectfully using ESRI Apps (Field Maps) in conjunction with a Trimble DA2 Global Positioning System (GPS) receiver with sub-meter accuracy after geo-processing. The data collected was incorporated into the Project database using GIS software.

2.2.4 CWA Other Waters Definition and Delineation Methodology

Other types of CWA WOTUS aquatic resources that are not wetlands as defined at 33 CFR § 328.3 (a) have the following limits of jurisdiction as:

(a) Territorial Seas. The limit of jurisdiction in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles. (See 33 CFR § 329.12)
(b) Tidal waters of the United States. The landward limits of jurisdiction in tidal waters:
  (1) Extends to the high tide line, or
  (2) When adjacent non-tidal waters of the United States are present, the jurisdiction extends to the limits identified in paragraph (c) of this section.
(c) Non-tidal waters of the United States. The limits of jurisdiction in non-tidal waters:
  (1) In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or
  (2) When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands.
  (3) When the water of the United States consists only of wetlands the jurisdiction extends to the limit of the wetland.

The meaning of adjacent, high tide Line, ordinary high water mark, and tidal waters as described above are defined by 33 CFR § 328.3 (c) follows:

> Adjacent means having a continuous surface connection. 33 CFR § 328.3 (c)(2)
>
> High tide line means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm. 33 CFR§ 328.3 (c)(3)

> Ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. 33 CFR§ 328.3 (c)(4)
>
> Tidal waters means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects. 33 CFR§ 328.3 (c)(5)

Field observations of physical features such as those described above which are indicative of a WOTUS High Tide Line (HTL) or Ordinary High Water (OHW) were recorded, if present, on Corps data forms (*Wetland Determination Data Form – Arid West Region; Version 2.0*) (Appendix E). The methodology used to identify and define an OHWM, if present, was based on the OHWM Field Guide (Lichvar and McColley 2008) and the *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Interim Version* (Gabrielle, et al., 2022). Indicators of OHWM were observed along channel landforms and were recorded on a field data form (Appendix E). A similar approach was taken to identify the HTL. If present, HTL and/or OHWM sample point locations were documented as point features, respectfully using ESRI Apps (Field Maps) in conjunction with a Trimble DA2 Global Positioning System (GPS) receiver with sub-meter accuracy after geo-processing. The data collected was incorporated into the Project database using GIS software.

2.2.5 RHA Navigable Waters Definition and Delineation Methodology

Navigable Waters as defined at 33 CFR § 329.4 have the following limits of jurisdiction as:

Non-Tidal Waters

> …. 1. The "ordinary high water mark" on non-tidal rivers is 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 soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas. 33 CFR § 329.11

Tidal Waters

> …. 2. Regulatory jurisdiction in coastal areas extends to the line on the shore reached by the plane of the mean (average) high water. Where precise determination of the actual location of the line becomes necessary, it must be established by survey with reference to the available tidal datum, preferably averaged over a period of 18.6 years. Less precise methods, such as observation of the "apparent shoreline" which is determined by reference to physical markings, lines of vegetation, or changes in type of vegetation,

> may be used only where an estimate is needed of the line reached by the mean high water. 33 CFR § 329.12

Field observations of physical features indicative of a Navigable Water such as those described above which indicate the presence of a non-tidal Ordinary High Water (OHW) were recorded, if present, on Corps data forms (*Wetland Determination Data Form – Arid West Region; Version 2.0*) (Appendix E). For areas subject to the ebb and flow of the tides, the nearest NOAA tide station was used to determine MHW. OHWM sample point locations were documented as point features using ESRI Apps (Field Maps) in conjunction with a Trimble DA2 Global Positioning System (GPS) receiver with sub-meter accuracy after geo-processing. The data collected was incorporated into the Project database using GIS software.

2.3 Rainfall Analysis

The Corps' Antecedent Precipitation Tool (APT) was used to assess precipitation conditions within the Review Area 90 days prior to field investigations. The rainfall analysis followed the latest Corps guidance. The purpose of the antecedent precipitation analysis was to aid in: (1) determining if the climatic/hydrologic conditions observed on the site are typical for the time of year in which field investigations were conducted (e.g., rainy season versus dry season); and (2) establishing whether observations made of surface and near-surface hydrology indicators or the lack thereof are the result of naturally problematic hydrology conditions (e.g., drought year, extreme precipitation/stormwater runoff event) preceding the field investigations. The APT assesses the presence of drought conditions and facilitates the comparison of recent rainfall conditions for a given location to the range of normal rainfall conditions that occurred during the preceding 30 years.

2.4 Mapping

2.4.1 CWA Wetland and Other Waters Observations

The GPS data collected during field sampling were incorporated into an HBG Project database using Geographic Information System (GIS) software and were geo-referenced in overlay fashion onto a digital topographic base map (LIDAR) and an orthorectified digital aerial photograph following national mapping standards. Data overlays of indicator observations were mapped to assist in the analysis to determine if areas meet the Corps' WOTUS definition. The geographic extent of areas identified as being potential wetlands or other waters were mapped and classified to the class level using the US Fish and Wildlife Service's Classification System for Wetland and Deepwater Habitats (Cowardin et al. 1979).

2.4.2 RHA Navigable Waters Observations

The GPS data collected during field sampling were incorporated into an HBG Project database using Geographic Information System (GIS) software and were geo-referenced in overlay fashion onto a digital topographic base map (LIDAR) and an orthorectified digital aerial photograph following national mapping standards. Data overlays of indicator observations were mapped to assist in the analysis to determine if areas meet the Corps' Navigable Waters definition. The geographic extent of areas

identified as being potential Navigable Waters were mapped and classified to the class level using the US Fish and Wildlife Service's Classification System for Wetland and Deepwater Habitats (Cowardin et al. 1979).

3.0 TECHNICAL FINDINGS

Section 3.1 discusses technical findings regarding the presence or absence of the vegetation, soil, and hydrology indicators of wetland conditions observed within the Review Area. Section 3.2 discusses technical findings regarding the presence of physical characteristics of the landward boundary of other waters as defined by an OHWM for non-tidal waters (Section 3.2.1). Section 3.3 describes flow duration and watershed connectivity characteristics of drainages.

For delineation of wetlands, field data are presented on Wetland Determination Data Forms for the Arid West Region in Appendix E. The following table provides a summary of the field data provided in Appendix E with the locations of sample points shown on Appendix A, Figure 6. Appendix G provides representative Review Area photographs.

Table 3. Summary of Aquatic Resources Delineation Sampling Data
4485 D Street Project, Sonoma County, California

Representative Sampling Point	Wetland Vegetation Indicators? [1] (Y/N)	Wetland Soil Indicators? (Y/N)	Wetland Hydrology Indicators? (Y/N)	Wetland Criteria Met? (Y/N)
SP01 – SP07	N	N	Y (OHWM)[1]	N
SP08	Y	Y	Y	Y

[1] OWHM = Ordinary High Water Mark

3.1 CWA Wetlands

3.1.1 Precipitation Analysis

According to APT analysis results, the September 2023 field surveys were conducted during a normal period following 90 days of normal rainfall conditions for the dry season (Appendix D).

3.1.2 Normal Circumstances

An assessment was conducted to determine if “Normal Circumstances” are present in the Review Area. The Corps’ Delineation Manual interprets "normal circumstances" as:

> the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed [7 CFR 12.31(b)(2)(i)] [Manual page 71].

The expired Corps Regulatory Guidance Letter (RGL 90-07) states:

> …. 4. The primary consideration in determining whether a disturbed area qualifies as a Section 404 wetland under "normal circumstances" involves an evaluation of the extent and relative permanence of the physical alteration of wetlands hydrology and hydrophytic vegetation. In addition, consideration is given to the purpose and cause of the physical alterations to hydrology and vegetation. For example, we have always maintained that areas where individuals have destroyed hydrophytic vegetation in an attempt to eliminate the regulatory requirements of Section 404 remain part of the overall aquatic system and are subject to regulation under Section 404. In such a case, where the Corps can determine or reasonably infer that the purpose of the physical disturbance to hydrophytic vegetation was to avoid regulation, the Corps will continue to assert Section 404 jurisdictions. …..

Detailed review of Google Earth Pro aerial photography and imagery from December 1985 to March 2023 shows that land use in the Review Area has remained relatively unchanged.

3.1.3 Field Indicators of Wetland Vegetation

Based on detailed review of Google Earth Pro aerial photography and aerial imagery, and onsite inspections during September 2023; it was determined that vegetation conditions are not significantly disturbed[2] throughout the Review Area. The dominant vegetation was determined not to be naturally problematic.[3] The vegetation is dominated by Common spikerush (*Eleocharis palustris*)[4,] an obligate (OBL) wetland species[5].

3.1.4 Field Indicators of Hydric Soils

Detailed review of Google Earth Pro aerial photography and imagery, and onsite inspections in September 2023, indicated soil conditions are not significantly disturbed over the Review Area since at least December 1985. These soils were found not to be significantly disturbed, except where the pond was excavated and areas with buildings and adjacent urban use areas. Soils were determined to not be naturally problematic. The NRCS Custom Soil Resources Report in Appendix C provides detailed soil mapping and soils descriptions. Onsite examination found that the NRCS soil mapping provided in the report is relatively accurate.

3.1.5 Field Indicators of Wetland Hydrology Conditions

Detailed review of Google Earth Pro aerial photography and imagery, and onsite inspections during September 2023, indicated that Review Area wetland hydrology conditions are significantly disturbed by construction of a pond (built after June 15, 1952 (Figure 7) and prior to May 1, 1965 (Figure 8), USGS) within the Project's Review Area watershed and capture of spring discharges by wells. Field indicators of wetland hydrology conditions observed (A3 – Saturation; B1 (Riverine) – Water Marks; B2 (Riverine) - Sediment Deposits; and B3 (Riverine) – Drift Deposits) were determined to not be naturally problematic, but representative of the 2022 and 2023-year's ponding and flooding events.

Evidence of wetland hydrology conditions in the form of ponding and surface water flow was found within the pond area, but not within the riverine drainage observed. No evidence of active springs or seeps were observed at the time of the site visit. The source of surface water within the pond is from direct precipitation and associated stormwater runoff within the watershed of the Review Area. The pond also receives water from wells. The riverine drainage below the pond area periodically receives surface water flows when the pond seasonally overflows as a result of extreme precipitation events. Soil pits dug for hydric soil investigations found no evidence of near surface groundwater conditions.

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[2] Disturbed areas consist of sites where vegetation, soil, or hydrology indicators may be impacted (obscured or absent) due to recent human activities or natural events.

[3] Naturally problematic refers to a problem area that are naturally occurring wetland types that lack indicators of hydrophytic vegetation, hydric soil, or wetland hydrology periodically due to normal seasonal or annual variability, or permanently due to the nature of the soils or plant species on the site.

[4] Taxonomic classifications follows: Greenhouse, Jeffrey, Staci Markos, Richard L. Moe, Scott Simono, Margriet Wetherwax, and Linda Ann Vorobik. *The Digital Jepson Manual: Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded*. Edited by Bruce G. Baldwin, Douglas H. Goldman, David J. Keil, Robert Patterson, Thomas J. Rosatti, and Dieter H. Wilken. 2nd ed. University of California Press, 2012. http://www.jstor.org/stable/10.1525/j.ctt1pn9sv

[5] Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X. http://wetland-plants.usace.army.mil/nwpl_static/data/DOC/lists_2016/National/National_2016v2.pdf

Flow Duration. Mazor, R.D., et al. (2021) define ephemeral, intermittent, and perennial flows as follows:

> Ephemeral streams are channels that flow only in direct response to precipitation. Water typically flows at the surface only during and/or shortly after large precipitation events, the streambed is always above the water table, and stormwater runoff is the primary water source.
>
> Intermittent reaches are channels that contain sustained flowing surface water for only part of the year, typically during the wet season, where the streambed may be below the water table and/or where the snowmelt from surrounding uplands provides sustained flow. The flow may vary greatly with stormwater runoff.
>
> Perennial reaches are channels that contain flowing surface water continuously during a year of normal rainfall, often with the streambed located below the water table for most of the year. Groundwater typically supplies the baseflow for perennial reaches, but the baseflow may also be supplemented by stormwater runoff and/or snowmelt.

Based on the above observations and definitions, the flow duration of the drainages within the Project Site is determined to be ephemeral.

3.2 CWA Other Waters and RHA Navigable Waters

3.2.1 Non-Tidal Areas

CWA and RHA. Non-tidal aquatic resource areas were found within the Review Area. One manmade pond and a connected ephemeral tributary were found onsite which conveys flows offsite to San Antonio Creek. Additionally, several earthlined ephemeral drainage ditches which convey stormwater flows to this tributary were identified and delineated as aquatic resources within the Review Area (Appendix A, Figure 6). San Antonio Creek flows to the Petaluma River (Appendix F). These drainages all had observable OHWMs. Indicators of these OHWMs included B1 (Riverine) – Water Marks; B2 (Riverine) - Sediment Deposits; B3 (Riverine) – Drift Deposits.

3.2.2 Tidal Areas

CWA and RHA. No aquatic resources associated with the ebb and flow of the tides exist in the Review Area.

4.0 POTENTIAL CWA SECTION 404 JURISDICTION

This section presents the findings of this delineation with respect to the identification and geographic extent of aquatic resources found that meet the technical criteria for either wetlands or other types of aquatic resources that potentially could be regulated by the Corps and the US EPA as a water of the US under Section 404 of the CWA.

4.1 Potential CWA Wetlands

Aquatic resources were identified and delineated within the Review Area (Appendix A, Figure 6) that would "potentially" meet the Corps' and US EPA's technical wetland criteria based on an analysis of the technical findings in Section 3.1. This analysis consisted of determining whether there was a collective presence of hydric soil, wetland hydrology, and hydrophytic vegetation as required by the Corps Delineation Manual. The Palustrine wetlands (pond/unconsolidated bottom and adjacent emergent wetlands) connect to a Riverine Intermittent "ephemeral" tributary (Appendix A, Figure 6) which flows offsite satisfies the wetland criteria. These wetlands however, although having a continuous surface connection to an (a)(1) water, are not adjacent to an (a)(1), (a)(2), or (a)(3) water as defined below.

> …. (a)(4) Wetlands adjacent to the following waters: (i) Waters identified in paragraph (a)(1) of this section; or (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters; [i.e., Jurisdictional Adjacent Wetlands]. ….

4.2 Potential CWA Other Aquatic Resources

The Riverine Intermittent "ephemeral" drainages identified within the of the Review Area (Appendix A, Figure 6) do not meet the relatively permanent continuously flowing surface water requirement needed to meet the WOTUS definition (33 CFR Section 328.3(a)) of a tributary as described below. These tributaries (Appendix F) only flow during and briefly following precipitation events which generate storm water runoff and therefore do not have a relatively permanent, standing or continuous flow.

WOTUS tributaries as defined by 33 CFR Section 328.3(a)(3) are:

> **….** (a)(3) Tributaries of waters identified in paragraph (a)(1) or (a)(2) of this section that are relatively permanent, standing or continuously flowing bodies of water; [i.e., Jurisdictional Tributaries]. ….

4.3 Summary of Aquatic Resources Identified and Delineated

The following table summarizes the types of aquatic resource habitats identified within the Review Area, why or not, they are potentially subject to CWA Section 404 Jurisdiction, their size, and Cowardin classification. Given the number of aquatic resources identified and delineated, the table below only provides a summary listing of these waters based on aquatic resource type.

Table 4. Summary of the Types of Aquatic Resource Habitats Identified Within the Review Area and Analysis for Why They are Potentially Subject to CWA Section 404 Jurisdiction, Size, and Cowardin Classification 4485 D Street Project, Sonoma County, California

Aquatic Resource ID #	Aquatic Habitat Type	WOTUS Definition Met?	Description of Relevant 33 CFR 328.3 WOTUS Definition and Analysis	Size		Cowardin Classification[1]
				Acres	Linear Ft	
P1	Wetland (pond)	No	P1 – is not an (a)(4) Wetlands adjacent to the following waters: (i) Waters identified in paragraph (a)(1) of this section; or (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters; [i.e., Jurisdictional Adjacent Wetlands] **Analysis**: P1 is not adjacent to an (a)(1), (a)(2), or (a)(3) water.	1.34	n/a	Palustrine Unconsolidated Bottom
W1	Wetland	No	W1 – is not an (a)(4) Wetlands adjacent to the following waters: (i) Waters identified in paragraph (a)(1) of this section; or (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters; [i.e., Jurisdictional Adjacent Wetlands] **Analysis**: W1 is not adjacent to an (a)(1), (a)(2), or (a)(3) water.	0.35	n/a	Palustrine Emergent
R1, R2, R3, and R4	Tributary	No	R1, R2, R3, and R4 are ephemeral drainages/streams that do not meet the WOTUS definition of Jurisdictional Tributaries which are defined by 33 CFR 328.3 as *(a)(3) jurisdictional Tributaries of waters identified in paragraph (a)(1) or (a)(2) of this section that are relatively permanent, standing or continuously flowing bodies of water; [i.e., Jurisdictional Tributaries].* **Analysis**: R1, R2, R3 and R4 are not relatively permanent, standing or continuously flowing bodies of water.	0.12	2,533.55	Riverine Intermittent "Ephemeral"

[1] Cowardin et al. 1979.

5.0 POTENTIAL RHA SECTION 10 JURISDICTION

5.1 Potential RHA Section 10 Aquatic Resources

Based on an analysis of the technical findings in Section 3.2, aquatic resources were also identified as being subject to the ebb and flow of the tide within the Review Area and therefore were considered potentially Subject to RHA Section 10 Jurisdiction.

The following table summarizes the aquatic resources identified and delineated within the Review Area potentially subject to RHA Section 10 Jurisdiction.

Table 5. Summary of Aquatic Resources Identified Within the Review Area that are Potentially Subject to RHA Section 10 Jurisdiction, 4485 D Street Project, Sonoma County, California

Aquatic Resource ID # [2]	Acres	Linear ft	Cowardin Wetland Classification[1]
N/A	N/A	N/A	N/A

[1] Aquatic Resources classified using the US Fish and Wildlife Service's Classification System for Wetland and Deepwater Habitats (Cowardin et al. 1979). [2] R = Riverine

No aquatic resources associated with the ebb and flow of the tides exist in the Review Area.

6.0 REFERENCES

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33 CFR Part 329. Definition of Navigable Waters of the United States. http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title33/33cfr329_main_02.tpl

40 CFR Part 230. Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material. http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr230_main_02.tpl

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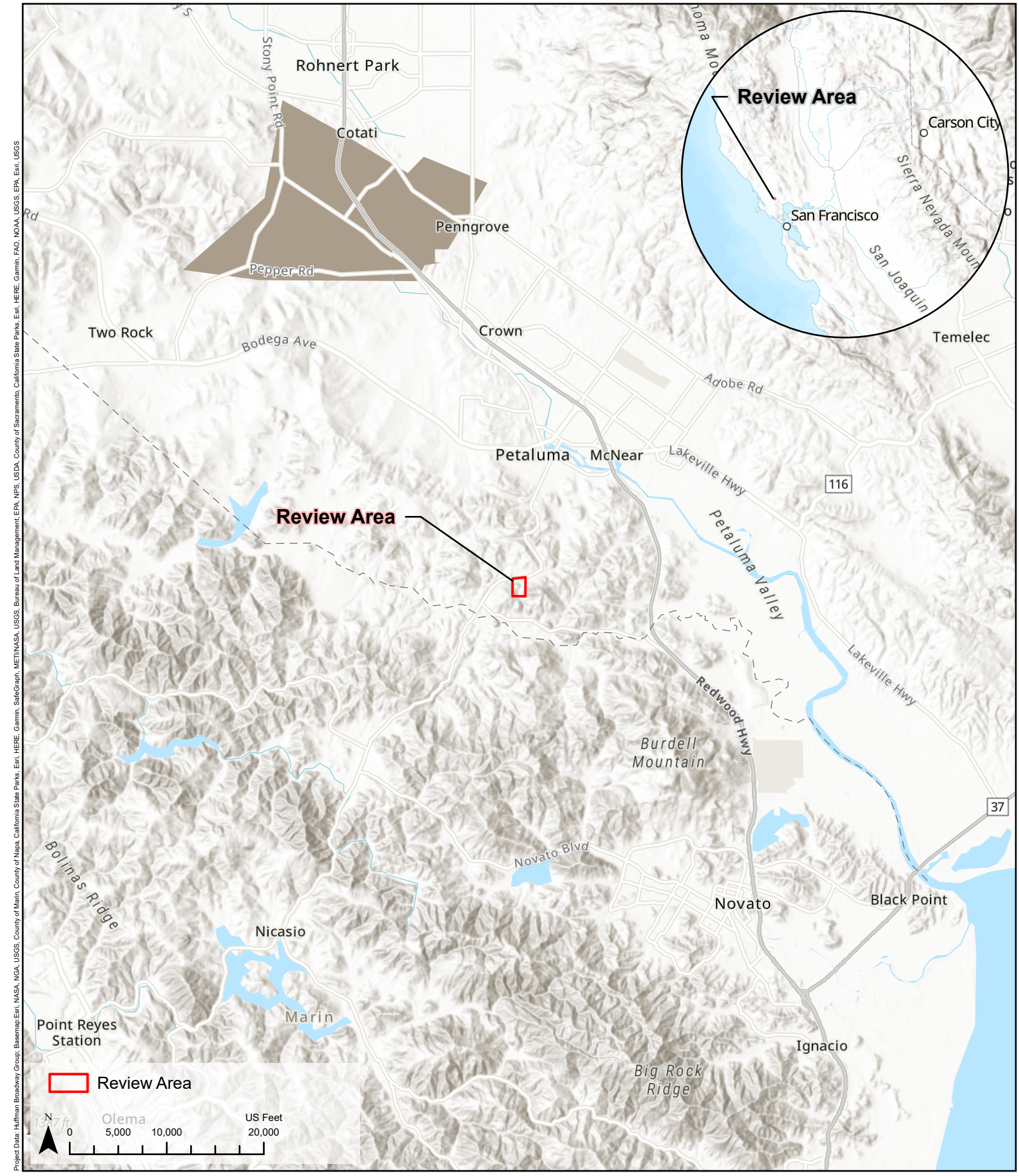
Appendix A

Figures



Project Data: Huffman Broadway Group; Basemap:Esri, NASA, NGA, USGS, County of Marin, County of Napa, California State Parks, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, County of Sacramento, California State Parks, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Esri, USGS

Figure 1. Review Area Location

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:150,000
Date: 1/3/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

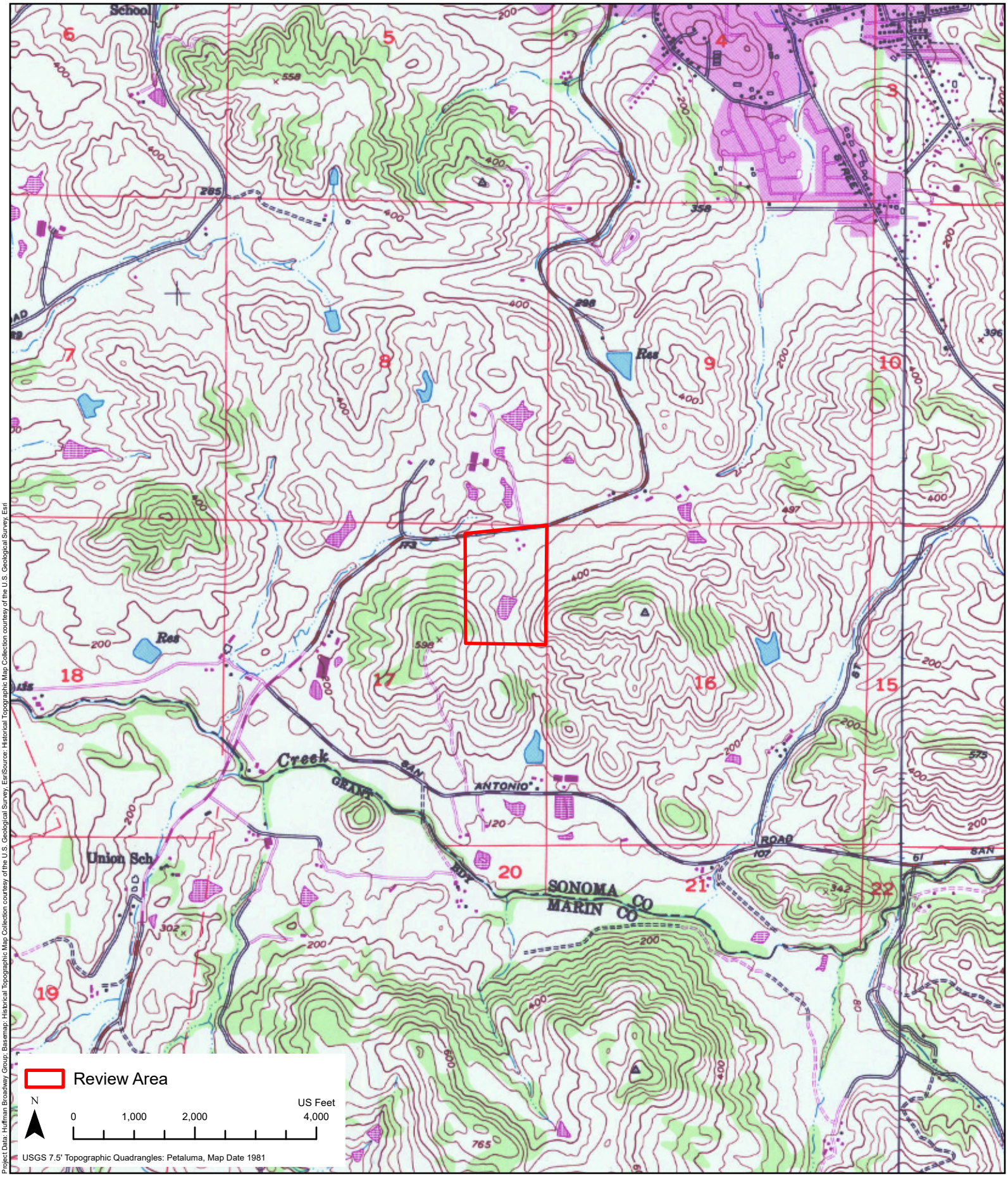


Figure 2. USGS Topographic Map of the Review Area

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:24,000
Date: 1/3/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

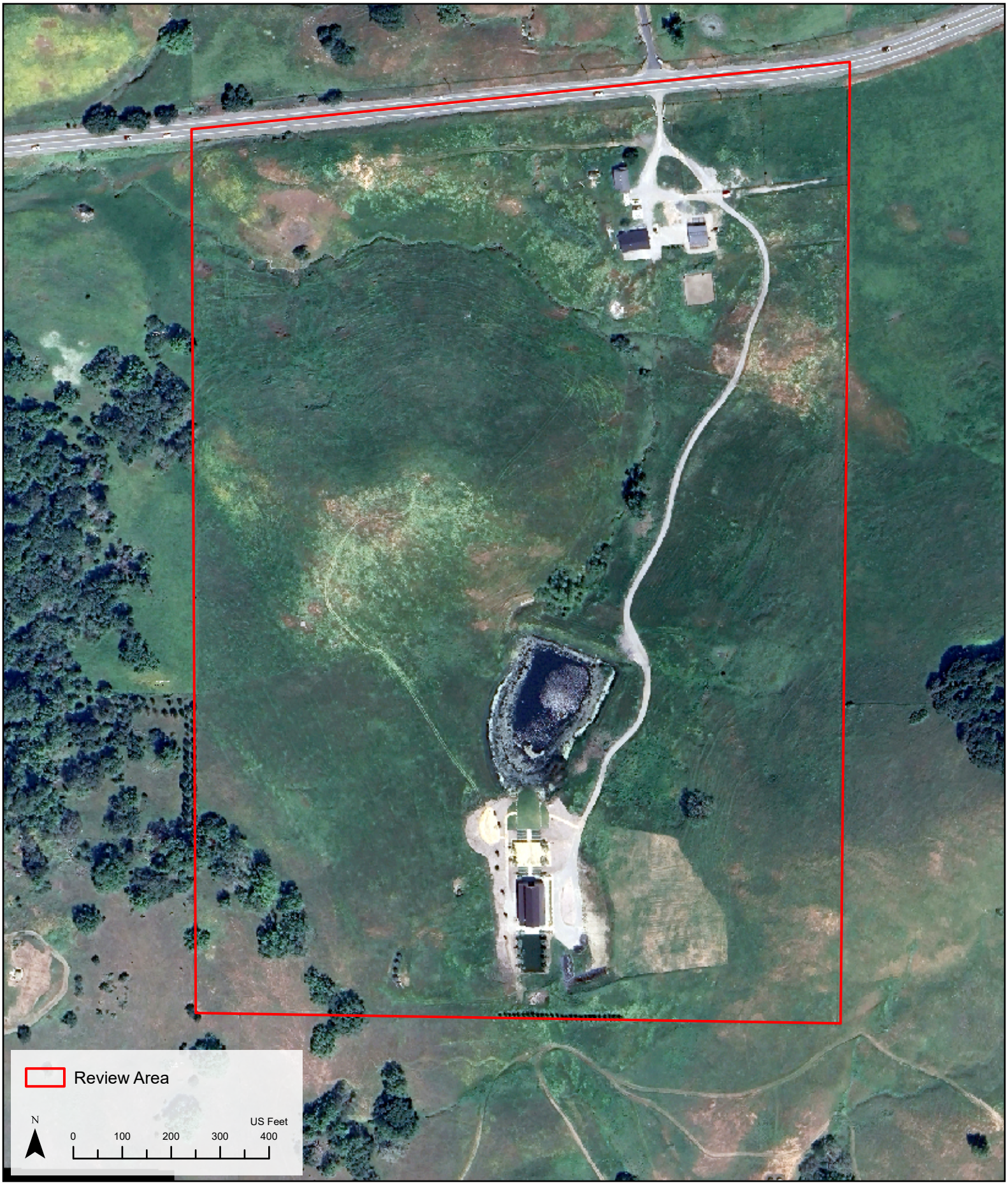


Figure 3. Aerial Image of the Review Area

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:3,000
Date: 1/9/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

Project Data: HBG; Wetlands: U.S. Fish and Wildlife Service; Basemap: Esri Community Maps Contributors, County of Marin, County of Napa, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS, Pictometry International, The County of Napa, Maxar, Aerial Imagery: Pictometry (Sonoma Accuplus IMG 2021) Image captured on Feb 19, 2021

Figure 4a. USFWS National Wetlands Inventory Mapping

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:10,000
Date: 1/8/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

Project Data: HBG; Basemap Imagery Credits: County of Marin, County of Napa, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, Pictometry International, The County of Napa, Maxar; Flood Zone Data: FEMA National Flood Hazard Layer (NFHL) - https://hazards.fema.gov/femaportal/wps/portal/NFHLWMS; Aerial Imagery: Pictometry (Sonoma Acuplus IMG 2021) Image captured on Feb 19, 2021

Figure 5. FEMA Flood Zone Mapping

4885 D Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:35,000
Date: 1/3/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

Figure 6. CWA Aquatic Resource Delineation

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:3,000
Map Created Date: 1/9/2024
GIS Specialists: Agie Gilmore & Deland Wing
HBG Project Manager: Greg Huffman

Figure 7. June 15, 1952 Aerial Imagery Showing Site Prior to Pond Construction

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:3,000
Date: 1/9/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

Figure 8. May 1, 1965 Aerial Imagery Showing Site Following Pond Construction

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference:
Name: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Scale: 1:3,000
Date: 1/9/2024
HBG GIS Analyst: Deland Wing
HBG PM: Terry Huffman, PhD

Appendix B

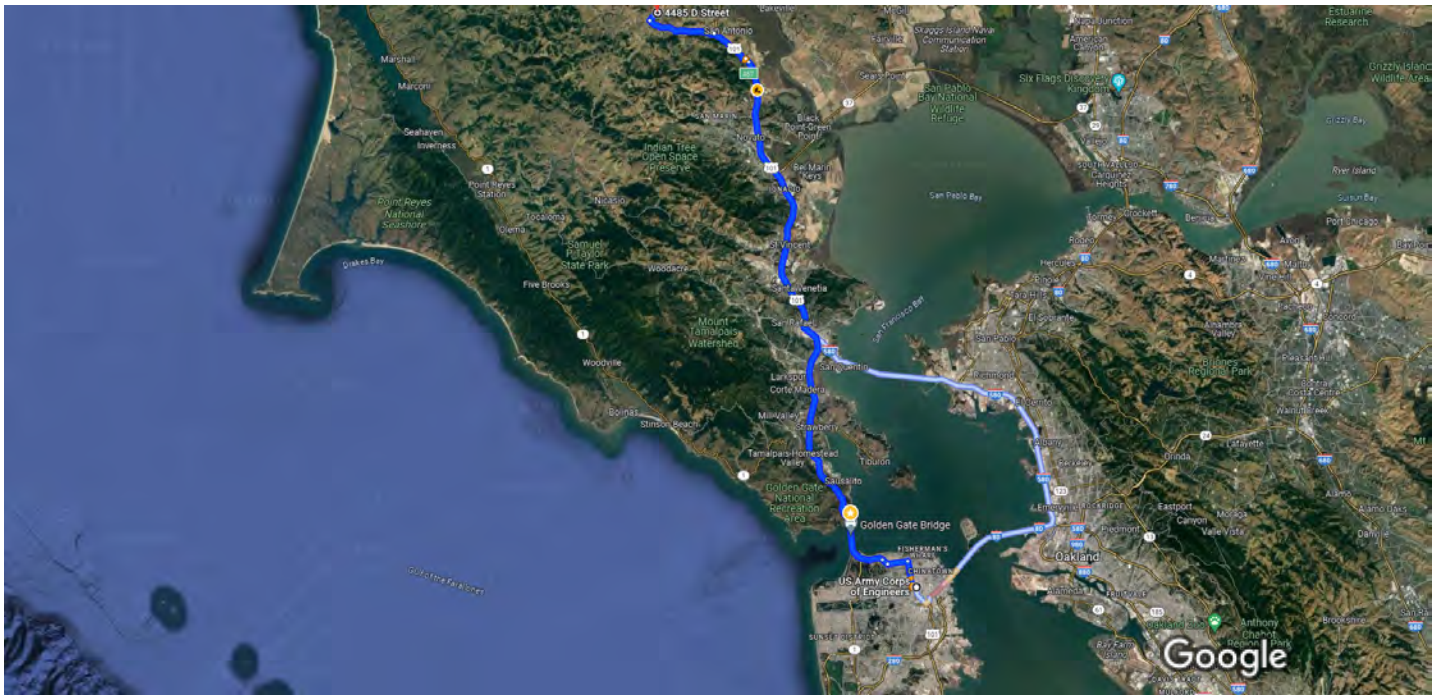
Driving Directions

Google Maps

US Army Corps of Engineers, 450 Golden Gate Ave 4th floor, San Francisco, CA 94102 to 4485 D St, Petaluma, CA 94952

Drive 37.7 miles, 49 min

4485 D Street Project



Imagery ©2023 TerraMetrics, Map data ©2023 Google 2 mi

US Army Corps of Engineers
450 Golden Gate Ave 4th floor, San Francisco, CA 94102

Take Franklin St and Lombard St to US-101/Presidio Pkwy

12 min (2.9 mi)

1. Head west on Turk St toward Polk St

0.2 mi

2. Turn right at the 3rd cross street onto Franklin St
   Pass by Wheel Works (on the left in 0.4 mi)

1.4 mi

3. Use the left 2 lanes to turn left onto Lombard St

1.0 mi

4. Continue onto Richardson Ave

0.3 mi

Follow US-101 to San Antonio Rd in Marin County. Take exit 467 from US-101

29 min (28.7 mi)

5. Continue onto US-101/Presidio Pkwy
   Continue to follow US-101

28.5 mi

6. Take exit 467 for San Antonio Rd toward Silveira Ranch Rd

0.2 mi

Follow San Antonio Rd to D St/D street Extension in Sonoma County

9 min (6.1 mi)

7. Turn left onto San Antonio Rd

2.1 mi

8. Turn left to stay on San Antonio Rd

3.4 mi

9. Turn right onto D St/D street Extension

Destination will be on the right

0.6 mi

4485 D St
Petaluma, CA 94952

Appendix C

NRCS Custom Soil Resource Report

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

4485 D Street

November 19, 2023

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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Contents

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: 1:3,500 if printed on A portrait (8.5" x 11") sheet.

N

0 50 100 200 300 Meters

0 150 300 600 900 Feet

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 17, Sep 11, 2023

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
LoD	Los Osos clay loam, 2 to 15 percent slopes	30.0	52.0%
LoE	Los Osos clay loam, 15 to 30 percent slopes, very rocky, MLRA 15	9.6	16.6%
LoF2	Los Osos clay loam, 30 to 50 percent slopes, eroded, MLRA 15	13.3	23.1%
LsE2	Los Osos clay loam, thin solum, 15 to 30 percent slopes, eroded	0.0	0.0%
LsF2	Los Osos clay loam, thin solum, 30 to 50 percent slopes	4.5	7.7%
ZaB	Zamora silty clay loam, moist, 0 to 8 percent slopes, MLRA 14	0.3	0.6%
Totals for Area of Interest		**57.6**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit

descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

LoD—Los Osos clay loam, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: hfgv
Elevation: 100 to 3,500 feet
Mean annual precipitation: 14 to 35 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 225 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Los Osos

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 sedimentary rock

Typical profile

H1 - 0 to 24 inches: clay loam
H2 - 24 to 34 inches: clay
H3 - 34 to 59 inches: weathered bedrock

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 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: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R015XD126CA - LOAMY UPLAND
Hydric soil rating: No

Minor Components

Steinbeck

Percent of map unit: 8 percent
Hydric soil rating: No

Pajaro
Percent of map unit: 7 percent
Hydric soil rating: No

LoE—Los Osos clay loam, 15 to 30 percent slopes, very rocky, MLRA 15

Map Unit Setting
National map unit symbol: 2tb86
Elevation: 10 to 650 feet
Mean annual precipitation: 28 to 46 inches
Mean annual air temperature: 56 to 59 degrees F
Frost-free period: 225 to 350 days
Farmland classification: Not prime farmland

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

Description of Los Osos

Setting
Landform: Hillslopes
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Parent material: Residuum weathered from sedimentary rock

Typical profile
A - 0 to 6 inches: clay loam
Bw - 6 to 16 inches: clay loam
Bt1 - 16 to 28 inches: clay
Bt2 - 28 to 34 inches: clay
Cr - 34 to 44 inches: bedrock

Properties and qualities
Slope: 15 to 30 percent
Surface area covered with cobbles, stones or boulders: 3.0 percent
Depth to restrictive feature: 30 to 50 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 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: Low (about 5.6 inches)

Interpretive groups
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D
Ecological site: R015XD126CA - LOAMY UPLAND
Hydric soil rating: No

Minor Components

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

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

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

Rock outcrop
Percent of map unit: 3 percent
Hydric soil rating: No

LoF2—Los Osos clay loam, 30 to 50 percent slopes, eroded, MLRA 15

Map Unit Setting
National map unit symbol: 2w619
Elevation: 20 to 620 feet
Mean annual precipitation: 28 to 44 inches
Mean annual air temperature: 57 to 60 degrees F
Frost-free period: 240 to 270 days
Farmland classification: Not prime farmland

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

Description of Los Osos

Setting
Landform: Mountain slopes, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile
A - 0 to 10 inches: clay loam
Bt1 - 10 to 20 inches: clay
Bt2 - 20 to 32 inches: clay

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 24 to 39 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 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: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XD126CA - LOAMY UPLAND
Hydric soil rating: No

Minor Components

Steinbeck

Percent of map unit: 5 percent
Landform: Mountain slopes, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Hydric soil rating: No

Goldridge

Percent of map unit: 5 percent
Landform: Mountain slopes, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Hydric soil rating: No

Rock outcrop

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

LsE2—Los Osos clay loam, thin solum, 15 to 30 percent slopes, eroded

Map Unit Setting

National map unit symbol: hfh1
Elevation: 100 to 3,500 feet
Mean annual precipitation: 14 to 35 inches
Mean annual air temperature: 57 to 63 degrees F

Frost-free period: 225 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Los Osos

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 sedimentary rock

Typical profile

H1 - 0 to 10 inches: clay loam
H2 - 10 to 20 inches: clay
H3 - 20 to 59 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 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: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XD129CA - SHALLOW LOAMY UPLANDS
Hydric soil rating: No

Minor Components

Goldridge

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

Steinbeck

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

Rock outcrop

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

LsF2—Los Osos clay loam, thin solum, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hfh2
Elevation: 100 to 3,500 feet
Mean annual precipitation: 14 to 35 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 225 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Los Osos

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 sedimentary rock

Typical profile

H1 - 0 to 4 inches: clay loam
H2 - 4 to 20 inches: clay
H3 - 20 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 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: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R015XD130CA - STEEP SHALLOW LOAMY UPLANDS
Hydric soil rating: No

Minor Components

Rock outcrop
Percent of map unit: 10 percent
Hydric soil rating: No

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

Steinbeck
Percent of map unit: 2 percent
Hydric soil rating: No

ZaB—Zamora silty clay loam, moist, 0 to 8 percent slopes, MLRA 14

Map Unit Setting
National map unit symbol: 2xcc1
Elevation: 20 to 350 feet
Mean annual precipitation: 29 to 44 inches
Mean annual air temperature: 58 to 60 degrees F
Frost-free period: 280 to 323 days
Farmland classification: Prime farmland if irrigated

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

Description of Zamora

Setting
Landform: Stream terraces, alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave, convex
Parent material: Alluvium derived from volcanic and sedimentary rock

Typical profile
A1 - 0 to 5 inches: silty clay loam
A2 - 5 to 17 inches: clay loam
A3 - 17 to 29 inches: clay loam
Bt1 - 29 to 41 inches: clay loam
Bt2 - 41 to 55 inches: sandy clay loam
Bt3 - 55 to 60 inches: gravelly clay

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.2 to 0.5 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Yolo

Percent of map unit: 6 percent
Hydric soil rating: No

Cortina

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

Pajaro

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

Unnamed

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

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Appendix D

Precipitation Analysis

WETS Table

WETS Station: PETALUMA AIRPORT, CA								
Requested years: 1971 - 2022								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	57.6	38.4	48.0	4.67	1.86	5.67	7	0.0
Feb	62.0	40.2	51.1	4.60	1.80	5.48	7	0.0
Mar	64.8	42.0	53.4	3.51	1.37	4.26	7	0.0
Apr	68.4	43.7	56.1	1.53	0.62	1.86	4	0.0
May	72.9	47.2	60.0	0.68	0.19	0.64	2	0.0
Jun	78.9	50.7	64.8	0.16	0.00	0.08	0	0.0
Jul	81.9	52.4	67.2	0.03	0.00	0.00	0	0.0
Aug	81.9	52.9	67.4	0.05	0.00	0.00	0	0.0
Sep	81.8	51.6	66.7	0.23	0.00	0.19	1	0.0
Oct	76.2	47.6	61.9	1.44	0.53	1.56	2	0.0
Nov	65.3	41.8	53.6	3.08	1.52	3.76	6	0.0
Dec	57.6	38.1	47.9	4.68	2.04	5.63	8	0.0
Annual:					18.28	28.12		
Average	70.8	45.6	58.2	-	-	-	-	-
Total	-	-	-	24.67			44	0.0

GROWING SEASON DATES			
Years with missing data:	24 deg = 7	28 deg = 7	32 deg = 6
Years with no occurrence:	24 deg = 40	28 deg = 8	32 deg = 0
Data years used:	24 deg = 45	28 deg = 45	32 deg = 46
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	1/22 to 12/25: 337 days	3/2 to 11/26: 269 days
70 percent *	No occurrence	1/5 to 1/12: 372 days	2/19 to 12/7: 291 days
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)													
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1893		2.34	6.41	1.24	0.65	0.00	0.00		M0.12	0.19	3.75	3.54	18.24
1894	M8.61	M2.92	0.85	0.69	0.69	0.69			1.61	1.72		10.15	27.93
1895	9.89	M2.47	2.55	0.61	0.81		0.08		0.36	0.15			16.92
1896													
1897													
1898													
1899													
1900													
1901													
1902													
1903													
1904													

1905													
1906													
1907													
1908													
1909													
1910													
1911													
1912													
1913		0.70	1.95	1.01	0.69	0.01	0.11	T	T	0.00	6.68	9.17	20.32
1914	15.77	5.97	1.02	1.04	0.37	0.14	0.00		0.02	1.07	0.48	7.49	33.37
1915	8.77	11.70	3.14	0.45	3.19		M0.02			0.06	0.83	6.26	34.42
1916	16.59	3.31	1.92	0.02	M0.15	0.08	0.12	0.22	0.73	0.46	1.14	6.03	30.77
1917	2.12	5.46	1.16	0.63	0.09	0.00			0.10		0.59	1.91	12.06
1918	1.43	4.76	2.79	0.64	0.00	0.11		0.00	2.85	0.63	4.15	2.32	19.68
1919	3.78	7.60	2.13	0.19	T	0.00			0.25	0.37	0.31	4.35	18.98
1920	0.24	1.00	3.00	1.71		0.44	0.06		0.10	2.59	4.79	8.03	21.96
1921	8.47	0.97	1.60	0.35	M2.93	0.02			0.25	0.85	1.64	6.51	23.59
1922	1.94	4.90	2.15	M0.24	0.34	0.12		0.00		2.28	3.43	10.06	25.46
1923	M2.48	1.27		4.56	0.05	0.06	MT	0.17	1.00	0.22	0.76	1.10	11.67
1924	3.40	3.29	1.72	0.23	0.14		0.00		0.00	3.57	1.70	M5.98	20.03
1925	1.66	11.17	2.89	M4.17	4.60	M0.06	0.03	0.16	0.38	0.55	3.65	1.28	30.60
1926	6.14	7.15	0.36	6.62	0.50	0.00	0.00	0.01	0.10	1.94	9.73	1.93	34.48
1927									MT	1.84	3.84	3.53	9.21
1928	2.35	2.71	5.23	1.82	0.17	0.00	0.00	0.00	0.03	0.07	4.02	4.75	21.15
1929	1.39	M2.08	M1.32	1.08	T	1.57	0.00	0.00		M0.06	0.00	M5.74	13.24
1930	M4.61	M2.62	3.35	1.30	0.20	0.00	0.00	0.00	0.48	0.97	1.29	0.38	15.20
1931	6.85	1.28	1.98	0.63	0.77	0.97	0.00	0.00	T	1.00	M1.53	11.26	26.27
1932	2.78	2.32	0.76	0.89	2.06	T	0.00	0.00	T	T	1.24	3.58	13.63
1933	6.25	1.39	3.16	0.15	1.40	0.00	0.00	0.00	T	M1.91	0.00	7.22	21.48
1934	0.75	4.49	0.38	0.74	1.75	0.48	0.00	T	0.30	M1.50	M3.81	3.90	18.10
1935	7.07	2.09	5.70	3.22	0.00	0.00	0.00	0.09	0.30	0.69	1.57	2.76	23.49
1936	6.85	9.68	1.17	1.30	0.22	0.71	T	T	0.00	0.35	0.02	2.79	23.09
1937	4.94	7.57	7.18	1.00	T	M0.85	T	0.00	0.00	1.19	3.61	4.35	30.69
1938	4.43	9.38	8.58	1.93	T	0.00	0.00	0.00	0.51	1.02	1.28	2.50	29.63
1939	3.40	2.07	2.23	0.15	0.48	T	0.00	0.00	0.08	0.19	0.18	1.50	10.28
1940	9.98	10.19	5.46	2.14	1.22	0.04	0.00	0.00	0.08	1.30	1.91	11.86	44.18
1941	9.58	8.50	5.91	5.43	0.90	0.30	0.00	T	T	1.48	2.18	6.72	41.00
1942	6.09	6.47	M3.61	4.50	1.12	0.00	0.00	0.00	0.	0.	4.71	M4.	31.

									08	99		19	76
1943	7.48	2.22	3.77	1.47	0.07	0.07	0.00	0.00	0.00	0.43	M0.43	2.46	18.40
1944	M4.72	7.03	2.10	2.12	1.20	0.24	0.00	0.02	T	1.59	5.01	4.66	28.69
1945	2.75	4.02	4.12	0.03	0.62	0.00	T	0.00	0.05	2.84	4.15	10.96	29.54
1946	2.15	2.59	2.09	0.29	0.08	0.00	0.04	0.00	0.04	0.23	3.52	2.97	14.00
1947	0.76	2.63	M4.03	0.69	0.29	M1.26	0.00	0.00	0.00	3.37	1.20	M0.45	14.68
1948	1.82	2.03	3.75	5.11	0.50	0.07	0.00	0.00	0.03	0.51	0.87	4.67	19.36
1949	1.50	2.54	7.16	0.00	0.24	0.00	M0.00	M0.10	T	0.12	1.18	2.77	15.61
1950	9.18	3.90	1.86	1.20	0.39	0.00	0.00	0.00	0.00	2.78	5.93	7.41	32.65
1951	4.03	3.38	1.30	0.74	0.86	0.00	0.00	0.00	0.00	1.36	3.17	6.99	21.83
1952	10.46	2.66	4.61	0.70	0.10	0.26	0.00	0.00	0.00	0.15	2.48	11.66	33.08
1953	4.68	0.08	1.87	3.04	0.66	0.35	0.00	0.20	0.00	0.28	3.58	0.60	15.34
1954	5.11	2.97	5.25	1.55	0.09	0.36	0.01	0.39	T	0.22	4.05	4.91	24.91
1955	4.06	0.95	0.37	3.34	0.00	0.00	0.00	0.00	0.55	0.18	2.22	15.48	27.15
1956	9.85	4.65	0.33	2.23	0.61	0.00	T	T	0.08	1.41	0.09	0.35	19.60
1957	3.52	5.46	2.34	1.50	2.16	T	0.00	0.00	0.99	4.87	0.88	3.08	24.80
1958	5.57	11.23	5.21	5.72	0.46	0.32	T	0.00	0.04	0.09	0.18	1.13	29.95
1959	6.35	6.26	0.59	0.35	0.08	0.00	0.06	T	1.85	0.04	T	1.31	16.89
1960	5.88	4.76	2.24	1.01	0.66	0.00	0.00	0.00	0.02	0.40	3.91	2.75	21.63
1961	4.37	1.99	3.25	1.15	0.37	0.07	0.00	0.02	0.63	0.07	3.29	4.11	19.32
1962	1.30	9.15	3.32	0.43	0.00	0.00	0.00	0.03	0.08	7.29	0.61	3.32	25.53
1963	4.97	3.04	4.58	4.58	0.46	0.00	0.00	0.00	0.05	1.52	5.60	0.92	25.72
1964	4.63	0.26	1.81	0.08	0.21	0.84	0.05	T	0.00	2.42	5.42	5.81	21.53
1965	5.19	0.66	1.53	3.57	0.00	T	0.00	0.41	0.00	0.20	5.93	3.70	21.19
1966	5.00	3.10	0.55	0.46	0.12	0.18	0.00	0.11	0.05	0.00	6.42	5.47	21.46
1967	12.78	0.49	4.47	4.96	0.07	2.02	0.00	0.00	0.03	0.82	2.35	3.15	31.14
1968	6.58	3.70	3.43	0.32	0.58	0.00	0.00	0.62	0.03	1.84	3.20	5.72	26.02
1969	7.72	7.57	1.63	2.52	0.00	0.01	0.00	0.00	T	1.65	0.88		21.98
1970	13.34	2.34	2.48	0.17	0.00	0.48	0.00	0.00	0.00	0.96	9.11	6.40	35.28
1971	1.87	0.31	3.38	0.85	0.33	0.00	0.00	0.00	0.15	0.21	2.37	5.48	14.95
1972	1.67	2.40	0.38	1.08	T	0.15	0.01	T	0.92	4.46	5.26	4.50	20.83
1973	11.27	8.55	2.81	0.08	0.02	T	0.00	0.00	0.27	1.25	9.70	4.65	38.60
1974	5.30	1.83	4.72	2.30	0.00	0.02	0.95	0.00	0.00	0.91	0.89	3.40	20.32
1975	1.97	7.17	6.41	1.13	T	0.11	0.12	0.03	T	4.64	0.68	0.79	23.05
1976	0.32	1.95	0.97	1.51	0.00	0.01	0.00	0.62	0.	0.	1.54	0.89	8.98

									57	60			
1977	1.80	1.26	2.00	0.06	0.82	0.00	0.00	0.00	0.73	0.41	4.70	4.16	15.94
1978	12.58	4.62	4.24	3.68	0.09	0.00	0.00	0.00	0.46	0.00	1.51	0.73	27.91
1979	10.45	5.61	1.73	1.17	0.38	0.00	0.00	0.00	0.09	3.40	M3.02	5.60	31.45
1980	5.89	10.26	M1.38	1.08	0.24	0.05	0.19	0.00	T	0.34	0.32	M3.30	23.05
1981	5.93	M1.37	4.24	0.07	0.38	0.00	0.20	0.00	0.00	2.19	M5.29	M8.11	27.78
1982	M9.48	3.44	5.58	3.28	0.00	0.01	0.00	0.00	0.64	2.91	6.72	2.74	34.80
1983		9.11	15.04	4.59	0.28	0.00	0.00	0.48	0.42	0.61	8.75	9.43	48.71
1984	0.41	1.92	1.43	1.33	0.19	0.26	T	0.13	0.15	2.25	7.43	1.64	17.14
1985	1.20	2.41	4.07	0.54	T	0.01	0.06	0.00	0.08	0.98	3.68	3.48	16.51
1986	4.58	15.26	7.07	1.15	0.44	0.00	T	0.00	1.67	0.24	0.26	2.33	33.00
1987	4.40	4.53	3.29	0.08	0.04	0.00	0.00	0.00	0.00	1.42	3.04	6.39	23.19
1988	5.43	0.55	0.08	M1.24	0.67	0.73	0.00	0.00	0.00	0.09	3.25	2.81	14.85
1989	1.39	0.99	6.14	1.08	0.15	0.01	0.00	0.00	1.77	1.69	1.77	0.00	14.99
1990	5.06	3.48	0.99	0.31	2.34	0.00	0.00		0.12				12.30
1991	0.36	4.33	8.67	0.46	0.20	0.60	M0.00	0.08					14.70
1992	2.14	M7.29	M5.11	M1.27	0.00	M1.12	0.00	T	0.04	M2.81	0.50	M7.89	28.17
1993	8.62	5.27	M2.10	M0.84	1.40	0.80	T	0.00	T	1.63	2.94	2.46	26.06
1994	2.38	4.45	0.29	1.51	1.21	0.04	0.00	0.00	0.00	1.20	7.21	3.22	21.51
1995	16.31	1.00	11.98	1.35	1.89	0.43	T	0.00	0.00	0.00	0.28	9.10	42.34
1996	5.58	8.04	2.54	3.40	2.37	T	T	0.00	0.10	1.01	2.73	10.82	36.59
1997	8.65	0.48	0.60	M0.30	0.38	M0.05	0.00	1.04	0.20	0.94	7.69	2.40	22.73
1998	9.49	19.59	2.55	2.95	3.74	0.01	0.00	0.00	0.04	0.85	5.47	1.24	45.93
1999	3.82	10.00	3.54	2.04	0.10		0.00	0.00	0.03	0.74	3.12	0.74	24.13
2000	4.95	10.25		1.65	1.21	0.16	0.00	0.01	0.20	2.00	1.35	0.71	22.49
2001	4.53		1.52	1.22	0.00	0.01	0.00	0.01	M0.10	0.59	5.39	8.64	22.01
2002	3.49	2.23	1.97	0.56	0.93	0.00	0.00	0.00	0.00	0.00	3.21	12.30	24.69
2003	2.12	1.49	0.76	3.34	1.22	T	T	0.00	0.03	0.27	1.76	7.27	18.26
2004	2.45	6.41	0.74	0.41	0.08	0.00	0.00	0.00	0.25	4.67	2.33	9.28	26.62
2005	4.64	4.35	4.35	1.54	3.03	0.86	0.00	0.01	0.00	0.62	1.61	13.12	34.13
2006	4.37	4.28	8.08	4.99	0.32	0.00	0.00	0.00	0.00	0.67	2.98	4.68	30.37
2007	0.79	5.31	0.20	1.36	0.23	0.00	0.10	0.00	0.10	1.82	0.69	3.67	14.27
2008	9.68	2.93	0.32	0.08	0.16	M0.00	0.00	0.00	0.04	0.54	2.11	2.15	18.01
2009	0.75	7.71	2.13	0.54	1.70	0.07	0.00	0.00	0.17	3.16	0.61	M2.01	18.85
2010	9.15	3.73	2.72	4.05	1.49	T	0.00	0.00	0.	M2.	2.53	8.35	34.

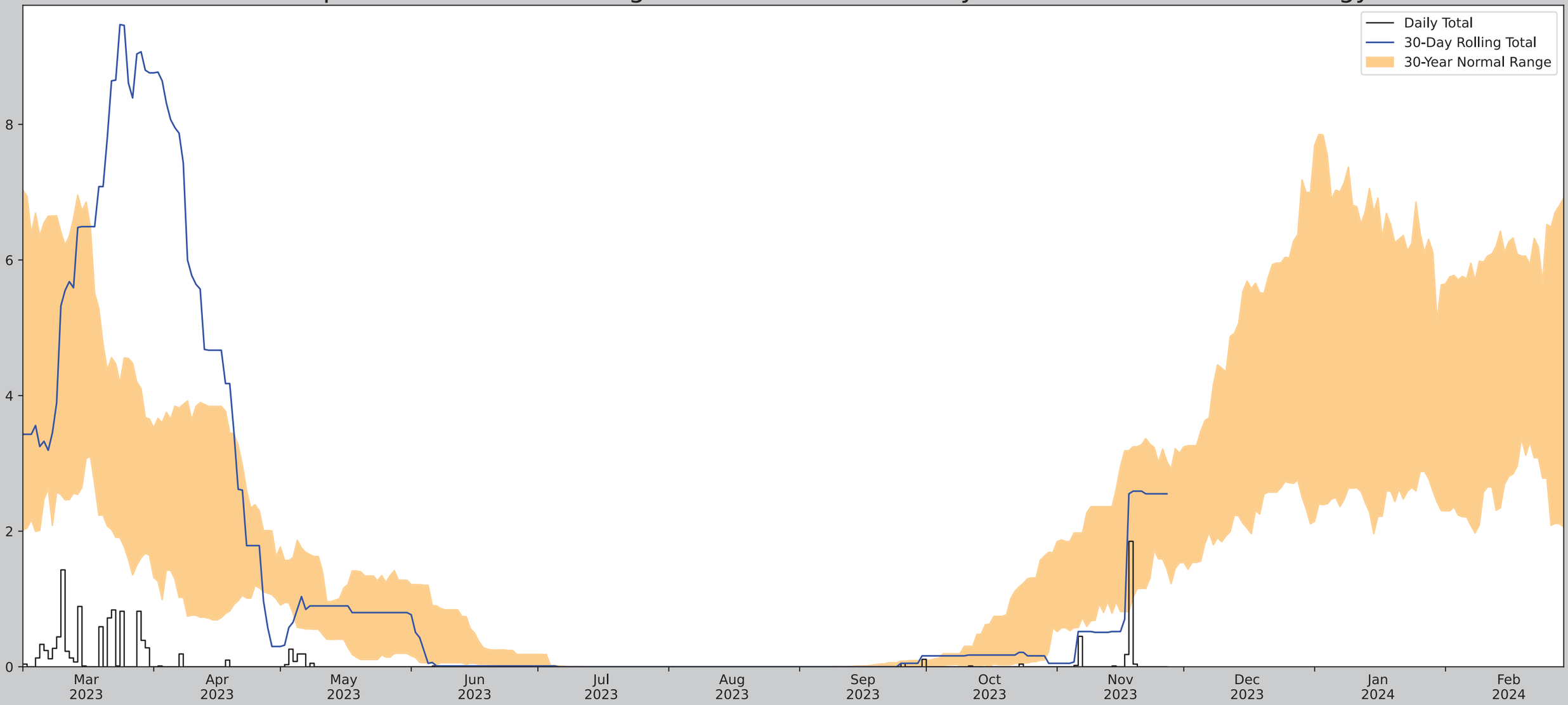
									00	46			48
2011	1.43	3.89	M9.88	0.55	1.60	2.32	0.00	0.00	0.00	2.06	1.62	0.10	23.45
2012	4.61	1.26	6.34	1.56	0.01	0.03	0.00	T	0.00	1.30	6.13	7.01	28.25
2013	0.60	0.44	0.80	1.15	0.21	0.56	0.00	0.00	0.61	0.00	0.87	0.38	5.62
2014	0.12	9.60	2.90	1.61	M0.00	0.00	0.02	0.05	0.42	0.59	3.25	15.60	34.16
2015	0.03	2.86	0.08	1.27	0.37	0.26	0.06	0.00	0.04	0.06	1.96	4.99	11.98
2016	6.96	0.88	6.63	1.05	0.31	0.00	0.00	0.00	0.00	5.56	3.09	3.92	28.40
2017	11.85	9.93	2.67	2.76	0.00	0.23	0.00	0.00	0.02	0.00	3.67	0.08	31.21
2018	4.80	0.15	5.24	4.55	0.35	0.00	0.00	0.00	0.00	1.34	4.19	2.42	23.04
2019	5.75	10.96	5.33	0.61	2.81	0.00	0.00	M0.00	0.05	0.02	M0.76	6.56	32.85
2020	2.55	0.00	2.15	1.07	M1.41	0.00	0.00	0.18	0.00	M0.00	M0.66	M1.67	9.69
2021	3.66	M0.90	1.73	0.05	0.00	0.00	0.00	0.00	0.09	M7.96	1.61	M5.91	21.91
2022	0.66	0.08	0.84	2.07	M0.00	0.42	0.00	0.03	1.02	0.00	1.53	8.29	14.94
2023	9.58	3.38	M8.52	0.30	0.80	0.01	0.00	0.00	0.16	0.05	2.84	M0.21	25.85

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

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

Creation date: 2023-12-04

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



Coordinates	38.195137, -122.648778
Observation Date	2023-09-21
Elevation (ft)	327.947
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-09-21	0.0	0.042913	0.0	Normal	2	3	6
2023-08-22	0.0	0.0	0.0	Normal	2	2	4
2023-07-23	0.0	0.0	0.0	Normal	2	1	2
Result							Normal Conditions - 12

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PETALUMA AP	38.2578, -122.6078	20.013	4.867	307.934	3.689	10981	90
PETALUMA 1.0 N	38.2561, -122.6229	51.837	0.828	31.824	0.399	2	0
PETALUMA 1.3 SW	38.2262, -122.6391	36.089	2.766	16.076	1.289	20	0
SONOMA 1.6 WNW	38.2964, -122.4882	103.018	7.014	83.005	3.738	3	0
SONOMA	38.2994, -122.4622	97.113	8.404	77.1	4.43	347	0

Appendix E

Wetland Delineation Data

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

This data sheet is being used for the purpose of determining the presence or absence of an Ordinary [illegible] (OHWM) within hills landforms. OHWM width = 2.5 feet.

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

OHWM width = 2.5 feet.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

This data sheet is being used for the purposes of determining the presence or absence of an Ordinary High Water Mark (OHWM) within hills landforms. OHWM width = 2.5 feet.

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

OHWM width = 2.5 feet.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
_____ = Total Cover			
Herb Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
_____ = Total Cover			
Woody Vine Stratum (Plot size: _____)			
1. _____			
2. _____			
_____ = Total Cover			

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

This data sheet is being used for the purposes of determining the presence or absence of an [illegible] Ordinary High Water Mark (OHWM) within hillslope landforms. OHWM width = 2.5 feet.

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

OHWM width = 2.5 feet.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

This data sheet is being used for the purposes of determining the presence or absence of an Ordinary High Water Mark (OHWM) within hills landforms. OHWM width = 1 foot.

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

OHWM width = 1 foot

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

This data sheet is being used for the purposes of determining the presence or absence of an [illegible] within hills landforms. OHWM width = 0.5 ft.

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

OHWM width = 0.5 ft.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

This data sheet is being used for the purposes of determining the presence or absence of an Ordinary High Water Mark (OHWM) within hills landforms. OHWM width = 1 foot

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

OHWM width = 1 foot

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks:

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

[illegible]ay loam, 15 to 30 percent slopes, very rocky, MLRA 15

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

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

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
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Sapling/Shrub Stratum (Plot size: _____)			
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2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
-								
-								
-								
-								
-								
-								
-								
-								

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

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 Vis ble 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 _____ Depth (inches): _____

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

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

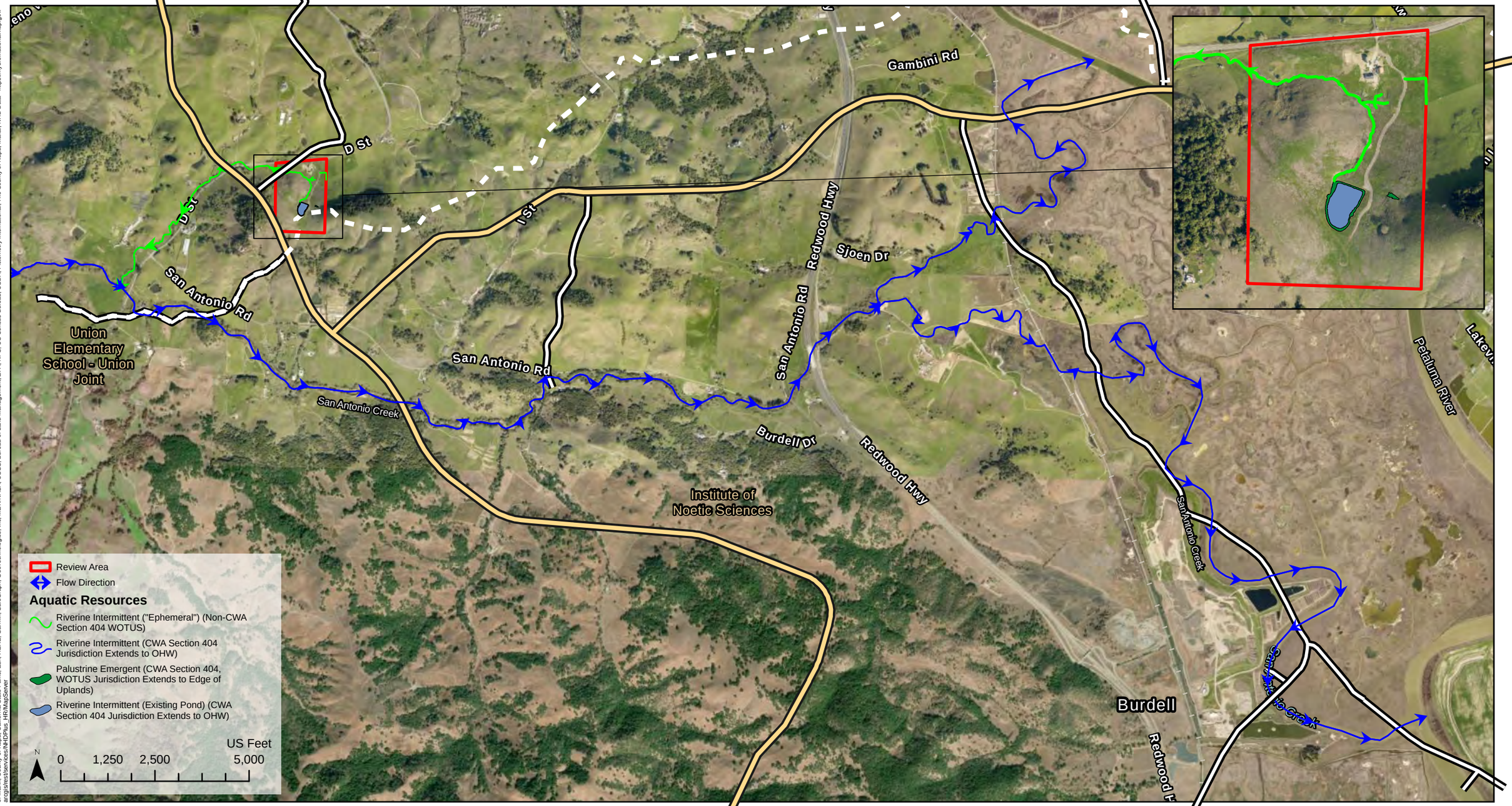
Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Appendix F

Surface Flow Mapping: Review Area Continuous Surface Connection to Traditional Navigable Waters



Appendix F. Surface Flow Mapping: Review Area Continuous Surface Connection to Traditional Navigable Waters

4885 D-Street
Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Spatial Reference
Name: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US
Scale: 1:35,000
Date: 12/29/2023
HBG GIS Specialists: Agie Gilmore & Deland Wing
HBG PM: Greg Huffman

Appendix G

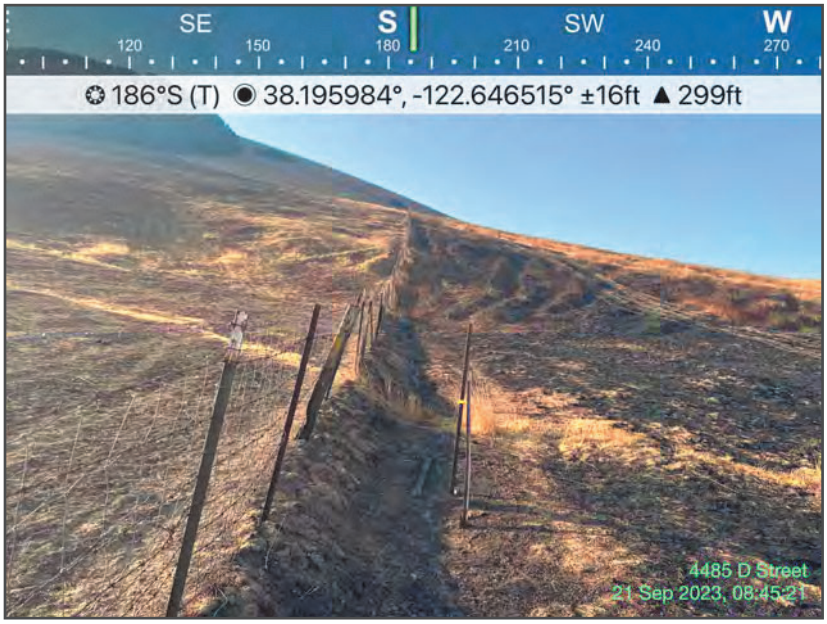
Representative Review Area Photographs

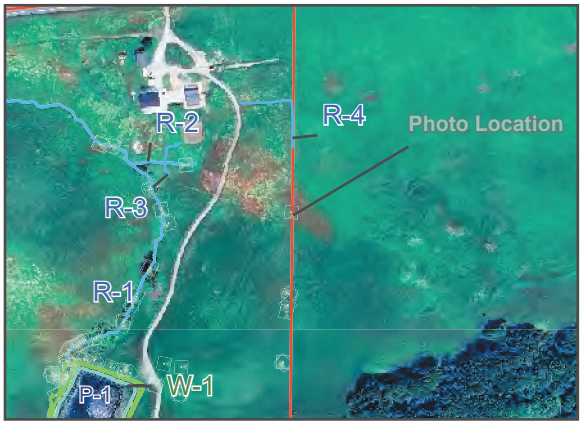
4485 D Street

Petaluma, Sonoma County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS
523 4TH ST. STE 224, SAN RAFAEL, CA 94901 · 415.925.2000 · www.h-bgroup.com

Photo ID: 1





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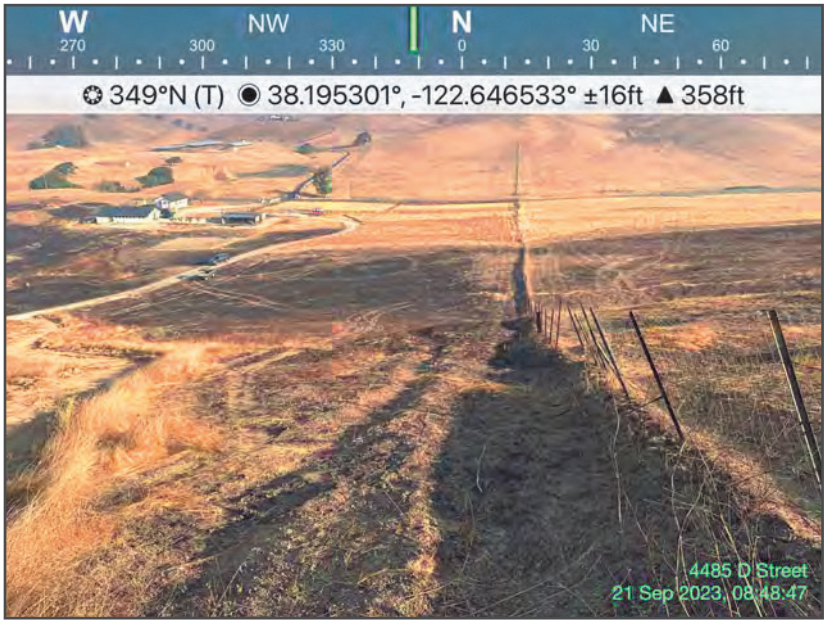

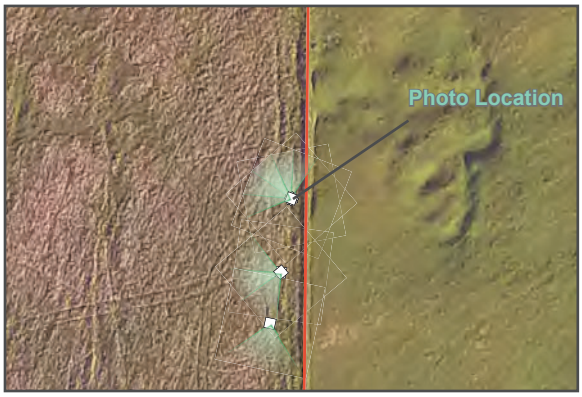

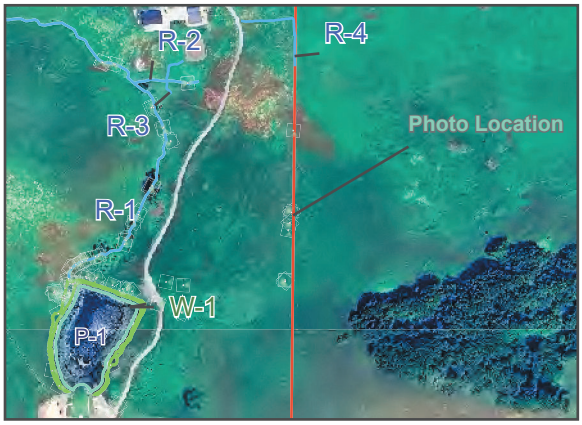

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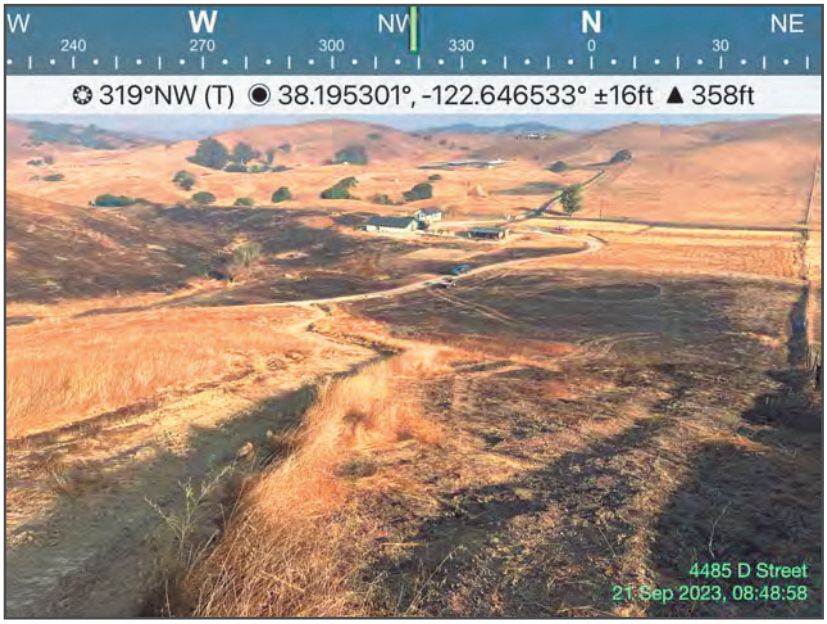

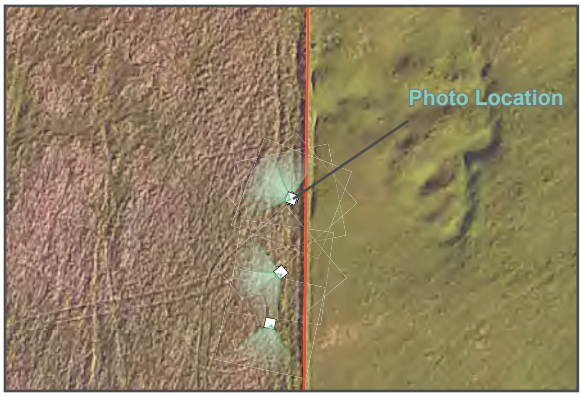

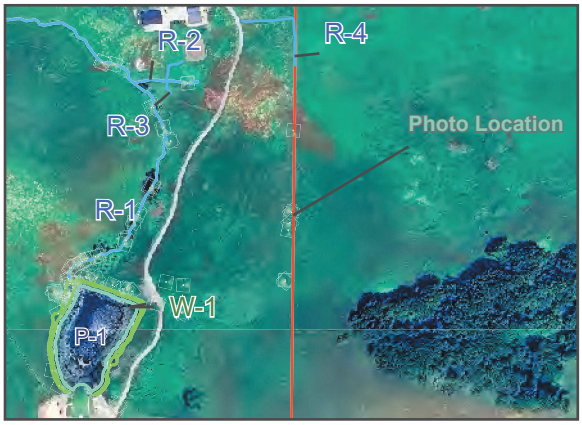

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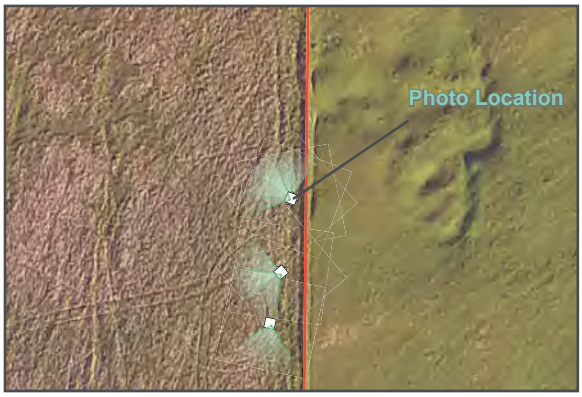

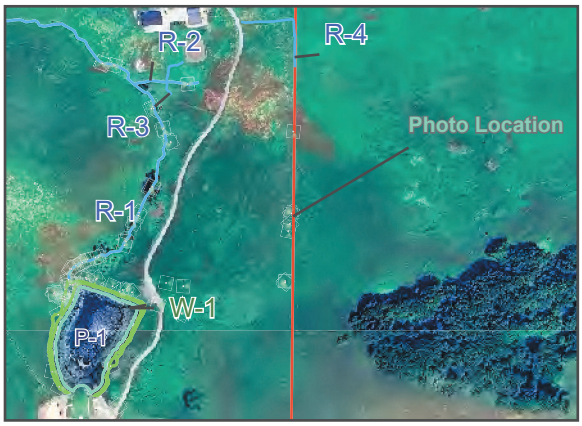

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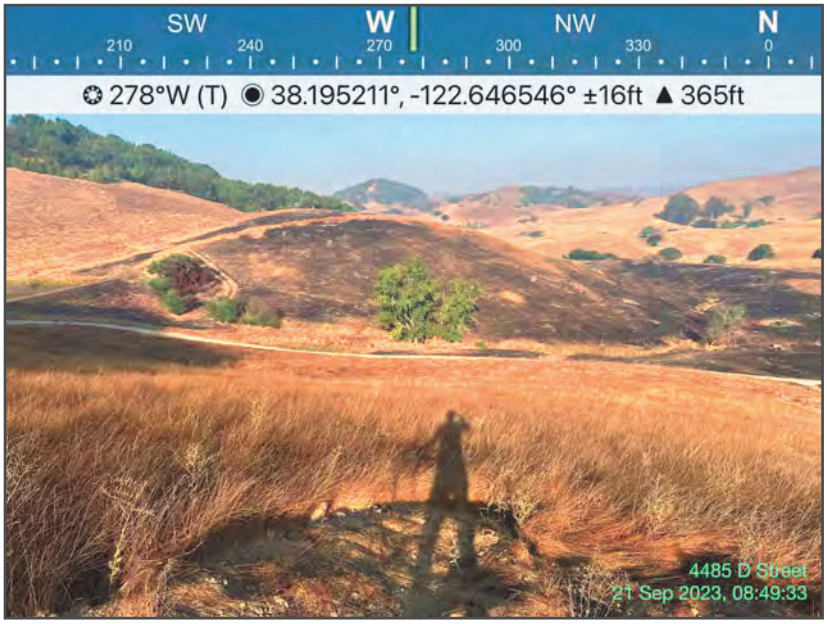

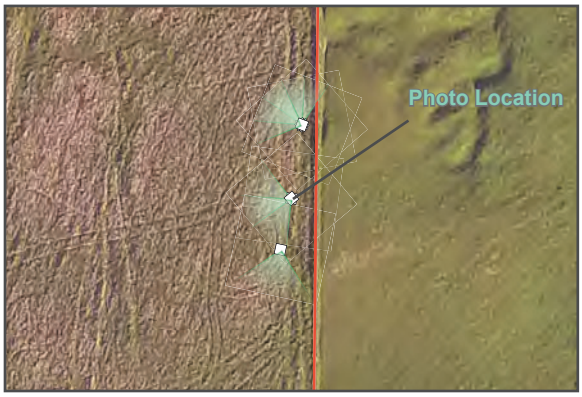

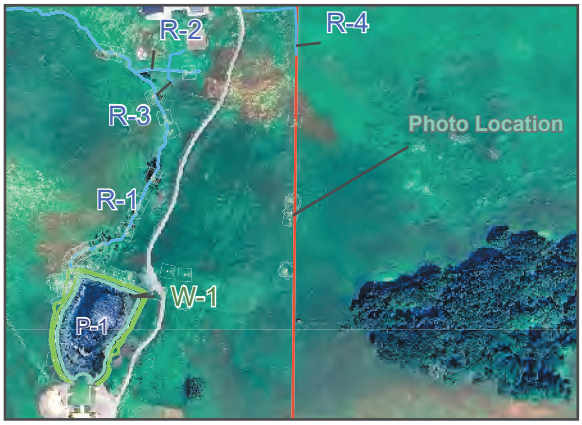

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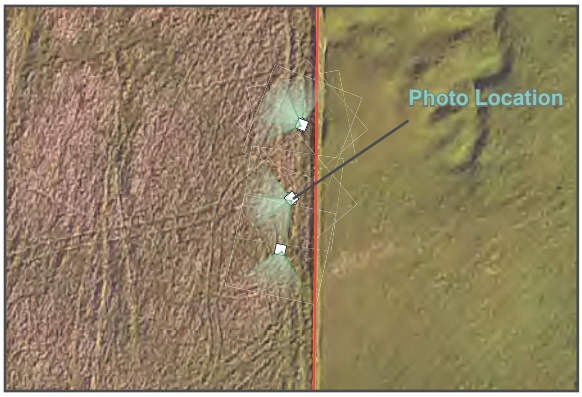

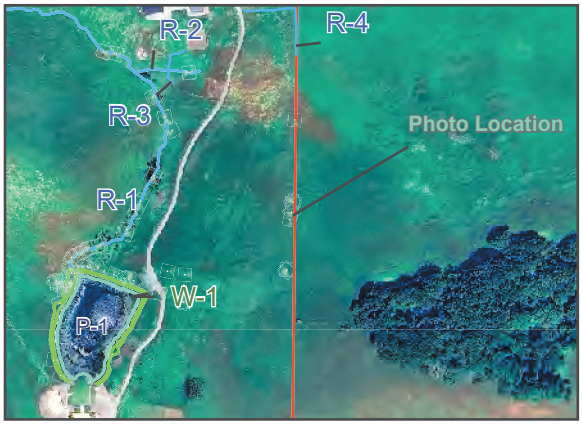

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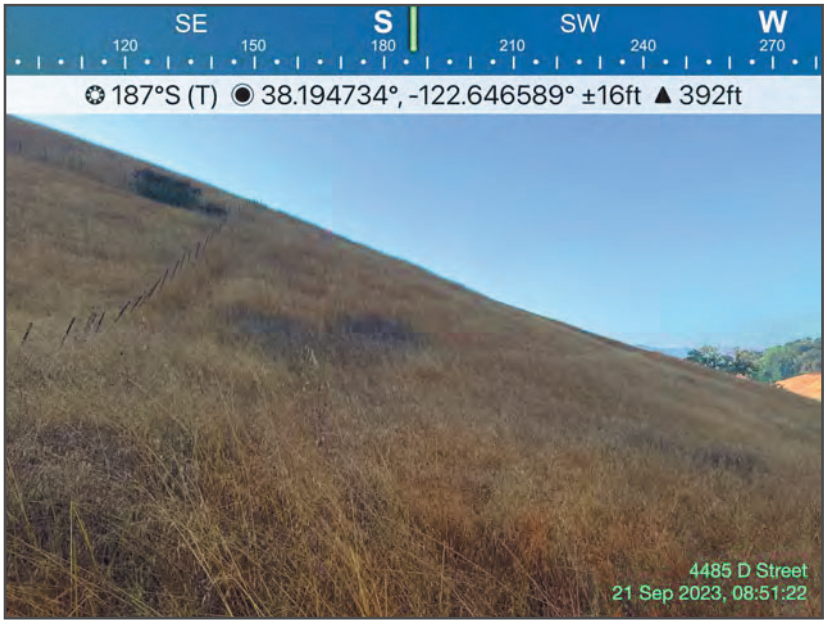

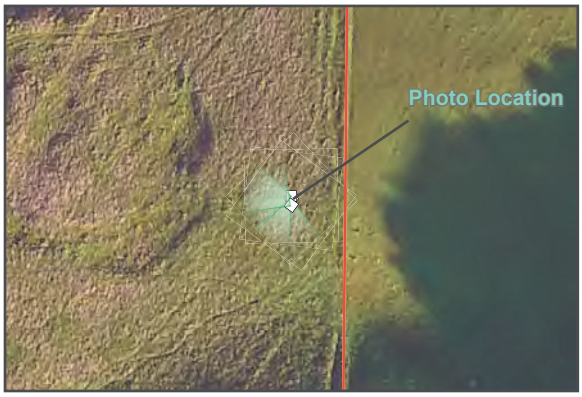

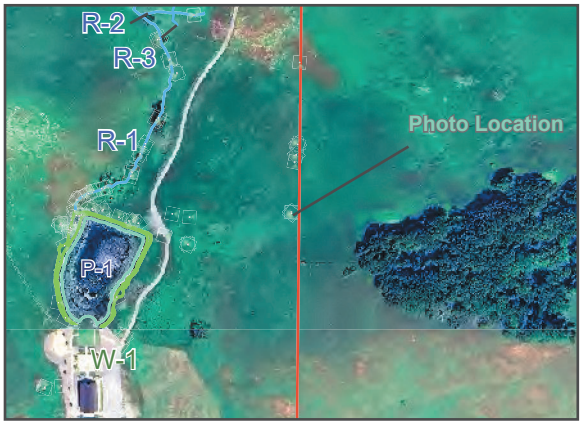

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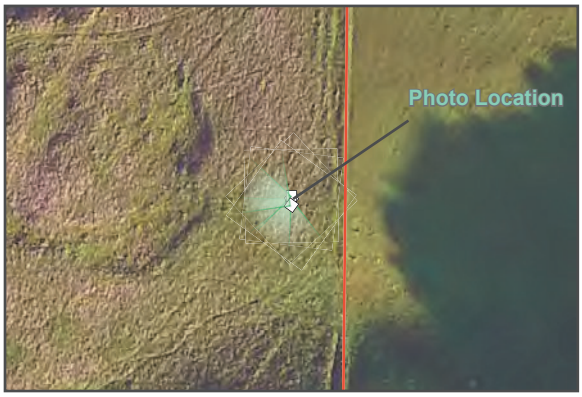

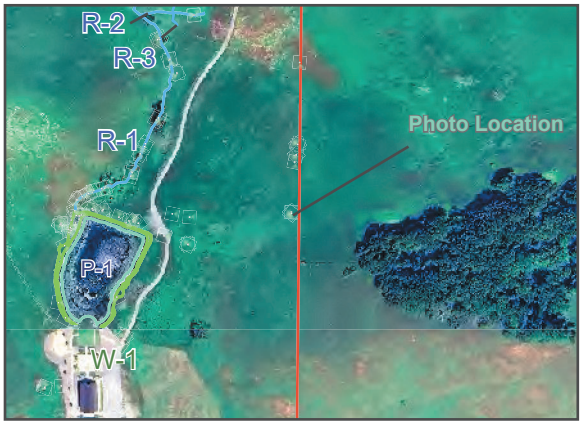

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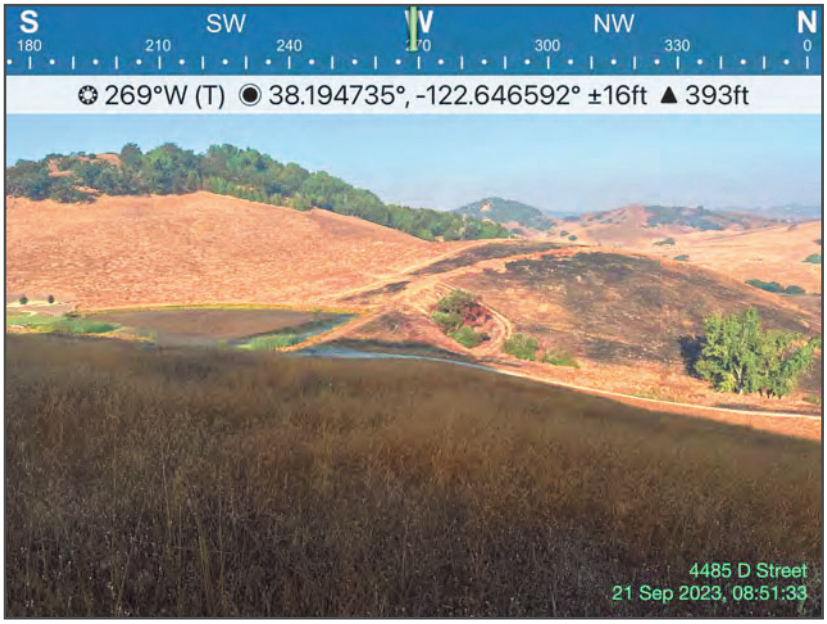

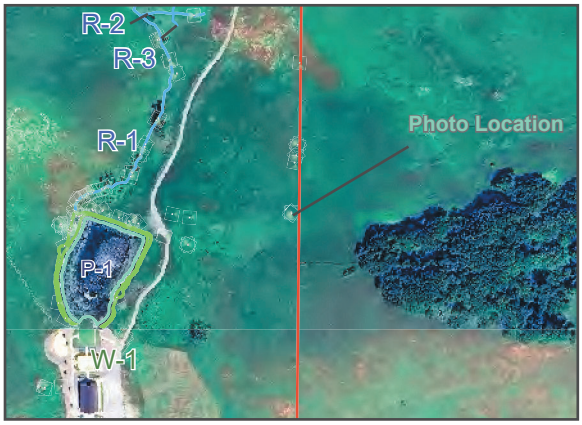

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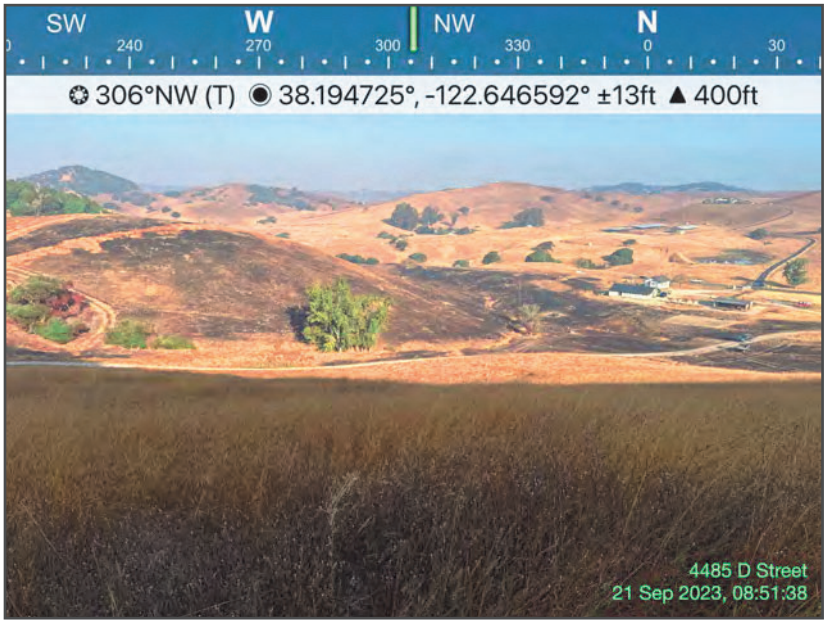

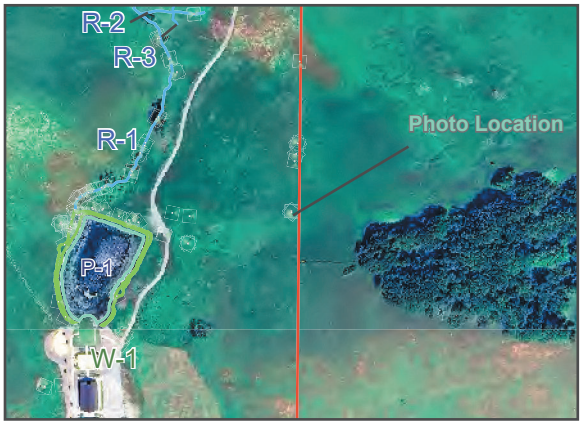

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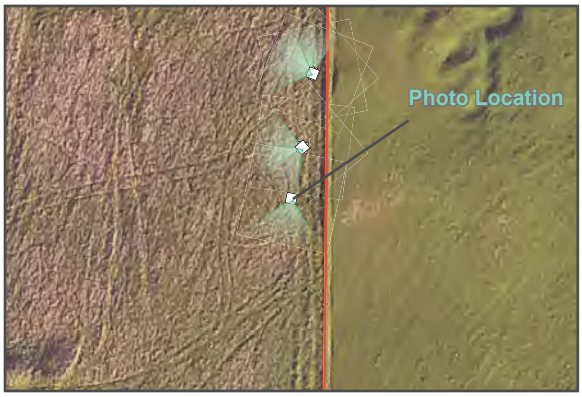

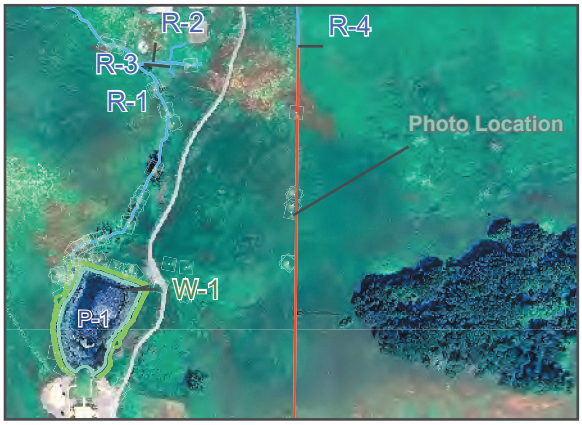

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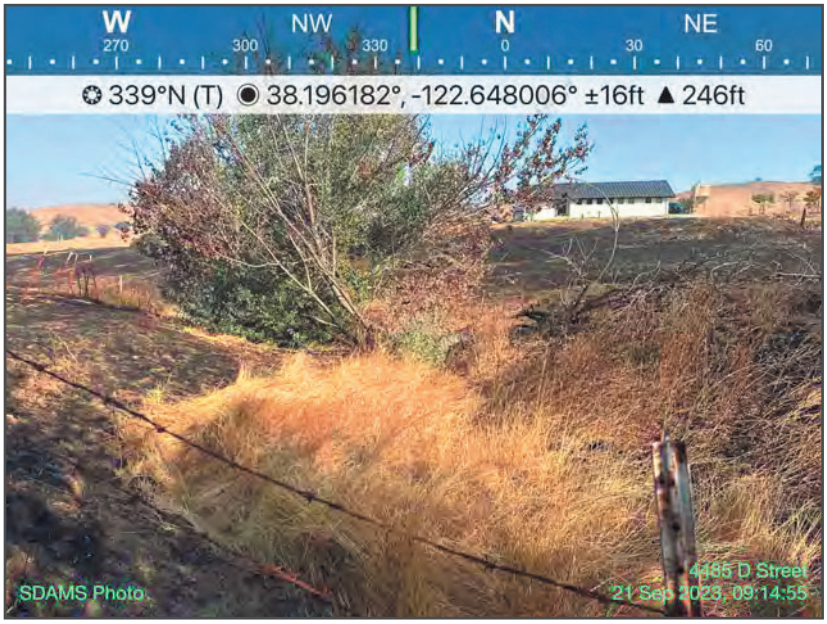

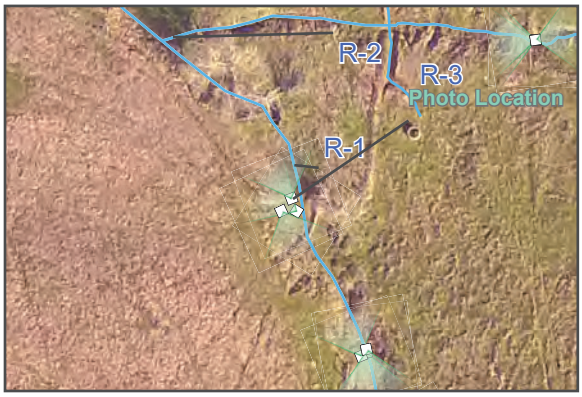

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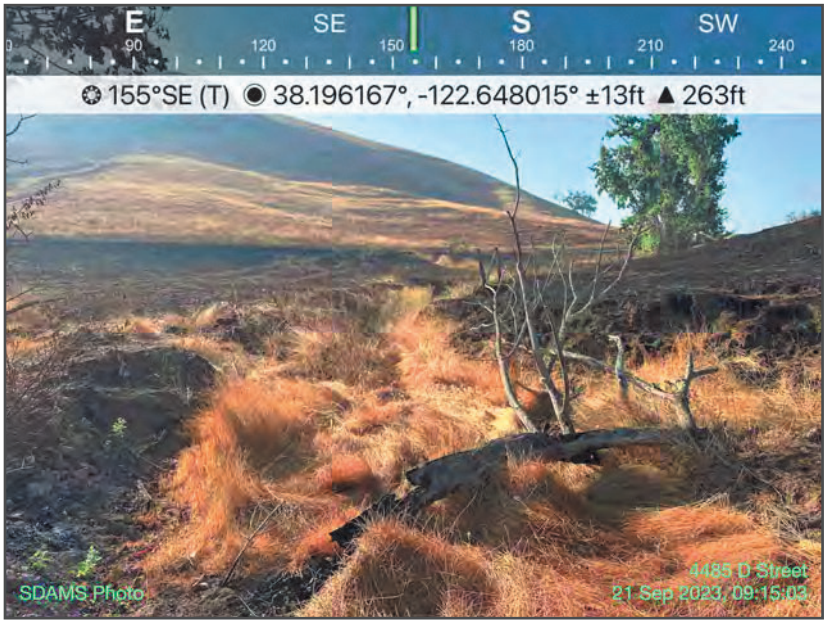

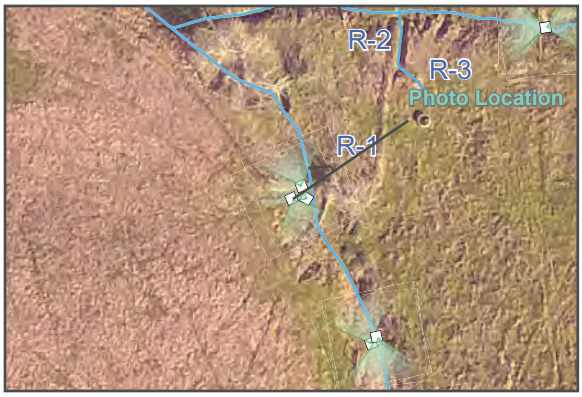

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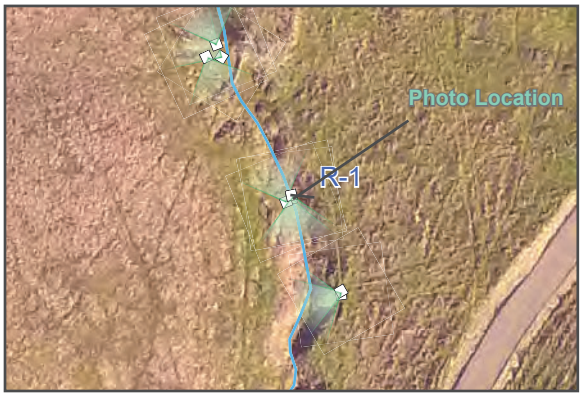

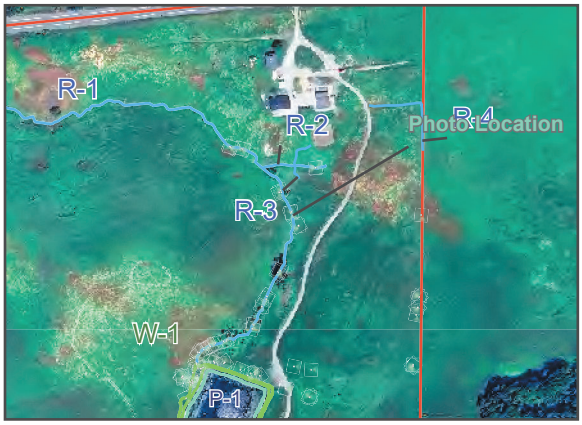

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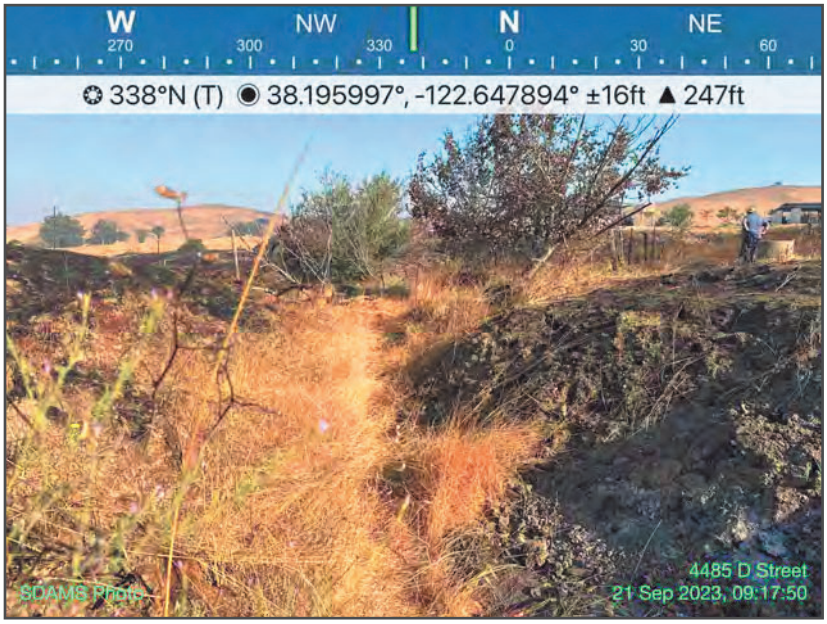

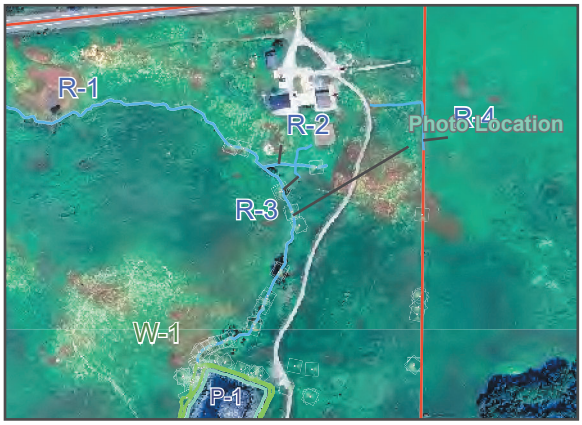

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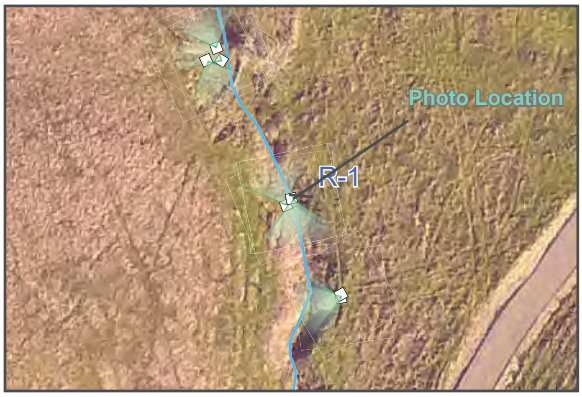

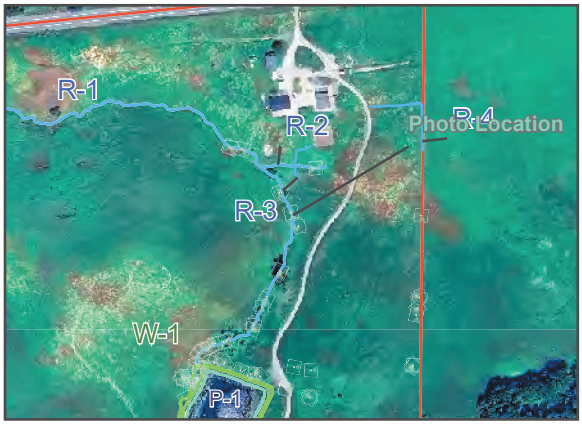

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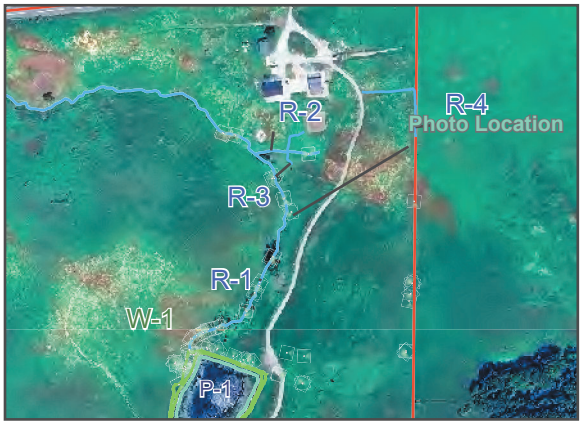

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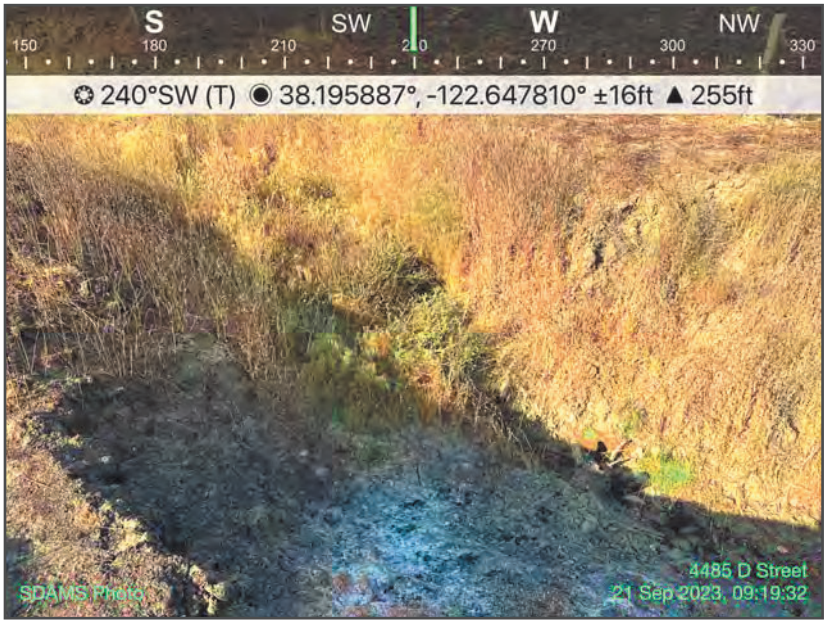

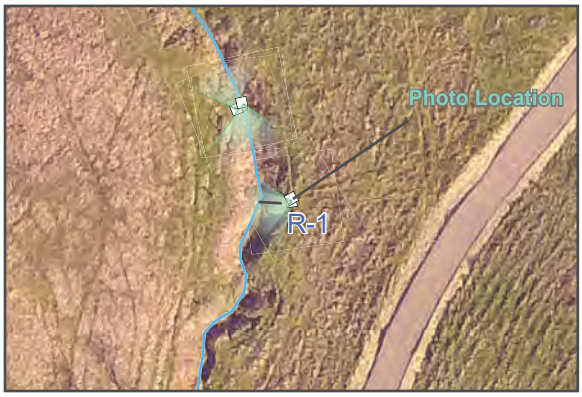

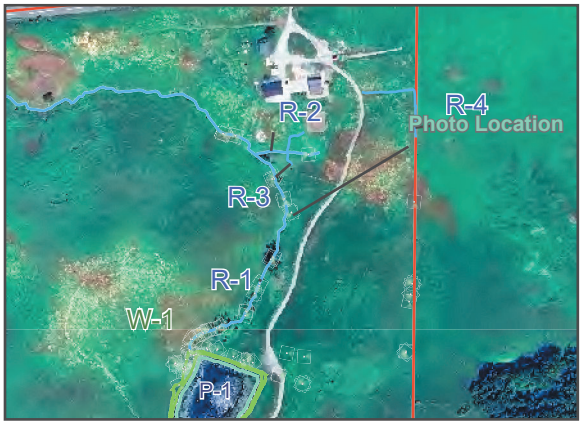

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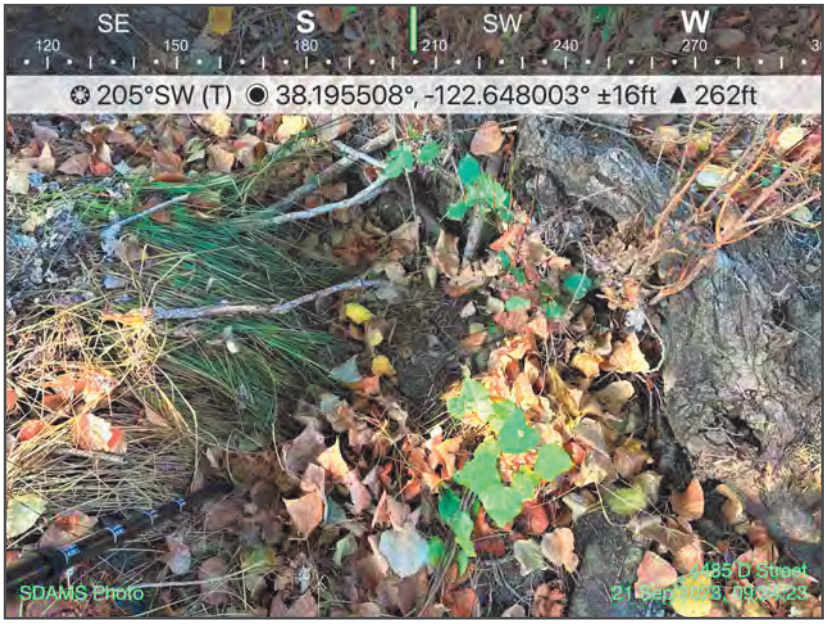

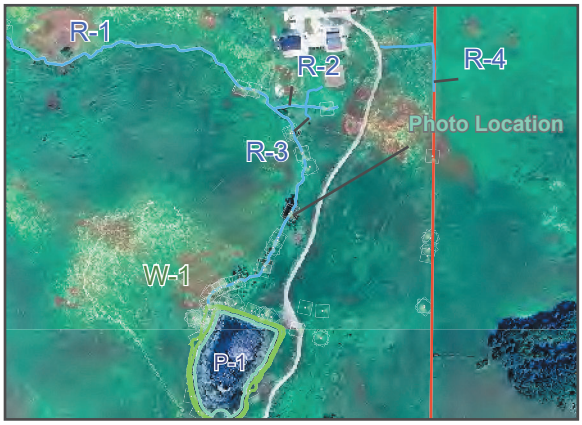

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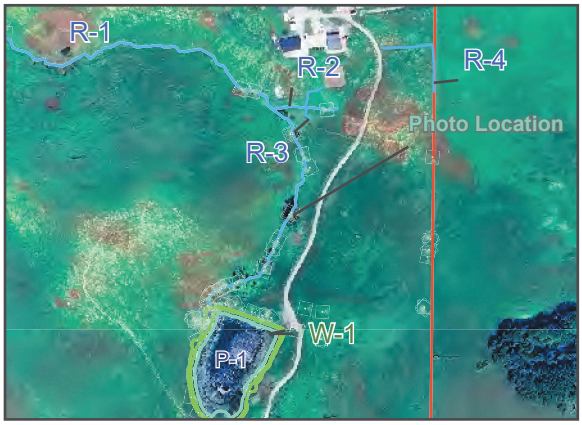

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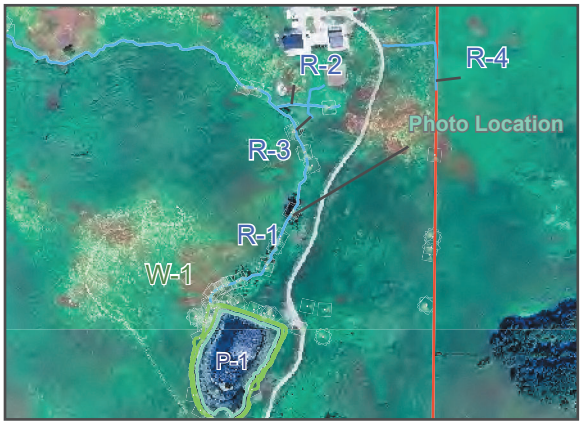

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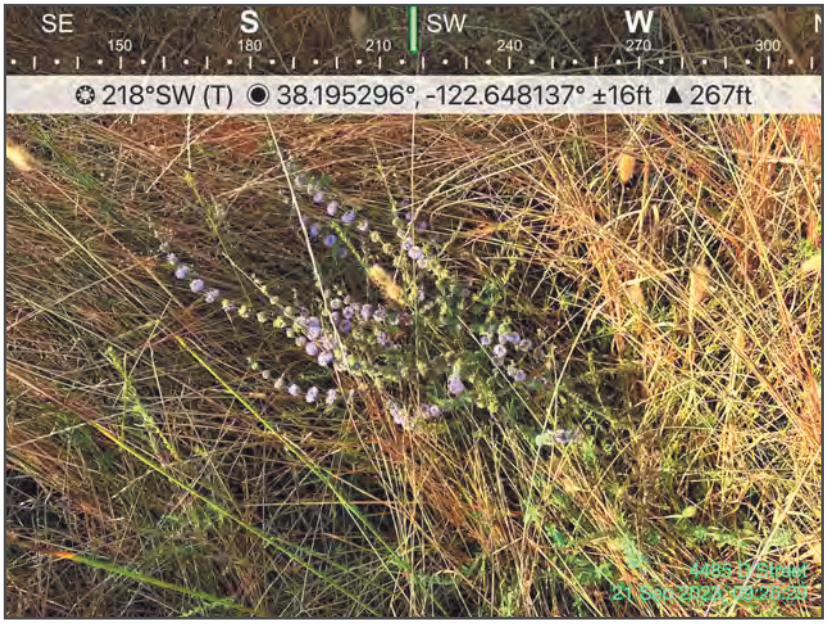

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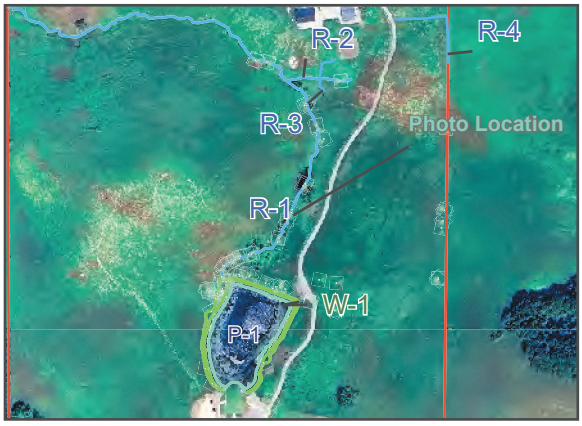

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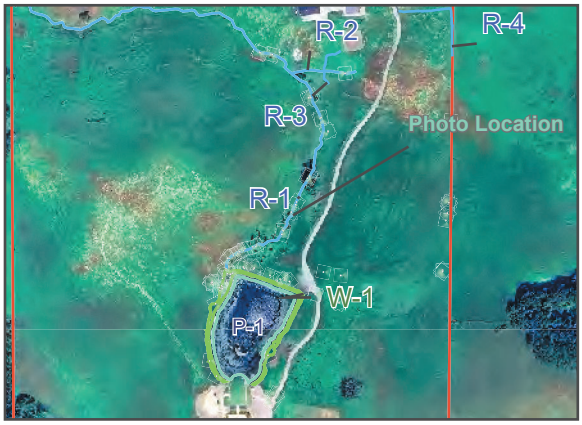

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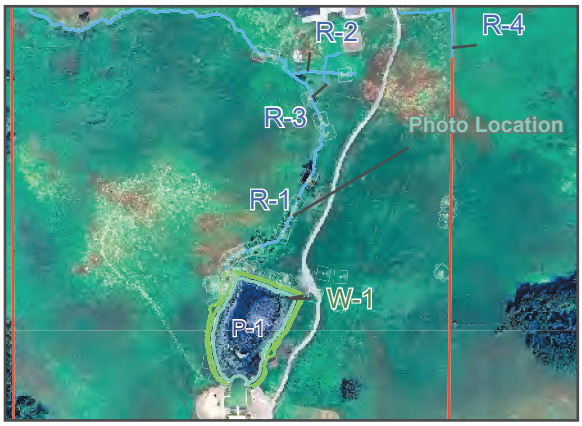

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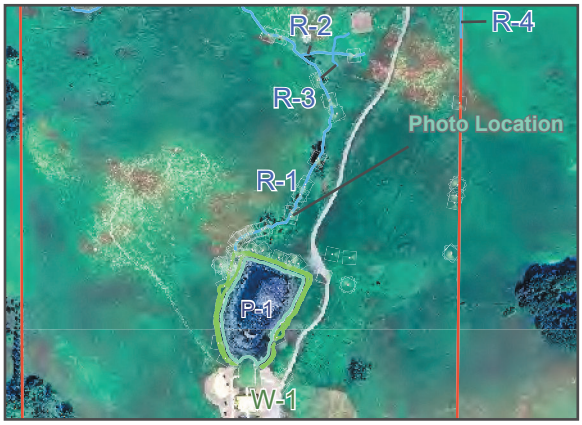

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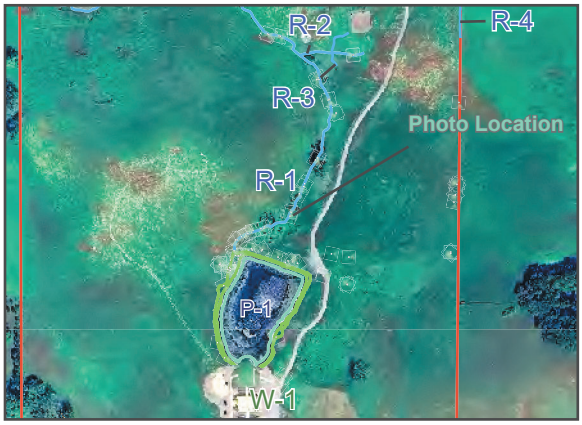

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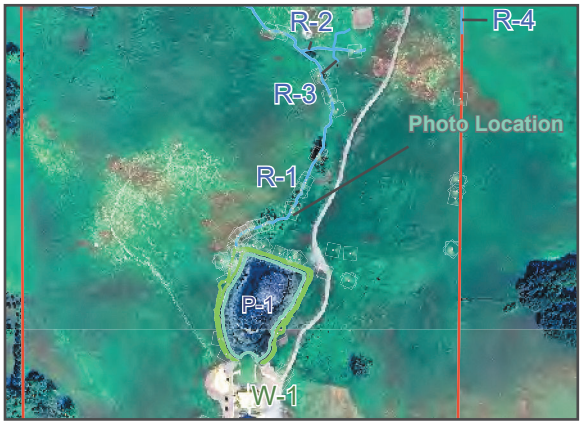

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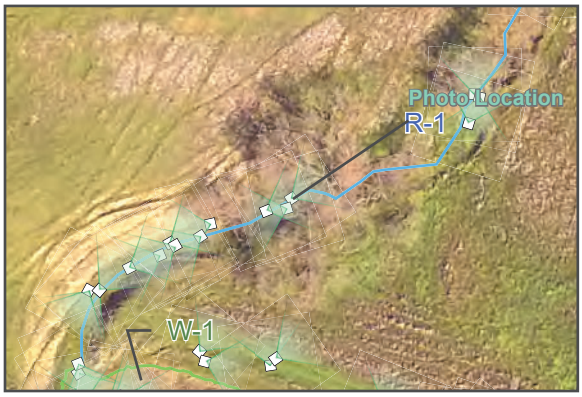

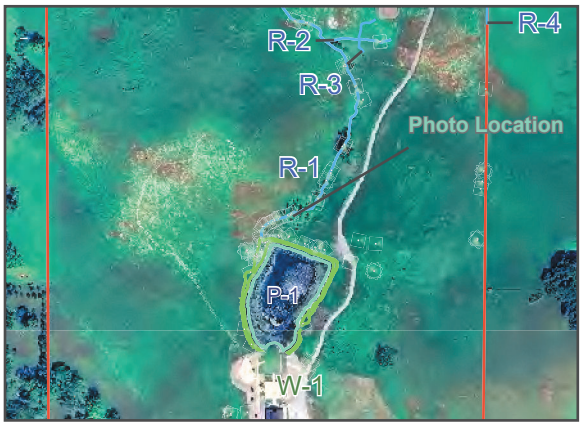

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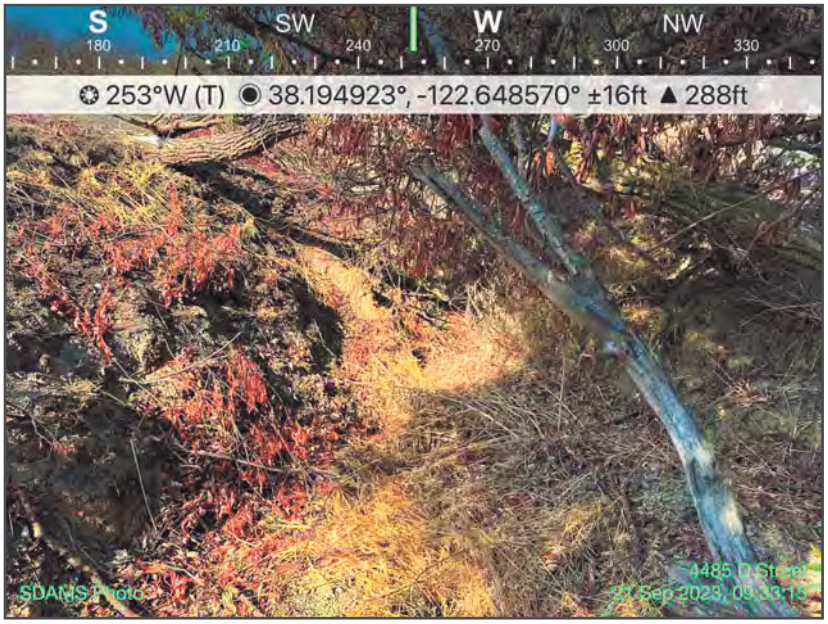

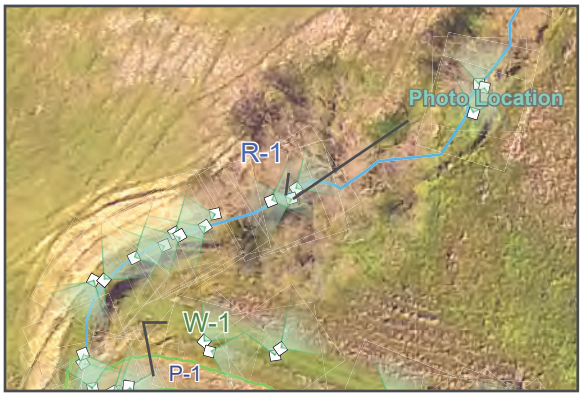

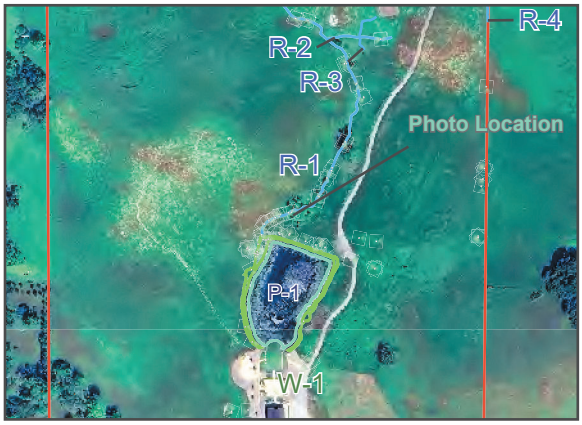

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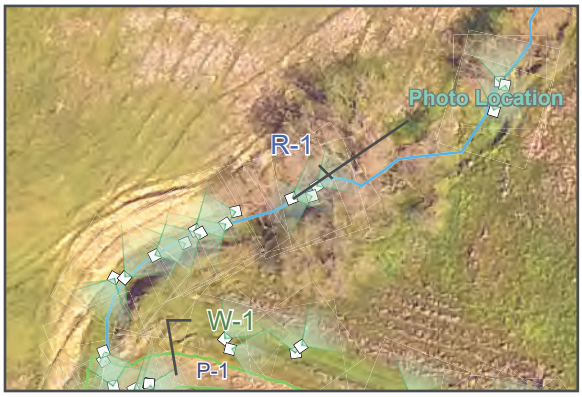

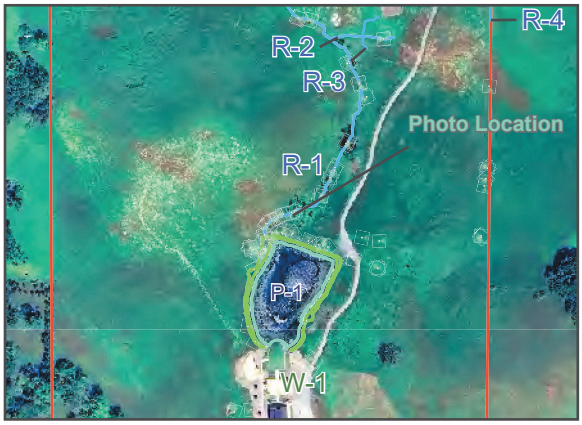

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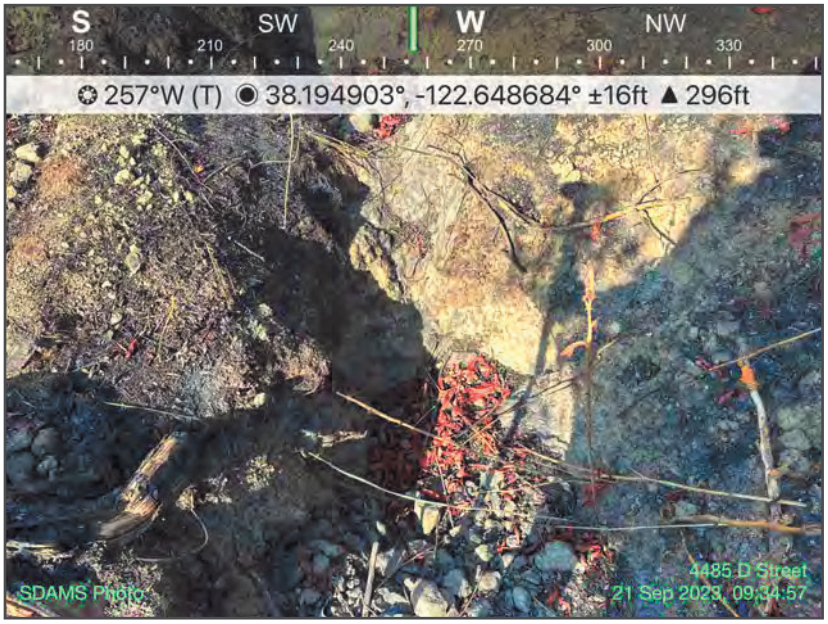

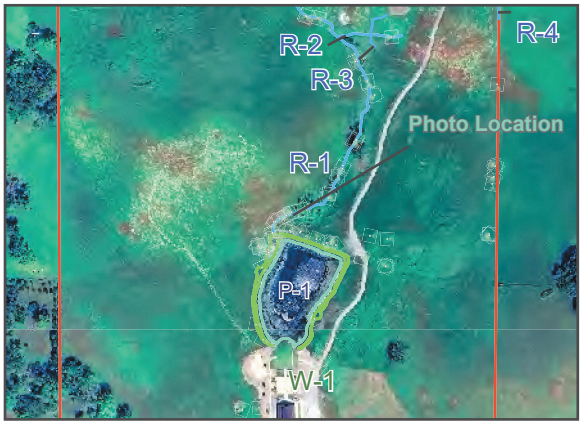

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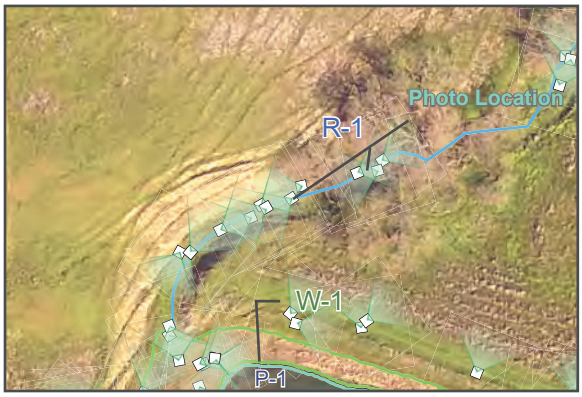

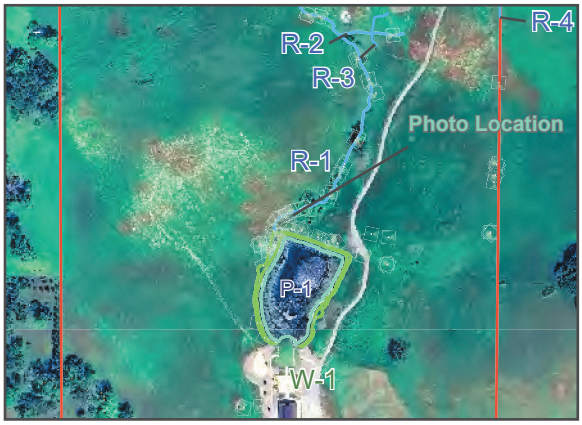

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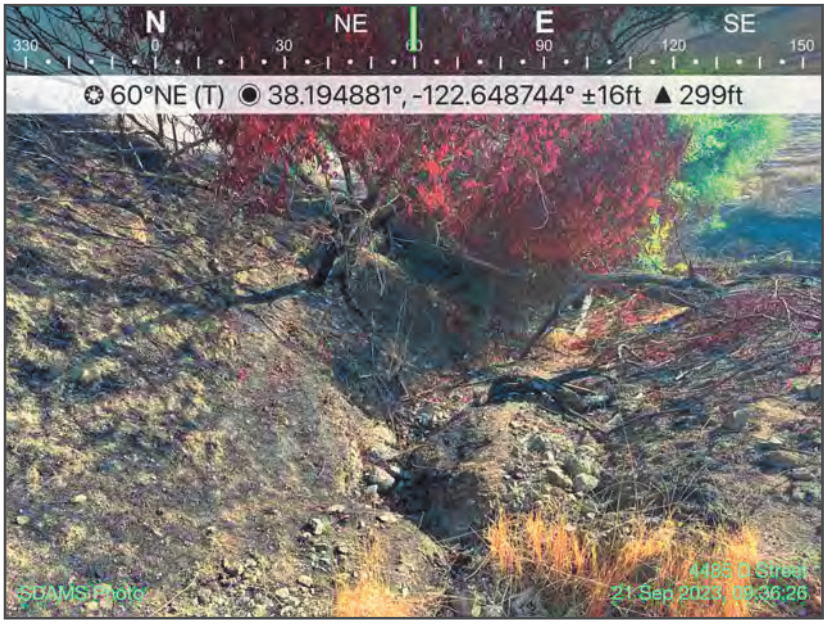

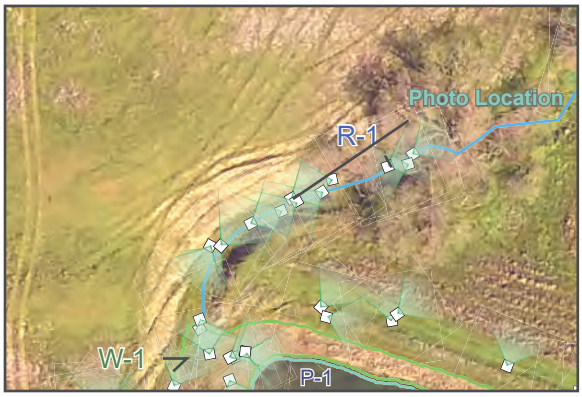

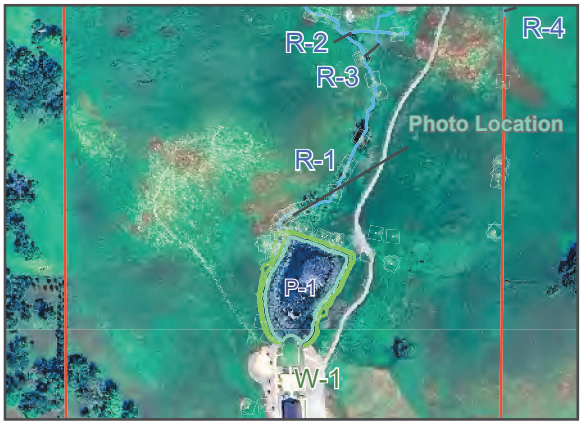

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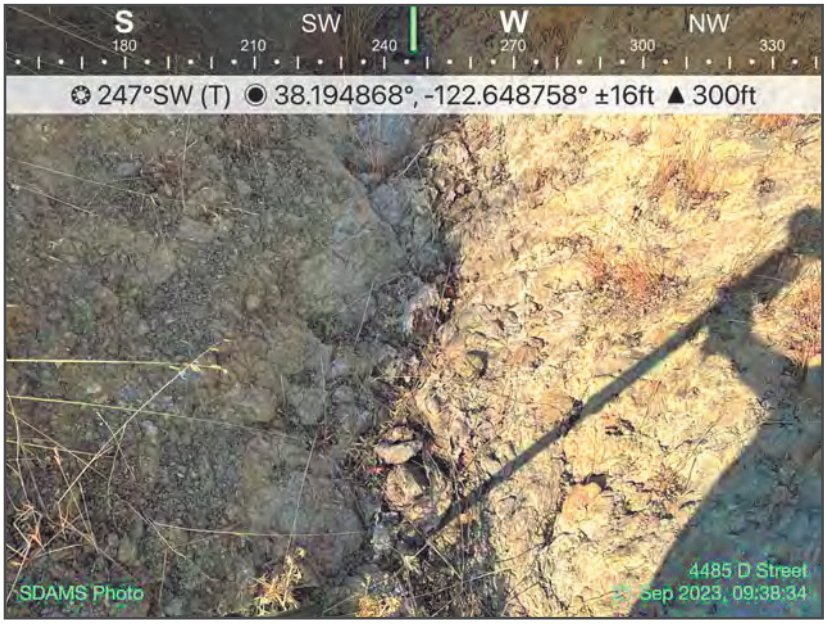

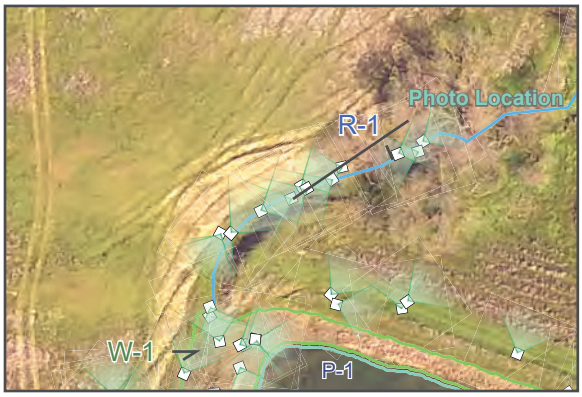

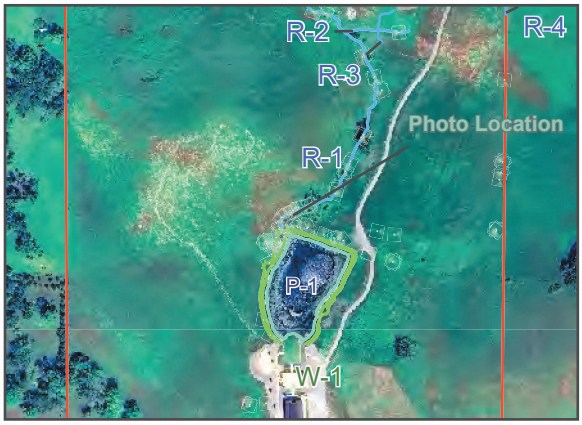

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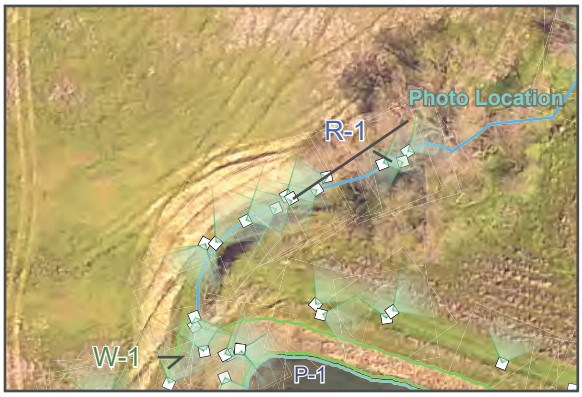

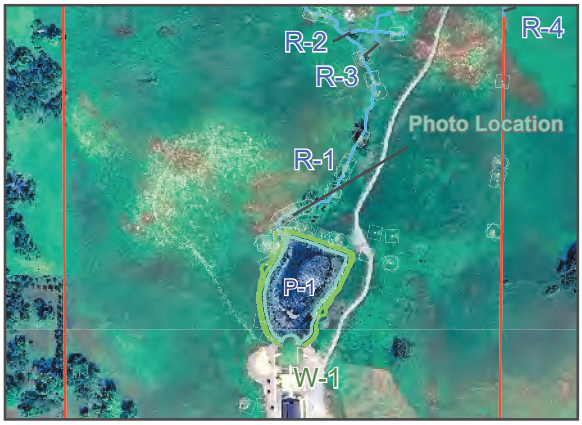

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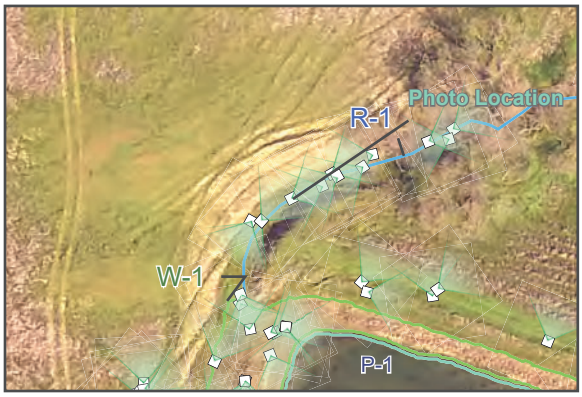

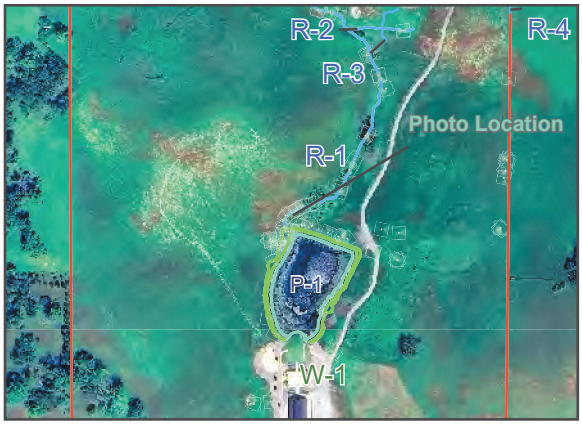

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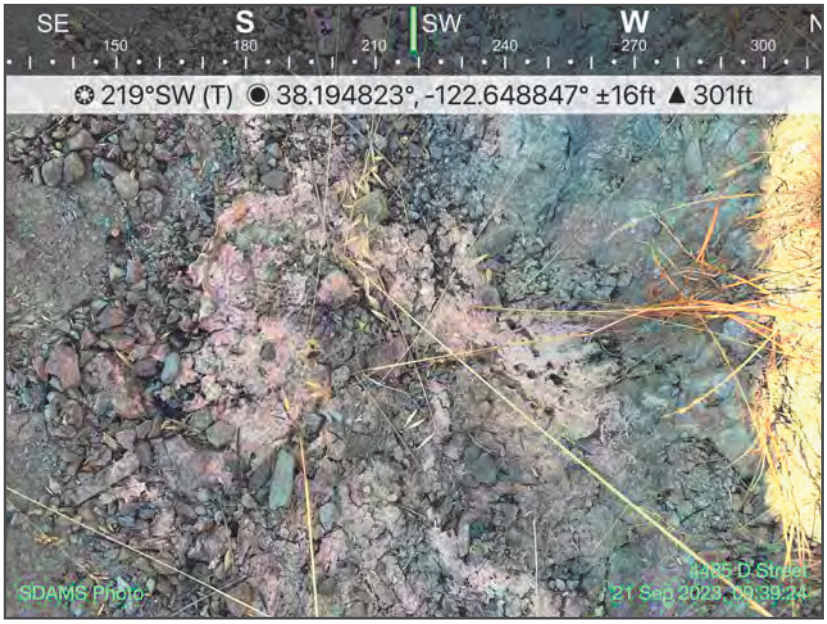

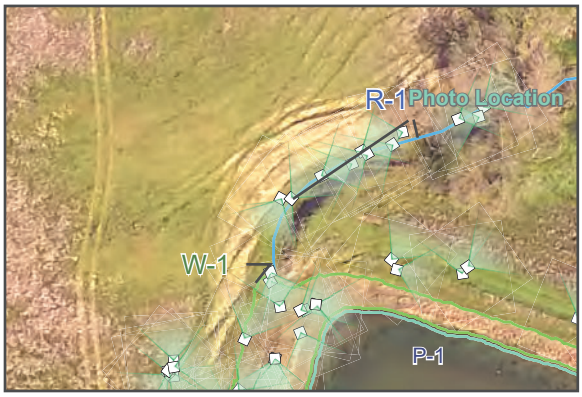

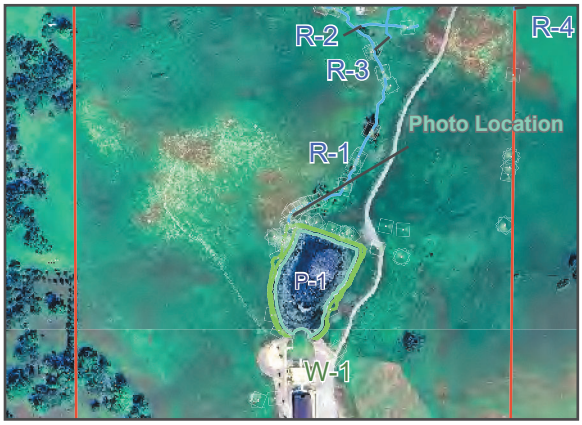

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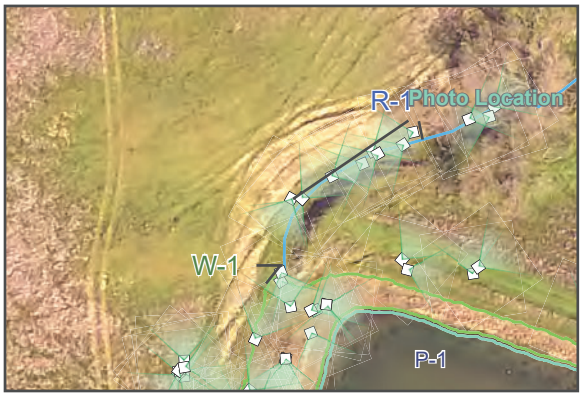

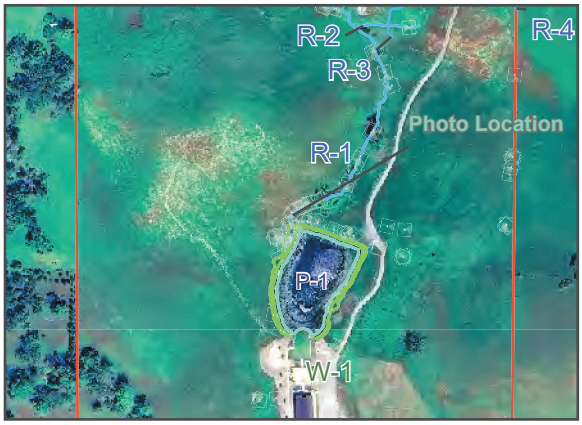

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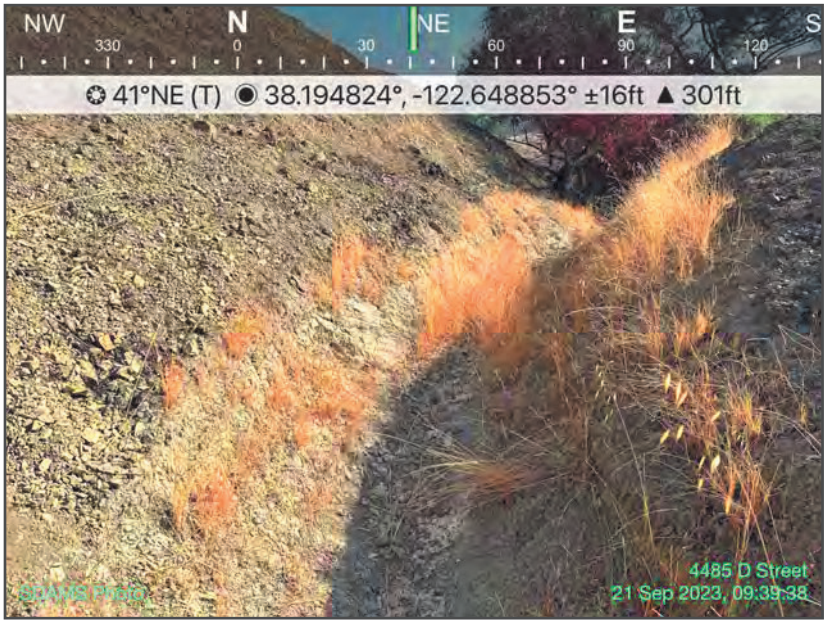

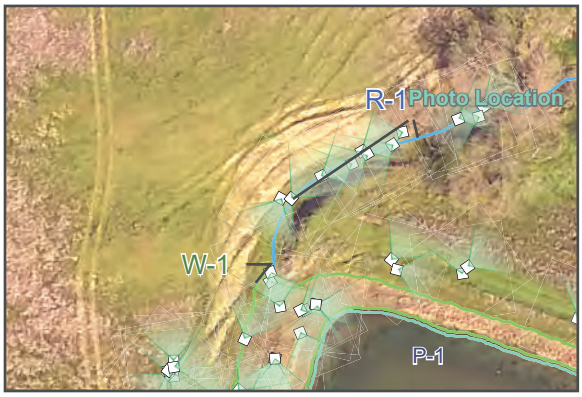

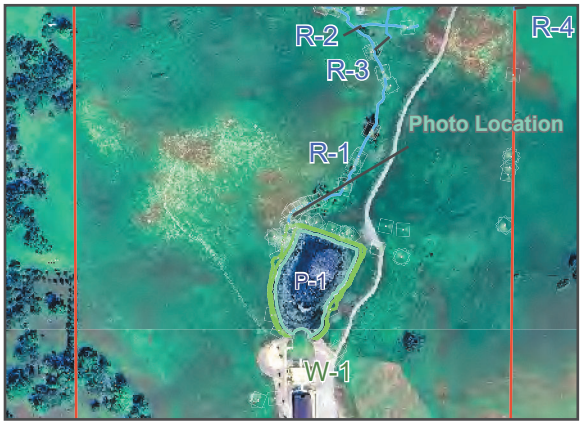

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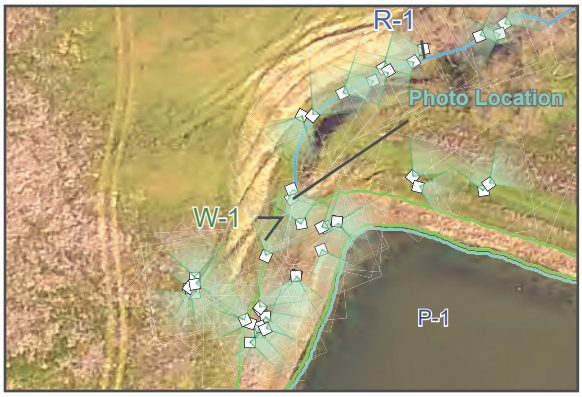

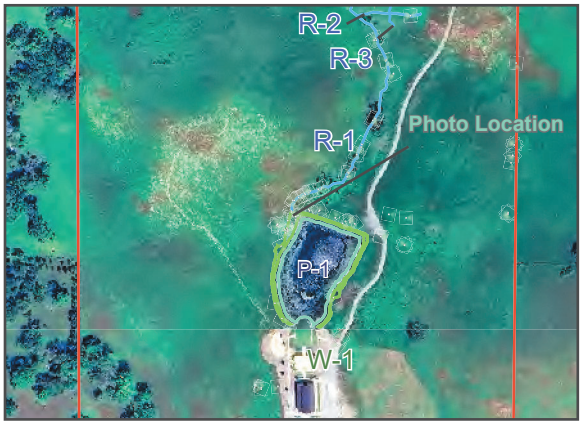

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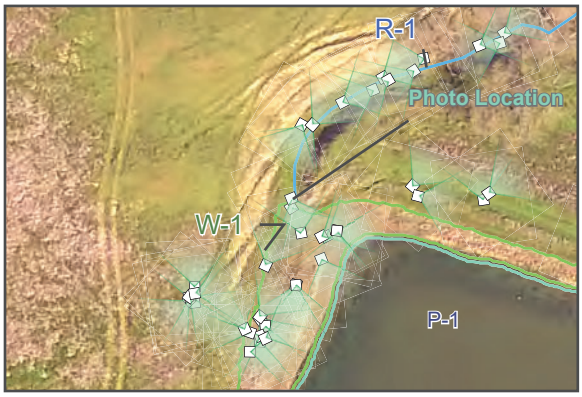

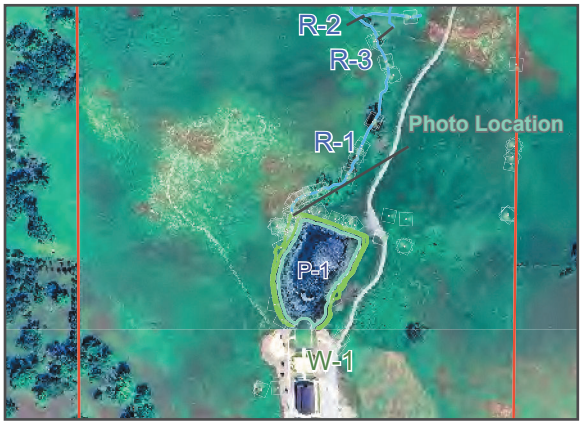

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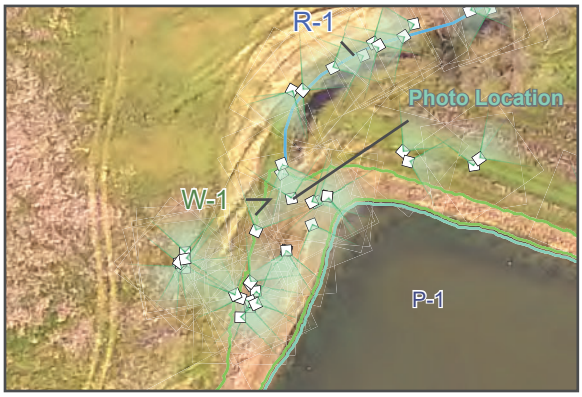

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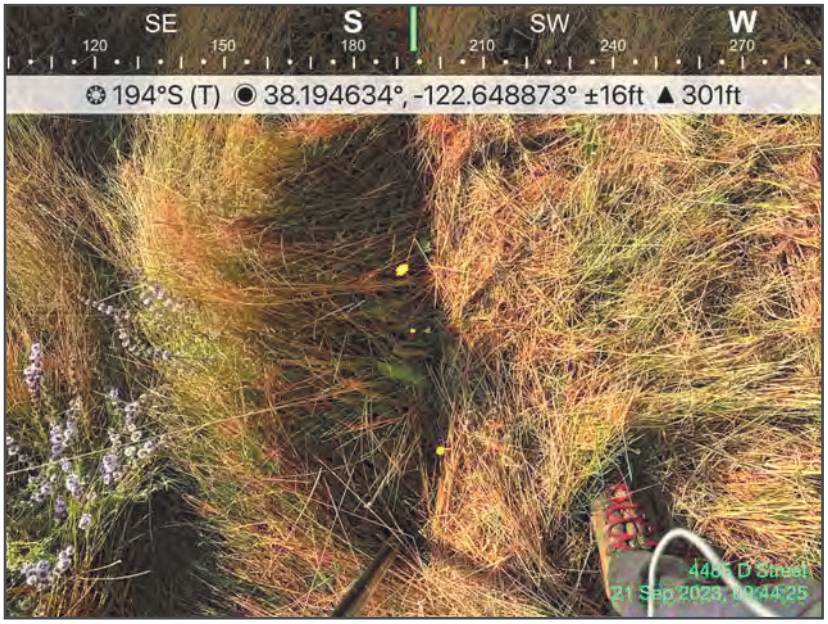

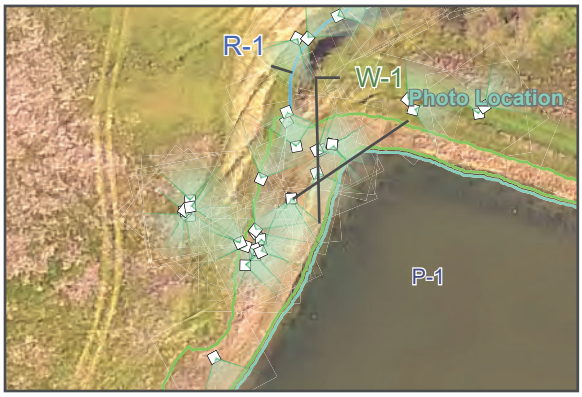

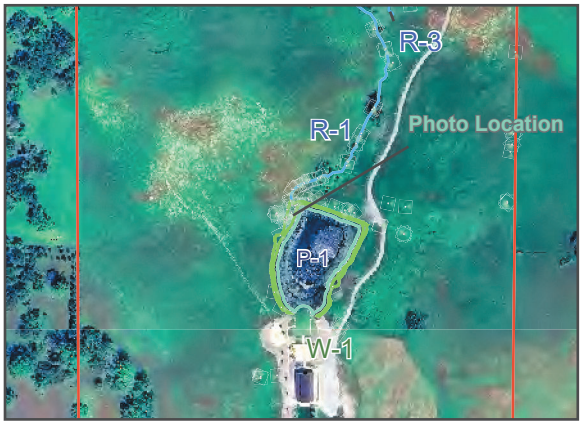

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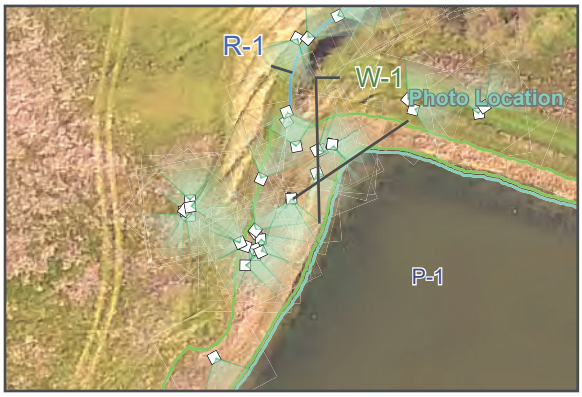

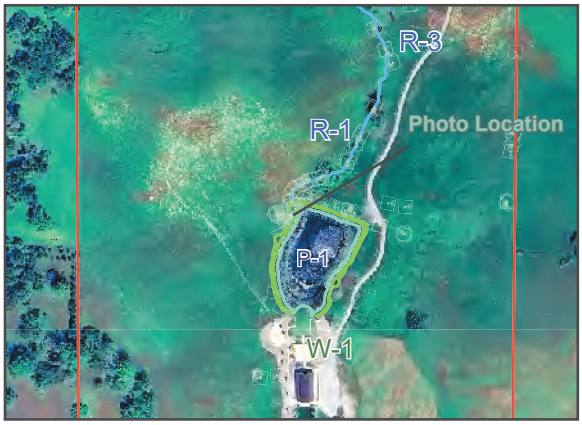

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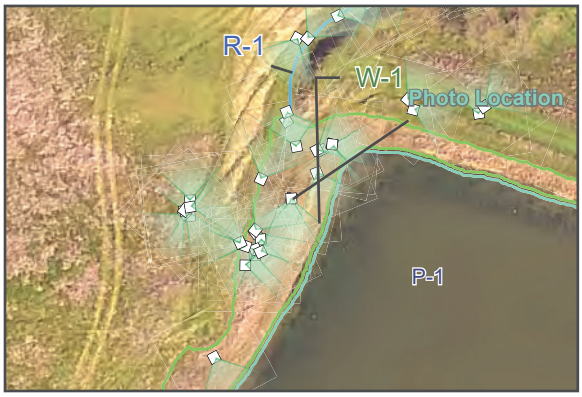

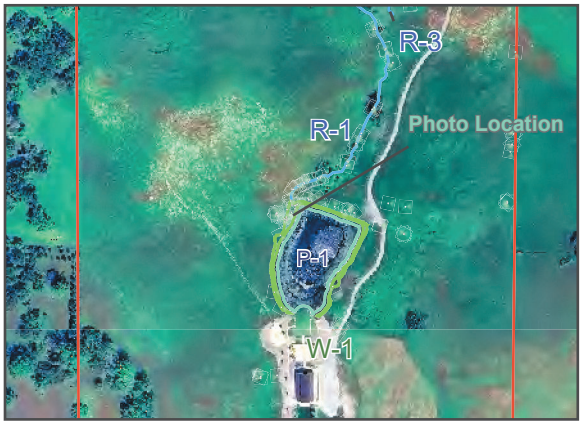

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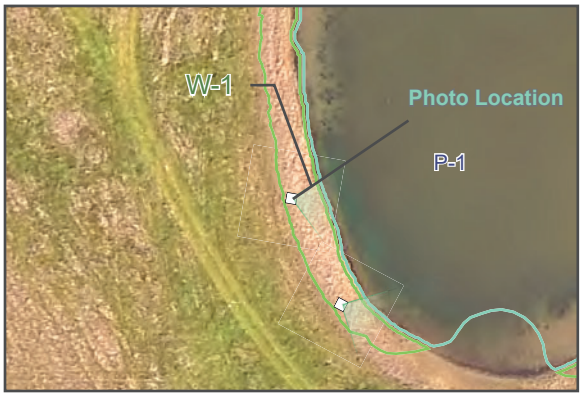

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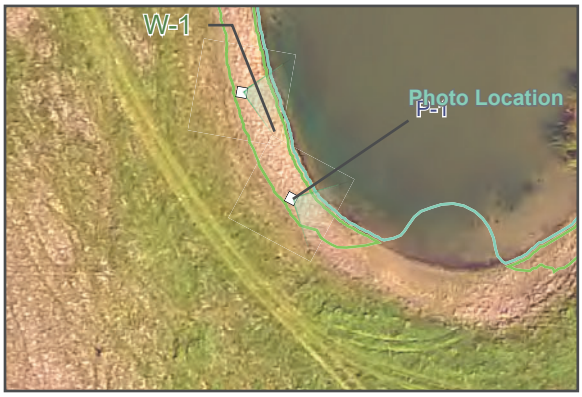

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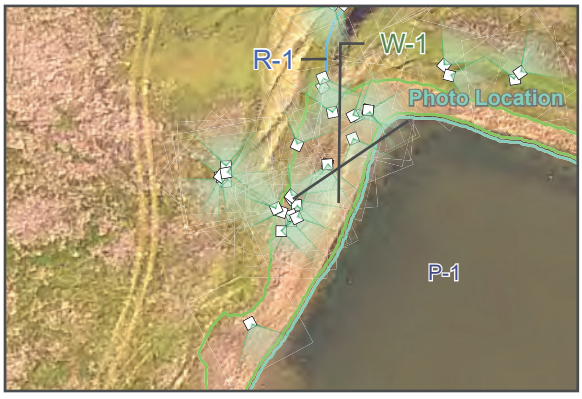

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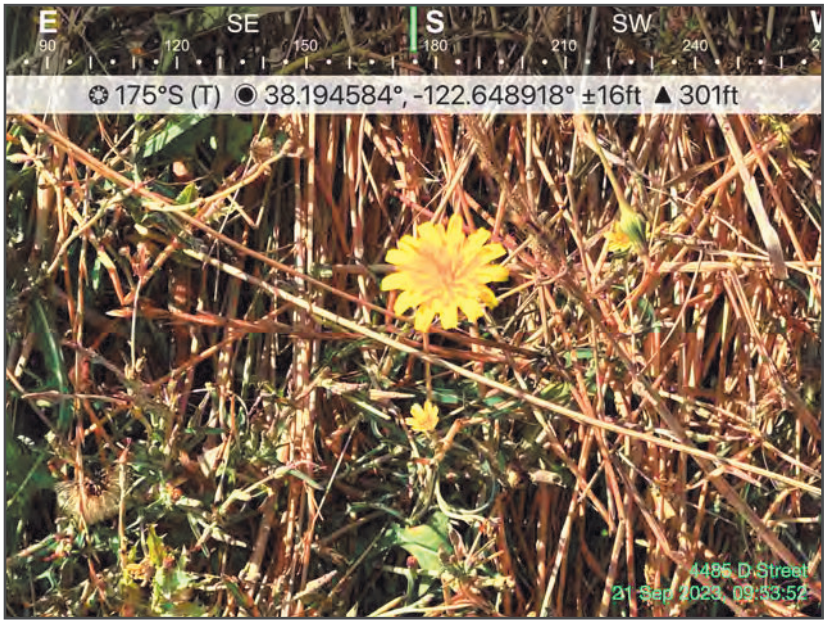

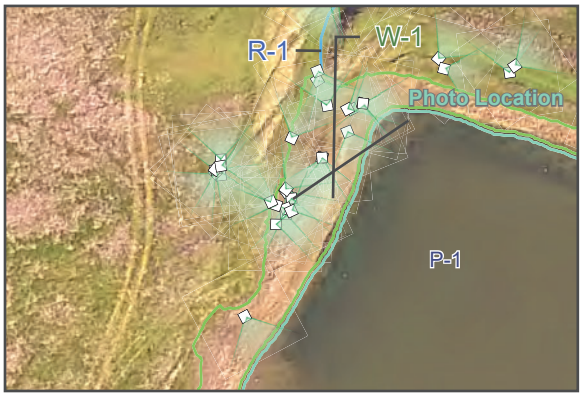

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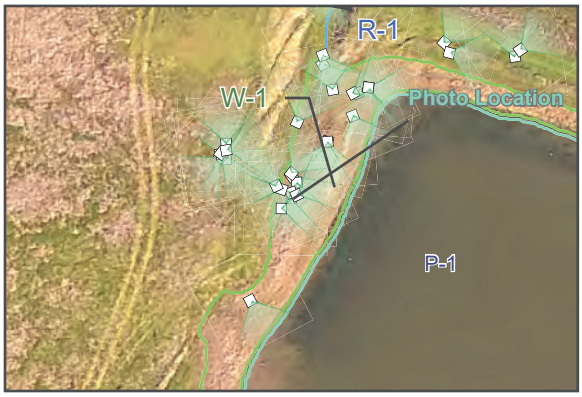

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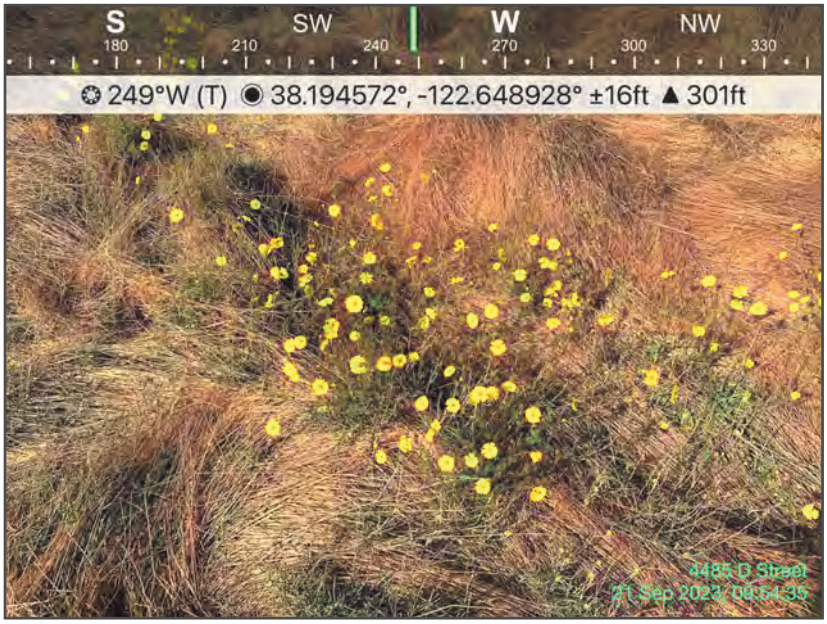

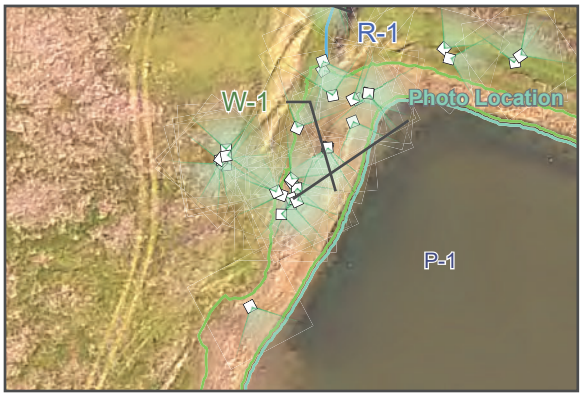

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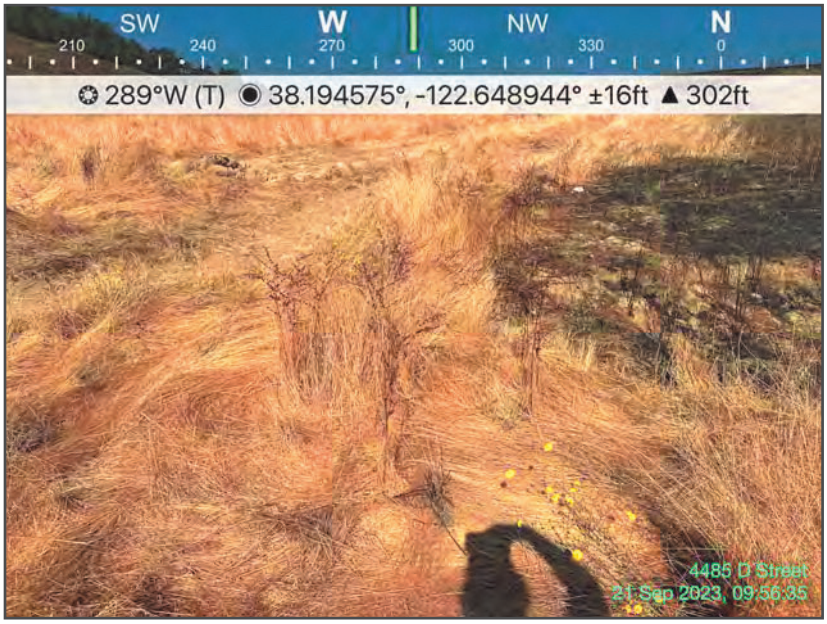

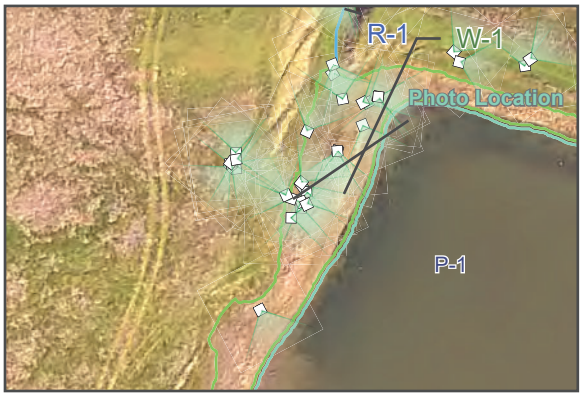

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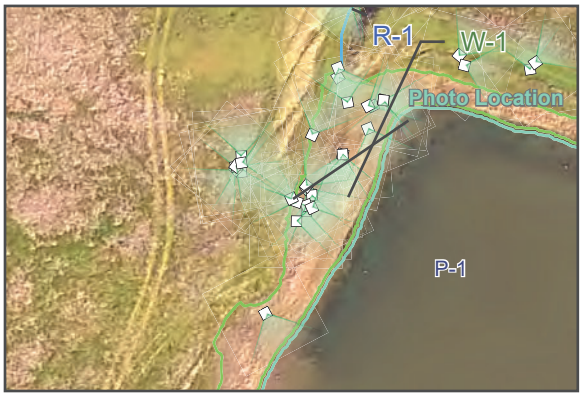

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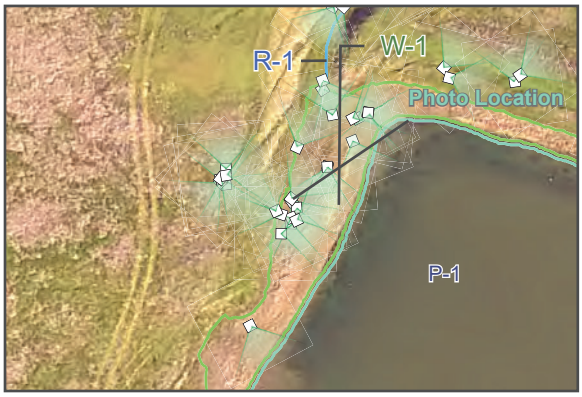

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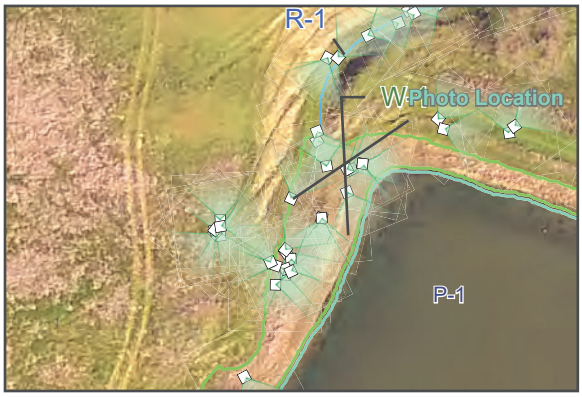

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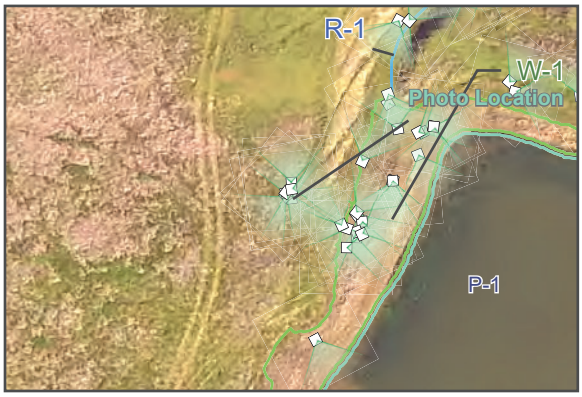

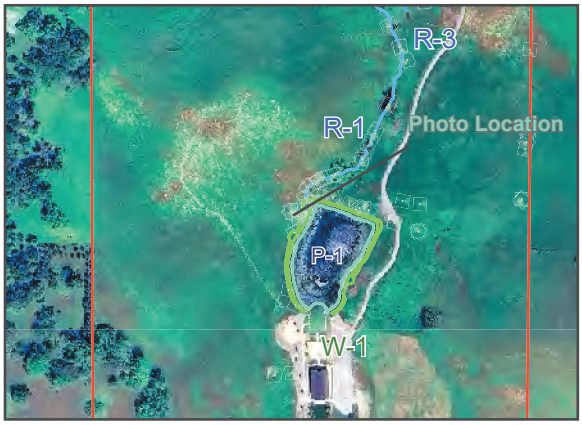

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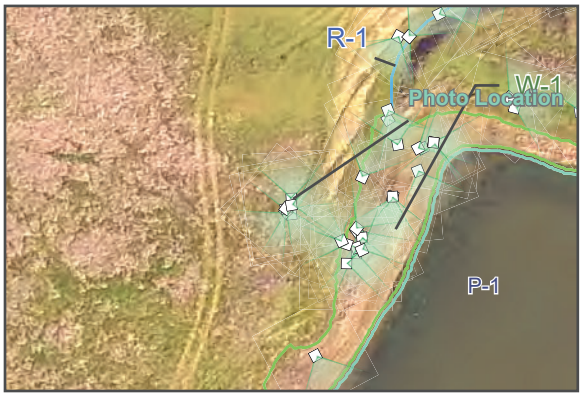

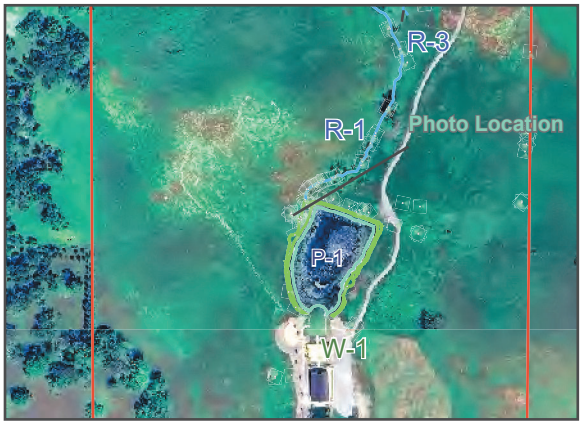

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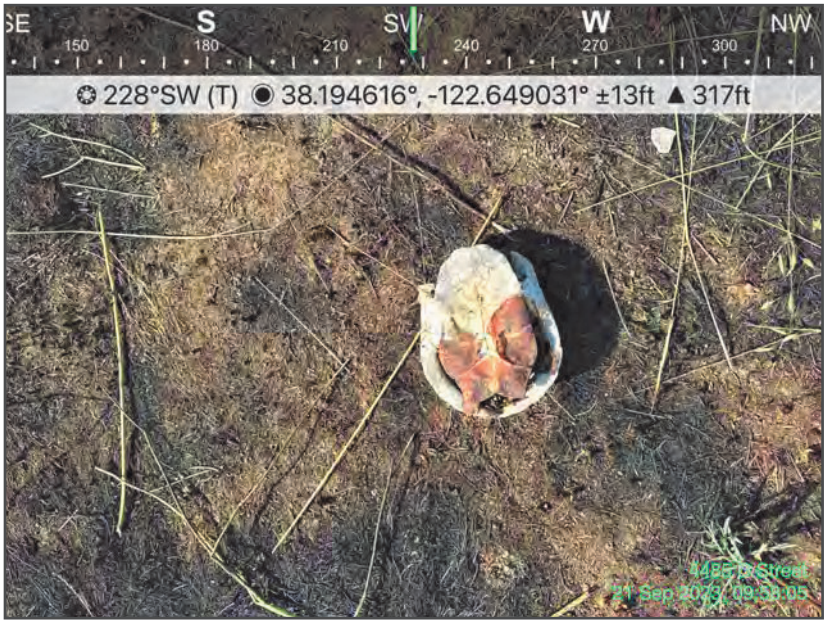

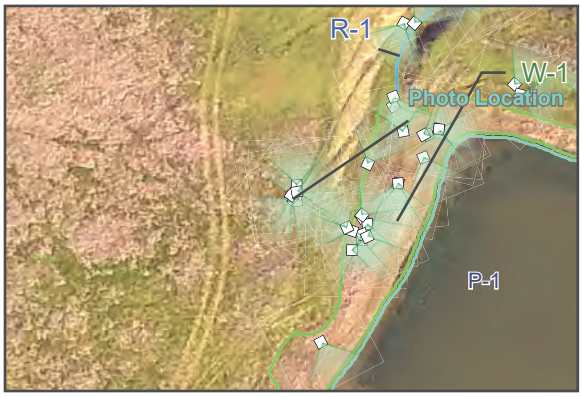

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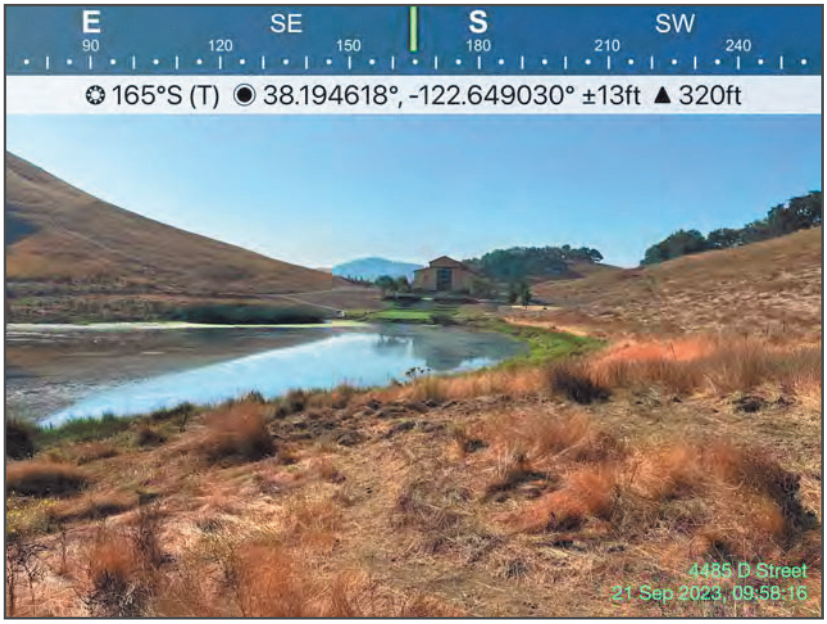

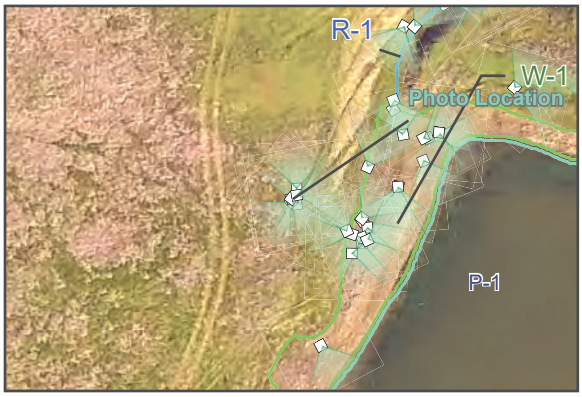

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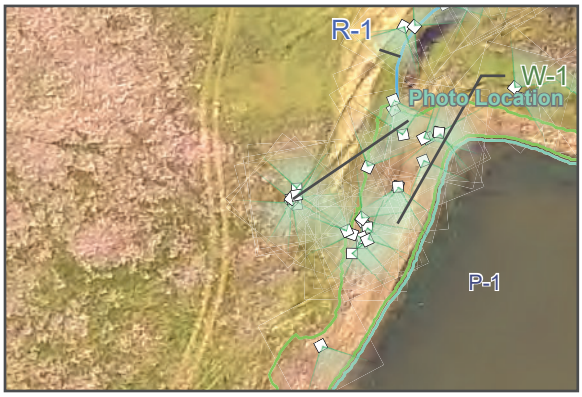

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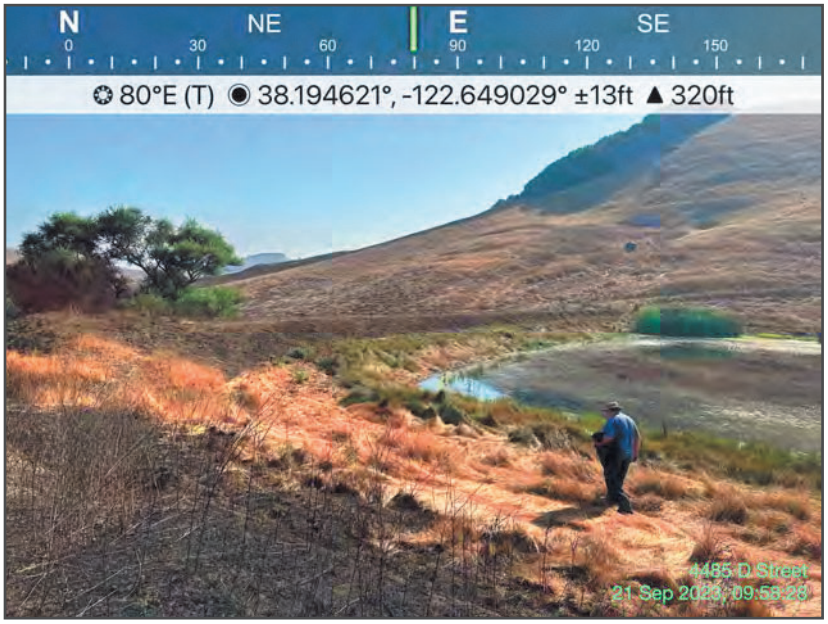

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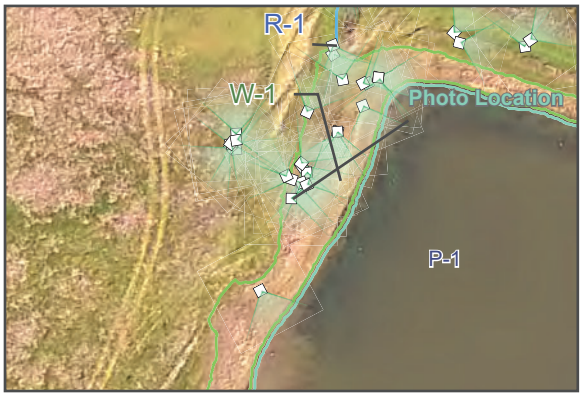

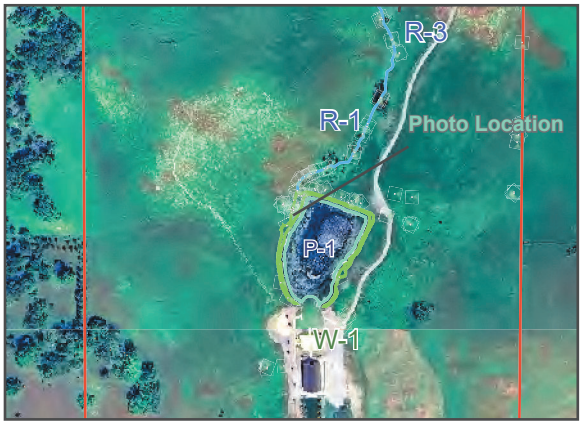

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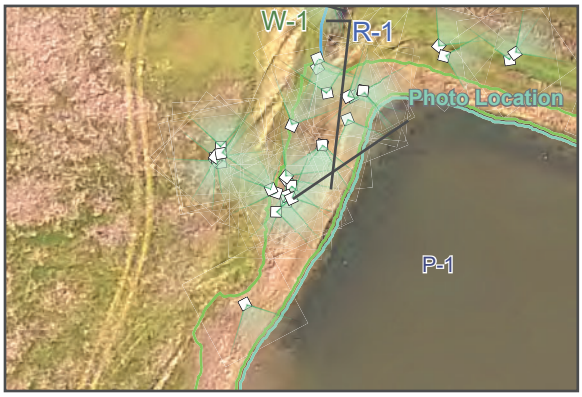

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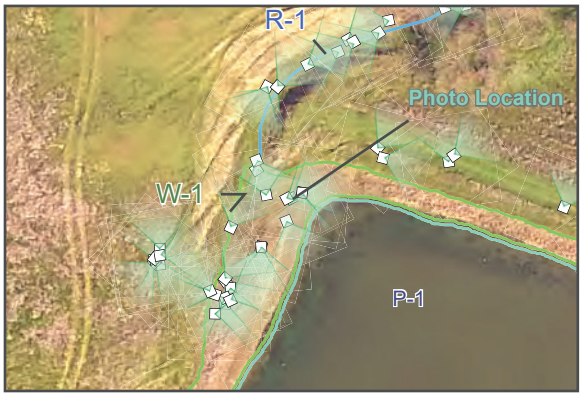

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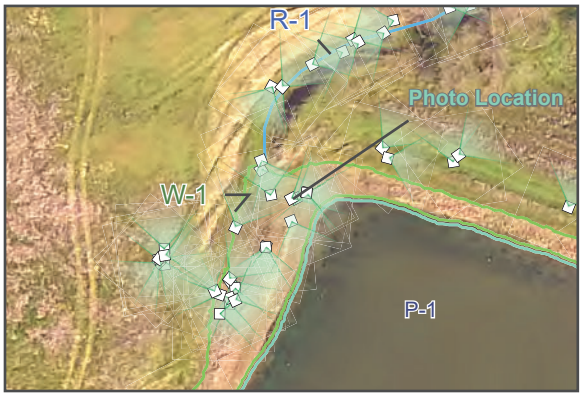

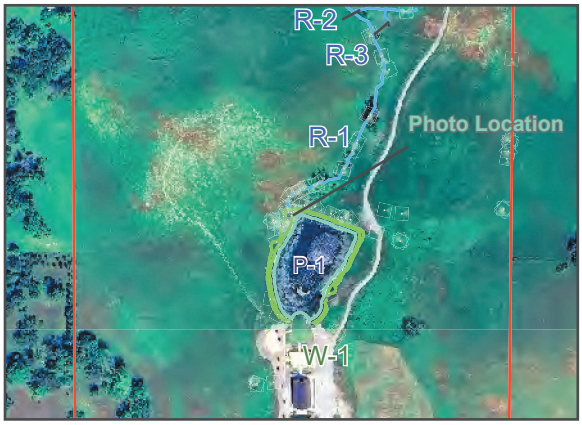

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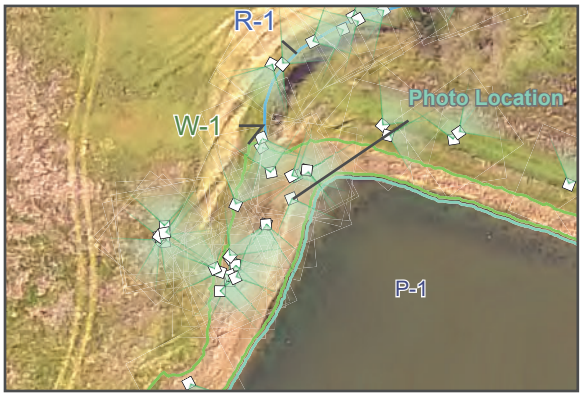

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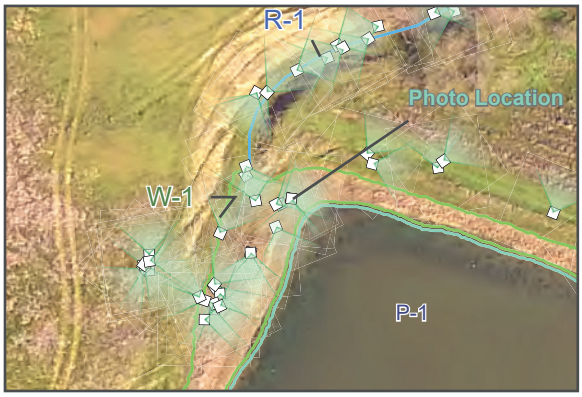

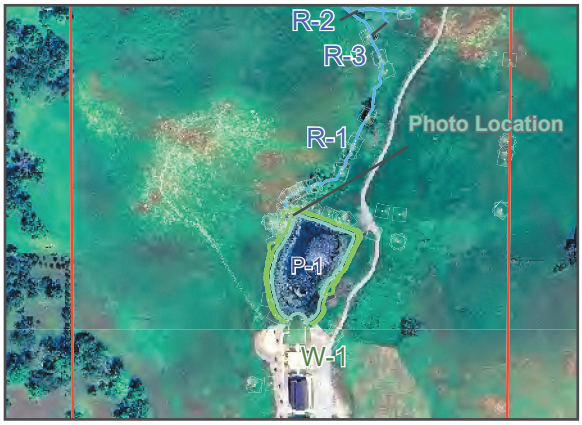

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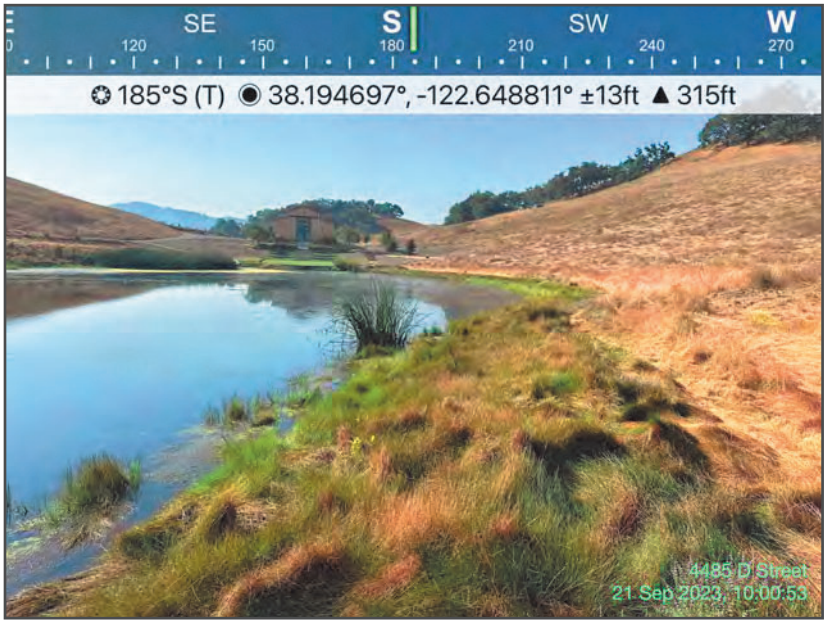

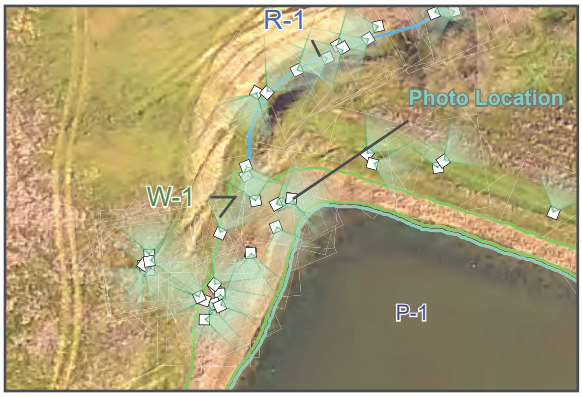

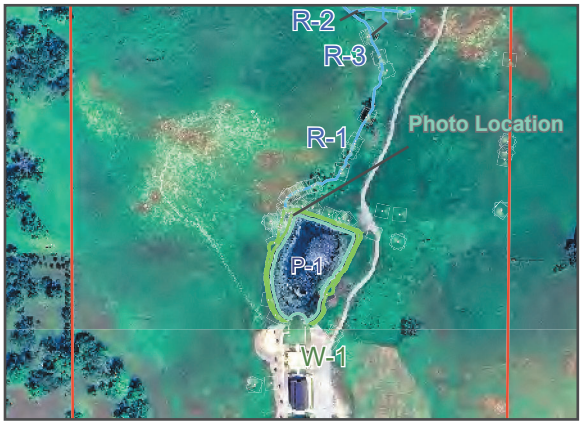

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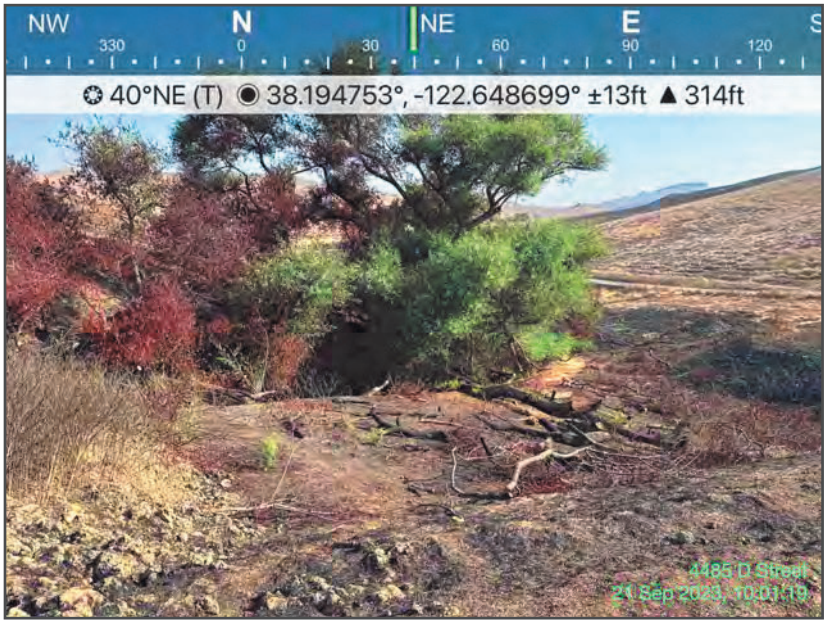

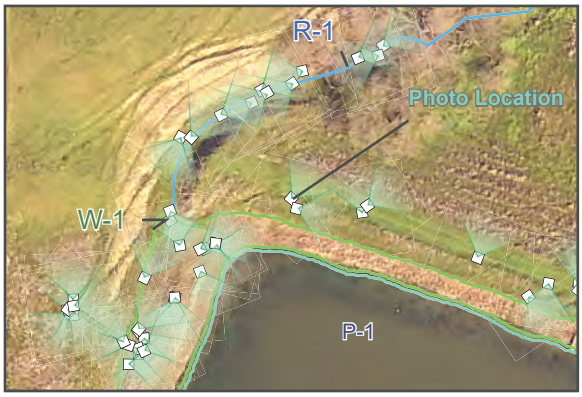

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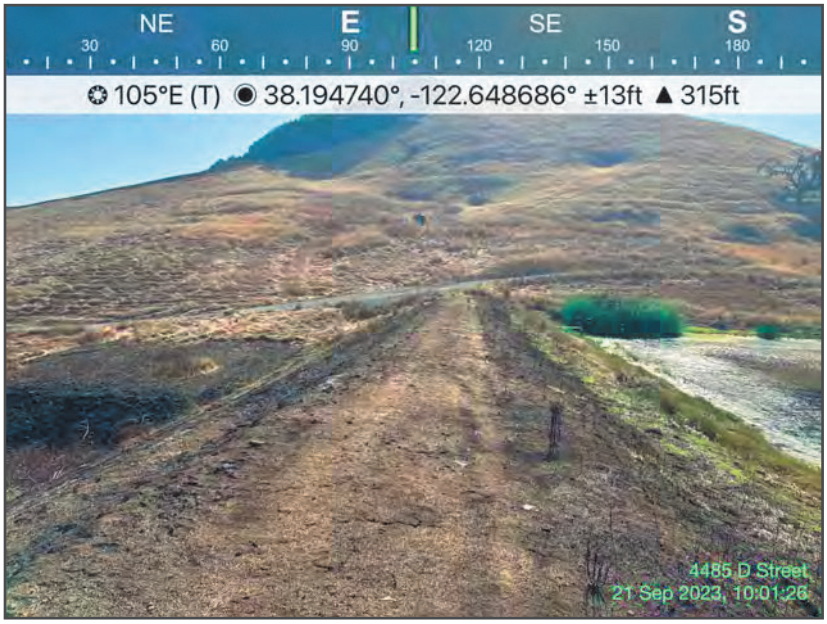

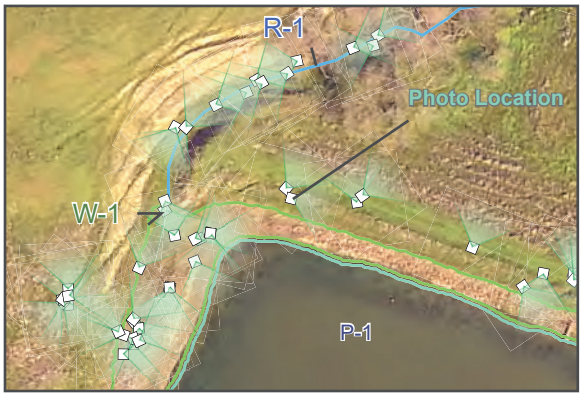

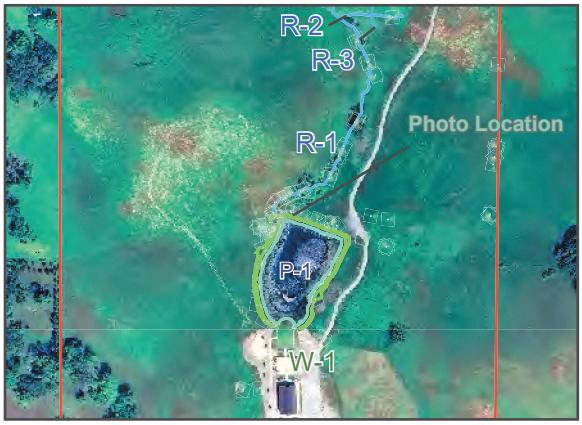

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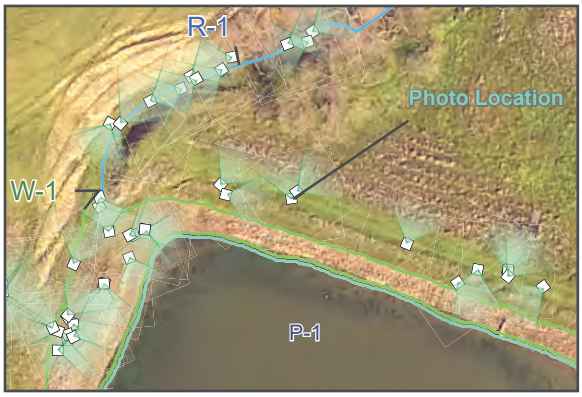

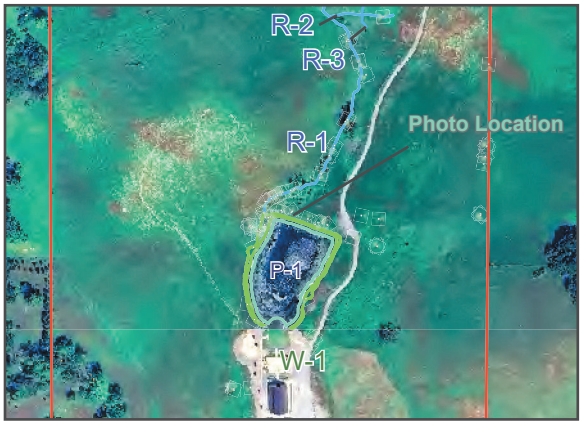

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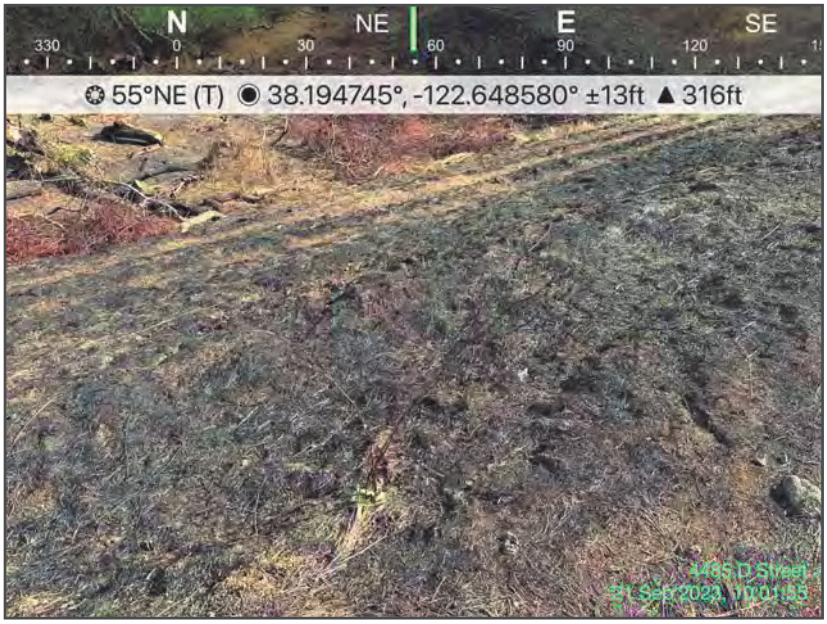

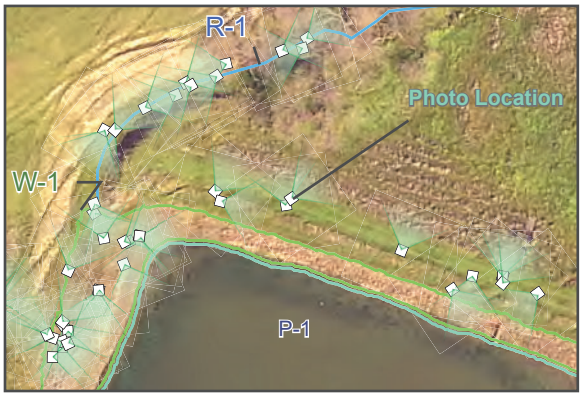

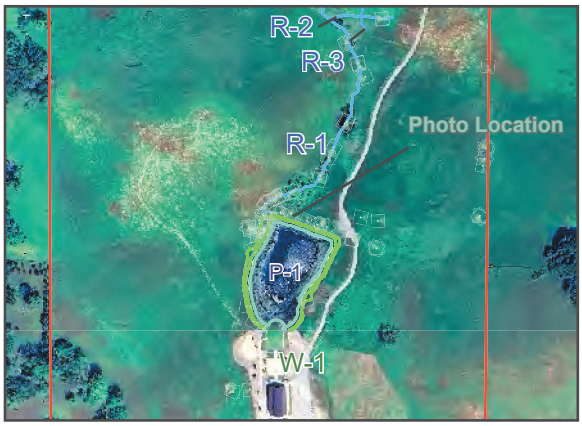

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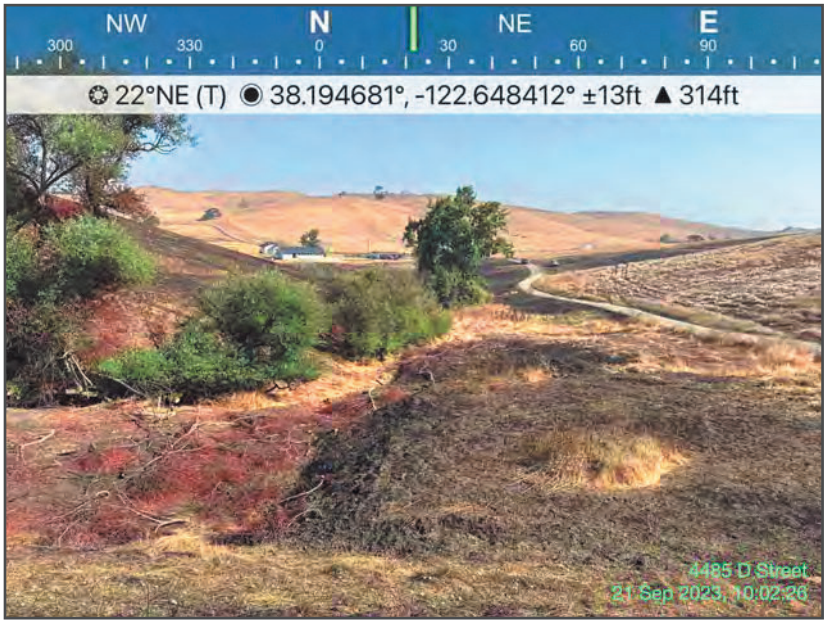

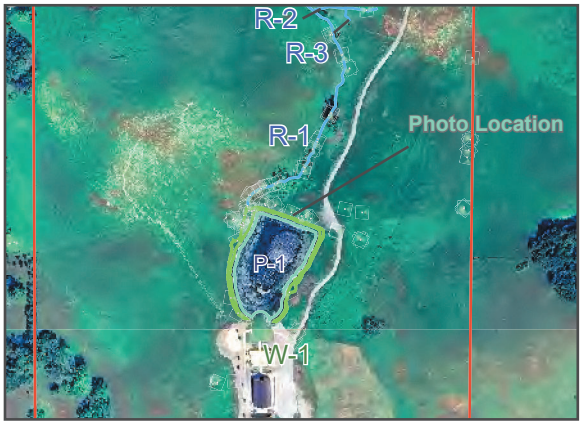

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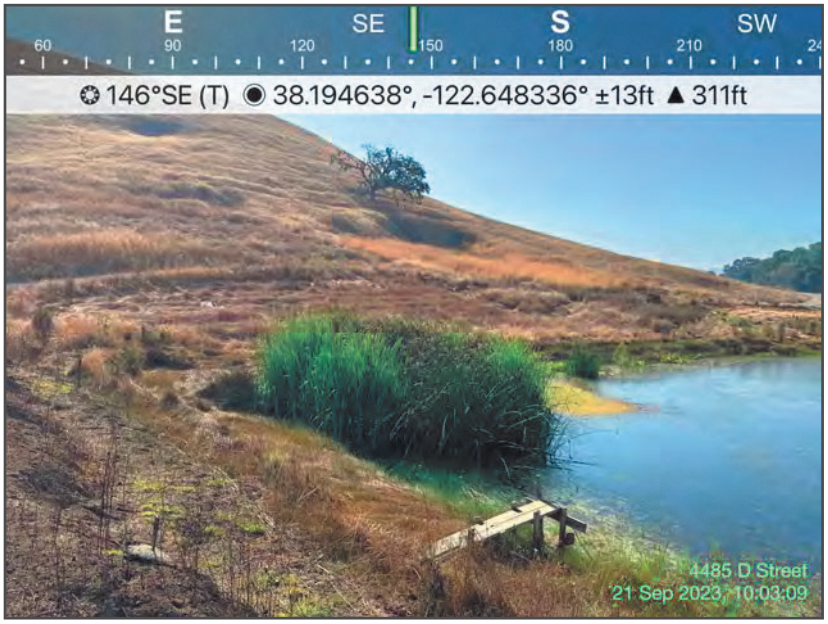

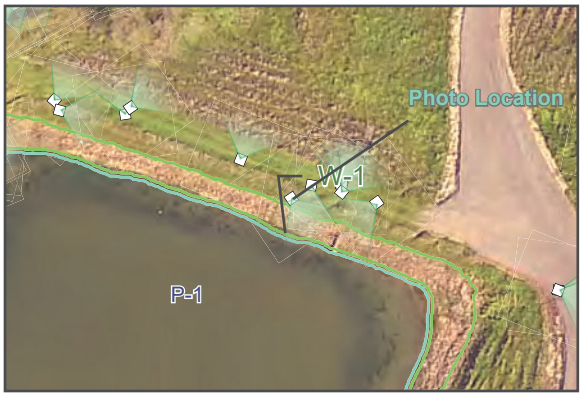

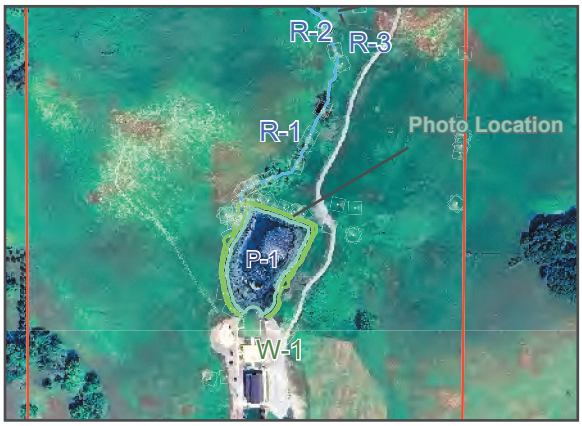

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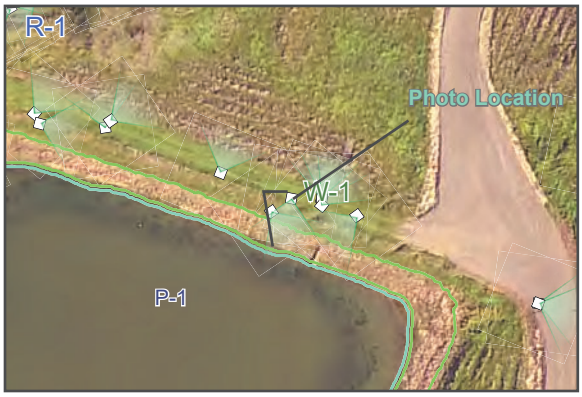

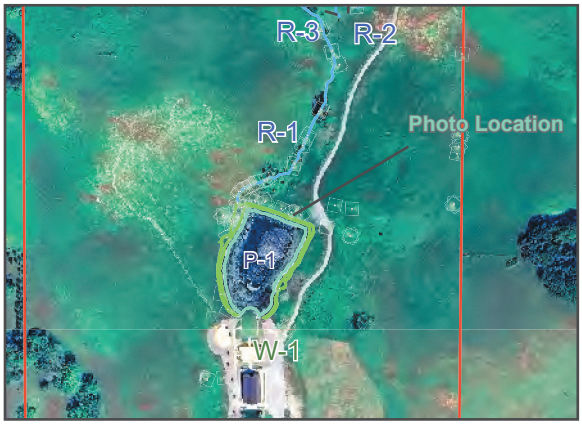

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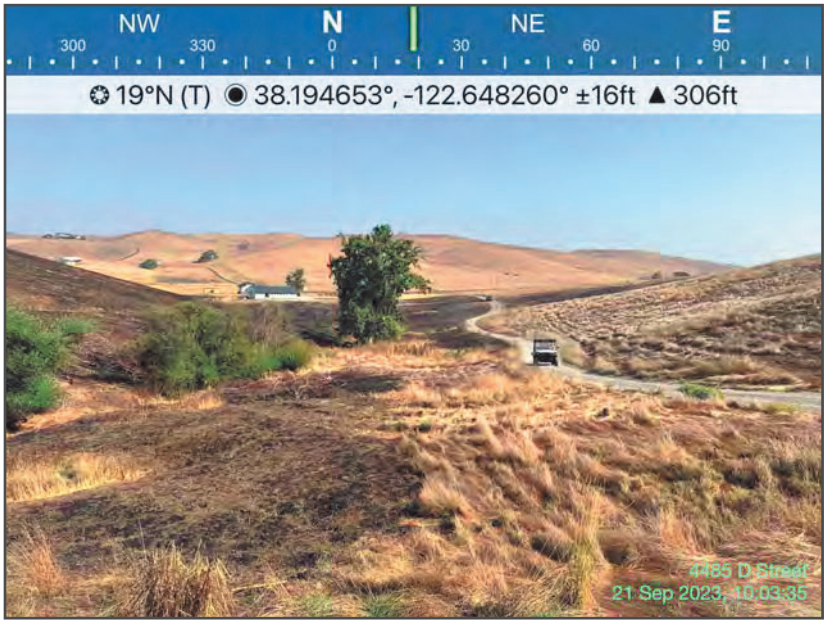

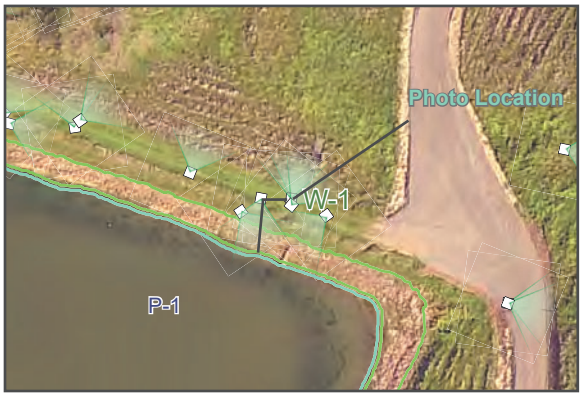

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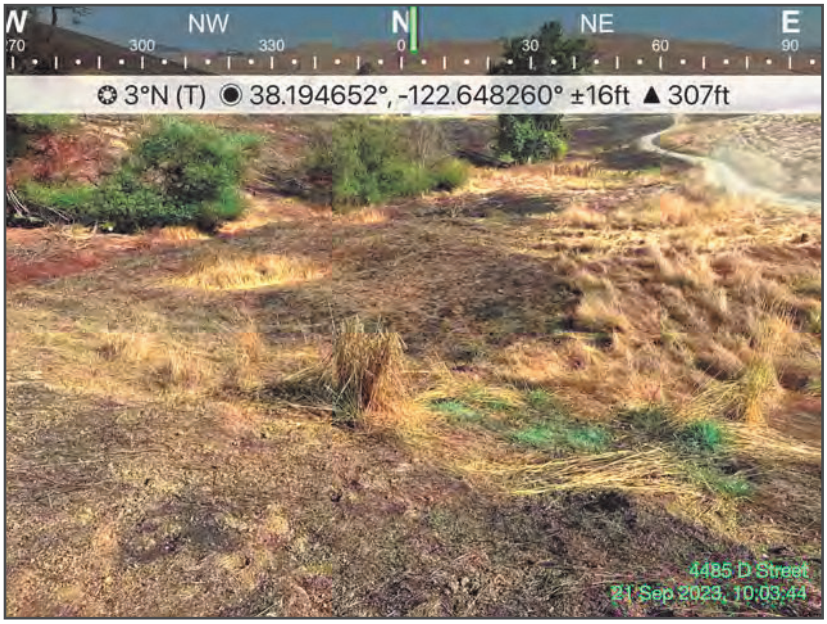

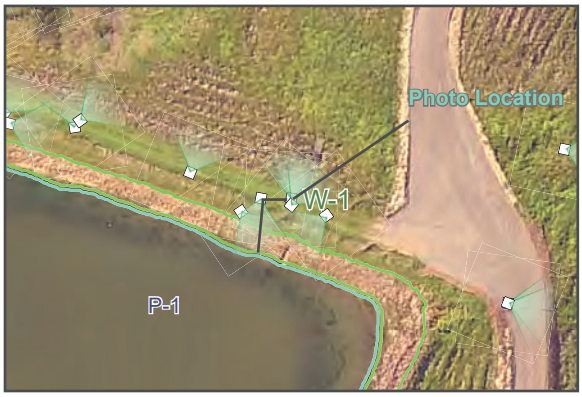

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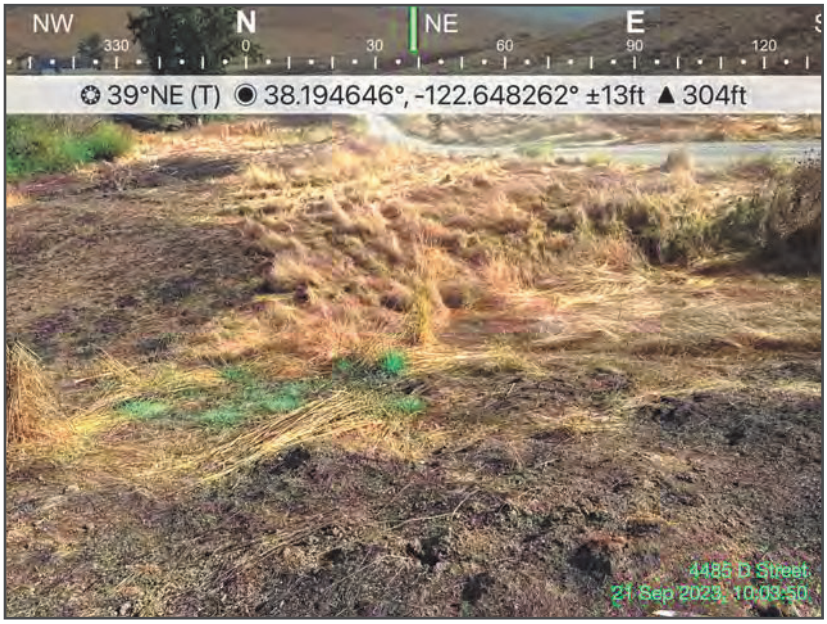

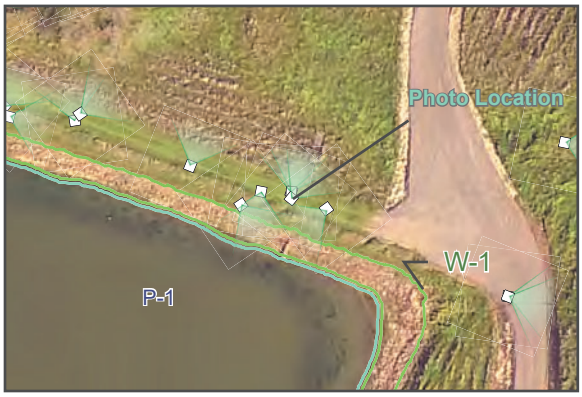

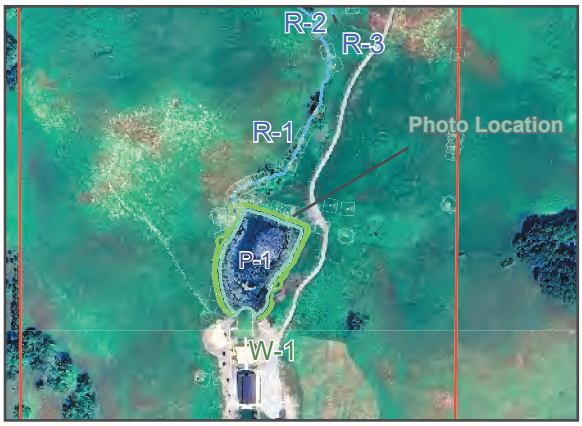

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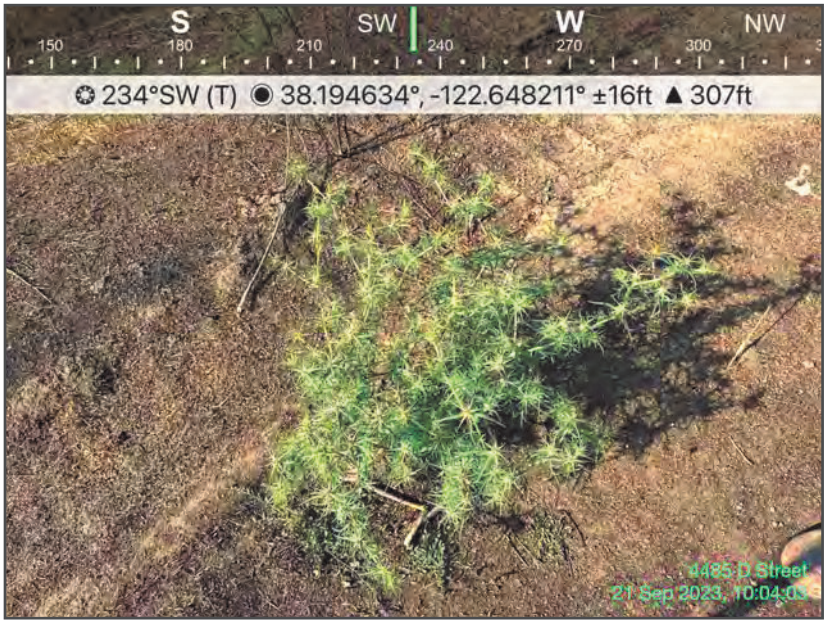

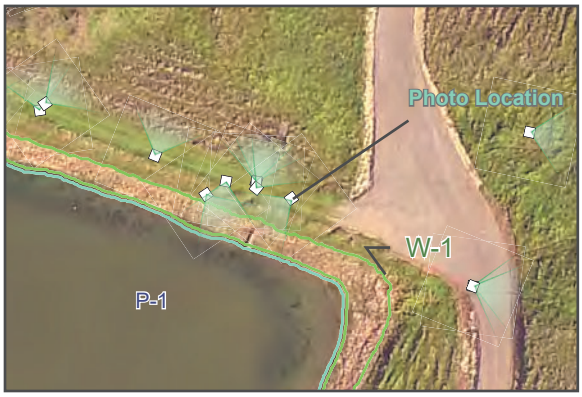

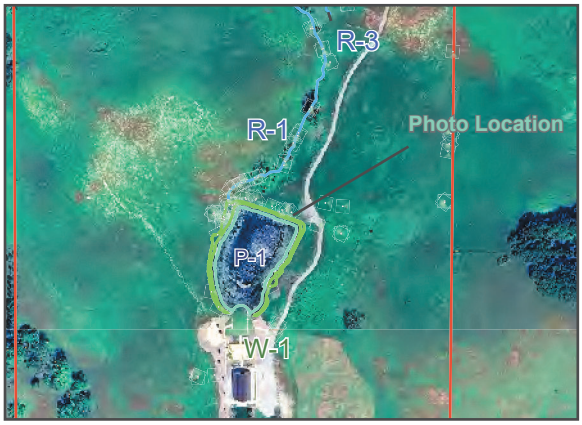

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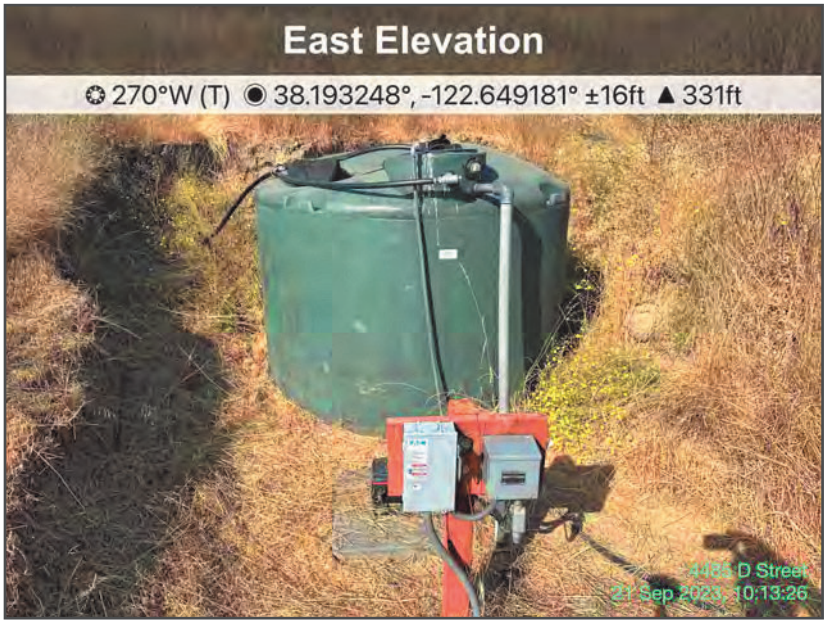

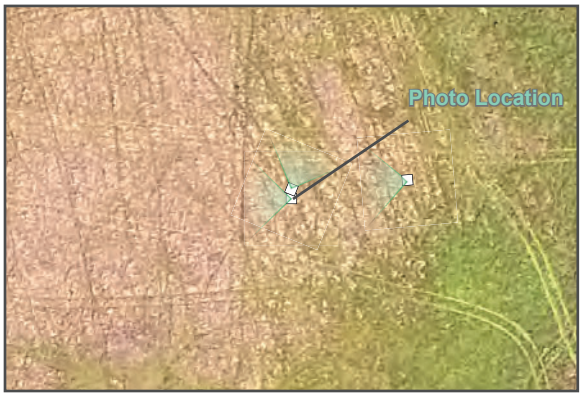

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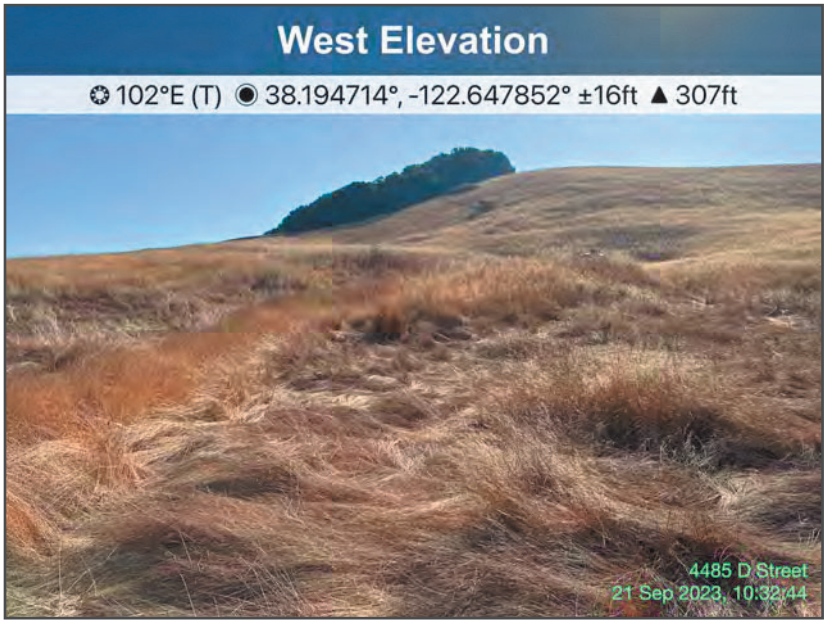

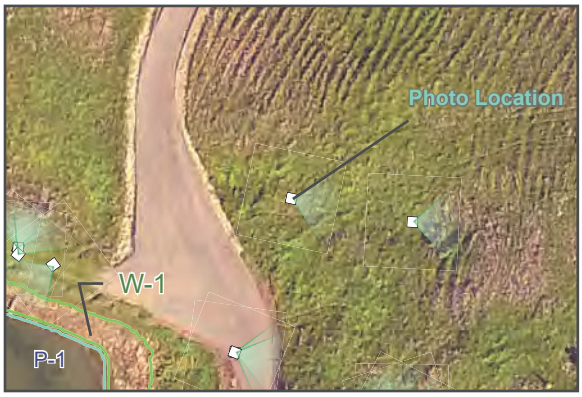

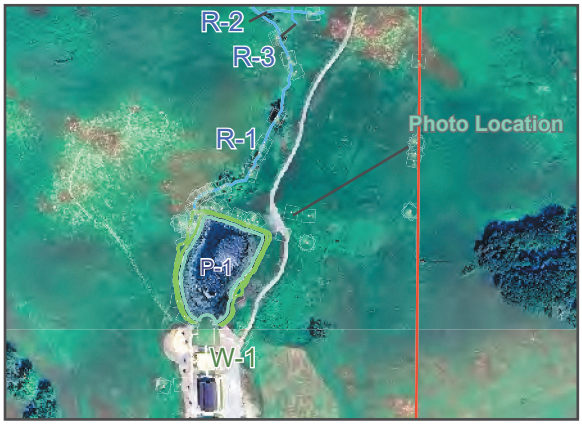

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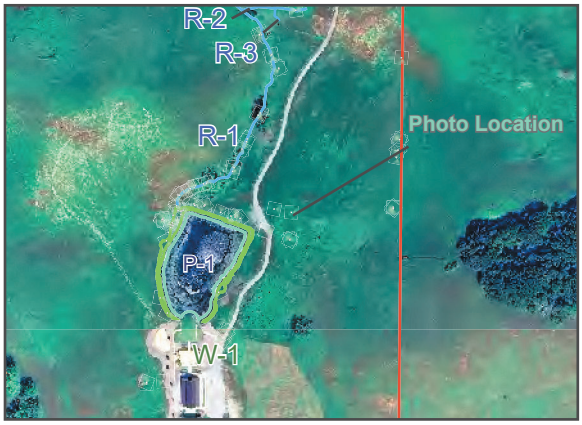

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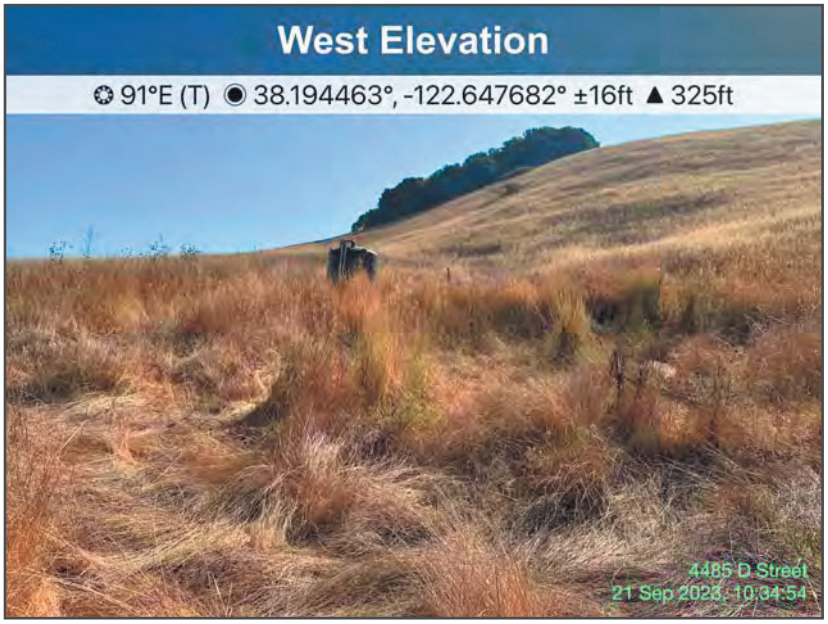

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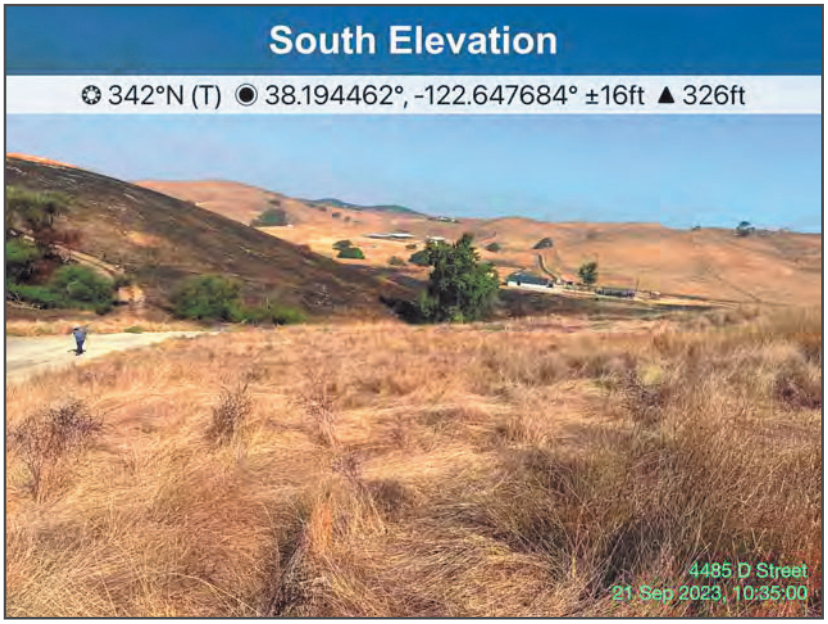

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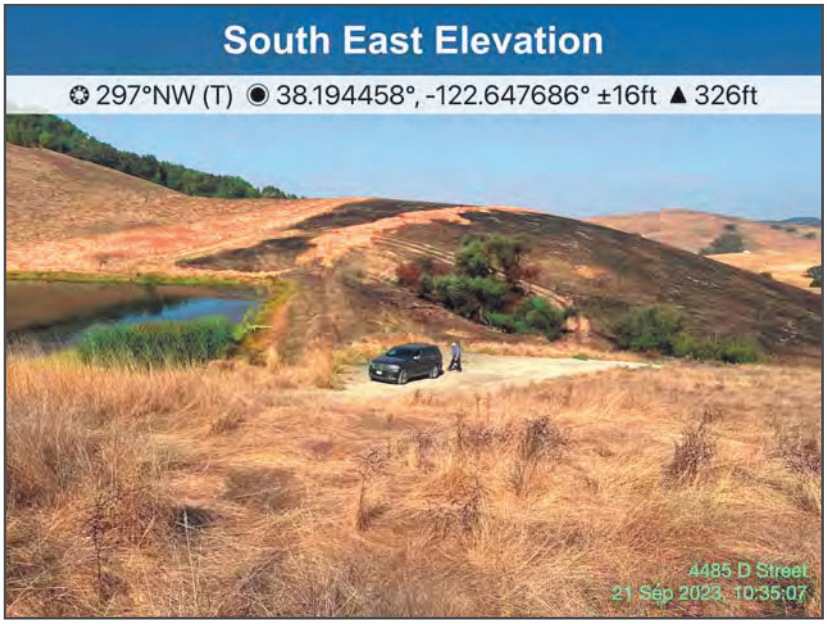

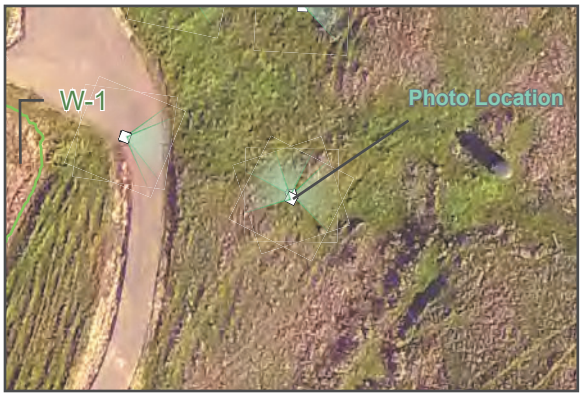

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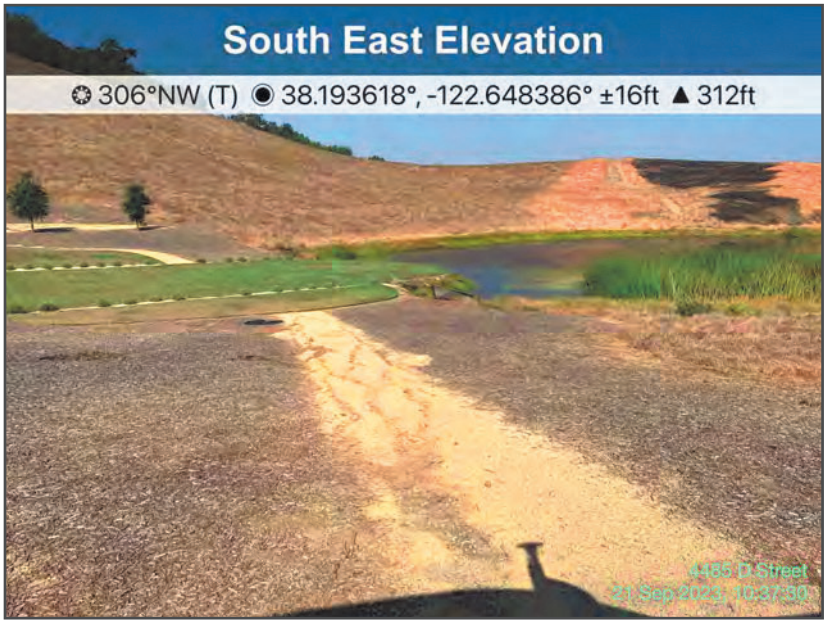

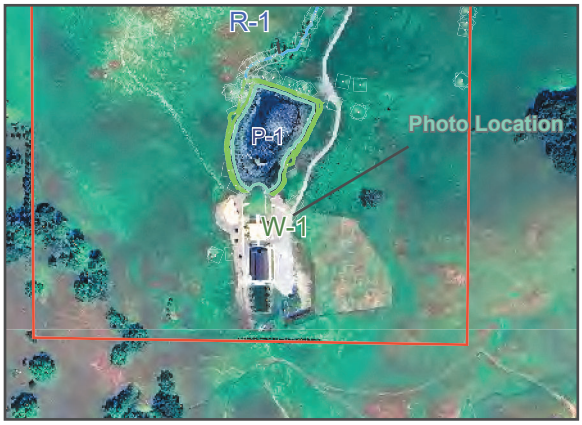

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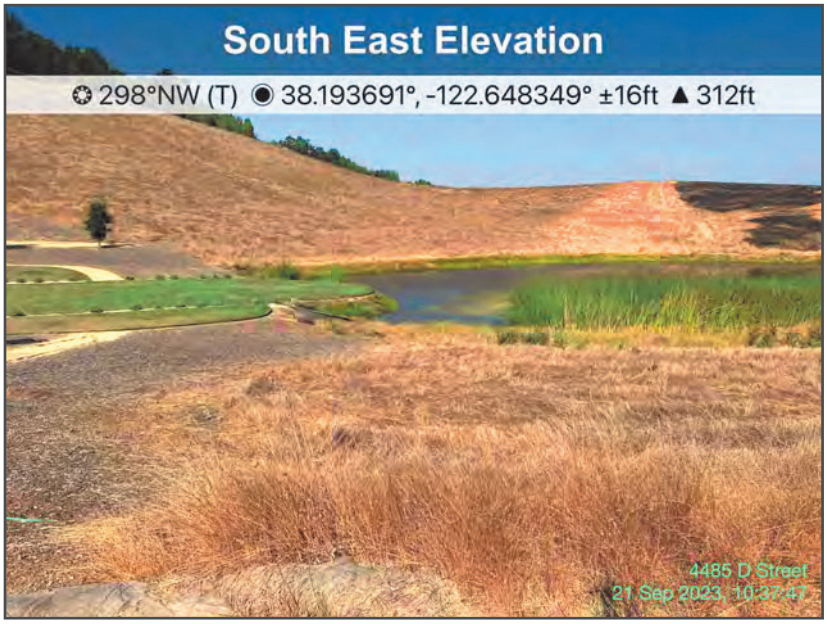

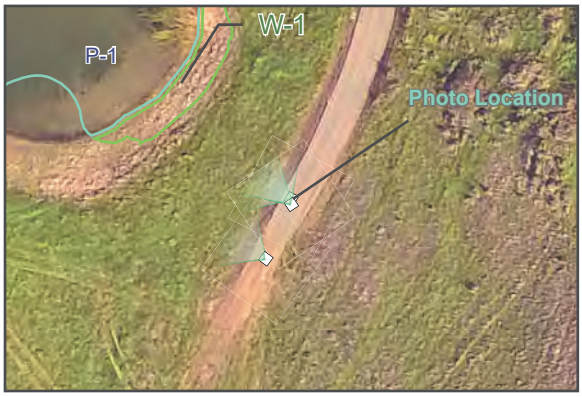

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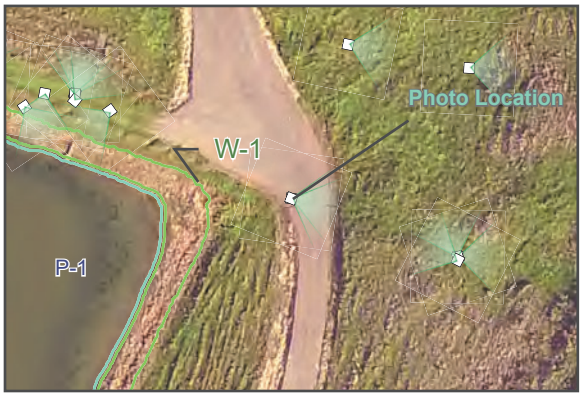

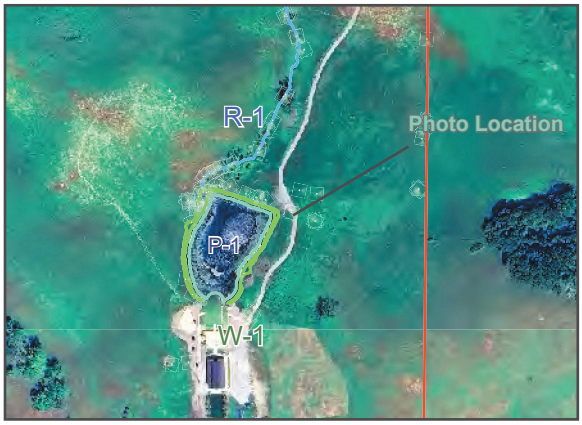

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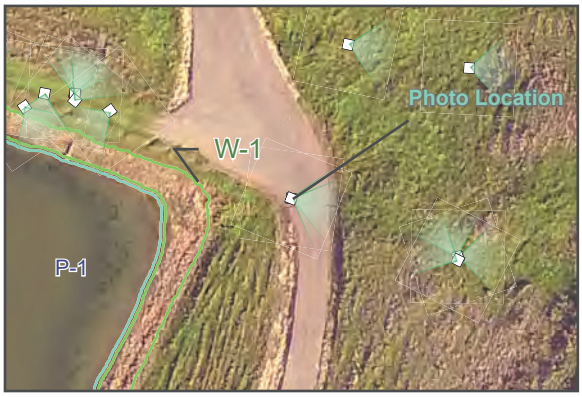

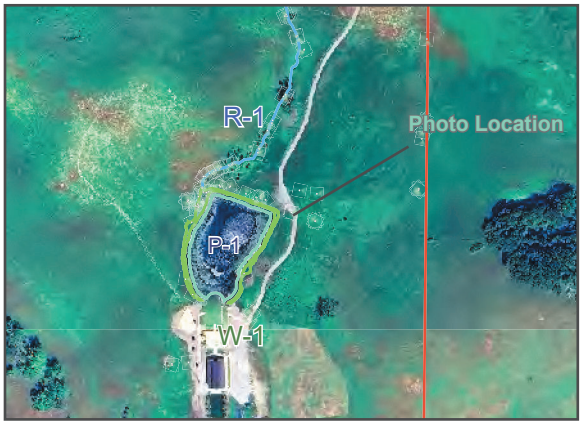

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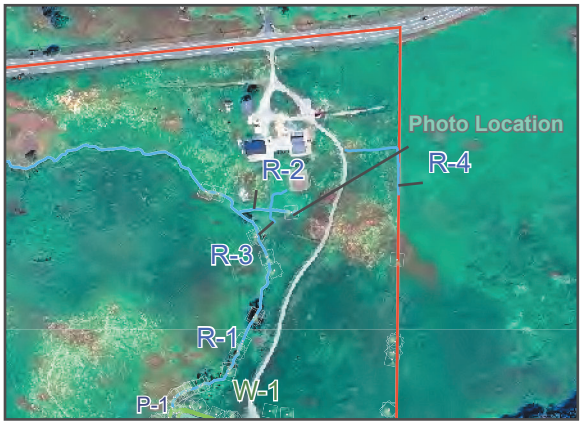

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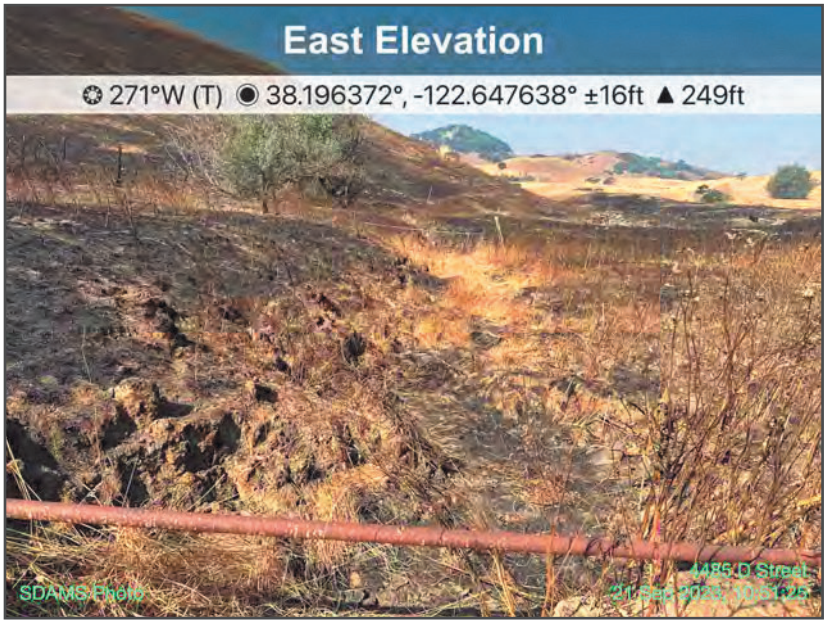

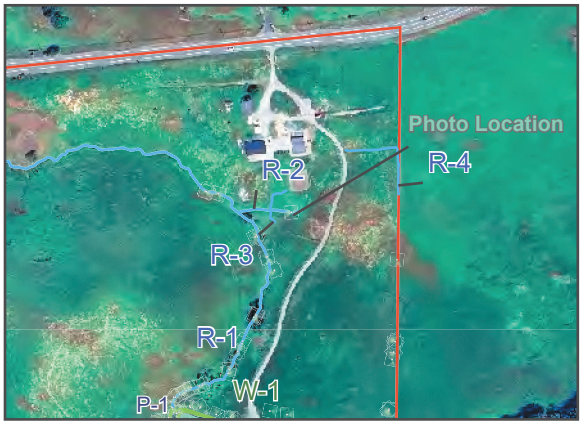

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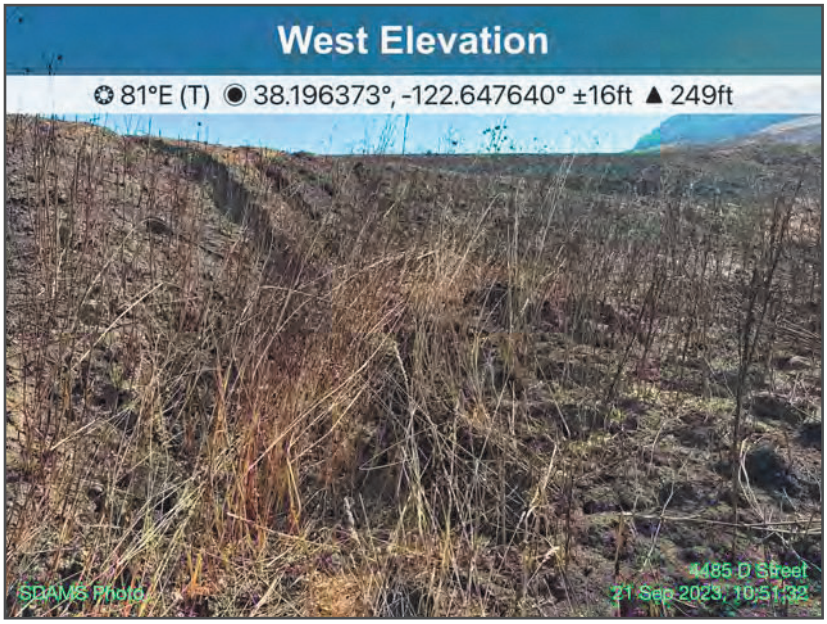

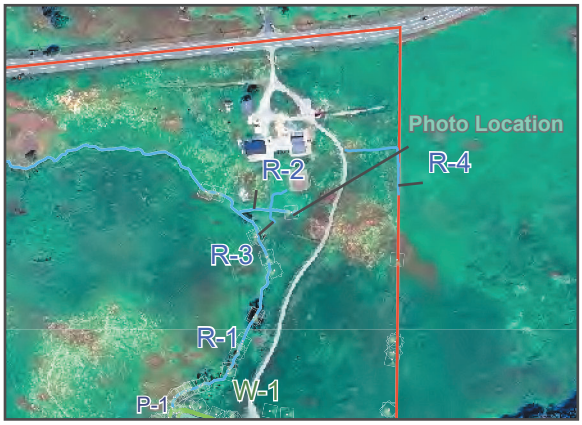

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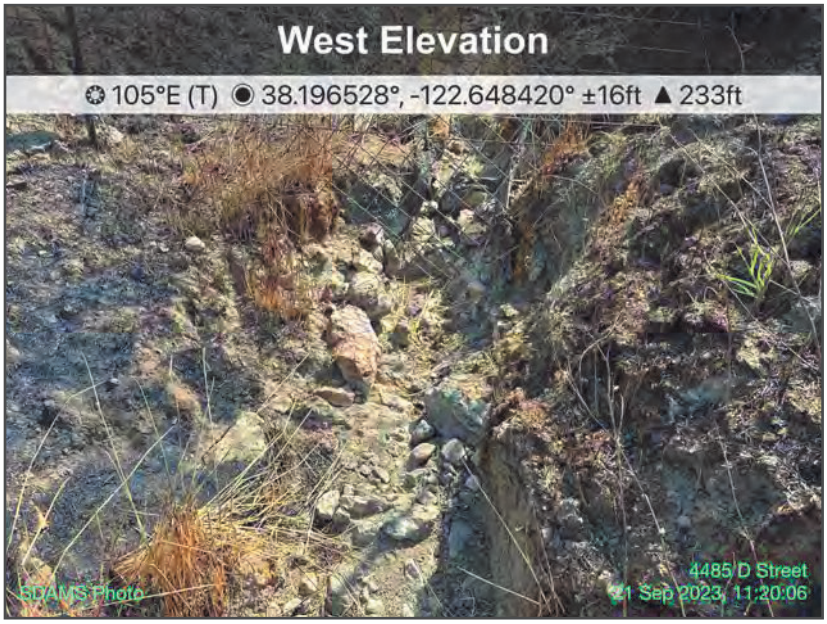

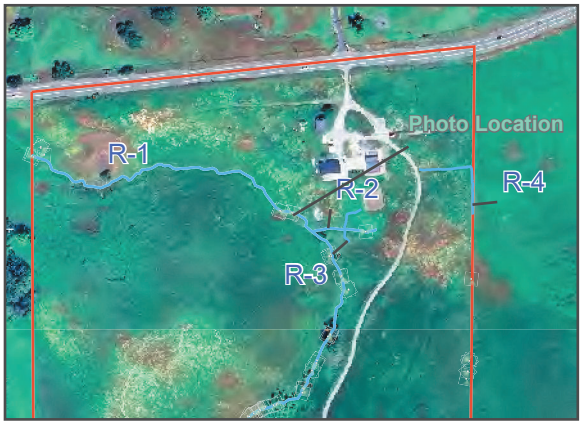

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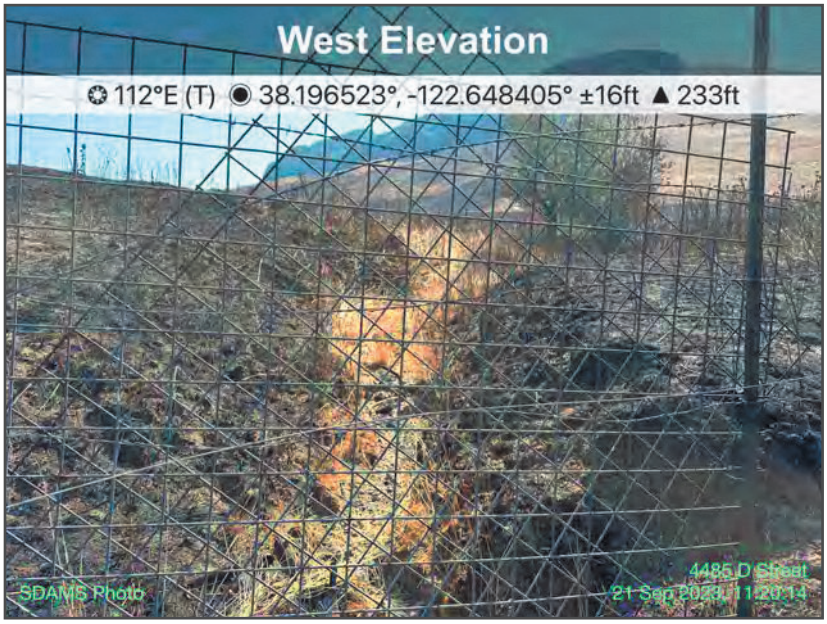

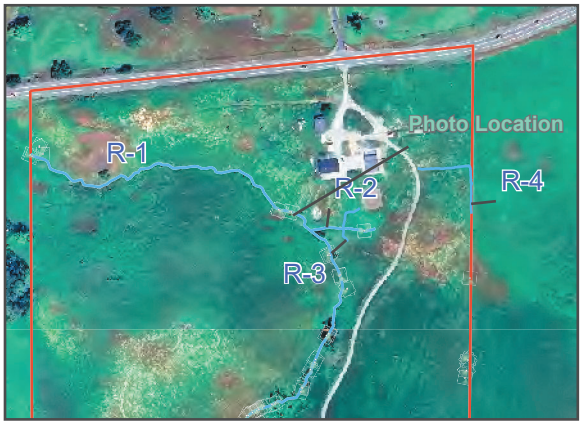

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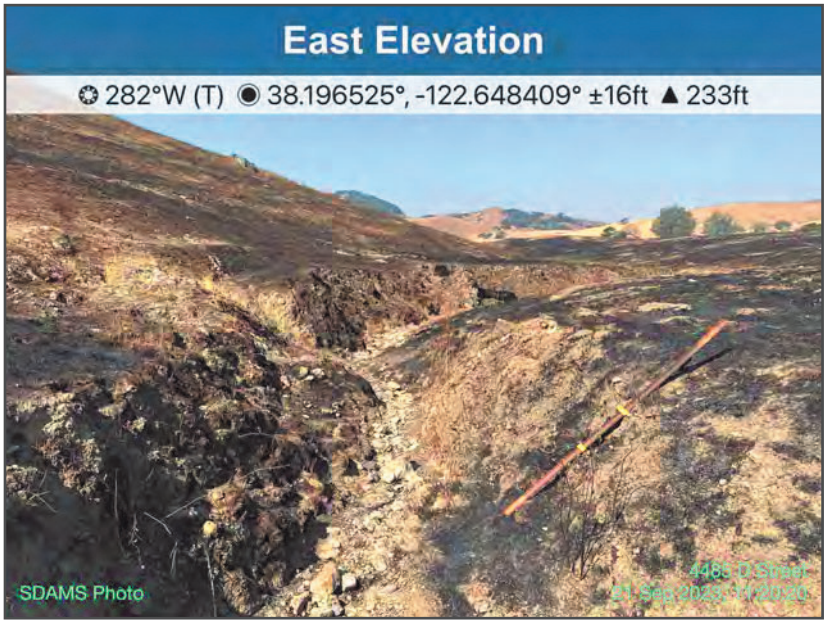

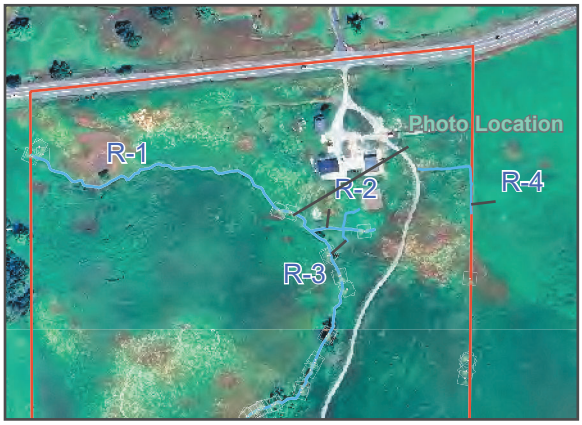

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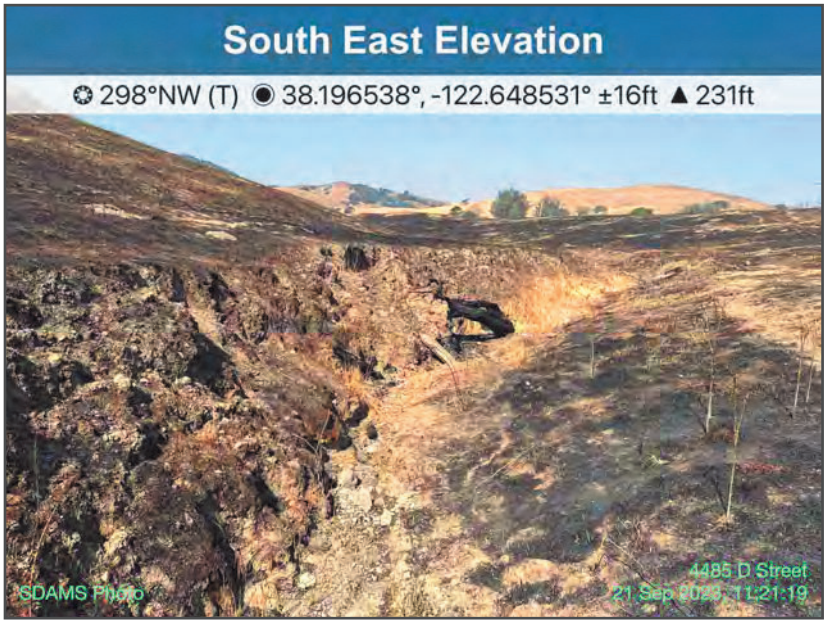

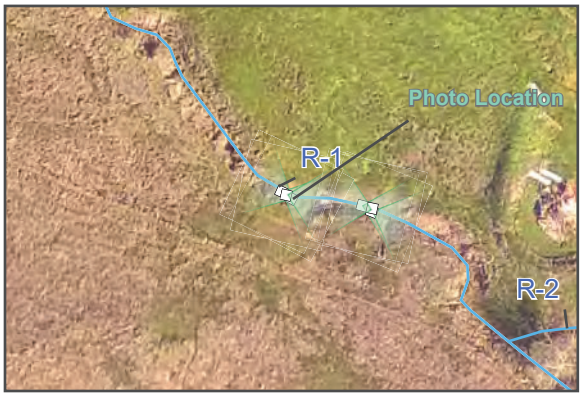

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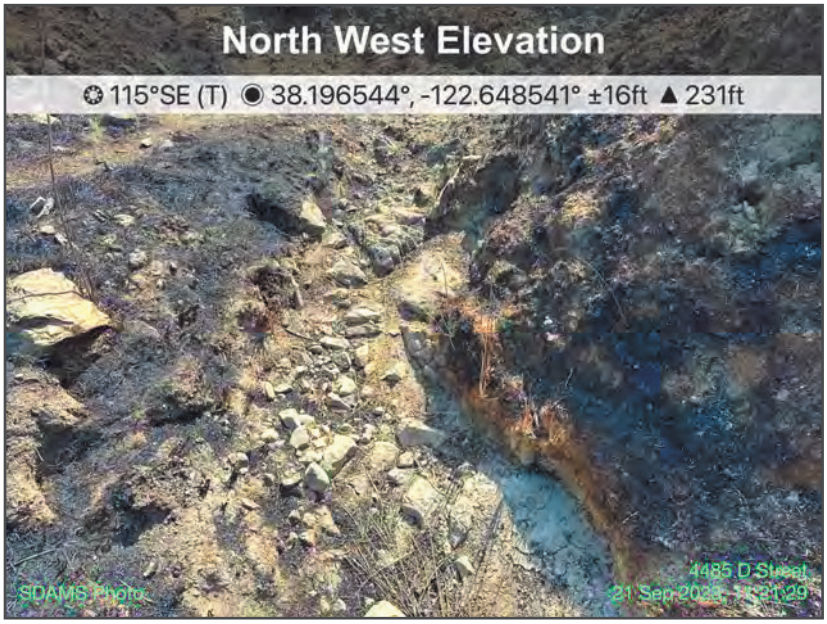

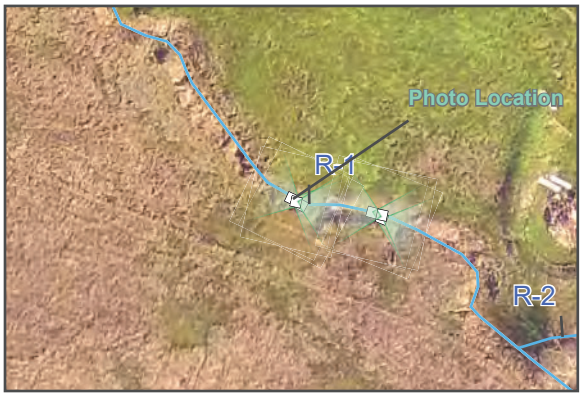

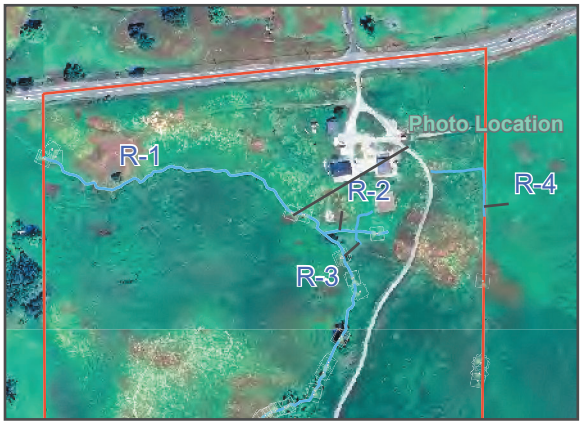

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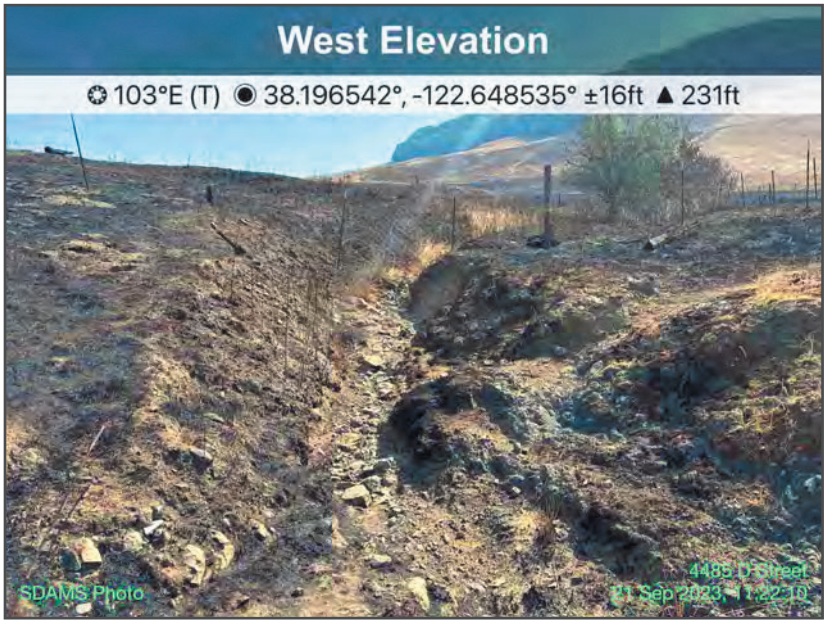

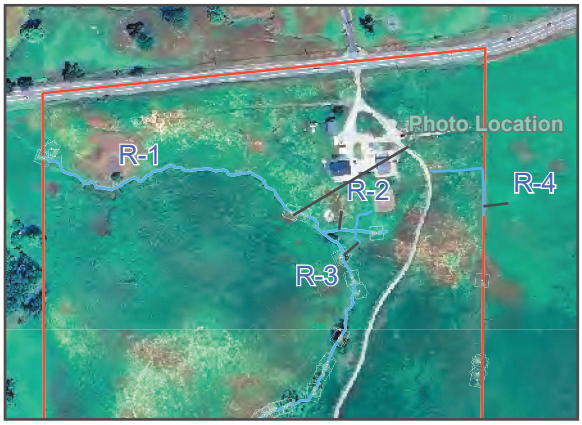

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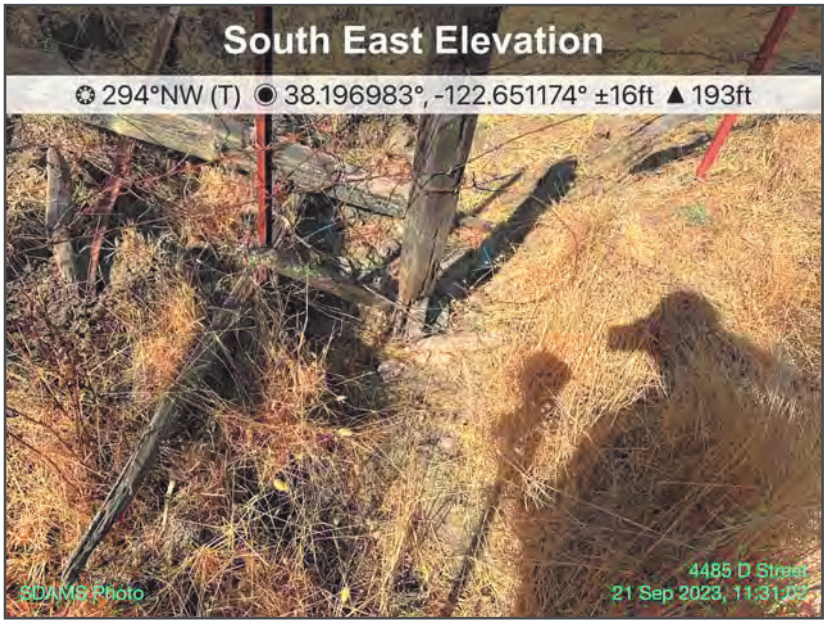

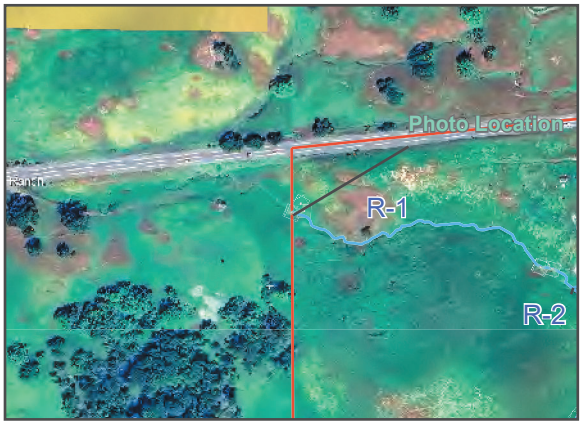

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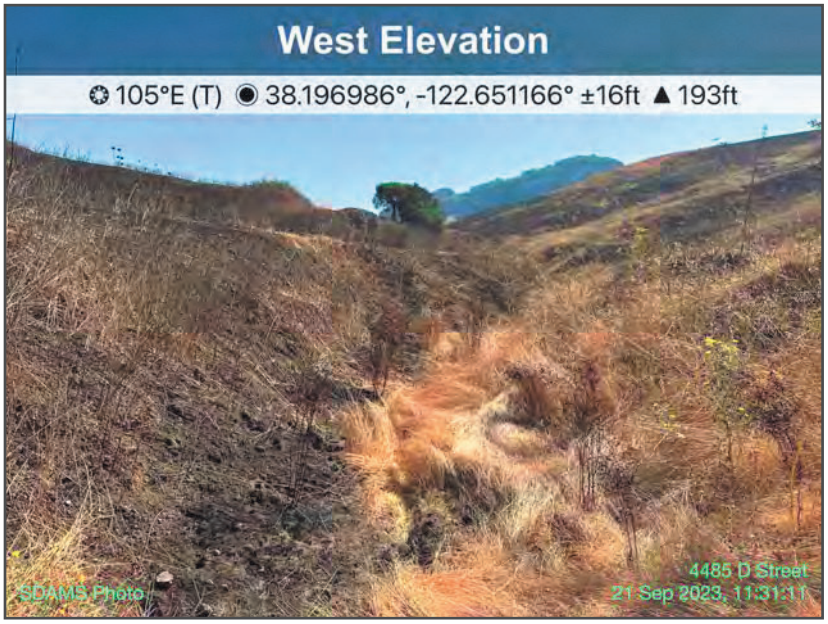

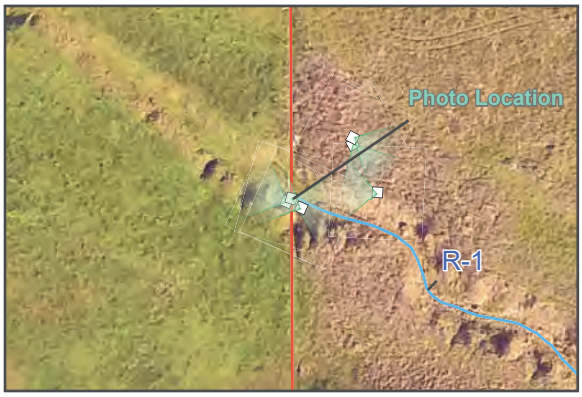

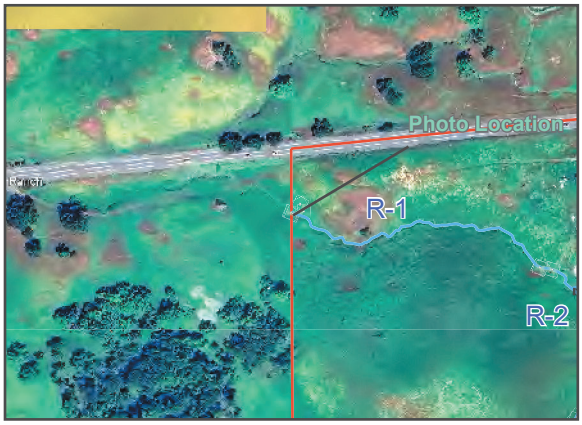

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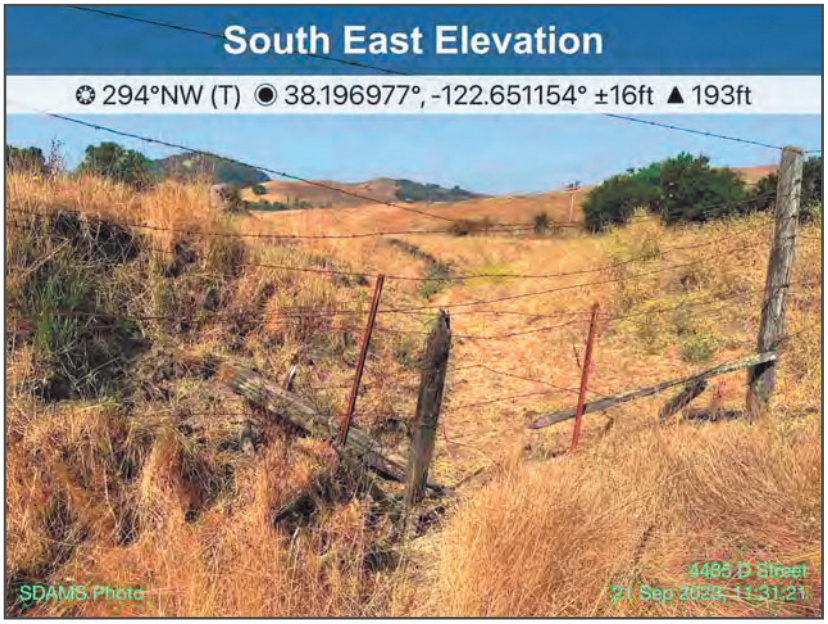

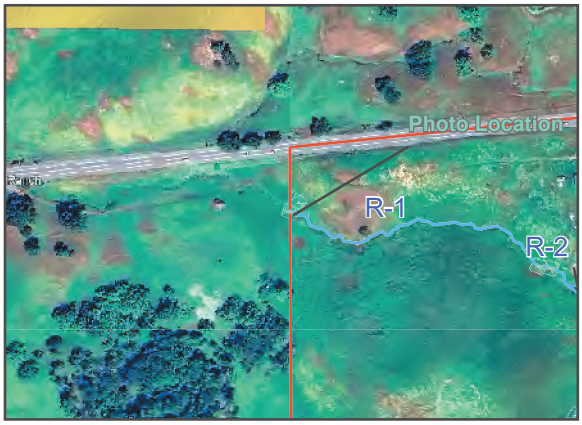

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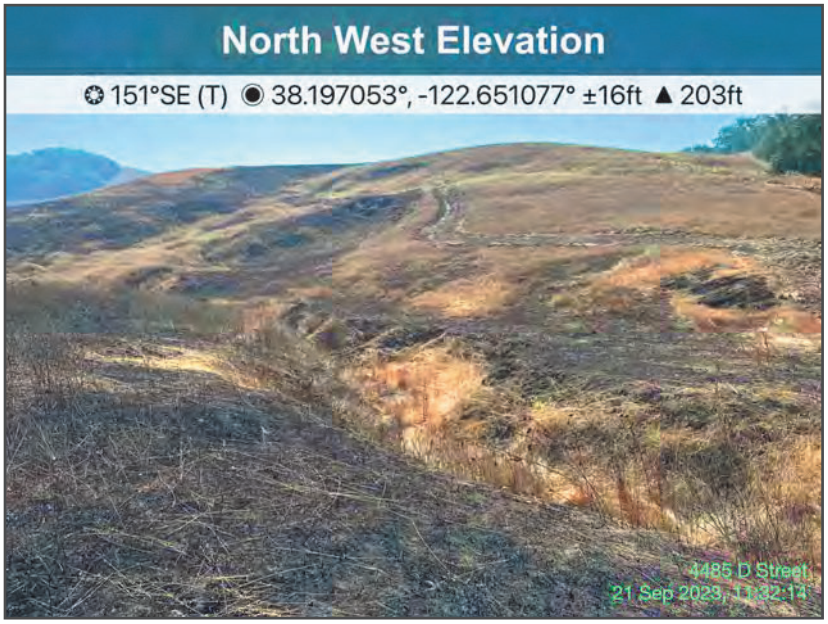

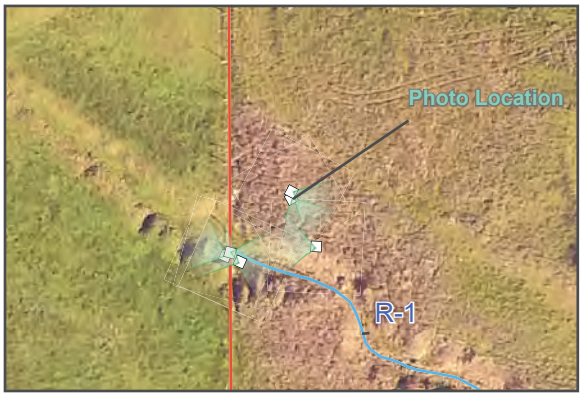

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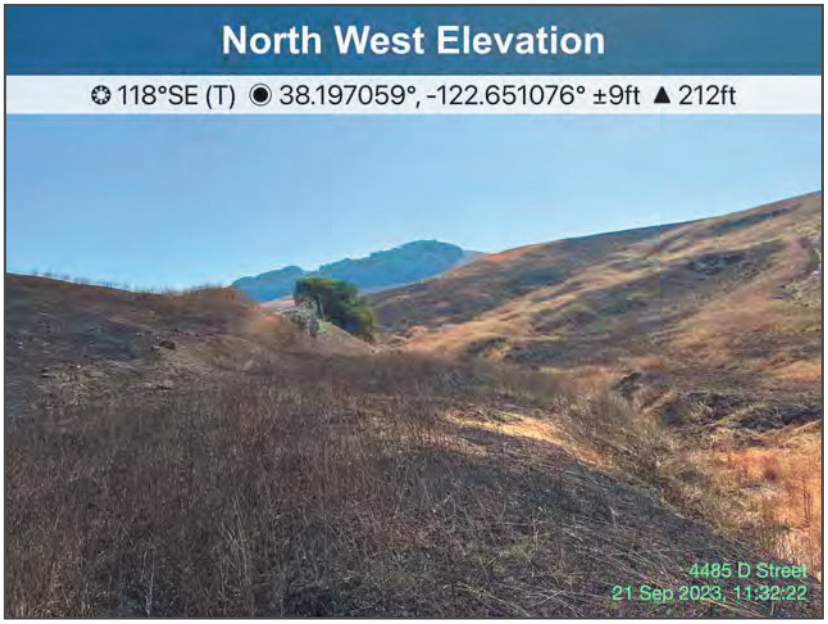

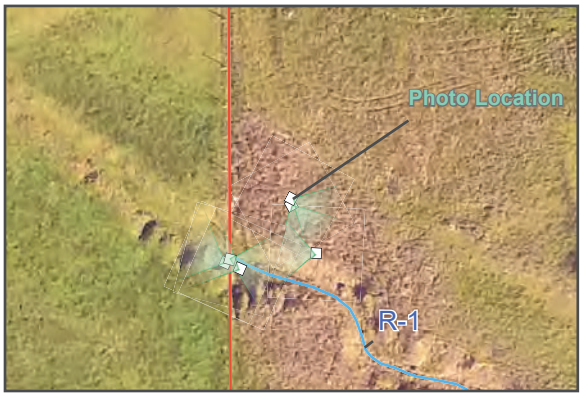

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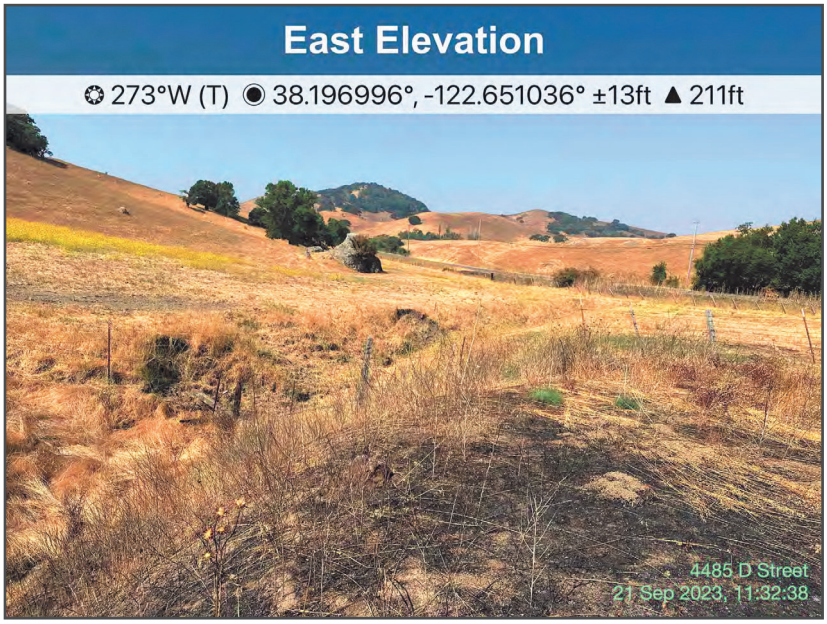

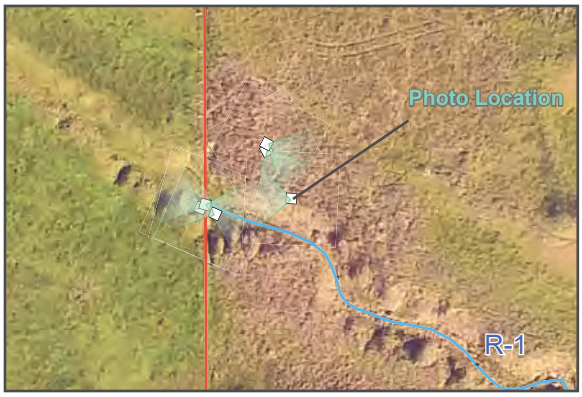

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