Appendix C:
Biological Resources Supporting Information

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C.1 - Biological Resources Assessment

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Biological Resources Assessment
Oak Hill Apartments Project
Marin County, California

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SECTION 1: INTRODUCTION

This Biological Resources Assessment (BRA) has been prepared by FirstCarbon Solutions (FCS) for the proposed Oak Hill Apartments Project (proposed project). The purpose of the BRA is to (1) document existing and potentially occurring biological resources on the project site and adjacent areas; (2) analyze potential project-related impacts on regulated biological resources; (3) summarize relevant local, State, and federal regulations; and (4) recommend appropriate measures to mitigate potential impacts on biological resources to less than significant levels.

1.1 - Project Location

The study area is located north and west of East Sir Francis Drake Boulevard, east of Drakes Cove Road, and south of Anderson Drive in an unincorporated area of Marin County known as San Quentin (Exhibit 1 and Exhibit 2). The study area is located on Accessor's Parcel Number (APN) 018-152-12 on the United States Geological Survey (USGS) *San Rafael and San Quentin, California* 7.5-minute Topographic Quadrangle Map in the southeastern portion of Marin County. Marin County is bound to the north by Sonoma County, to the east by the San Francisco Bay, to the south by the City and County of San Francisco, and to the west by the Pacific Ocean. Regional access is provided by Interstate 580 (I-580) and by U.S. Route 101 (US-101).

1.2 - Project Description

Eden Housing and Education Housing Partners, Inc. (applicant or project proponent) proposes to develop the proposed project on approximately 6.7 acres of the 8.3-acre site The limit of grading disturbance extends outside of the site boundary in certain areas, resulting in a total study area of 10.43 acres. (Exhibit 3). The 100 percent affordable housing project would include the construction of up to 250 new apartments. A total of 135 units would be available to low- to moderate-income educators working in and employees of the County of Marin and 115 units would be available to extremely low to low-income residents.

The apartments would be clustered into two podium style buildings that would be terraced up the hillside with exterior elevations ranging from 3 to 5-stories. The proposed project would feature several amenities, including an outdoor terraces, children's play areas, fitness centers, a fenced dog area, a community courtyard, business/computer labs, and a potential trail connection to open space north of the project site.

The podium garage parking would largely be lined with residential units, lobbies, and amenity space.

This unit mix may change depending on financial and design conditions. There is a strong possibility that the low- to moderate-income portion will feature fewer 3-bedroom units in favor of more smaller units, potentially totaling up to 135 low to moderate-income units. However, the total number of units would not exceed 250.

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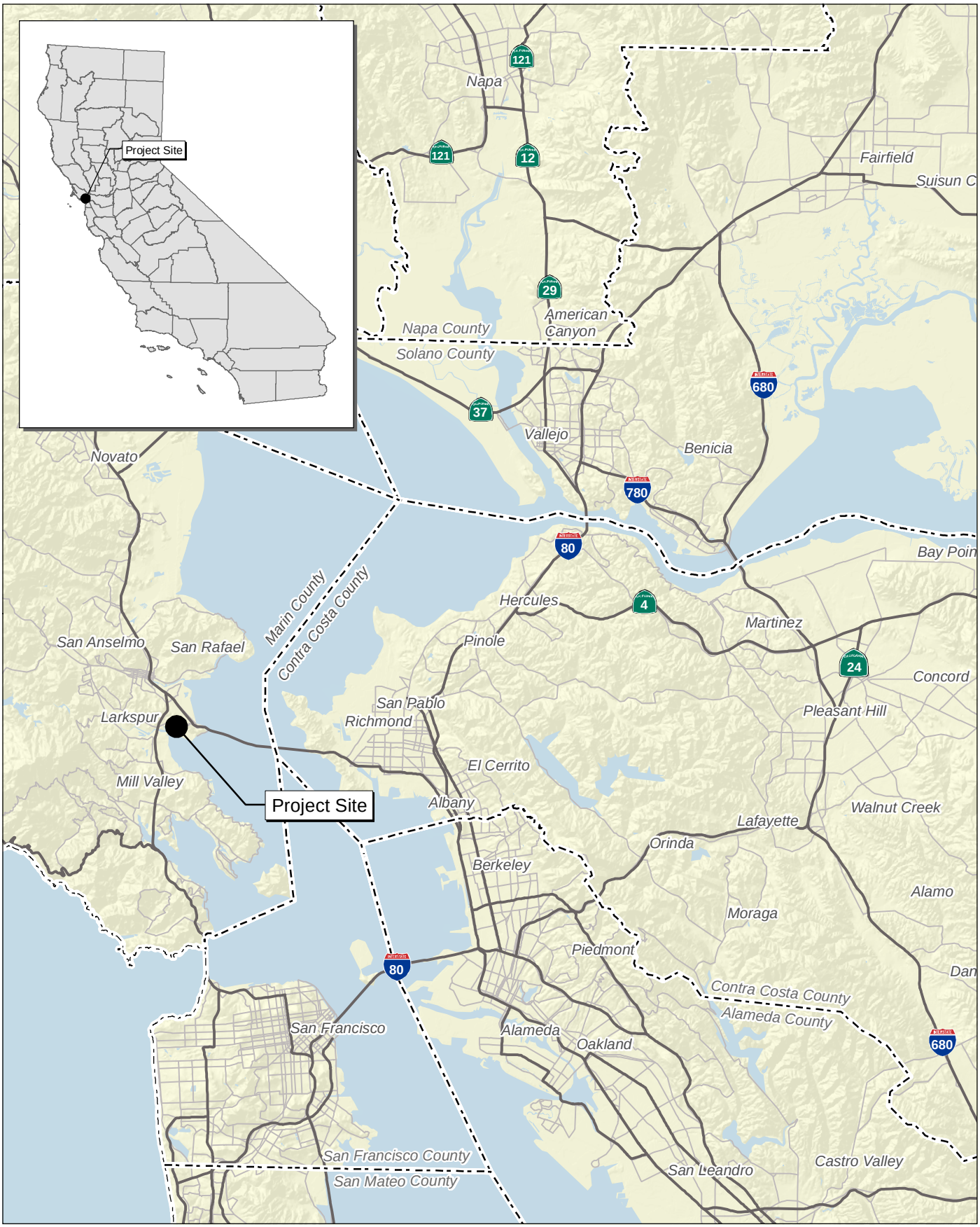

Source: Census 2000 Data, The California Spatial Information Library (CaSIL).

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5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

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STATE OF CALIFORNIA DEPARTMENT OF GENERAL SERVICES
OAK HILL APARTMENTS
BIOLOGICAL RESOURCES ASSESSMENT

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Source: Bing Aerial Imagery. California Department of Fish and Wildlife

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1,000 500 0 1,000 Feet

Exhibit 2
Local Vicinity Map

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STATE OF CALIFORNIA DEPARTMENT OF GENERAL SERVICES
OAK HILL APARTMENTS
BIOLOGICAL RESOURCES ASSESSMENT

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Source: SVA Architects, June 2022.

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Exhibit 3
Conceptual Site Plan

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SECTION 2: REGULATORY SETTING

2.1 - Federal

2.1.1 - Endangered Species Act of 1973

The United States Fish and Wildlife Service (USFWS) has jurisdiction over species listed as threatened or endangered under the federal Endangered Species Act of 1973. Section 9 of Endangered Species Act protects listed species from "take," which is broadly defined as actions taken to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." The Endangered Species Act protects threatened and endangered plants and animals and their critical habitat. Candidate species are those proposed for listing; these species are usually treated by resource agencies as if they were actually listed during the environmental review process.

2.1.2 - Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, 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. All migratory birds and their nests are protected from take and other impacts under the MBTA (16 United States Code [USC] § 703, *et seq*.).

2.1.3 - Bald and Golden Eagle Protection Act

The golden eagle (*Aquila chrysaetos*) and bald eagle (*Haliaeetus leucocephalus*) are afforded additional protection under the Eagle Protection Act, amended in 1973 (16 USC § 669, *et seq*.) and the Bald and Golden Eagle Protection Act (16 USC §§ 668–668d).

2.1.4 - Clean Water Act

Section 404

The United States Army Corps of Engineers (USACE) administers Section 404 of the federal Clean Water Act (CWA), which regulates the discharge of dredge and fill material into waters of the United States.

As of the date of this report, January 6, 2022, the Environmental Protection Agency and USACE (hereafter the agencies) are in receipt of the U.S. District Court for the District of Arizona's August 30, 2021, order vacating and remanding the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. In light of this order, these agencies have halted implementation of the Navigable Waters Protection Rule and are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice.[1]

Therefore, since the agencies are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice, our analysis follows 40 Code of Federal Regulations

[1] United States Environmental Protection Agency (EPA). 2021. Website: https://www.epa.gov/wotus/current-implementation-waters-united-states. Accessed September 9, 2021.

230.3(s), which defines "waters of the United States" as follows:

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

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the United States Environmental Protection Agency (EPA) and/or USACE.

"Wetland" refers to areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and seasonal wetlands. Wetlands are considered jurisdictional if they fall under one of the categories of waters of the United States defined above. The USACE jurisdiction typically extends up to the ordinary high water mark (OHWM).

In general, a USACE permit must be obtained before placing fill in wetlands or other waters of the United States. The type of permit depends on the impacted acreage, the purpose of the proposed fill, and other factors.

Section 401

As stated in Section 401 of the CWA, "any applicant for a federal permit for activities that involve a discharge to waters of the State, shall provide the federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act." Therefore, before the USACE will issue a Section 404 permit, applicants must apply for and receive a Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB).

2.2 - State

2.2.1 - CEQA Guidelines

The California Environmental Quality Act (CEQA) requires public agencies to evaluate potential impacts to special-status species and their habitat. The following CEQA Guidelines Appendix G checklist questions serve as thresholds of significance when evaluating the potential impacts of a proposed project on biological resources. Impacts are considered significant if a project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as being a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS.
- Have a substantial adverse effect on federally and State protected wetlands as defined by Section 404 of the CWA (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State Habitat Conservation Plan.

Oak Woodlands Conservation Act

California State Senate Bill (SB) 1334, the Oak Woodlands Conservation Act, became law on January 1, 2005, and was added to the CEQA statutes as 21083.4. This statute requires that a county must determine whether or not a project will result in a significant impact on oak woodlands and, if it is determined that a project may result in a significant impact on oak woodlands then the County shall require one or more of the following mitigation measures:

- Conserve oak woodlands through the use of conservation easements;

- Plant an appropriate number of trees, including maintenance of plantings and replacement of failed plantings;
- Contribute funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements;
- Other mitigation measures developed by the county.

2.2.2 - California Endangered Species Act

The State of California enacted the California Endangered Species Act (CESA) in 1984. CESA 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 continued existence of a listed species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available (Fish and Game Code [FGC] § 2080). CESA directs agencies to consult with the CDFW on projects or actions that could affect listed species, directs the CDFW to determine whether jeopardy would occur, and allows the CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. CESA allows the CDFW to authorize exceptions to the State's prohibition against take of a listed species if the "take" of a listed species is incidental to carrying out an otherwise lawful project that has been approved under CEQA (FGC § 2081).

2.2.3 - California Fish and Game Code

Under CESA, the CDFW has the responsibility for maintaining a list of endangered and threatened species (FGC § 2070). Fish and Game Code Sections 2050 through 2098 outline the protection provided to California's rare, endangered, and threatened species. Fish and Game Code Section 2080 prohibits the taking of plants and animals listed under the CESA. Fish and Game Code Section 2081 established an incidental take permit program for State listed species. The CDFW maintains a list of "candidate species," which it formally notices as being under review for addition to the list of endangered or threatened species.

In addition, the Native Plant Protection Act of 1977 (NPPA) (FGC § 1900, *et seq*.) prohibits the taking, possessing, or sale within the State of any plants with a State designation of rare, threatened, or endangered (as defined by the CDFW). An exception to this prohibition in the NPPA allows landowners, under specified circumstances, to take listed plant species, provided that the owners first notify the CDFW and give the agency at least 10 days to come and retrieve (and presumably replant) the plants before they are plowed under or otherwise destroyed. Fish and Game Code Section 1913 exempts from "take" prohibition "the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right-of-way." Project impacts to these species are not considered significant unless the species are known to have a high potential to occur within the area of disturbance associated with construction of the proposed project.

In addition to formal listing under the Endangered Species Act and CESA, some species receive additional consideration by the CDFW and local lead agencies during the CEQA process. Species that may be considered for review are those listed as a "Species of Special Concern." The CDFW

maintains lists of "Species of Special Concern" that serve as species "watch lists." Species with this status may have limited distributions or limited populations, and/or the extent of their habitats has been reduced substantially, such that their populations may be threatened. Thus, their populations are monitored, and they may receive special attention during environmental review. While they do not have statutory protection, they may be considered rare under CEQA and specific protection measures may be warranted. In addition to Species of Special Concern, the CDFW Special Animals List identifies animals that are tracked by the California Natural Diversity Database (CNDDB) and may be potentially vulnerable but warrant no federal interest and no legal protection.

Sensitive species that would qualify for listing but are not currently listed are afforded protection under CEQA. CEQA Guidelines Section 15065 (Mandatory Findings of Significance) requires that a substantial reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines Section 15380 (Rare or Endangered Species) provides for the assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Unlisted plant species on the California Native Plant Society (CNPS) List ranked 1A, 1B, and 2 would typically require evaluation under CEQA.

Fish and Game Code Sections 3500 to 5500 outline protection for fully protected species of mammals, birds, reptiles, amphibians, and fish. Species that are fully protected by these sections may not be taken or possessed at any time. The CDFW cannot issue permits or licenses that authorize the take of any fully protected species, except under certain circumstances such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock.

Under Fish and Game Code Section 3503.5, it is unlawful to take, possess, or destroy any birds in the orders of *Falconiformes* or *Strigiformes* (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto. To comply with the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any State listed endangered or threatened species may be present in the project study area and determine whether the proposed project will have a potentially significant impact on such species. In addition, the CDFW encourages informal consultation on any proposed project that may impact a candidate species.

Project-related impacts to species on the CESA endangered or threatened list would be considered significant. State listed species are fully protected under the mandates of CESA. "Take" of protected species incidental to otherwise lawful management activities may be authorized under Fish and Game Code Section 206.591. Authorization from the CDFW would be in the form of an Incidental Take Permit.

Fish and Game Code Section 1602 requires any entity to notify the CDFW before beginning any activity that "may substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake" or "deposit debris, waste, or other materials that could pass into any river, stream, or lake." "River, stream, or lake" includes waters that are episodic and perennial and ephemeral streams, desert washes, and watercourses with a subsurface flow. A Lake or Streambed Alteration Agreement will be required if the CDFW

determines that project activities may substantially adversely affect fish or wildlife resources through alterations to a covered body of water. CDFW jurisdiction typically extends to the edge or "drip line" of the riparian habitat or top of bank.

2.2.4 - California Porter-Cologne Water Quality Control Act

The RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect the water of the State" (Water Code § 13260(a)), pursuant to provisions of the Porter-Cologne Water Quality Act. "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (Water Code § 13050€). In 2019, the California State Water Resources Control Board (State Water Board) published the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (Procedures) to guide wetland/waters of the State determinations and the permitting process.[2]

2.2.5 - California Native Plant Society

The CNPS maintains a rank of plant species that are native to California and that have low population numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. Following are the definitions of the CNPS ranks:

- **Rank 1A:** Plants presumed extirpated in California and either rare or extinct elsewhere
- **Rank 1B:** Plants rare, threatened, or endangered in California and elsewhere
- **Rank 2A:** Plants presumed extirpated in California but common elsewhere
- **Rank 2B:** Plants rare, threatened, or endangered in California but more common elsewhere
- **Rank 3:** Plants about which more information is needed, a review list
- **Rank 4:** Plants of limited distribution, a watch list

Potential impacts to populations of CNPS ranked plants receive consideration under CEQA review. All plants appearing on the CNPS List ranked 1 or 2 are considered to meet the CEQA Guidelines Section 15380 criteria. Rank 3 and 4 plants do not automatically meet this definition. Rank 4 plants do not clearly meet CEQA standards and thresholds for impact considerations. Nevertheless, some level of CEQA review is justified for California Rare Plant Rank (CRPR) 4 taxa, and under some circumstances, a full impact analysis is warranted. Taxa that can be shown to meet the criteria for endangered, rare, or threatened status under CEQA Section 15380(d) or that can be shown to be regionally rare or unique as defined in CEQA Section 15125(c) must be fully analyzed in a CEQA document. Some circumstances, such as local rarity, having occurrences peripheral to the taxon's distribution, or having occurrences on unusual substrates or rare and declining habitats, provide justification for treating some CRPR 4 taxa occurrences as regionally rare or unique. One limitation to fully analyzing

[2] California State Water Resources Control Board (State Water Board). 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. April 2, 2019.

impacts on CRPR 4 taxa is the difficulty in obtaining current data on the number and condition of the occurrences.[3]

2.3 - Regional and Local

No relevant regional or local laws or regulations apply to the proposed project.

[3] California Native Plant Society (CNPS). 2020. Considerations for Including CRPR 4 Plant Taxa in CEQA Biological Resource Impact Analysis. Sacramento, CA. 21 January 2020.

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SECTION 3: METHODS

3.1 - Literature Review

Literature review was conducted to analyze existing documentation regarding biological resources and habitat conditions within the study area and is summarized below.

3.1.1 - Existing Documentation

As part of the literature review, an FCS Biologist compiled and analyzed existing environmental documentation for the study area and relevant areas in its vicinity. This documentation included literature pertaining to the habitat requirements of special-status species with the potential to occur in the project vicinity; and federal register listings, protocols, and species data provided by the USFWS, CDFW and CNPS. Additionally, an Aquatic Resources Delineation (Appendix C), a USACE Preliminary Jurisdictional Determination (Appendix D), and a Preliminary Arborist Report (Appendix E) were reviewed, and the provided information and conclusions were integrated into this BRA.

3.1.2 - Topographic Maps and Aerial Photographs

An FCS Biologist reviewed current USGS 7.5-minute topographic quadrangle map(s) and aerial photographs as a preliminary analysis of the existing conditions within the project site and immediate vicinity.[4] Information obtained from the topographic maps included elevation, general watershed information, and potential drainage feature locations using Google Earth in conjunction with the EPA Watershed Assessment, Tracking, and Environmental Results System (WATERS).[5] Aerial photographs provided a perspective of the current site conditions relative to on-site and off-site land use, plant community locations, and potential locations of wildlife movement corridors.

3.1.3 - Soil Surveys

The United States Department of Agriculture (USDA) has published soil surveys that describe the soil series (i.e., group of soils with similar profiles) occurring within a particular area.[6] These profiles include major horizons with similar thickness, arrangement, and other important characteristics. These series are further subdivided into soil mapping units that provide specific information regarding soil characteristics. Many special-status plant species have a limited distribution based exclusively on soil type. Therefore, pertinent USDA soil survey maps were reviewed to determine the existing soil mapping units within the project site and to inform whether the soil conditions on-site are potentially suitable for any special-status plant species. However, Natural Resources

[4] United States Geological Survey (USGS). 2021. National Geospatial Program. Website: https://www.usgs.gov/core-science-systems/national-geospatial-program/us-topo-maps-america?qt-science_support_page_related_con=4#qt-science_support_page_related_con. Accessed January 21, 2022.

[5] United States Environmental Protection Agency (EPA). 2022. Watershed Assessment, Tracking and Environmental Results System (WATERS). Website: https://www.epa.gov/waterdata/waters-watershed-assessment-tracking-environmental-results-system. Accessed January 21, 2022.

[6] Natural Resources Conservation Service (NRCS). 2022. Web Soil Survey (WSS). United States Department of Agriculture (USDA). Website: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed January 21, 2022.

Conservation Service (NRCS) soil maps utilize an approximately 1.4-acre minimum mapping unit, and line placement may not be accurate on a large (i.e., parcel-level) scale.

3.1.4 - Special-status Species Database Search

An FCS Biologist compiled a list of threatened, endangered, and otherwise special-status species previously recorded within the project vicinity based on a search of the USFWS Information for Planning and Consultation (IPaC) database,[7] the California Natural Diversity Database (CNDDB), and the CNPS Electronic Inventory (CNPSEI) of Rare and Endangered Vascular Plants of California for the USGS *San Quentin, California* 7.5-minute Topographic Quadrangle Map, and the eight surrounding quadrangles.[8,9] The CNDDB Biogeographic Information and Observation System (BIOS 5) was used to determine the distance between the known occurrences of special-status species and the project site.[10]

3.2 - Field Surveys and Focused Studies

3.2.1 - Biological Resources Field Surveys

FCS Biologists familiar with the biological resources of the region conducted general wildlife, habitat, vegetation community and aquatic resource surveys on September 29 and 30, 2021; December 8, 2021; and September 8, 2022. The objective of the field survey was to ascertain general site conditions, wildlife use, and identify whether existing vegetation communities provide suitable habitat for special-status plant or wildlife species. Potentially sensitive areas identified during the literature review were ground-truthed during the field survey for mapping accuracy. Special attention was paid to sensitive habitats and areas potentially supporting special-status floral and faunal species.

3.2.2 - Wildlife Surveys

Wildlife species detected during the reconnaissance-level survey by sight, calls, tracks, scat, or other signs were recorded. Notations were made regarding suitable habitat for those special-status species determined to have the potential to occur within the project site.[11] Appropriate field guides were

[7] United States Fish and Wildlife Service (USFWS). 2021. Information for Planning and Consultation (IPaC). Website: https://ecos.fws.gov/ipac/. Accessed January 22, 2022.
[8] California Department of Fish and Wildlife (CDFW). 2022. California Natural Diversity Database (CNDDB) RareFind 5 California Natural Diversity Database Query for Special-Status Species. Website: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx. Accessed January 22, 2022.
[9] California Native Plant Society (CNPS). 2022. California Native Plant Society Rare and Endangered Plant Inventory. Website: http://www.rareplants.cnps.org/. Accessed January 22, 2022.
[10] California Department of Fish and Wildlife (CDFW). 2022. Biogeographic Information and Observation System (BIOS 5). Website: https://map.dfg.ca.gov/bios/. Accessed January 22, 2022.
[11] California Department of Fish and Wildlife (CDFW). 2022. CNDDB RareFind 5 California Natural Diversity Database Query for Special-Status Species. Website: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx. Accessed January 22, 2022.

used to assist in species identification during surveys, such as Peterson, Reid, and Stebbins.[12,13,14] Online resources such as eBird and California Herps were also consulted, as necessary.[15,16]

3.2.3 - Wildlife Movement Corridors

Wildlife movement corridors link areas of suitable wildlife habitat that are otherwise separated by natural and anthropogenic dispersal barriers, including rugged terrain, changes in vegetation, development, or human disturbance. Urbanization and the resulting fragmentation of open space areas create isolated "islands" of wildlife habitat, forming separated populations. Corridors act as an effective link between populations.

The project site was evaluated for evidence of a wildlife movement corridor during the reconnaissance-level survey and review of aerial photographs. The focus of this study was to determine whether a change in land use at the project site could have significant impacts on the regional movement of wildlife. Conclusions are based on the information compiled during the literature review, including the Center for Watershed Protection (CWP), aerial photographs, USGS topographic maps and resource maps for the vicinity; the field survey; and professional experience with the desired topography, habitat, and resource requirements of the special-status species potentially utilizing the project site and vicinity.

3.2.4 - Aquatic Resources Delineation Survey and Jurisdictional Determination

FCS Senior Biologist and Certified Wetland Delineator, Bernhard Warzecha, assisted by FCS Biologists Robert Carroll and Alec Villanueva, conducted a jurisdictional waters and wetlands delineation of the study area on December 8, 2021. The results of this survey are summarized in the Aquatic Resources Delineation Report (Appendix C) and were verified by the USACE (Appendix D).

3.2.5 - Protocol-level Rare Plant Surveys and Study

A protocol-level special-status plant study was conducted by Pinecrest Environmental Consulting (PEC) across three dates in 2022 to determine the presence or absence of special-status plants and/or sensitive plant communities on the study area as of July 2022. Floristic plant surveys were conducted on February 25, April 25 and June 23, 2022, to coincide with early-, mid-, and late-flowering time periods. Observation of the local coastal flora were made periodically, and appropriate flowering windows chosen in real-time to capture the greatest abundance of flowering plants possible. The surveys all began in the early afternoon and took approximately 3-4 hours in the field, with a subsequent 1-2 hours spent in the laboratory performing identification.

[12] Peterson, T.R. 2010. A Field Guide to Birds of Western North America, 4th Edition. Boston: Houghton Mifflin Harcourt.
[13] Reid, F. 2006. A Field Guide to Mammals of North America, 4th Edition. Boston: Houghton Mifflin Harcourt.
[14] Stebbins, R.C. 2003. A Field Guide to Western Reptiles and Amphibians. Third Edition. Boston: Houghton Mifflin Harcourt.
[15] eBird. 2022. Online bird occurrence database. Website: http://ebird.org/content/ebird/. Accessed January 22, 2022.
[16] California Herps. 2022. A Guide to the Amphibians and Reptiles of California. Website: http://www.californiaherps.com/Accessed January 22, 2022.

All taxonomic terminology follows currently accepted nomenclature as described in The Jepson Manual (2012). Methods for detecting special-status plants followed the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities*.[17]

Beginning at approximately 1:00 p.m. on each of the survey dates, the entire study area was surveyed on foot by qualified PEC Botanist Dr. Christopher DiVittorio. PEC Botanist Dr. Zoya Akulova also participated in the April field survey, and also performed secondary identification on physical voucher specimens and photographs from the February and June surveys. Resumes for Dr. DiVittorio and Dr. Akulova can be provided upon request. The botanical field survey included walking the study area as of July 2022 on foot in parallel lines approximately 15 feet apart, identifying every species that was flowering, and making note of any species that were past flowering or that had not yet flowered. Voucher specimens and photographs were taken of any species that required identification in the laboratory.

Approximately 2 acres were added to the project site limit of disturbance, located to the south and southeast hill slope after the rare plant survey was completed, and the spring season survey window for 2022 had closed. While a late season rare plant survey was conducted for late blooming species (including rare tarplants) on September 8, 2022, and additional survey will be conducted in spring 2023 to provide data from the peak blooming period.

3.2.6 - Sensitive Natural Communities Identification and Mapping

Sensitive natural communities are vegetation communities or special wildlife habitats that are rare or occur in limited distributions or provide specific habitat requirements for special-status plant or wildlife species. The CDFW maintains a list of natural communities which attempts to classify vegetation types found within the State of California and rank them based on rarity. Communities ranked S1-S3 are considered sensitive natural communities.[18] Riparian vegetation and wetland communities are generally considered sensitive, regardless of species composition.

Per the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities*[19], identification and mapping of plant community types following the Manual of California Vegetation was conducted by the qualified botanists concurrently with the protocol-level rare plant surveys (see Section 3.2.5 for details); and additionally on September 8, 2022, for the extended limits of disturbance.

[17] California Department of Fish and Wildlife (CDFW). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. Website: https://www.cnps.org/wp-content/uploads/2019/10/Bot-Cert_2018-CDFW-Plant-and-Vegetation-Survey-Protocols-LR.pdf#:~:text=The%20conservation%20of%20special%20status%20native%20plants%20and,survey%20for%20the%20presence%20of%20special%20status%20plants3. Accessed February 7, 2023.

[18] California Department of Fish and Wildlife (CDFW). 2022. Natural Communities List, Sacramento: California Department of Fish and Wildlife. https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities. Accessed January 22, 2022.

[19] California Department of Fish and Wildlife (CDFW). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. Website: https://www.cnps.org/wp-content/uploads/2019/10/Bot-Cert_2018-CDFW-Plant-and-Vegetation-Survey-Protocols-LR.pdf#:~:text=The%20conservation%20of%20special%20status%20native%20plants%20and,survey%20for%20the%20presence%20of%20special%20status%20plants3. Accessed February 7, 2023.

SECTION 4: RESULTS

This section summarizes all relevant results of the literature research, database analyses, field surveys, and focused studies listed in Section 3.2, above.

4.1 - Environmental Setting

The study area is located within the eastern portion of Marin County. Marin County is bound to the north by Sonoma County, to the east by the San Francisco and San Pablo Bays, to the south by the City and County of San Francisco, and to the west by the Pacific Ocean. The study area is located north and west of East Sir Francis Drake Boulevard, east of Drakes Cove Road, and south of Anderson Drive in an unincorporated area of Marin County known as San Quentin. The approximately study area is located on APN 018-152-12 on the USGS *San Quentin, California* 7.5-minute Topographic Quadrangle Map. Regional access is provided by I-580 and by US-101.

The study area was previously used as a gun range but is currently vacant with the exception of a junction box, a hydrogen peroxide dosing odor control facility, , and an approximately 11,500-square-foot asphalt pad located at the southwestern corner of the project site. The site contains drainages, mature trees, shrubs, grasses, and forbs, as described in detail below.

4.1.1 - Topography and Hydrology

The study area is located on the toe of a ridge forming a peninsula extending into the northern San Francisco Bay. The western part of the study area consists of a relatively steep slope, while the eastern part consists of a terrace, including an area graded to accommodate a shooting range in the past. Elevations range from 20 feet above mean sea level (AMSL) on the western boundary, to 145 feet AMSL on the eastern hill slope. Subsequently, the site drains direct precipitation from the slopes east and north of the study area through the site via a network of first and second order ephemeral to intermittent drainage channels and conveys collected runoff through two channels and culverts under Sir Francis Drake Boulevard to the lagoon at Remillard Park, an impoundment of San Francisco Bay.

4.1.2 - Soils

The NRCS Web Soil Survey (WSS) depicts two soil types within the project site, predominantly *Tocaloma-Saurin association, steep*; and a small area of *Xerothents, fill*.[20] The location and extent of these soil types are shown on Exhibit 4.

Tocaloma-Saurin association, steep is a well-drained soil derived from parent material consisting of residuum weathered from sandstone and shale. It has no hydric soil rating; and a typical profile includes bedrock, layered with very gravelly loam, layered with loam.

[20] Natural Resources Conservation Service (NRCS). 2021. Web Soil Survey (WSS). United States Department of Agriculture (USDA). Website: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed August 2, 2021.

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Source: Bing Aerial Imagery. Pinecrest Environmental Consulting. USDA Soils Data Mart, Marin County.

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Exhibit 4
Soils Map

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4.2 - Vegetation Communities and Land Cover Types

The following section describes the vegetation communities and land cover types present on the study area. The location and extent of each vegetation community is shown on Exhibit 5.

4.2.1 - Coyote Brush Scrub–*Baccharis pilularis Shrubland Alliance*

This vegetation type is one of the most common and robust woody vegetation types of the region. While individual coyote brush can be found scattered throughout the site, only a few disjunct areas are dominated by Coyote Brush Scrub, meeting the Manual of California Vegetation (MCV) definition of *Baccharis pilularis* Shrubland Alliance. Species composition of this vegetation type varies depending on successional development, with later stages of development being indicated by other shrub species co-dominating, specifically on this site consisting of French broom (*Genista monspessulana*) and poison oak (*Toxicodendron diversilobum*). Earlier stages show a substantial portion of non-native annual grassland intermixed.

4.2.2 - Non-Native Annual Grassland–*Avena spp.–Bromus spp. Herbaceous Semi-natural Alliance*

This vegetation type is typically described by being dominated by non-native annual grasses and annual or perennial forbs from dense to sparse cover with less than 10 percent tree cover. With a few exceptions, the plants are dead through the summer and fall dry season, persisting as seeds. This community usually occurs below 3,000 feet and is the most common herbaceous vegetation type of the region. This vegetation type is classified by the MCV as *Avena spp. - Bromus spp.* Herbaceous Semi-Natural Alliance, which has broad membership rules, but is dominated by a non-native annual grass species. Within the study area a few iterations of this alliance are present; Avena spp. greater than 70 percent cover and false brome (*Brachypodium distachyon*) and other brome species (*Bromus* spp). greater than 60 percent cover. The herb layer in this alliance is less than 1.2 m and cover ranges from open to continuous. Trees and shrubs may be present at low cover. This community is found on various substrates including foothills, waste spaces, rangelands, and openings in woods.

Non-native annual grassland is scattered throughout the study area. Some areas of this community have a species composition that trends toward ruderal, however, these are small enough to be considered part of the grassland matrix. Further, the flush of ruderal weeds may be a response to past disturbance. Individual scattered trees, including mature oak trees that occur within this habitat type are not considered their own vegetation type, but rather a component of the grassland matrix.

This community type is dominated by non-native annual grasses reaching a height of approximately two feet tall, unless grazed or mowed. The most predominant non-native grass species within the study area is slim oat (*Avena barbata*). Other common grass species include rattlesnake grass (*Briza maxima*), little rattlesnake grass (*Briza minor*), dogtail grass (*Cynosurus echinatus*), false brome, and others. A small patch of beardless wild rye (*Elymus triticoides*) and purple needlegrass (*Stipa pulchra*) occur, however these patches are far below the CDFW-defined minimum mapping unit of 0.25 acre to be considered or mapped as separate, individual plant communities.

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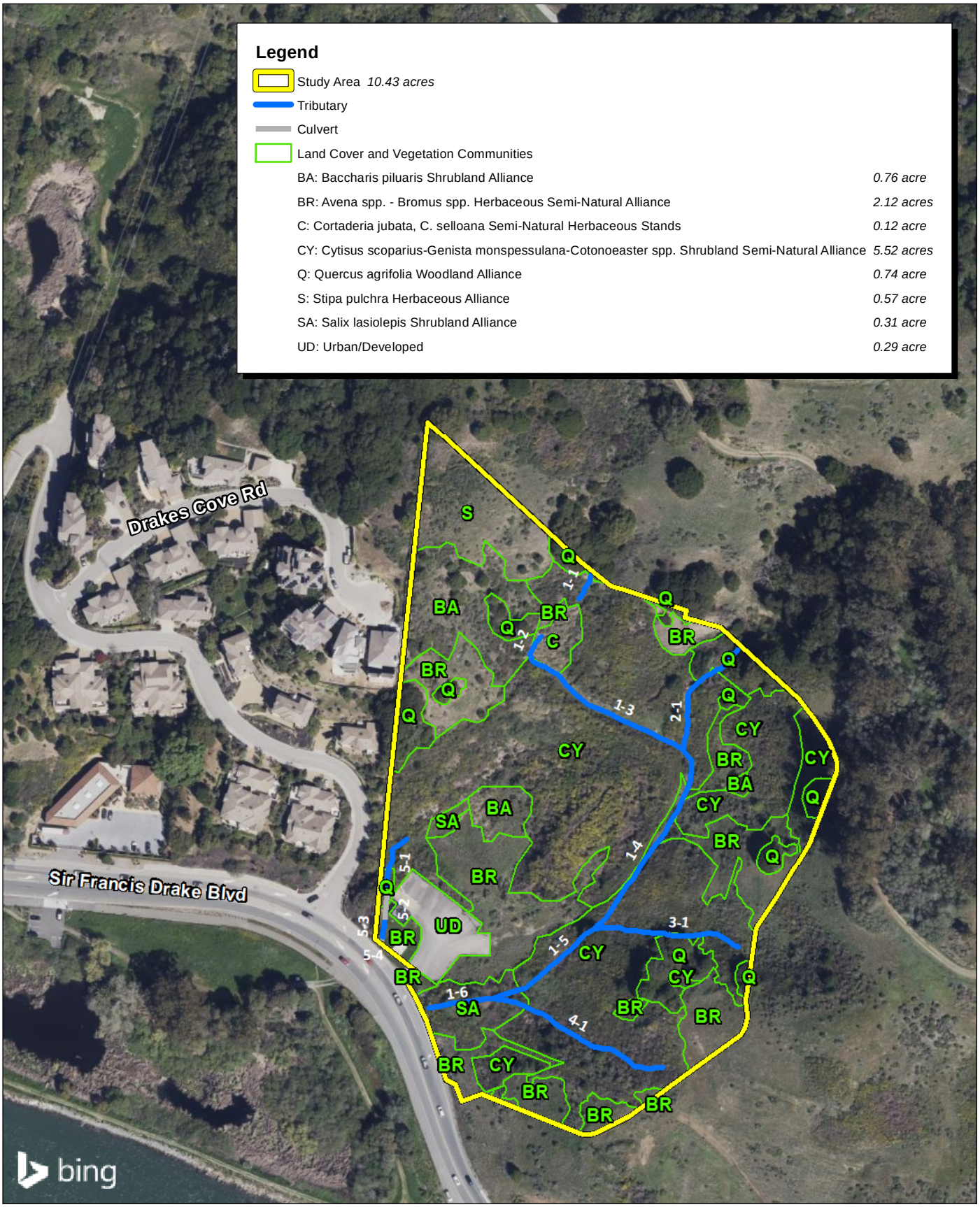

Source: Bing Aerial Imagery. Pinecrest Environmental Consulting.

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Exhibit 5
Land Cover and Vegetation Communities

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4.2.3 - Purple Needlegrass–Oat species–Brome species Grassland–Nassella pulchra–Avena spp.–Bromus spp

This grassland has an open to dense herbaceous layer of Nassella pulchra, Avena spp., and Bromus diandrus. The overall herbaceous cover ranges from 19 to 86 percent. Non-native annual bromes and Avena spp. are greater than 35 percent of the herbaceous layer, while the native Nassella pulchra is usually 5 percent or more absolute cover and characterizes the stand. Elevations range from approximately 10 to 470 m above mean sea levels. Soil textures include fine clays and clay loams.

Specifically, this plant community on-site is consistent with the CDFW-defined California Natural Sensitive Community 41.150.05 *Nassella pulchra–Avena spp.–Bromus spp.* It consists of areas where purple needlegrass is dominant or characteristically present in the herbaceous layer with other perennial grasses and herbs including the species found in the non-native annual grassland described above. Scattered emergent trees and shrubs are present at low cover.

4.2.4 - Pampas Grass Patches–*Cortaderia jubata, C. selloana Semi-Natural Herbaceous Stands*

This vegetation community is defined by where *Cortaderia jubata* or *Cortaderia selloana* is dominant in the herbaceous and shrub canopies. Emergent trees and shrubs may be present at low cover. *Cortaderia* species invade and threaten California's native coastal vegetation types, particularly those in sensitive coastal dune and bluff scrub areas. Within the study area, this vegetation community is found as a dense patch on the northern hill slope. Individuals of pampas grass are scattered throughout the site within other vegetation communities, and primarily in more disturbed areas.

4.2.5 - Coast Live Oak Woodland–*Quercus agrifolia Woodland Alliance*

Groupings of individual coast live oaks forming what can be considered parts of a woodland are found throughout the study area, but primarily on the lesser-disturbed slopes. Where they occur, it is predominantly as small stands, often dominated by one mature, fully developed coast live oak with smaller saplings recolonizing nearby, as part of the natural succession process from grassland to shrubland to woodland. Scattered individual coast live oaks are present that are not part of the coast woodland but are included as constituents of other vegetation communities as appropriate. A specific inventory of all coast live oaks over a certain trunk diameter are listed in the Arborist Report for the project.

4.2.6 - Broom Patches–*Cytisus scoparius-Genista monspessulana-Cotonoeaster spp. Shrubland*

On-site, the dominant species of this vegetation community is French broom (*Genista monspessulana*), with presence of woolly and milkflower cotoneaster in the shrub canopy (Appendix B). Shrubs, including coyote shrub and emergent trees in form of coast live oak are present at low cover. This vegetation community is the most abundant cover type of the project site and is an indicator of its disturbance history and its current intermediate successional state from grassland to shrubland to oak woodland.

4.2.7 - Arroyo willow thickets–*Salix lasiolepis Shrubland Alliance* (riparian and non-riparian)

Arroyo willow (*Salix lasiolepis*) are dominant or co-dominant in the tall shrub or low tree canopy. On-site, this vegetation type persists as a small stand on the northern slope, and as a more substantial stand along the lower reach of the second order tributary on the western terrace. The population along the drainage appears to persist at this location because of the increased hydrological conditions associated with the flows, including subsurface flows of the drainage and the terrace landform, which allows water to saturate the soil more easily, and decrease drainage rates. Because of its clear association with the drainage, the arroyo willow thicket at this location functions as a riparian community. The other occurrence of this vegetation type is not associated with a drainage channel, and therefore it is not classified as a riparian community.

4.2.1 - Drainage Channels

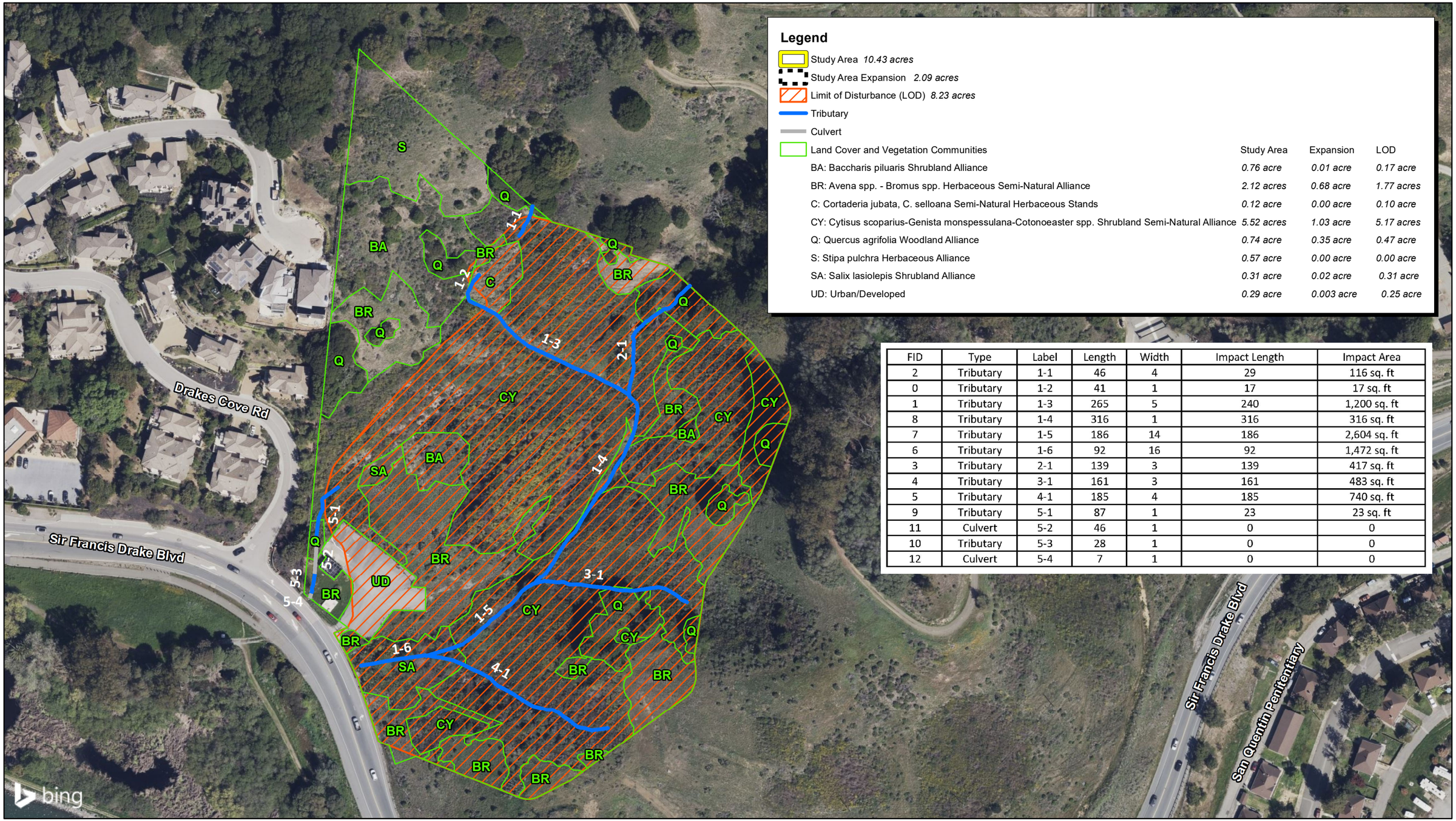
The drainage channels on-site consist of first to second order ephemeral to intermittent tributaries to San Francisco Bay (through Remillard Lagoon) and are described in detail in the Aquatic Resources Delineation (Appendix C), which was verified by the USACE. The drainage patterns have been significantly modified by excavating at least two sections, shown as Tributary Segments 1-3 and 1-4 (Exhibit 6). Specifically, Segment 1-3 is a channel dug parallel to the slope, and therefore does not drain readily and is saturated and ponds water much longer into the season than is typical for a natural drainage at this location. Ponding and saturation at one small section of this artificial channel allowed plant species adapted to wetter conditions to persist in trace amounts, including the rushes listed in the Plant List (Appendix B). However, these patches are substantially below the typical minimum mapping unit of 0.25 acre for plant community mapping and are therefore not addressed as a separate vegetation community. The only riparian vegetation community associated with these ephemeral to intermittent drainages is the arroyo willow thicket described above.

4.2.2 - Urban/Developed

Developed land includes areas that have been constructed upon or physically altered to an extent that native or semi-natural vegetation is no longer supported and retains no soil substrate. Developed land is characterized by permanent or semi-permanent structures, pavement or other hardscape, and landscaped areas that require active management. On-site, this landcover type includes the paved access road and staging area, and the small utility structure found on the western terrace along East Sir Francis Drake Boulevard.

4.3 - Wildlife

The vegetation community and land cover types discussed above provide habitat for numerous wildlife species. Wildlife activity was low during the field survey and consisted primarily of avian species. The following discussions regarding the wildlife species observed within the project site are organized by taxonomic group. Each discussion contains representative examples of a particular taxonomic group either observed or expected to occur on-site.



FID	Type	Label	Length	Width	Impact Length	Impact Area
2	Tributary	1-1	46	4	29	116 sq. ft
0	Tributary	1-2	41	1	17	17 sq. ft
1	Tributary	1-3	265	5	240	1,200 sq. ft
8	Tributary	1-4	316	1	316	316 sq. ft
7	Tributary	1-5	186	14	186	2,604 sq. ft
6	Tributary	1-6	92	16	92	1,472 sq. ft
3	Tributary	2-1	139	3	139	417 sq. ft
4	Tributary	3-1	161	3	161	483 sq. ft
5	Tributary	4-1	185	4	185	740 sq. ft
9	Tributary	5-1	87	1	23	23 sq. ft
11	Culvert	5-2	46	1	0	0
10	Tributary	5-3	28	1	0	0
12	Culvert	5-4	7	1	0	0

Source: Bing Aerial Imagery. Pinecrest Environmental Consulting.

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Exhibit 6
Impacts on Biological Resources

STATE OF CALIFORNIA DEPARTMENT OF GENERAL SERVICES
OAK HILL APARTMENTS
BIOLOGICAL RESOURCES ASSESSMENT

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4.3.1 - Amphibians

Because of the lack of reliable ponding and lack of substantial intermittent or perennial aquatic habitats, and the substantial barrier of Sir Francis Drake Boulevard, no substantial or sensitive amphibian use of the site is expected. Sierran treefrog (*Pseudacris sierra*) may be present if Tributary Segment 1-3 ponds for a considerable time, but no individual of this species or evidence of the species were observed during site surveys

4.3.2 - Birds

Bird species observed directly on-site included red-tailed hawk, red-shouldered hawk, European starling (*Sturnus vulgaris*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), house sparrow (*Passer domesticus*), California scrub jay (*Aphelocoma californica*), house finch (*Haemorhous mexicanus*), Anna's hummingbird (*Calypte anna*), turkey vulture (*Cathartes aura*) and others. While most terrestrial avian species known to occur in the area may be observable foraging or dispersing on the site, nesting species would be limited to those species with a nesting habitat preference in grassland, shrubland and trees with a moderate tolerance of disturbance, such as common passerines, common dove species, local hummingbirds, corvids, certain birds of prey.

4.3.3 - Mammals

White-tailed deer (*Odocoileus virginianus*) and a few woodrat nests likely from dusky footed woodrat (*Neotoma fuscipes ssp. fuscipes*) were observed on-site. Other mammals adapted to urban/wildland interface areas and expected to occur at least temporarily would include raccoon (*Procyon lotor*), Botta's pocket gopher (*Thomomys bottae*), and potentially coyote (*Canis latrans*). However, the ridge of the San Quentin peninsular to which the site is connected is surrounded on all sides by either open water or substantial and dense development, making it unlikely that terrestrial non-volant species that rely on larger areas of relatively undisturbed habitat can disperse to the site and establish self-sustaining populations. Tree-roosting common bat species tolerant of human disturbance, such as noise and light pollution and human trespassers and nearby development could potentially occur on-site.

4.3.4 - Reptiles

Western fence lizard (*Sceloporus occidentalis*) was observed on-site. Presence of common reptiles adapted to urban environments such as Pacific gopher snake (*Pituophis catenifer catenifer*) have potential to occur on-site, but no Pacific gopher snake or evidence of the species were observed during site surveys

4.4 - Wildlife Movement Corridors

A wildlife corridor is an area of habitat connecting wildlife populations separated by human activities or structures (such as roads, development, or logging). This allows an exchange of individuals between populations, which may help prevent the negative effects of inbreeding and reduced genetic diversity (via genetic drift) that often occur within isolated populations.

The project site is surrounded on two sites by development, specifically East Sir Francis Drake Boulevard and the San Francisco Bay to the southwest and a residential development to the

northwest. Therefore, non-volant wildlife movement through the site is limited, and the site does not connect habitats suitable for sustainable wildlife populations.

While the ridgeline above the project site likely facilitates common wildlife movement within its undeveloped areas, including open space to the north and east, CDFW does not identify this area or any areas on the San Quentin peninsular as part of an Essential Connectivity Area.[21]

4.5 - Habitat Conservation Plans

No Habitat Conservation Plan exists for the study area.

[21] California Department of Fish and Wildlife (CDFW). 2022. Biogeographic Information and Observation System (BIOS). Essential Connectivity Areas-California Essential Habitat Connectivity (CEHC) [ds620].Website: https://wildlife.ca.gov/Data/BIOS. Accessed January 24, 2023.

SECTION 5: SENSITIVE BIOLOGICAL RESOURCES

Sensitive biological resources typically include sensitive natural communities, special-status species and their habitats, protected aquatic resources (i.e., State or federally protected wetlands and other waters), wildlife nursery sites, wildlife movement corridors, and protected trees.

The following section discusses the extent to which the biological resources determined in Section 4 to be present or potentially present on-site qualify as sensitive and would therefore be protected through environmental laws and regulations, including CEQA.

5.1 - Special-status Plant Species

The CNDDB and CNPS list 76 special-status or sensitive plant species that have been recorded within the *San Quentin, California,* USGS Topographic Quadrangle Map and the eight surrounding quadrangles (Appendix A).[22,23,24] The CNDDB occurrences near the study area are shown on Exhibit 7. A list of all plant species recorded on-site during the protocol-level floristic surveys is included in Appendix B. No rare or special-status plant species were observed during the appropriately timed protocol-level floristic surveys (see Section 3), and are therefore determined to be absent from the approximately 8.3-acre study area surveyed to date. Because of the approximately 2-acre expansion of the project site after completion of the rare plant surveys, absence of rare plants on the additional area is likely but will be confirmed during the spring flowering season of 2023 (see Impact Analysis for Special-status Plant Species including related Mitigation Measure, below).

5.2 - Special-status Wildlife Species

FCS Biologists compiled a list of threatened, endangered, and otherwise special-status species previously recorded within a 2-mile radius of the project site (Appendix A). CNDDB identifies 44 federal and State listed threatened and/or endangered wildlife species and State Species of Special Concern that have been recorded within the *San Quentin, California,* USGS Topographic Quadrangle Map and eight surrounding quadrangles (Appendix A; CNDDB occurrences near the study area are shown on Exhibit 7). Thirty-eight of these species have no potential to occur on-site, as discussed in the Special-status Species Occurrence Evaluation (Appendix A).

Special-status wildlife species or functional groups that potentially include special-status species that have at least low potential to visit or utilize the site temporarily, are therefore discussed in more detail below.

[22] United States Geological Survey (USGS). 2022. National Geospatial Program. Website: https://www.usgs.gov/core-science-systems/national-geospatial-program/us-topo-maps-america?qt-science_support_page_related_con=4#qt-science_support_page_related_con.

[23] California Department of Fish and Wildlife (CDFW). 2022. CNDDB RareFind 5 California Natural Diversity Database Query for Special-status Species. Website: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx. Accessed January 2022.

[24] California Native Plant Society (CNPS). 2022. California Native Plant Society Rare and Endangered Plant Inventory. Website: http://www.rareplants.cnps.org/. Accessed January 2022.

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Exhibit 7: CNDDB Special-status Species Occurrences (2-mile radius)

This exhibit contains sensitive information relating to biological resources and is not intended for public distribution pursuant to Public Resources Code Section 21082.3(C)(2). A copy of confidential Exhibit 7: CNDDB Special-Status Species Occurrences is on file with the Department of General Services and is available to qualified professionals upon request.

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5.2.1 - White-tailed Kite and Cooper's Hawk

Both species have been reported in 2020 and 2021 from areas adjacent to the project site, and the trees on the project site or within disturbance distance could provide suitable nesting habitat for either species. While the habitat is not optimal due to its proximity to residential development and small size, it cannot be ruled out that white-tailed kite or Cooper's hawk could nest on the project site or within relevant disturbance distance.

5.2.1 - Protected Nesting Birds (Including All Special-status Bird Species)

In addition to the specific special-status bird species discussed in more detail above, the active nests of most resident and migratory (game and non-game) birds (including the nests of additional special-status bird on-site) are protected by the MBTA and/or Fish and Game Code; and are therefore categorized as "special-status" wildlife functional group during this time.

Almost the entire project site provides nesting opportunities for different taxa of birds, including for ground nesters. The grass and shrubland on-site provide foraging opportunities to support successful nesting and rearing habitat. Therefore, it is likely that protected bird nests are present on the project site during the nesting season (typically considered to last from February 15 to August 31 for most species).

5.2.1 - Bats (including special-status bats)

The project site offers degraded but potentially viable roosting habitat for bat species. Bats could potentially use cavities in trees on-site to roost and forage over the grassland and shrubland.

Bat species are often grouped together on the basis of their roosting habitat requirements. Of the special-status bat species that have potential to occur in the region, but unlikely to inhabit the site due to their sensitivity and rarity, Townsend's big-eared bat (*Corynorhinus townsendii*), long-eared myotis, fringed myotis, long-legged myotis, yuma myotis, and greater western mastiff bat (*Eumops perotis*) are likely to be found roosting in artificial structures (e.g., the utility structure on-site), although they are known to roost in natural features also. Other species, such as pallid bat, western red bat (*Lasiurus blossevillii*), hoary bat (*Lasiurus cinereus*), and California myotis (*Myotis californicus*), would be more likely to roost in natural features rather than artificial structures.

Roosts are used during the daytime to seek refuge; at night between foraging excursions to rest, digest prey, seek refuge from predators or poor weather conditions, or for social purposes; and in winter for hibernation. Adult females and their young use some particularly secure roosts as maternity roosts. The number of bats occupying a given roost can vary from a solitary individual to a large colony, depending on the species. Roosting sites are very sensitive to human disturbance, especially when bats are hibernating or rearing young.

At dusk, bats leave their roosts to forage for insects in nearby ponds or riparian habitats. Bats generally prey on insect species that are locally abundant near water bodies. Ecotone areas (areas of transition between habitats) are also used as foraging areas. The grass and shrublands of the project site and riparian area of Remillard Lagoon has foraging potential for bat species.

Therefore, it cannot be ruled out that bat roosts are present on the project site, while none were observed during the site surveys

5.2.2 - Monarch Butterfly

The monarch butterfly is listed as Candidate under the Endangered Species Act, and wintering roosts are protected under the Fish and Game Code.

Preferred monarch habitat is filled with diverse nectar sources which support monarchs and native bees. Native milkweeds (*Asclepias* spp.) and other nectar sources provide monarchs with breeding habitat, resting and refueling stops during migration, and food at the overwintering sites.

Overwintering habitats consist of tree groves that typically occur within 1.5 miles of the Pacific coastline, or within the San Francisco Bay Area, where the proximity to large water bodies moderates temperature fluctuations. Overwintering begins in September or October. Suitable grove conditions include temperatures above freezing, high humidity, dappled sunlight, access to water and nectar, and protection from high winds and storms. Monarchs will select the native Monterey pine, Monterey cypress, western sycamore, and other native tree species when they are available, but will also utilize non-native eucalyptus species if other optimal habitat conditions are met. During breeding season in the late spring and summer, female monarch butterflies will lay their eggs on the underside of young leaves or flower buds of milkweeds, caterpillars then hatch within 3-5 days and begin to feed on milkweed leaves that provide energy and protective toxic compounds that protect the caterpillars from predation. Within a month, the caterpillars will grow, produce a chrysalis, and emerge as fully formed adult butterflies.

No milkweed is present on-site as confirmed through protocol-level rare plant surveys. The project site does not contain suitable tree groves to support overwintering populations of this species. No overwintering roosts have been documented from the site or from adjacent areas, or were observed during winter wildlife surveys. The closest known overwintering site (#2902) is located at McNears Beach County Park in northeast San Rafael, approximately 4.3 miles northeast of the project site.

Therefore, the project site does not contain the structural characteristics required for overwintering or to establish a viable permanent population on-site. However, there is potential for dispersing individuals to occur on-site, although no monarch butterfly was observed on-site during site surveys

5.2.1 - Northern Spotted Owl

Northern spotted owl is listed as threatened under the Endangered Species Act and CESA. The northern spotted owl is a medium-sized, dark brown owl with a barred tail, white spots on the head and breast, and dark brown eyes surrounded by prominent facial disks. Males and females have similar plumage, but females typically weigh 10 to 20 percent more than males. The distribution of the northern subspecies includes southwestern British Columbia, western Washington and Oregon, and northwestern California south to Marin County. Spotted owl are mostly nocturnal, but they may forage opportunistically during the day. Northern flying squirrel (*Glaucomys sabrinus*) and woodrats are usually the predominant prey. Other prey species such as the red tree vole (*Arborimus*

longicaudus), red-backed vole (*Clethrionomys gapperi*), mice, rabbit and hare, birds, and insects may be seasonally or locally important.

Northern spotted owl generally inhabits older forested habitats because they contain the structural characteristics required for nesting, roosting, and foraging. Specifically, northern spotted owl requires a multi-layered, multi-species canopy with moderate to high canopy closure. The stands typically contain a high incidence of trees with large cavities and other types of deformities; large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owl to fly. Recent landscape-level analyses suggest that in some parts of the subspecies' range a mosaic of older forest habitat interspersed with other vegetation types may benefit northern spotted owl more than large, homogeneous expanses of older forests.[25]

Northern spotted owl is known to occur in Marin County, including in the past from San Anselmo and Corte Madera Area, so it is possible that a vagrant dispersing individual may at some point visit the project site.

The trees on the project site do not form a multi-layered, multi-species forest canopy with moderate to high canopy closure; and do not contain a high incidence of trees with large cavities and other types of deformities, large snags, an abundance of large, dead wood on the ground, and open space within and below the upper canopy for spotted owls to fly. Rather, the scattered oak woodland generally has a single canopy, and the understory is generally herbaceous with areas where invasive French broom as the dominant understory species and disturbed by human presence and activities, including active homeless encampment.

Therefore, the woodlands of the project site do not contain the structural characteristics required for nesting, roosting, and foraging for northern spotted owl, no potential for this species to establish nesting on-site, and a low potential for a vagrant dispersing individual to occur on-site. No owls were observed during several surveys.

5.3 - Sensitive Natural Communities

The CDFW maintains a list of natural communities which attempts to classify vegetation types found within the State of California and ranks them based on rarity. Communities ranked S1-S3 are considered sensitive natural communities. Wetland communities and riparian habitats are also typically considered sensitive natural communities, regulated by federal and State resource agencies, and are addressed in the environmental review process.

All landcover types and plant communities are defined and described in detail in Section 4.2 following the MCV classification system where applicable and are shown on Exhibit 5. Of these communities, the following are considered sensitive communities.

[25] United States Fish and Wildlife Service (USFWS), Arcata Fish and Wildlife Office. 2020. Northern Spotted Owl. February 18. Website: https://www.fws.gov/arcata/es/birds/NSO/ns_owl.html. Accessed July 2022.

5.3.1 - Riparian Arroyo Willow Riparian Woodland

An approximately 0.27-acre stand of arroyo willow woodland (*Salix lasiolepis* Shrubland Alliance) is associated with the open drainage channel Segment 1-6 and is considered a sensitive community due to its association with a watercourse, providing woody riparian functions. Individual willows are interspersed in other locations of the site; however, they would not meet the definition of a sensitive plant community.

5.3.1 - Purple Needlegrass–Oat species–Brome species Grassland–*Nassella pulchra–Avena spp.–Bromus spp*

The Purple Needlegrass–Oat species–Brome species Grassland is defined by the CDFW as California Sensitive Natural Community 41.150.05 with a ranked rarity of "G3S3" and is identified as "sensitive." Approximately 0.57 acre of this community can be found in the northwest corner of the study area (Exhibit 5). It should be noted that purple needlegrass is not a special-status species or rare plant species. However, when it forms a substantial plant community, that community is considered a sensitive natural community, which is the case for this specific population.

5.3.2 - Coast Live Oak Woodland

CDFW does not identify coast live oak woodland as sensitive; however, the Marin Countywide Plan (while not applicable to this analysis) identifies coast live oak woodland vegetation community as sensitive, and the County would afford protections for individual coast live oak trees within this community through its tree protection ordinance, would it be applicable to this analysis. Therefore, and out of the intent to reduce all impacts on biological resources as much as feasible, this BRA identifies the coast live oak woodland on-site as potentially sensitive.

5.4 - Protected Waters and Wetlands

5.4.1 - Federal and State Protected Wetlands and Other Waters

All drainage features on-site have bed, bank, and evidence of seasonal concentrated surface flow, and consist of ephemeral to intermittent second to first-order streams and tributaries to San Francisco Bay. All drainage features delineated on-site and discussed in the Aquatic Resources Delineation Report for the project site (Appendix C) were determined by the USACE (Appendix D) to be jurisdictional non-wetland waters of the United States. Consequently, these features are also regulated (i.e., protected) by the RWQCB as jurisdictional waters of the State. Additionally, activities potentially impacting bed, banks or riparian habitat are expected to be protected through the FGC Streambed Alteration Program, administered by CDFW.

5.5 - Wildlife Nursery Sites

Wildlife nursery sites include nesting birds and maternity bat roosts, aquatic breeding habitat, and special-status and non-special-status wildlife breeding or nesting colonies. No significant breeding/nesting colonies were observed during the wildlife surveys. However, individual nesting birds and roosting bats have a potential of being present on-site seasonally.

SECTION 6: IMPACT ANALYSIS AND RECOMMENDATIONS

The following discussion addresses potential project impacts on sensitive biological resources, including special-status species, and recommends mitigation measures to avoid and/or mitigate impacts to a less than significant level under CEQA Guidelines.

6.1 - Impact Analysis for Special-status Species

The following section analyzes potential project-related impacts on special-status species potentially occurring on or within disturbance distance of the proposed project.

6.1.1 - Impact Analysis for Special-status Plant Species

No special-status or rare plant species occur on the approximately 8.3-acre portion of the project site (see Section 5.1) surveyed to date. Therefore, no impacts on special-status or rare plant species are expected to occur in this area. Because the surveyed area includes over 80 percent of the entire study area and includes the same habitat types, and the newly added portion of the project site was surveyed for late blooming rare plants, it is unlikely that the newly added portion of the project site (consisting of approximately 2 acres in the south and southeast portion of the project site) would support rare plants. However, presence cannot be ruled out, and therefore a protocol-level rare plant survey should be conducted in the peak spring blooming period to confirm absence of special-status plants, as defined in the MM BIO-1a. If special-status plant species are found, MM BIO-1b requires compensatory mitigation to offset losses of these populations. With implementation of these project-specific implementation measures recommended below, potential impacts to special-status plants would be less than significant.

MM BIO-1a A qualified Botanist shall conduct protocol-level rare plant surveys of previously un-surveyed areas at the next spring blooming season to confirm absence of rare plants within the portion of the project site that was not surveyed in 2022. Rare plant surveys shall be conducted following the California Department of Fish and Wildlife (CDFW) Protocol for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities. The results of the rare plant surveys shall be summarized in a rare plant report following the CDFW requirements defined in the protocol and shall be submitted to CDFW within 60 days after completion of the field work.

MM BIO-1b If a special-status or rare plant species is found, the project proponent shall hire a qualified Biologist to prepare and implement a compensatory mitigation plan (including monitoring and reporting requirements) submitted and approved by the California Department of Fish and Wildlife (CDFW) to offset any losses at a minimum of 1:1 ratio.

6.1.2 - Impact Analysis for Special-status Wildlife Species

Protected Nesting Birds (including Cooper's Hawk and White-tailed Kite)

All vegetated habitats within the project site and adjacent areas provide suitable nesting habitat for a variety of species of nesting birds, including special-status bird species Cooper's hawk and white-tailed kite. Relatively undisturbed grassland and barren areas provide potential nesting opportunities for ground nesting birds. Construction activities that occur during the avian nesting season (generally February 1 to August 31) could disturb protected nesting sites within the construction footprint and within disturbance distance. Grading and the removal of vegetation during the nesting season could result in direct harm to nesting birds, while noise, light, and other construction-related disturbances may cause nesting birds adjacent to the vegetation removal areas to abandon their nests. Loss of protected active bird nests due to direct or indirect project-related activities would be considered a significant impact.

With implementation of MM BIO-2, requiring pre-construction nesting bird surveys and avoidance of direct and indirect impacts on nests, potential project-related impacts on protected bird nests can be reduced to a less than significant level under CEQA.

MM BIO-2 Protection of Active Bird Nests (includes pre-construction survey and implementation of avoidance buffer, if found).

1. Removal of trees shall be limited to only those necessary to construct the proposed project as reflected in the relevant project approval documents.
2. If the proposed project requires vegetation to be removed during the nesting season (February 1 to August 31), pre-construction surveys shall be conducted no more than 7 days prior to the start of ground or vegetation disturbance (including tree removal) to determine whether or not active nests are present.
3. If an active nest is located during pre-construction surveys, a qualified Biologist shall determine an appropriately sized avoidance buffer based on the species and anticipated disturbance level. (The California Department of Fish and Wildlife [CDFW] recommends a minimum no-disturbance buffer of 250 feet around active nests of non-listed bird species and a 500-foot no-disturbance buffer around active nests of non-listed raptors.) A qualified Biologist shall delineate the avoidance buffer using Environmentally Sensitive Area fencing, pin flags, and/or yellow caution tape. The buffer zone will be maintained around the active nest site(s) until the young have fledged and are foraging independently. No construction activities or construction foot traffic is allowed to occur within the avoidance buffer(s).
4. The qualified Biologist shall monitor the active nest during construction activities and modify the protection zone accordingly to prevent project-related nest disturbance, until the young have fledged.

Roosting Bats

The project site contains trees that could provide suitable bat roosting habitat, including for special-status bats such as pallid bat. While no bat species were observed on-site, this analysis

conservatively concludes the proposed project could have a significant impact if bat roosts are present at the start of project construction. Potential direct and indirect impacts could occur to roosting bats due to removal of potential roosting habitat during project construction. These activities could potentially subject bats to risk of death or injury, and they are likely to avoid using the area until such construction activities have dissipated or ceased. Relocation, in turn, could cause hunger or stress among individual bats by displacing them into adjacent territories belonging to other individuals.

With implementation of MM BIO-3, requiring pre-construction roosting bat surveys and avoidance of direct and indirect impacts on active bat roosts, potential project-related impacts on protected roosting bats can be reduced to a less than significant level under CEQA.

MM BIO-3 Roosting Bat Pre-construction Survey and Avoidance

A qualified Biologist with relevant roosting bat experience shall conduct a survey for special-status bats during the appropriate time of day to maximize detectability to determine whether bat species are roosting near the work area no less than 7 days and no more than 14 days prior to beginning ground disturbance and/or construction. Survey methodology may include visual surveys of bats (e.g., observation of bats during foraging period), inspection for suitable habitat, bat sign (e.g., guano), or use of ultrasonic detectors (Anabat, etc.).

If the Biologist determines or presumes bats are present, the Biologist shall exclude the bats from suitable spaces by installing one-way exclusion devices. After the bats vacate the space, the Biologist shall close off the space to prevent recolonization. Site disturbance, including grading or vegetation removal shall only commence after the Biologist verifies 7 to 10 days later that the exclusion methods have successfully prevented bats from returning. To avoid impacts on non-volant (i.e., nonflying) bats, the Biologist shall only conduct bat exclusion and eviction from May 1 through October 1. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young).

Monarch Butterfly

As established in detail in Section 5.2.1, there is potential for dispersing individual monarch butterflies to visit the site temporarily. However, the site does not have a population of the obligate host plant milkweed and does not support overwintering habitat. Therefore, the proposed project would not result in significant impacts on this species.

Northern Spotted Owl

As established in detail in Section 5.2.2, there is a low potential for a vagrant individual northern spotted owl to visit the site temporarily. However, the site does not contain northern spotted owl nesting habitat but would likely constitute a population sink for this species (i.e., site conditions would result in a negative outcome should a dispersing northern spotted owl attempt to establish on-site). Therefore, the proposed project would not result in significant impacts on this species.

6.2 - Impact Analysis for Sensitive Natural Communities

The proposed project would remove 0.27 acre of riparian arroyo willow thickets and 0.47 acre of coast live oak woodland (see Section 5.3). No removal or impact of purple needlegrass grassland is proposed or expected, as the identified location of this species is in the far northwest corner of the site and well outside the proposed disturbance area.

Removal of riparian arroyo willow thickets and coast live oak woodland is considered a significant impact on sensitive natural communities. Therefore, compensatory mitigation at a ratio of at least 1:1 as defined in MM BIO-4 would be necessary to reduce this impact to a less than significant level under CEQA Guidelines.

MM BIO-4 Compensatory Mitigation for loss of Riparian Arroyo Willow Thickets

The Applicant shall compensate for the loss of 0.27 acre of riparian arroyo willow thickets by restoring and conserving native riparian vegetation at a ratio of at least 1:1, or by purchasing adequate mitigation credits as determined by the California Department of Fish and Wildlife (CDFW) through a Streambed Alteration Agreement. Restoration may include removal of invasive species from riparian areas and planting and maintenance of native riparian species, with a preference for arroyo willow where feasible.

Additionally, the Applicant shall compensate for the loss of 0.47 acre of coast live oak woodland by either purchasing mitigation credits from a mitigation bank, or restoring and conserving oak woodland at a ratio of at least 1:1 on-site or off-site within Marin County. Restoration of oak woodland includes planting and maintaining of suitable oak species and co-occurring native woody vegetation, maintenance of mitigation plantings to guarantee establishment of a self-sustaining oak woodland.

In case of Applicant-responsible establishment of riparian arroyo willow and coast live oak woodland, the Applicant shall submit a Mitigation and Monitoring Plan (MMP) to CDFW. The MMP shall be prepared by a qualified restoration ecologist, and shall include planting and maintenance protocols, performance criteria, and a monitoring and reporting program. At a minimum, the planting and maintenance protocols shall define planting locations, density and spacing, a native species palette, browse protection, irrigation regime, replacement of dead plants, annually escalating performance criteria until the mitigation goal is achieved, long-term funding commitments, monitoring and reporting based on the trajectory for achieving the 1:1 minimum replacement. Impact Analysis for Wildlife Nursery Sites

No substantial wildlife nursery sites, including breeding or nesting colonies, breeding ponds, or dens are present on-site or within disturbance distance. However, the vegetated portions on-site have the potential to provide some opportunity for wildlife nursery sites, including for nesting birds and maternity roosts for bats, as discussed in Section 6.1. With implementation of MM BIO-1 through BIO-4 and MM

BIO-6, impacts on potentially present wildlife nursery sites (if present) would be reduced to less than significant through direct and indirect impact avoidance and compensatory mitigation for loss of sensitive vegetation communities.

However, if significantly increased noise and lighting levels are projected into adjacent semi-natural areas during the night (including the ridgeline above the project site), potential significant indirect edge effects may occur, limiting the uses of these edge habitats for wildlife nursing and movement activities. MM BIO-5 would reduce these potentially significant impacts by reducing the noise and lighting levels projected into these areas.

MM BIO-5 Construction Noise Limits

Construction noise shall be limited to daylight hours. All project lighting associated with construction staging areas, access routes and construction sites in natural lands shall not spill into adjacent natural areas. Temporary project lighting shall not be directed into natural areas to prevent additional light pollution and disruption of nocturnal wildlife activity. Baffles and shielding devices will be required on all lighting systems to limit significant light pollution into natural areas. The Applicant shall ensure that newly installed lighting associated with new development or facilities (including street lighting, recreational facilities, and parking) shall be designed to prevent illuminating adjacent natural areas at a level greater than 2 foot-candle above ambient conditions.

6.3 - Impact Analysis for Wildlife Movement Corridors

The site does not function as a wildlife movement corridor, as discussed in Section 3.2.3. Therefore, project-related impacts on wildlife movement would be considered less than significant.

6.4 - Impact Analysis for State and Federally Protected Waters and Wetlands

The proposed project would impact 3,090 linear feet (approximately 7,390 square feet; 0.17 acres) of open ephemeral to intermittent headwater drainages (Exhibit 6), protected by State and federal laws and regulations as waters of the United States and State (see Section 5.4), and by CDFW's Streambed Alteration Program.

Impacts to these features are regulated pursuant the CWA, Porter-Cologne Water Quality Control Act, and Fish and Game Code Section 1602 *et seq*., and would require the project proponent to comply with the avoidance, minimization and compensatory mitigation measures defined by the USACE, RWQCB, and CDFW (trustee agencies; see also Section 2). The agency-defined permitting regimes (including agency-defined enforceable mitigation measures) have the effect to avoid and/or offset any impacts to a level of less than significant under CEQA, because they require to satisfy no-net-loss policies regarding aquatic area and function. Therefore, no additional mitigation measures to those required by the trustee agencies are warranted to reduce any potential impacts to less than significant under CEQA.

However, it is determined that impacts on these drainage features would constitute a significant impact under CEQA, which would be reduced to less than significant with implementation of MM BIO-6 (or mitigation measures required by the trustee agencies, whichever are more conservative).

MM BIO-6 Jurisdictional Waters

The fill of jurisdictional waters in the form of ephemeral to intermittent streams will be avoided and minimized to the extent feasible. Authorization for the fill of waters of the United States and State shall be obtained by the project proponent prior to the start of construction. Mitigation for the fill of jurisdictional waters shall be accomplished through creation or restoration of other waters at a minimum 1:1 ratio within the project site, at an approved mitigation bank, or at another location within a San Francisco Bay Basin watershed approved of by the United States Army Corp of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW). The mitigation goal shall be to create and/or enhance aquatic habitats with habitat functions and values greater than or equal to those that will be impacted by the proposed project. Compensatory mitigation within the project site or at another location within the San Francisco Bay Basin watershed would be described in a stream mitigation plan that would:

- Be prepared consistent with the USACE 2015 Final Regional Compensatory Mitigation and Monitoring Guidelines and the USACE 2008 Compensatory Mitigation for Losses of Aquatic Resources: Final Rule.
- Define the location of all restoration and creation activities.
- Describe measures that would ensure that adjacent land uses would not adversely affect the ecological functions and values of the stream mitigation area, so as to ensure consistency with the foregoing federal guidelines and rules. Such measures may include the use of appropriately sized buffers between the stream mitigation area and any adjacent development, the use of fencing or walls to prevent unauthorized access, lighting in adjacent development designed to avoid light spillage into the stream mitigation area, landscape-based Best Management Practices (BMPs) for adjacent development prior to discharge into the stream mitigation area, and signage describing the sensitive nature of the wetland mitigation area.
- Provide evidence of a suitable water budget to support restored and created streams.
- Identify the species, quantity, and location of plants to be installed in the stream habitats.
- Identify the time of year for planting and method for supplemental watering during the establishment period.
- Identify the monitoring so as to ensure consistency with the foregoing federal guidelines and rules, which shall be not less than 5 years for stream restoration.

- Define success criteria that shall be required for restoration efforts to be deemed a success.
- Identify adaptive management procedures that may be employed as needed to ensure the success of the mitigation project and its consistency with the foregoing federal guidelines and rules. These include, but are not limited to, remedial measures to address exotic invasive species, insufficient hydrology to support the attainment of performance standards, and wildlife harm.
- Define management and maintenance activities, including weeding, supplemental irrigation, and site protection.
- Define responsibility for maintaining, monitoring, and ensuring the preservation of the mitigation site in perpetuity. The project applicant shall comply with all terms of the permits issued by these agencies, including mitigation requirements, and shall provide proof of compliance to the applicable State agency prior to issuance of a grading permit.

6.5 - Conflict with Local Policies or Ordinances

No conflicts with local policies or ordinances will occur as no local policies or ordinances are applicable to the proposed project.

6.6 - Conflict with Habitat Conservation Plans

No adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State Habitat Conservation Plan is applicable to the project site. Therefore, the proposed project would not conflict with provision of such a document.

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Appendix A:
Special-status Species Occurrence Evaluation

Table 1: Special-status Plant Species Occurrence Evaluation

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Bryophytes					
Entosthodon kochii Koch's cord moss	—	—	1B.3	Cismontane woodland. Moss growing on soil on river banks. Elevation: 185-365 m. Bloom period: N/A	**None.** The project site does not contain cismontane woodland or streambed habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Fissidens pauperculus minute pocket moss	—	—	1B.2	North coast coniferous forest. Moss growing on damp soil along the coast. In dry streambeds and on stream banks. Elevation: 30-1025 m. Bloom period: N/A	**None.** The project site does not contain cismontane woodland or streambed habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Mielichhoferia elongate elongate copper moss	—	—	4.3	Cismontane woodland. Moss growing on very acidic, metamorphic rock or substrate; usually in higher portions in fens. Often on substrates naturally enriched with heavy metals (e.g. copper) such as mine tailings. Elevation: 5-1085 m. Bloom period: N/A	**None.** The project site does not contain cismontane woodland or very acidic metamorphic rock substrate, fens or mining tailings. Not observed during appropriately timed protocol-level rare plant surveys.
Triquetrella californica coastal triquetrella	—	—	1B.2	Coastal bluff scrub, coastal scrub. Grows within 30 m. from the coast in coastal scrub, grasslands and in open gravels on roadsides, hillsides, rocky slopes, and fields. On gravel or thin soil over outcrops. Elevation: 20-1175 m. Bloom period: N/A	**None.** The project site is located mora than 30 m. from the coast. Not observed during appropriately timed protocol-level rare plant surveys.
Dicots					
Amorpha californica var. napensis Napa false indigo	—	—	1B.2	Openings in broad-leafed upland forest, chaparral, and cismontane woodland. Elevation: 30-735 m. Bloom period: April-July	**None.** The project site does not contain broad-leafed upland forest or and cismontane woodland. Not observed during appropriately timed protocol-level rare plant surveys.
Amsinckia lunaris bent-flowered fiddleneck	—	—	1B.2	Cismontane woodland, valley and foothill grassland, coastal bluff scrub. Elevation: 3-795 m. Bloom period: March-June	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Arctostaphylos franciscana Franciscan manzanita	FE	__	1B.1	Chaparral. Serpentine outcrops in chaparral. Elevation: 30-215 m. Bloom period: February-April	**None.** The project site does not contain serpentine soils/substates. Not observed during appropriately timed protocol-level rare plant surveys.
Arctostaphylos montana ssp. montana Mt. Tamalpais manzanita	__	__	1B.3	Chaparral, valley and foothill grassland. Serpentine slopes in chaparral and grassland. Elevation: 150-680 m. Bloom period: February-April	**None.** The project site does not contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.
Arctostaphylos montana ssp. ravenii Presidio manzanita	FE	SE	1B.1	Chaparral, coastal prairie, coastal scrub. Open, rocky serpentine slopes. Elevation: 20-215 m. Bloom period: February-March	**None.** The project site does not contain serpentine soils/substates. Not observed during appropriately timed protocol-level rare plant surveys.
Arctostaphylos virgata Marin manzanita	__	__	1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, north coast coniferous forest on sandstone or granitic substrates. Elevation: 1-800 m. Bloom period: January-March	**None.** The project site does not contain broadleafed upland forest, closed-cone coniferous forest. Not observed during appropriately timed protocol-level rare plant surveys.
Arenaria paludicola marsh sandwort	FE	SE	1B.1	Marshes and swamps. Growing up through dense mats of *Typha, Juncus, Scirpus*, etc. in freshwater marsh. Sandy soil. Elevation: 3-170 m. Bloom period: May-August	**None.** The project site does not contain coastal freshwater marsh habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Astragalus pycnostachyus var. pycnostachyus coastal marsh milk-vetch	__	__	1B.2	Coastal dunes, marshes and swamps, coastal scrub. Mesic sites in dunes or along streams or coastal salt marshes. Elevation: 0-155 m. Bloom period: (April)June-October	**None.** The project site does not contain coastal dunes or salt marsh habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Astragalus tener var. tener alkali milk-vetch	__	__	1B.2	Alkali playa, valley and foothill grassland. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. Elevation: 0-168 m. Blooming period: March-June	**None.** The project site does not contain grassland, alkali playas or vernal pool habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Calystegia purpurata ssp. saxicola coastal bluff morning-glory	—	—	1B.2	Coastal dunes, coastal scrub, coastal bluff scrub, north coast coniferous forest. Elevation: 4-165 m. Blooming period: (March)April-September	**None.** The project site does not contain coastal dunes, coastal scrub or coniferous forests. Not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Cardamine angulate seaside bittercress	—	—	2B.1	North coast coniferous forest, lower montane coniferous forest. Wet areas, streambanks. Elevation: 5-515 m. Bloom period: March-July	**None.** The project site does not contain wet coniferous forests. Not observed during appropriately timed protocol-level rare plant surveys.
Castilleja affinis var. neglecta Tiburon paintbrush	FE	ST	1B.2	Valley and foothill grassland. Rocky serpentine sites. Elevation: 120-400 m. Bloom period: April-June	**None.** The project site does not contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.
Ceanothus decornutus Nicasio ceanothus	—	—	1B.2	Chaparral. Maritime chaparral; serpentinite, rocky, sometimes clay. Elevation: 235-290 m. Bloom period: March-May	**None.** The project site does not contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.
Ceanothus masonii Mason's ceanothus	—	CR	1B.2	Chaparral. Serpentine ridges or slopes in chaparral or transition zone. Elevation: 180-460 m. Bloom period: March-April	**None.** The project site does not contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	—	—	1B.2	Coastal salt marsh usually with *Salicornia*, *Distichlis*, *Jaumea*, *Spartina*, etc. Elevation: 0-115 m. Blooming period: June-November	**None.** The project site does not contain coastal salt marsh habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Chorizanthe cuspidata var. cuspidata San Francisco Bay spineflower	—	—	1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Closely related to *C. pungens*. Sandy soil on terraces and slopes. Elevation: 2-550 m. Bloom period: April-July(August)	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Cirsium andrewsii Franciscan thistle	—	—	1B.2	Coastal bluff scrub, broadleafed upland forest, coastal scrub, coastal prairie. Sometimes serpentine seeps. Elevation: 0-295 m. Bloom period: March-July	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Cirsium hydrophilum var. vaseyi Mt. Tamalpais thistle	—	—	1B.2	Broadleafed upland forest, chaparral, meadows and seeps. Serpentine seeps and streams in chaparral and woodland. Elevation: 180-610 m. Bloom period: May-August	**None.** The project site does not broadleafed upland forest/woodlands or contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Clarkia franciscana Presidio clarkia	FE	SE	1B.1	Coastal scrub, valley and foothill grassland. Serpentine outcrops in grassland or scrub. Elevation: 20-305 m. Bloom period: May-July	**None.** The project site does not contain serpentine soils. Not observed during appropriately timed protocol-level rare plant surveys.
Collinsia corymbose round-headed Chinese-houses	—	—	1B.2	Coastal dunes. Elevation: 0-30 m. Bloom period: April-June	**None.** The project site does not contain coastal dune habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Collinsia multicolor San Francisco collinsia	—	—	1B.2	Closed-cone coniferous forest, coastal scrub. On decomposed shale (mudstone) mixed with humus; sometimes grows on serpentine soils. Elevation: 10-275 m. Blooming period: (February)March-May	**None.** The project site does contain coastal scrub/chaparral habitat and shale soils/substrates. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Dirca occidentalis western leatherwood	—	—	1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland. On brushy slopes, mesic sites; mostly in mixed evergreen & foothill woodland communities. Elevation: 20-640 m. Blooming period: January-March(April)	**None:** The project site does not contain suitable boradleafed or coniferous forest habitat to support this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Eriogonum luteolum var. caninum Tiburon buckwheat	—	—	1B.2	Chaparral, valley and foothill grassland, cismontane woodland, coastal prairie. Serpentine soils; sandy to gravelly sites. Elevation: 60-640 m. Bloom period: May-September	**None.** The project site does not contain serpentine soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Gilia capitata ssp. chamissonis blue coast gilia	—	—	1B.1	Coastal dunes, coastal scrub. Elevation: 3-200 m. Bloom period: April-July	**None.** The project site does not contain coastal dune habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Gilia capitata ssp. tomentosa woolly-headed gilia	—	—	1B.1	Coastal bluff scrub, valley and foothill grassland, riparian woodland. Rocky outcrops, sometimes serpentine. Elevation: 6-290 m. Bloom period: May-July	**None.** The project site does not contain serpentine soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Gilia millefoliata dark-eyed gilia	—	—	1B.2	Coastal dunes. Elevation: 1-60 m. Bloom period: April-July	**None.** The project site does not contain coastal dune habitat. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Grindelia hirsutula var. maritima San Francisco gumplant	—	—	3.2	Coastal scrub, coastal bluff scrub, valley and foothill grassland. Sandy or serpentine slopes, sea bluffs. Elevation: 15-305 m. Bloom period: June-September	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Helianthella castanea Diablo helianthella	—	—	1B.2	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade. Elevation: 45-1070 m. Bloom period: March-June	**None.** Species not observed during appropriately timed protocol-level rare plant surveys.
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	—	—	1B.2	Valley and foothill grassland. Grassy valleys and hills, often in fallow fields; sometimes along roadsides. Elevation: 5-520 m. Bloom period: April-November	**None.** The project site contains some disturbed grassland habitat. However, this species was not observed during appropriately timed protocol-level rare plant surveys.
Hesperolinon congestum Marin western flax	FT	ST	1B.1	Chaparral, valley and foothill grassland. In serpentine barrens and in serpentine grassland and chaparral. Elevation: 60-400 m. Bloom period: April-July	**None.** The project site does not contain serpentine soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Holocarpha macradenia Santa Cruz tarplant	FT	SE	1B.1	Coastal prairie, coastal scrub, valley and foothill grassland. On light, sandy soil or sandy clay; found often with non-natives. Elevation: 10-275 m. Blooming period: June-October	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Horkelia cuneata var. sericea Kellogg's horkelia	—	—	1B.1	Closed-cone coniferous forest, coastal scrub, coastal dunes, chaparral. Old dunes, coastal sandhills; openings. Sandy or gravelly soils. Elevation: 5-430 m. Bloom period: April-September	**None.** The project site does not contain coniferous forest or coastal dunes with sandy or gravelly soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Horkelia marinensis Point Reyes horkelia	—	—	1B.2	Coastal dunes, coastal prairie, coastal scrub. Sandy flats and dunes near coast; in grassland or scrub plant communities. Elevation: 2-775 m. Bloom period: May-September	**None.** The project site does not contain coastal dunes or scrub/prairie vegetation with sandy soils. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Horkelia tenuiloba thin-lobed horkelia	—	—	1B.2	Broad-leafed upland forest, chaparral, valley and foothill grassland with sandy soils. Often found in mesic habitats. Elevation: 45-640 m. Bloom period: May-July (August)	**None:** The project site does not contain mesic boradleafed forest or grassland vegetation with sandy soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Kopsiopsis hookeri small groundcone	—	—	2B.3	North coast coniferous forest. Open woods, shrubby places, generally on Gaultheria shallon. Elevation: 120-1435 m. Bloom period: April-August	**None.** The project site does not contain coniferous forests or woodland. The project site is below the elevation this species is known to occur. Species not observed during appropriately timed protocol-level rare plant surveys.
Layia carnosa beach layia	FE	SE	1B.1	Coastal dunes, coastal scrub. On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. Elevation: 3-30 m. Bloom period: March-July	**None.** The project site does not contain coastal dune habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Leptosiphon rosaceus rose leptosiphon	—	—	1B.1	Coastal bluff scrub. Elevation: 10-140 m. Bloom period: April-July	**None.** The project site does not contain coastal bluff scrub. Species not observed during appropriately timed protocol-level rare plant surveys.
Lessingia germanorum San Francisco lessingia	FE	SE	1B.1	Coastal scrub. On remnant dunes. Open sandy soils relatively free of competing plants. Elevation: 3-155 m. Bloom period: (June)July-November	**None.** The project site does not contain coastal dune habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Lessingia micradenia var. micradenia Tamalpais lessingia	—	—	1B.2	Chaparral, valley and foothill grassland. Usually on serpentine, in serpentine grassland or serpentine chaparral. Often on roadsides. Elevation: 60-305 m. Bloom period: (June)July-October	**None.** The project site does not contain serpentine soils. The project site is below the elevation this species is known to occur. Species not observed during appropriately timed protocol-level rare plant surveys.
Microseris paludosa marsh microseris	—	—	1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation: 3-610 m. Bloom period: April-June (July)	**None.** The project site does not contain coniferous forests, woodland, but could support grassland habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Navarretia rosulata Marin County navarretia	—	—	1B.2	Closed-cone coniferous forest, chaparral. Dry, open rocky places; can occur on serpentine. Elevation: 185-640 m. Bloom period: May-July	**None.** The project site does not contain coniferous forests or open rocky places. The project site is below the elevation this species is known to occur. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Pentachaeta bellidiflora white-rayed pentachaeta	FE	SE	1B.1	Valley and foothill grassland, cismontane woodland. Open dry rocky slopes and grassy areas, often on soils derived from serpentine bedrock. Elevation: 35-610 m. Bloom period: March-May	**None.** The project site does not contain serpentine soils/substrates. There is one occurrence located approximately 1,100 feet north of the project site, however agencies believe this species to be extirpated from this area. Species not observed during appropriately timed protocol-level rare plant surveys.
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	—	—	1B.2	Chaparral, coastal scrub, coastal prairie. Mesic sites. Elevation: 5-705 m. Bloom period: March-June	**None.** Suitable chaparral/coastal scrub habitat is present on-site. However, the nearest know occurrence of this species are located across San Francisco Bay. Species not observed during appropriately timed protocol-level rare plant surveys.
Plagiobothrys diffuses San Francisco popcornflower	—	SE	1B.1	Valley and foothill grassland, coastal prairie. Historically from grassy slopes with marine influence. Elevation: 45-360 m. Bloom period: March-June	**None.** The project site does have a maritime climate however it could contain grassland vegetation. Species not observed during appropriately timed protocol-level rare plant surveys.
Plagiobothrys glaber hairless popcornflower	—	—	1A	Meadows and seeps, marshes and swamps. Coastal salt marshes and alkaline meadows. Elevation: 5-125 m. Bloom period: March-May	**None.** The project site does not contain coastal salt marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Polemonium carneum Oregon polemonium	—	—	2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Elevation: 15-1525 m. Blooming period: April-September	**None:** The project site does not contain coastal prairie or coniferous forest vegetation. Species not observed during appropriately timed protocol-level rare plant surveys.
Polygonum marinense Marin knotweed	—	—	3.1	Marshes and swamps. Coastal salt marshes and brackish marshes. Elevation: 0-10 m. Bloom period: (April)May-August(October)	**None.** The project site does not contain coastal salt marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Quercus parvula var. tamalpaisensis Tamalpais oak	—	—	1B.3	Lower montane coniferous forest, cismontane woodland. Elevation: 200-640 m. Bloom period: March-April	**None.** Project site below known elevation for this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Sanicula maritima adobe sanicle	—	—	1B.1	Meadows and seeps, valley and foothill grassland, chaparral, coastal prairie. Moist clay or ultramafic soils. Elevation: 15-215 m. Bloom period: February-May	**None.** The project site does not contain meadow, seeps or prairie/grassland vegetation or contain ultramafic soils. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	—	—	1B.2	Marshes and swamps. Freshwater marshes near the coast. Elevation: 5-95 m. Bloom period: April-September	**None.** The project site does not contain coastal freshwater marsh habitat.
Sidalcea hickmanii ssp. viridis Marin checkerbloom	—	—	1B.1	Chaparral. Serpentine or volcanic soils; sometimes appears after burns. Elevation: 1-425 m. Bloom period: May-June	**None.** The project site does not contain serpentine or volcanic soils.
Silene scouleri ssp. scouleri Scouler's catchfly	—	—	2B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland. Elevation: 5-315 m. Bloom period: (March)June-August(September)	**None.** The project site does not contain coastal prairie, but contains patches of grassland habitat. Species was not observed during appropriately timed protocol-level rare plant surveys.
Silene verecunda ssp. verecunda San Francisco campion	—	—	1B.2	Coastal scrub, valley and foothill grassland, coastal bluff scrub, chaparral, coastal prairie. Often on mudstone or shale; one site on serpentine. Elevation: 30-645 m. Bloom period: February (March)-July(August)	**None.** The project site contains chaparral/scrub habitat and shale soils/substrates. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Spergularia macrotheca var. longistyla long-styled sand-spurrey	—	—	1B.2	Alkaline marshes and swamps, meadows and seeps. Elevation: 0-220 m. Blooming period: February-May	**None.** The project site does not contain alkaline freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Stebbinsoseris decipiens Santa Cruz microseris	—	—	1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. Open areas in loose or disturbed soil, usually derived from sandstone, shale or serpentine, on seaward slopes. Elevation: 90-750 m. Blooming period: April-May	**None.** The project site contains suitable chaparral/scrub habitat and shale soils/substrates. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Streptanthus batrachopus Tamalpais jewelflower	—	—	1B.3	Closed-cone coniferous forest, chaparral. Talus serpentine outcrops. Elevation: 335-670 m. Bloom period: April-July	**None.** The project site does not contain closed-cone coniferous forest or serpentine soils/substrates. The project site is below the elevation this species is known to occur. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Streptanthus glandulosus ssp. niger Tiburon jewelflower	FE	SE	1B.1	Valley and foothill grassland. Shallow, rocky serpentine slopes. Elevation: 30-150 m. Bloom period: May-June	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Streptanthus glandulosus ssp. pulchellus Mt. Tamalpais bristly jewelflower	—	—	1B.2	Chaparral, valley and foothill grassland. Serpentine slopes. Elevation: 125-670 m. Bloom period: May-July(August)	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Symphyotrichum lentum Suisun Marsh aster	—	—	1B.2	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with *Phragmites*, *Scirpus*, blackberry, *Typha*, etc. Elevation: 0-15 m. Blooming period: May-November	**None.** The project site does not contain brackish or freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Trifolium amoenum two-fork clover	FE	—	1B.1	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite) Elevation: 5-415 m. Bloom period: April–June	**None.** The project site does contain some disturbed grassland habitat, but no serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Trifolium hydrophilum saline clover	—	—	1B.2	Mesic, alkaline sites such as marshes and swamps, valley and foothill grassland, vernal pools. Elevation: 1-335 m. Blooming period: April-June	**None.** The project site does not contain alkaline marshes vernal pools or other mesic habitats. Species not observed during appropriately timed protocol-level rare plant surveys.
Triphysaria floribunda San Francisco owl's-clover	—	—	1B.2	Coastal prairie, coastal scrub, valley and foothill grassland. On serpentine and non-serpentine substrate (such as at Pt. Reyes). Elevation: 1-150 m. Bloom period: April-June	**None.** The project site does not contain coastal prairie or suitable grassland habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Lichens					
Hypogymnia schizidiata island tube lichen	—	—	1B.3	Chaparral, closed-cone coniferous forest. On bark and wood of hardwoods and conifers. Elevation: 255-545 m. Bloom period: N/A	**None.** Project site below known elevation for this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Monocots					

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Alopecurus aequalis var. sonomensis Sonoma alopecurus	FE	—	1B.1	Freshwater marshes and swamps, riparian scrub, and riparian banks, with other wetland species. Elevation: 5-360 m. Bloom period: May-July	**None.** The project site does not contain freshwater marsh or riparian habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Calamagrostis crassiglumis Thurber's reed grass	—	—	2B.1	Coastal scrub, marshes and swamps. Usually in marshy swales surrounded by grassland or coastal scrub. Elevation: 5-50 m. Bloom period: May-August	**None.** The project site does not contain coastal freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Calochortus tiburonensis Tiburon mariposa-lily	—	—	1B.1	Valley and foothill grassland. On open, rocky, slopes in serpentine grassland. Elevation: 50-150 m. Bloom period: March-June	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Carex comosa bristly sedge	—	—	2B.1	Marshes and swamps, coastal prairie, valley and foothill grassland. Lake margins, wet places. Elevation: 0-1010 m. Bloom period: May-September	**None.** The project site does not contain suitable wetland habitat to support this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Carex lyngbyei Lyngbye's sedge	—	—	2B.2	Marshes and swamps (brackish or freshwater). Elevation: 0-200 m. Bloom period: April-August	**None.** The project site does not contain brackish or freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Carex praticola northern meadow sedge	—	—	2B.2	Wet meadows and seeps. Elevation: 15-3200 m. Blooming period: May-July	**None.** The project site does not contain suitable wetland habitat to support this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Fritillaria lanceolata var. tristulis Marin checker lily	—	—	1B.1	Coastal bluff scrub, coastal scrub, coastal prairie. Occurrences reported from canyons and riparian areas as well as rock outcrops; often on serpentine. Elevation: 5-305 m. Bloom period: February-May	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Fritillaria liliacea fragrant fritillary	—	—	1B.2	Coastal scrub, valley and foothill grassland, coastal prairie, cismontane woodland. Often grows on serpentine soils. Can grow on other soil types such as clay soils in grassland habitats. Elevation: 3-385 m. Blooming period: February-April	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status USFWS[1]	Status CDFW[2]	Status CNPS[3]	Habitat Description[4]	Occurrence Determination and Rationale
Heteranthera dubia water star-grass	—	—	2B.2	Marshes and swamps. Alkaline, still or slow-moving water. Requires a pH of 7 or higher, usually in slightly eutrophic waters. Elevation: 15-1510 m. Bloom period: July-October	**None.** The project site does not contain alkaline marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Pleuropogon hooverianus North Coast semaphore grass	—	ST	1B.1	Broadleafed upland forest, meadows and seeps, north coast coniferous forest. Wet grassy, usually shady areas, sometimes freshwater marsh; associated with forest environments. Elevation: 45-1160 m. Bloom period: April-June	**None.** The project site does not contain broadleafed upland forest, coniferous forest or freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.

Code Designations

[1] Federal Status: 2020 USFWS Listing

- **ESU** = Evolutionary Significant Unit is a distinctive population.
- **FE** = Listed as endangered under the FESA.
- **FT** = Listed as threatened under the FESA.
- **FC** = Candidate for listing (threatened or endangered) under FESA.
- **FD** = Delisted in accordance with the FESA.
- **FPD** = Federally Proposed to be Delisted.
- **MBTA** = protected by the Migratory Bird Treaty Act
- **—** = Not federally listed

[2] State Status: 2020 CDFW Listing

- **SE** = Listed as endangered under the CESA.
- **ST** = Listed as threatened under the CESA.
- **SSC** = Species of Special Concern as identified by the CDFW.
- **FP** = Listed as fully protected under FGC.
- **CFG** = FGC =protected by FGC 3503.5
- **CR** = Rare in California.
- **—** = Not state listed

[3] CNPS: 2020 CNPS Listing

- **Rank 1A** = Plants species that presumed extinct in California.
- **Rank 1B** = Plant species that are rare, threatened, or endangered in California and elsewhere.
- **Rank 2** = Plant species that are rare, threatened, or endangered in California, but more common elsewhere.
- **Rank 3** = Plants about which we need more information—A Review List
- **Rank 4** = Plants of limited distribution—A Watch List

Blooming period: Months in parentheses are uncommon.

[4] **Habitat Description**: Habitat description adapted from CNDDB and CNPS online inventory or other specified source.

Sources:

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Natural Resources Conservation Service (NRCS). 2020. Web Soil Survey (WSS). United States Department of Agriculture (USDA). Website: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed July 28, 2021.
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Table 2: Special-status Wildlife Species Occurrence Evaluation

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Amphibians				
Dicamptodon ensatus California giant salamander	— 	— SSC	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.	**None.** The project parcel does not contain suitable habitat to support this species. No wet forests or cold, clear streams are on site or in dispersal distance. Closest known occurrence is from 1954 associated with Larkspur Creek. None observed during several surveys.
Rana boylii foothill yellow-legged frog	—	FE SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in forests, chaparral, and woodlands. Needs at least some cobble-sized substrate for egg-laying.	**None.** The project parcel does not contain suitable aquatic or riparian habitat to support this species. All known historic occurrences of this species within 4 miles are considered extirpated (CNDDB). None observed during several surveys.
Rana draytonii California red-legged frog	FT	— SSC	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.	**None.** The project parcel does not contain suitable aquatic or riparian habitat to support this species. Closest known occurrences are northeast of San Rafael, more than twice the dispersal range, including substantial barriers. None observed during several surveys.
Birds				
Accipiter cooperii Cooper's hawk	— MBTA	— WL FGC	Prefers woodland habitat, chiefly of open, interrupted or marginal type, including cismontane woodlands, riparian forests/woodlands and upper montane coniferous forest. May also occur near parks and residential areas. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	**Low.** The few trees located on the project site or within disturbance distance have the potential to supporting nesting. Not observed during several surveys.
Asio flammeus short-eared owl	— MBTA	— SSC FGC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Needs tule patches/tall grass for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	**None.** The project does not contain suitable nesting habitat in the form of tule patches or tall grass. None observed during several surveys.
Athene cunicularia burrowing owl	— MBTA	— SSC FGC	Found in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. A subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	**None.** Site lacks habitat features required for this species, including burrow complexes, open and short grassland cover. No signs of this species were observed during several surveys.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Charadrius nivosus nivosus western snowy plover	FT MBTA	— SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**None.** The project site lacks suitable nesting habitat in the form of sandy or gravelly beaches, levees or lake shores.
Circus hudsonius northern harrier	— MBTA	— SSC	Found in coastal salt and freshwater marshes. Ground nester in shrubby vegetation usually at marsh edge.	**None.** Site does not contain marsh or marsh edge. No suitable nesting habitat present. Species not observed during several surveys.
Cypseloides niger black swift	— MBTA	— SSC	Coastal belt of Santa Cruz and Monterey counties; central & southern Sierra Nevada; San Bernardino & San Jacinto mountains. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.	**None.** The project site does not contain suitable nesting habitat in the form of cliffs, deep canyons or bluffs. None observed during several surveys.
Elanus leucurus white-tailed kite	— MBTA	— FP	Often found near foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland or isolated dense-topped trees for nesting and perching. Forages in open grasslands, meadows, or marshes.	**Low.** The project site contains a few suitable nesting trees. Suitable grassland and saltmarsh foraging habitat can be found nearby. None observed during several surveys.
Falco peregrinus anatum American peregrine falcon	FD MBTA	SD FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	**None.** The project site does not contain cliffs or tall man-made structures suitable for nesting. None observed during several surveys.
Geothlypis trichas sinuosa saltmarsh common yellowthroat	— MBTA	— SSC	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.	**None.** The project site lacks suitable salt marsh habitat to support this species. None observed during several surveys.
Laterallus jamaicensis coturniculus California black rail	— MBTA	ST FP	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.	**None.** The project site lacks marsh or meadow habitat to support this species.
Melospiza melodia pusillula Alameda song sparrow	— MBTA	— SSC	Resident of salt marshes bordering south arm of San Francisco Bay. Inhabits *Salicornia* marshes; nests low in *Grindelia* bushes (high enough to escape high tides).	**None.** The project site lacks suitable salt marsh habitat to support this species. None observed during several surveys.
Melospiza melodia samuelis San Pablo song sparrow	— MBTA	— SSC	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.	**None.** The project site lacks suitable salt marsh habitat to support this species. None observed during several surveys.

Scientific Name Common Name	Status USFWS[1]	Status CDFW[2]	Habitat Description[3]	Potential to Occur and Rationale[4]
Phalacrocorax auratus double-crested cormorant	— MBTA	— WL	Requires large water bodies big enough to support their mostly fish diet. However, they may roost and form breeding colonies on smaller lagoons or ponds. In addition to fishing waters, cormorants need high, airy perches to dry off and digest their meals (rocks, wires, tops of dead trees, ship masts). This species tend to form breeding colonies in clusters of trees in or near water. Nests can be on the ground, on rocks or reefs with no vegetation, or atop trees.	**None.** The project site lacks suitable nesting habitat in the form of tree clusters, rocks or reefs. None observed during several surveys.
Rallus obsoletus obsoletus California Ridgway's rail	FE MBTA	SE FP	Salt and brackish marshes in the vicinity of the San Francisco Bay. Associated with abundant *Salicornia*.	**None.** The project site lacks suitable salt marsh habitat to support this species. None observed during several surveys.
Riparia riparia bank swallow	— MBTA	ST	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.	**None.** The project site lacks suitable nesting habitat in the form of riparian banks or cliffs. None observed during several surveys.
Strix occidentalis caurina northern spotted owl	FT MBTA	ST FGC	Old-growth conifer or redwood forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. High, multistory canopy dominated by big trees, many trees with cavities or broken tops, woody debris, and space under canopy.	**None (nesting).** Known to occur in Marin, including the San Anselmo and Corte Madera Area, so it is possible that a vagrant dispersing individual may at some point visit the project site. However, the project does not contain suitable nesting habitat, and no nests are known to occur within disturbance distance. Project site may constitute a population sink for this species. This species was not observed during several surveys.
Crustaceans				
Syncaris pacifica California freshwater shrimp	FE	SE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from main streamflow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**None.** The project site lacks suitable aquatic habitat to support this species.
Fish				
Eucyclogobius newberryi tidewater goby	FE	—	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.	**None.** The project site lacks suitable aquatic habitat to support this species.
Lavinia symmetricus ssp. 2 Tomales roach	—	— SSC	Found within tributaries to Tomales Bay.	**None.** The project site lacks suitable aquatic habitat to support this species.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Oncorhynchus kisutch (pop. 4) coho salmon (central California coast ESU) [1]	FE	SE	Preferred habitat consists of low-gradient coastal streams. Species requires beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water & sufficient dissolved oxygen.	**None.** The project site lacks suitable aquatic habitat to support this species.
Oncorhynchus mykiss irideus (pop. 8) steelhead (central California coast DPS)[2]	FT	—	Steelhead require cool, swift, shallow water & clean loose gravel for spawning, & suitably large pools in which to spend the summer. Minimum water depth for upstream migration is 18 cm. Water velocities greater than 3-4 m/sec may impede upstream progress.	**None.** The project site lacks suitable aquatic habitat to support this species.
Pogonichthys macrolepidotus Sacramento splittail	—	— SSC	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.	**None.** The project site lacks suitable aquatic habitat to support this species.
Spirinchus thaleichthys longfin smelt	FC	ST	Bays, estuaries, and nearshore coastal areas, and migrate into freshwater rivers to spawn. Spawning occurs primarily from January through March.	**None.** The project site lacks suitable aquatic habitat to support this species.
Thaleichthys pacificus eulachon	FT	—	Found in Klamath River, Mad River, Redwood Creek, and in small numbers in Smith River and Humboldt Bay tributaries. Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand, and woody debris.	**None.** The project site lacks suitable aquatic habitat to support this species.
Insects				
Danaus plexippus (pop. 1) monarch butterfly (California overwintering population)	FC	—	Roosts located in wind protected Eucalyptus, Monterey pine, and Cypress tree groves with nectar and water sources nearby.	**None.** The project site does not contain suitable tree groves to support overwintering populations of this species. No known overwintering site known nearby. No monarch hostplants (*Asclepius* spp.) present on site.
Euphydryas editha bayensis Bay checkerspot butterfly	FT	—	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. *Plantago erecta* is the primary host plant; *Orthocarpus densiflorus* & *O. purpurscens* are the secondary host plants.	**None.** The project site does not contain serpentine soils necessary to support this species' host plants.

[1] Federal listing = pops between Punta Gorda & San Lorenzo River. State listing = pops south of Punta Gorda. Source: CNDDB 2021.
[2] 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. Source: CNDDB 2021.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Plebejus icarioides missionensis Mission blue butterfly	FE	—	Inhabits grasslands of the San Francisco peninsula. Three larval host plants: *Lupinus albifrons*, *L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.	**None.** Site outside known range for this species.
Speyeria callippe callippe callippe silverspot butterfly	FE	—	Restricted to the northern coastal scrub of the San Francisco peninsula. Hostplant is *Viola pedunculata*. Most adults found on east facing slopes; males congregate on hilltops in search of females.	**None.** Site outside known range for this species.
Mammals				
Antrozous pallidus pallid bat	—	— SSC	Inhabits low elevation (below 1,830 m./6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forests (below 2,100 m./7,000 feet). Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees, and various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings.	**Low.** The project site contains a few trees which may provide suitable roosting habitat.
Aplodontia rufa phaea Point Reyes mountain beaver	—	— SSC	Coastal area of Point Reyes in areas of springs or seepages. North-facing slopes of hills and gullies in areas overgrown with sword ferns and thimbleberries.	**None.** The project site does not contain suitable habitat and is located outside the know range of this species.
Corynorhinus townsendii Townsend's big-eared bat	—	— SSC	Found throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. This species is extremely sensitive to human disturbance.	**Low.** The project site contains a few trees which may provide suitable roosting habitat. Disturbance levels likely too high at the site for this species.
Enhydra lutris nereis southern sea otter	FT	— FP	Nearshore marine environments from about Ano Nuevo, San Mateo Co. to Point Sal, Santa Barbara Co. Needs canopies of giant kelp & bull kelp for rafting & feeding. Prefers rocky substrates with abundant invertebrates.	**None.** The project site does not contain suitable marine habitat to support this species. The project site is cut off from Bay shore via Sir Francis Drake Boulevard.
Eumetopias jubatus Steller (northern) sea-lion	FD	—	Breeds on Ano Nuevo, San Miguel and Farallon islands, Point St. George, & Sugarloaf. Hauls-out on islands & rocks. Needs haul-out and breeding sites with unrestricted access to water, near aquatic food supply and with no human disturbance.	**None.** The project site does not contain suitable marine habitat to support this species. The project does not border the ocean.
Lasiurus blossevillii western red bat	—	— SSC	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	**Low.** The project site contains a few trees which may provide suitable roosting habitat.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Microtus californicus sanpabloensis San Pablo vole	—	— SSC	Saltmarshes of San Pablo Creek, on the south shore of San Pablo Bay. Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow.	**None.** The project site does not contain saltmarsh habitat to support this species.
Reithrodontomys raviventris salt-marsh harvest mouse	FE	SE FP	Saline emergent wetlands of San Francisco Bay and it's tributaries. *Salicornia* is primary habitat but may occur in other marsh vegetation types.	**None.** The project site does not contain aquatic habitat with *Salicornia* present.
Sorex ornatus sinuosus Suisun shrew	—	— SSC	Tidal marshes of the northern shores of San Pablo and Suisun bays. Require dense low-lying cover and driftweed and other litter above the mean hightide line for nesting and foraging.	**None.** The project site does not contain saltmarsh habitat to support this species.
Sorex vagrans halicoetes salt-marsh wandering shrew	—	— SSC	Salt marshes of the southern portion of the San Francisco Bay. Marsh, wetland, or swamps with Salicornia and abundant driftwood	**None:** The project site does not contain aquatic habitat with *Salicornia* present.
Taxidea taxus *American badger*	—	— SSC	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 large burrows.	**None.** No suitable habitat present. Site isolated from in-migration from known occurrences. No signs of badger dens observed during multiple surveys.
Zapus trinotatus orarius *Point Reyes jumping mouse*	—	— SSC	Primarily in bunch grass marshes on the uplands of Point Reyes. Also present in coastal scrub, grassland, and meadows. Eats mainly grass seeds w/ some insects & fruit taken. Builds grassy nests on ground under vegetation, burrows in winter.	**None.** The project site lacks bunch grass marshes and is located outside of the known range of this species.
Reptiles				
Emys marmorata western pond turtle	—	— SSC	Occurs in 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.	**None.** The project parcel does not contain suitable aquatic to support this species.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		

Code Designations

[1] Federal Status: 2020 USFWS Listing		[2] State Status: 2020 CDFW Listing	
ESU	= Evolutionary Significant Unit is a distinctive population.	**SE**	= Listed as endangered under the CESA.
FE	= Listed as endangered under the FESA.	**ST**	= Listed as threatened under the CESA.
FT	= Listed as threatened under the FESA.	**SSC**	= Species of Special Concern as identified by the CDFW.
FC	= Candidate for listing (threatened or endangered) under FESA.	**FP**	= Listed as fully protected under FGC.
FD	= Delisted in accordance with the FESA.	**CFG**	= FGC =protected by FGC 3503.5
FPD	= Federally Proposed to be Delisted.	**CE**	= Candidate endangered under the CESA.
MBTA	= protected by the Migratory Bird Treaty Act	**WL**	= Species monitored by CDFW "Watch List".
—	= Not federally listed	**—**	= Not state listed

[3] **Habitat Description**: Habitat description adapted from CNDDB or other specified source*.
[4] **Potential to Occur and Rationale**: Location of recorded species occurrences determined by geospatial information from BIOS 5 or other specified source*.

Sources:

California Department of Fish and Wildlife (CDFW). 2021. CNDDB RareFind 5 California Natural Diversity Database Query for Special-Status Species. Website: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx. Accessed July 28, 2021.
California Department of Fish and Wildlife (CDFW). 2021. Biogeographic Information and Observation System (BIOS 5). Website: https://map.dfg.ca.gov/bios/. Accessed July 28, 2021.
iNaturalist. 2021. Observations: northern spotted owl (*Strix occidentalis caurina*) https://www.inaturalist.org/. Accessed July 28, 2021.

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Appendix B: Plant List

Plant species observed during botanical surveys at the Oak Hill site, Marin County, California, on February 25, April 25, and June 23 (2022), by Dr. Chris DiVittorio and Dr. Zoya Akulova.

Scientific name & CNPS Status (if any)	Common name	Native
Acmispon parviflorus	Hill lotus	yes
Aira caryophyllea	Silver hairgrass	no
Artemisia californica	California sagebrush	yes
Avena fatua	Wild oats	no
Baccharis pilularis ssp. *consanguinea*	Coyote brush	yes
Bellardia trixago	Mediterranean lineseed	no
Brachypodium distachyon	False brome	no
Briza maxima	Rattlesnake grass	no
Briza minor	Little quacking grass	no
Bromus caroli-henrici	Weedy brome	no
Bromus diandrus	Ripgut brome	no
Bromus hordeaceus	Soft chess	no
Bromus madritensis	Madrid brome	no
Calendula arvensis	Field marigold	no
Calystegia occidentalis	Bush morning glory	yes
Cardamine oligosperma	Bitter cress	yes
Carduus pycnocephalus	Italian thistle	no
Carex densa	Dense sedge	yes
Carex gracilior	Slender sedge	yes
Carex tumulicola	Split awn sedge	yes
Chlorogalum pomeridianum var. *pomeridianum*	Soap plant	yes
Cirsium vulgare	Bull thistle	no
Conium maculatum	Poison hemlock	no
Convolvulus arvensis	Field bindweed	no
Cordyline australis	Cabbage tree	no
Cortaderia jubata	Pampas grass	no
Cotoneaster lacteus	Milkflower cotoneaster	no
Cotoneaster pannosus	Woolly cotoneaster	no
Cotula coronopifolia	Brass buttons	no
Cynosurus echinatus	Dog tail	no
Cyperus eragrostis	Tall flatsedge	yes
Danthonia californica	California oat grass	yes
Dipsacus sativus	Teasel	no
Dittrichia graveolens	Stinkwort	no
Ehrharta erecta	Panic veldtgrass	no
Eleocharis macrostachya	Common spikerush	yes
Elymus triticoides	Creeping wildrye	yes
Erodium botrys	Broad leaf filaree	no
Erodium cicutarium	Redstem filaree	no
Erodium moschatum	Whitestem filaree	no
Eschscholzia californica	California poppy	yes
Festuca bromoides	Brome fescue	no
Festuca perennis	Italian ryegrass	no

Foeniculum vulgare	Sweet fennel	no
Galium aparine	Common bedstraw	yes
Gastridium phleoides	Nit grass	no
Genista monspessulana	French broom	no
Geranium dissectum	Cut-leaf geranium	no
Geranium molle	Woodland geranium	no
Hedypnois rhagadioloides	Crete weed	no
Helminthotheca echioides	Prickly x-tongue	no
Hemizonia congesta ssp. *lutescens*	Hayfield tarweed	yes
Hirschfeldia incana	Short-pod mustard	no
Hordeum brachyantherum	Meadow barley	yes
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	no
Hordeum murinum ssp. *leporinum*	Lepor barley	no
Hypochaeris glabra	Smooth cat's ears	no
Hypochaeris radicata	Rough cat's ears	no
Juncus bufonius	Toad rush	yes
Juncus patens	Common rush	yes
Juncus tenuis	Path rush	yes
Koeleria gerardii	Annual June grass	no
Linum bienne	Narrowleaf flax	no
Logfia gallica	Narrow-leaf cottonrose	no
Lotus corniculatus	Bird's foot trefoil	no
Lysimachia arvensis	Scarlet pimpernel	no
Lythrum hyssopifolia	Hyssop loosestrife	no
Madia gracilis	Grassy tarweed	yes
Medicago polymorpha	Bur-clover	no
Melica californica	California melic grass	yes
Melilotus indicus	Annual yellow sweetclover	no
Mentha pulegium	Pennyroyal	no
Parentucellia viscosa	Yellow glandweed	no
Phalaris aquatica	Harding grass	no
Plantago coronopus	Buckhorn plantain	no
Plantago lanceolata	English plantain	no
Polypodium calirhiza	Licorice fern	yes
Polypogon monspeliensis	Rabbitsfoot grass	no
Populus nigra 'Italica'	Lombardy poplar	no
Prunus cerasifera	Wild plum	no
Pseudognaphalium californicum	California cudweed	yes
Pseudognaphalium luteoalbum	Jersey cudweed	no
Pyracantha fortuneana	Firethorn	no
Quercus agrifolia	Coast live oak	yes
Quercus berberidifolia	Scrub oak	yes
Raphanus sativus	Wild radish	no
Rosa spp.	Cultivated rose	no
Rubus armeniacus	Himalayan blackberry	no
Rumex crispus	Curly dock	no
Salix lasiolepis	Arroyo willow	yes
Sanicula bipinnatifida	Purple sanicle	yes
Scrophularia californica	Bee plant	yes

Sisyrinchium bellum	Blue-eyed grass	yes
Solanum americanum	Small-flowered Nightshade	yes
Sonchus asper ssp. *asper*	Prickly sow thistle	no
Sonchus oleraceus	Common sow thistle	no
Stipa pulchra	Purple needle grass	yes
Symphoricarpos mollis	Snowberry	yes
Symphyotrichum chilense	California aster	yes
Taraxia ovata	Sun cups	yes
Toxicodendron diversilobum	Poison oak	yes
Trifolium campestre	Field clover	no
Trifolium dubium	Little hop clover	no
Trifolium hirtum	Rose clover	no
Trifolium subterraneum	Subterranean clover	no
Triteleia laxa	Ithuriel's spear	yes
Vicia sativa	Common vetch	no
Wyethia angustifolia	Narrow leaf mule's ears	yes
Zeltnera muehlenbergii	Muehlenberg's centaury	yes

Appendix C:
Aquatic Resources Delineation

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Aquatic Resources Delineation Report
Oak Hill Apartment Project
Marin County, California

Prepared for:
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Date: January 12, 2022

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SECTION 1: INTRODUCTION

At the request of the project applicant, Thompson Dorfman, LLC, FirstCarbon Solutions (FCS) completed a delineation of aquatic resources and proposes a Jurisdictional Determination (JD) for the Oak Hill Apartment Project Study Area (Study Area) as depicted on Exhibit 1 through Exhibit 3.

The purpose of this report is to support jurisdictional determinations by the United States Army Corps of Engineers (USACE) and the Regional Water Quality Control Board (RWQCB); to support California Department of Fish and Wildlife (CDFW) evaluation pursuant to Fish and Game Code Sections 1602 *et seq*. (Streambed Alteration Program); and to support the project applicant's planning and permitting efforts for a proposed development project.

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SECTION 2: ENVIRONMENTAL SETTING

2.1 - Location

The 6.7-acre Study Area is located in unincorporated Marin County, California and borders the City of Larkspur, California. The Study Area is located across the street from Remillard Park, north of Sir Francis Drake Boulevard. The Study Area is centered around 37.944566° latitude and -122.501095 longitude. The regional location of the Study Area is within the northern San Francisco Bay region, as shown on Exhibit 1, and the Study Area boundary on a recent high-resolution aerial image is shown on Exhibit 2.

2.2 - Vegetation and Land Cover Types

Vegetation of different areas of the Study Area is dominated by typical upland vegetation for this location, including non-native annual grassland, French broom (*Genista monspessulana*), coyote brush (*Baccharis pilularis*), coast live oak (*Quercus agrifolia*), pampas grass (*Cortaderia selloana*) and others. A robust small stand of willows (*Salix* sp.) is located along the lower reach of one of the drainages. Vegetation associated with open drainage channels is described for each feature in more detail, below. No obligate wetland plant species were observed in the channels or anywhere within the Study Area.

2.3 - Topography and Hydrogeomorphology

The Study Area is located on the toe of a ridge forming a peninsular extending into the northern San Francisco Bay. The western part of the Study Area consists of a relatively steep slope, while the eastern part consists of a terrace, including an area graded to accommodate a shooting range in the past. Elevations range from 20 feet above mean sea level (MSL) on the western boundary, to 145 feet MSL on the eastern hill slope. Subsequently, the site drains direct precipitation from the slopes west and south of the Study Area through the site via a network of first and second order ephemeral drainage channels and conveys collected runoff through two channels and culverts under Sir Francis Drake Boulevard to the lagoon at Remillard Park, an artificial impoundment of San Francisco Bay.

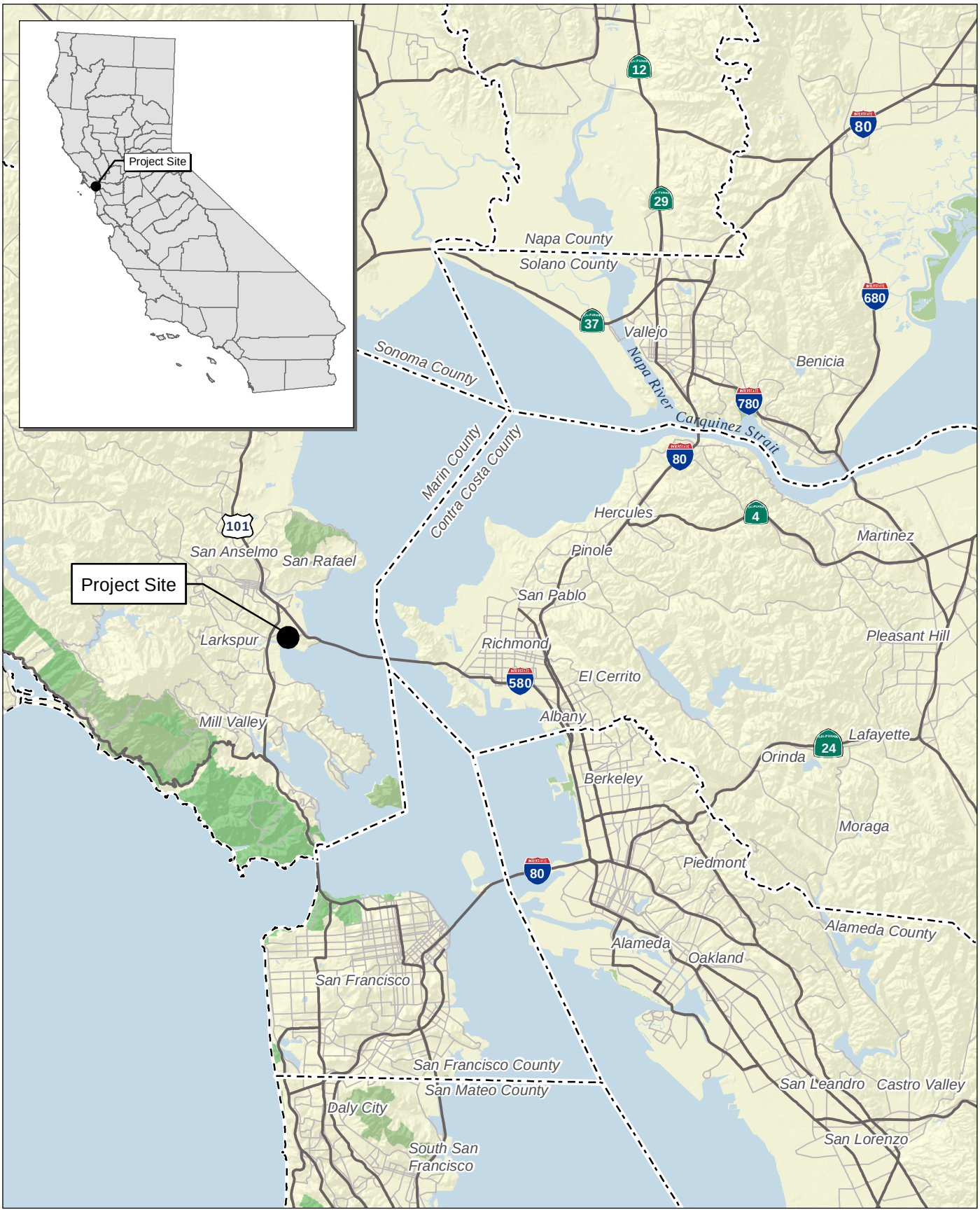
The natural drainage channel alignment and subsequently hydrogeomorphology was substantially altered in the past, including the grading and fill of approximately 2 acres in the center of the site, resulting in removal of the natural drainage channel segment in this area; and excavation of artificial diversion channels, one that now runs parallel to the western slope (channel Segment 1-3; Exhibit 3); and channel Segment 1-4, which connects the diverted flows to the remaining natural channel (segments 1-5 and 1-6).

2.4 - Soils

The soils of 95 percent of the Study Area are mapped by Natural Resources Conservation Service (NRCS) as *Tocaloma-Saurin association, steep*. Approximately 0.5 acre of the Study Area along Sir Francis Drake Boulevard were mapped as *Xerorthents, fill*. However, field sampling indicates that a larger area, potentially up to 2 acres, was likely subject to fill, either imported or spread deposits

derived from igneous, metamorphic, and sedimentary rock. Regardless, none of the soil types mapped or observed are classified as hydric soils.[1]

[1] United States Department of Agriculture (USDA), Natural Resources Conservation Service. 2020. Web Soil Survey 3.3.2. Website: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed October 2020.



Source: Census 2000 Data, The California Spatial Information Library (CaSIL).

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5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

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OAK HILL APARTMENTS
AQUATIC RESOURCES DELINEATION

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Source: FCS

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Feet

Exhibit 2
Study Area Boundary

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SECTION 3: REGULATORY SETTING

3.1 - Federal

3.1.1 - Clean Water Act

The USACE administers Section 404 of the federal Clean Water Act (CWA), which regulates the discharge of dredge and fill material into waters of the United States.

As of the date of this report, the United States Environmental Protection Agency (EPA) and USACE (hereafter the agencies) are in receipt of the U.S. District Court for the District of Arizona's August 30, 2021 order vacating and remanding the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. In light of this order, these agencies have halted implementation of the Navigable Waters Protection Rule and are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice.[2]

Therefore, since the agencies are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice, our analysis follows 40 CFR 230.3(s), which defines "waters of the United States" as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:
    a) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    b) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    c) Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
6. The territorial sea;

[2] United States Environmental Protection Agency (EPA). 2021. https://www.epa.gov/wotus/current-implementation-waters-united-states. Accessed September 9, 2021.

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 Code of Federal Regulations 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the EPA and/or USACE.

"Wetland" refers to areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and seasonal wetlands. Wetlands are considered jurisdictional if they fall under one of the categories of waters of the United States defined above.

In general, a USACE permit must be obtained before placing fill in wetlands or other waters of the United States. The type of permit depends on the acreage involved, the purpose of the proposed fill, and other factors. Additionally, Section 401 of the CWA states that "any applicant for a federal permit for activities that involve a discharge to waters of the State, shall provide the federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the federal Clean Water Act." Therefore, applicants seeking to fill waters of the United States are required to obtain a CWA Section 401 Water Quality Certification from the RWQCB.

3.2 - State

3.2.1 - California Porter-Cologne Water Quality Control Act

The RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the State" (Water Code § 13260(a)), pursuant to provisions of the Porter-Cologne Water Quality Act. "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (Water Code § 13050(e)). In 2019, the California State Water Resources Control Board (State Water Board) published the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (Procedures) to guide wetland waters of the State determinations and the permitting process.[3]

3.2.2 - California Fish and Game Code

Sections 1600-1607 of the California Fish and Game Code require that a Notification of Lake or Streambed Alteration be submitted to the CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or

[3] California State Water Resources Control Board (State Water Board). 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. April 2, 2019.

lake." The CDFW reviews the proposed actions in the Notification and, if necessary, prepares a Lake or Streambed Agreement that includes measures to protect fish and wildlife resources.

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SECTION 4: METHODS

FCS Senior Biologist and Certified Wetland Delineator, Bernhard Warzecha, MS, assisted by FCS Biologists Robert Carroll and Alec Villanueva, surveyed the Study Area on December 10, 2021, as described in the following section.

4.1 - Wetlands

The presence/absence of wetlands was determined based on the requirements of the *Corps of Engineers Wetlands Delineation Manual* and revised procedures in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*.[4,5] These procedures include standards that define wetlands, including specific saturation and/or ponding regimes, and evaluate hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland indicator status of vegetation follows the 2018 National Wetland Plant List for the Arid West Region.[6]

4.2 - Drainage Channels and Tributaries

Drainage channels were characterized through presence/absence of bed, bank, and ordinary high water mark (OHWM); hydrology; and hydrological connectivity. The OHWM is determined and characterized using definitions and guidance of *A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States*.[7] A discussion of what constitutes a potentially jurisdictional "tributary," and which features, such as features without a significant nexus, may be excluded from the definition of waters of the United States is provided in Section 5, below.

Culverted drainage sections were examined for evidence of concentrated flow, including presence of water stains, mineral or sediment deposits, and biofilm.

4.2.1 - Definitions of Hydrological Regimes

An ephemeral stream is defined as a watercourse that carries only surface runoff and flows during and immediately after periods of precipitation. An intermittent stream is defined as a watercourse that is temporally intermittent or seasonal and that flows during the wet season, continues to flow after the period of precipitation, and ceases surface flow during at least part of the dry season. Intermittent streams are typically shown as a dashed blue line on United States Geological Survey (USGS) quadrangle maps.

A perennial stream is a watercourse that flows throughout the year. Riparian vegetation is defined as vegetation associated with a watercourse and relying on the higher level of water provided by the watercourse. Riparian vegetation can include trees, shrubs, and/or herbaceous plants.

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4 Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1.
5 United States Army Corps of Engineers (USACE). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28.
6 The National Wetland Plant List–Arid West Version 1. 2018. United States Army Corps of Engineers.
7 Lichvar, R.W. and S.M. McColley. 2008. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States.

4.3 - Additional Background Information Review

Additional relevant information about the Study Area was reviewed including current and historical aerial imagery, the Watershed Assessment, Tracking and Environmental Results System (WATERS), the EPA's National Hydrography Data Set Plus (NHDPlus Version 2), the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI),[8] and the NRCS Web Soil Survey and Climate Analysis for Wetlands (WETS).[9,10,11] Specifically, the standard NRCS WETS analysis includes a weighted comparison of historical rainfall to observed rainfall for the 3-month period before a wetland delineation field survey in order to evaluate if abnormal rainfall patterns may have contributed to observed presence or absence of wetland indicators.[12] The WETS analysis is based on data from the nearest WETS-listed station located in Kentfield, Marin County. Additionally, the United States Drought Monitor data for Marin County were incorporated into the analysis.

[8] United States Fish and Wildlife Service (USFWS). National Wetland Inventory. Website: https://www.fws.gov/wetlands/data/mapper.html. Accessed December 2021.

[9] United States Environmental Protection Agency (EPA). Watershed Assessment, Tracking, and Environmental Results System (WATERS) Website: https://www.epa.gov/waterdata/waters-watershed-assessment-tracking-environmental-results-system. Accessed December 2021.

[10] United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2020. Web Soil Survey 3.3.2. Website: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed December 2021.

[11] United States Department of Agriculture (USDA), Natural Resources Conservation Service. 1997. Part 650 Engineering Field Handbook - Chapter 19: Hydrology Test for Wetland Determination.

[12] Ibid.

SECTION 5: RESULTS

The following section describes the results of both the background research and analysis, and the results of the protocol-level delineation field work. Representative photographs of current site conditions are included in Appendix A.

5.1 - Climatic Conditions

Results of the WETS analysis (Appendix B) indicate that conditions during the delineation survey were normal for the 3-month period prior the delineation (i.e., September through November 2021). The last rain event prior to the delineation occurred in November 2021 with an accumulated precipitation volume of 3.95 inch for the month, based on data of the nearest publicly available weather station located at the Greenbrae Boardwalk. However, Marin County experienced drought conditions throughout the Water Year 2020/2021, and the United States Drought Monitor ranked the conditions in Marin County as *D3-Extreme Drought*.

5.2 - Aquatic Resources

Aquatic resources are shown in Exhibit 3. Dimensions of all aquatic resources occurring within the Study Area boundary are presented in Table 1, and described in more detail below.

Table 1: Summary of Aquatic Resources Within the Study Area

Type	Segment ID	Length (linear feet)	Width (feet)	Area (square feet)	Area (acre)
Open Drainage Channel	1-1	46	4	184	0.004
Open Drainage Channel	1-2	41	1	41	0.001
Open Drainage Channel	1-3	265	5	1,325	0.030
Open Drainage Channel	1-4	316	1	316	0.007
Open Drainage Channel	1-5	186	14	2,604	0.060
Open Drainage Channel	1-6	92	16	1,472	0.034
Open Drainage Channel	2-1	139	3	417	0.010
Open Drainage Channel	3-1	161	3	483	0.011
Open Drainage Channel	4-1	185	4	740	0.017
Open Drainage Channel	5-1	87	1	87	0.002
Open Drainage Channel	5-3	28	1	28	0.001
Sum open drainage channels	–	**1,546**	**n/a**	**7,697**	**0.177**
Culvert Pipe	5-2	46	1	46	0.001
Culvert Pipe	5-4	7	1	7	0.000
Sum Culvert Pipes	–	**53**	**n/a**	**53**	**0.001**

Type	Segment ID	Length (linear feet)	Width (feet)	Area (square feet)	Area (acre)
Sum All Potentially Jurisdictional Waters	–	**1,599**	**n/a**	**7,750**	**0.178**

5.2.1 - Open Drainage Channels

The following is a description and discussion of all observed open drainage channel segments. Dimensions of each segment are listed in Table 1, and locations are shown on Exhibit 3. A definition of ephemeral and intermittent flow regimes is provided in Section 4.2.1.

Segment 1-1

Open Drainage Segment 1-1 is a naturally occurring ephemeral headwater drainage. The channel is characterized by presence of incised bed and banks. The OHWM is characterized by scour and sediment deposits. At the time of the survey, no flowing water but soil moisture was present. Given substantial rainfall throughout the weeks before the delineation, lack of flowing or standing water indicates a likely ephemeral flow regime. This drainage segment is located under predominantly closed canopy of coast live oak. Understory is sparse and ruderal and dominated by a mix of non-native upland grasses and forbs. No hydrophytic plants were observed in the channel. Segment 1-1 terminates at a vegetated terrace (potentially graded in the past). No bed or banks connect Segment 1-1 to Segment 1-2; however, it is assumed that any surface flow from Segment 1-1 reach Segment 1-2 and Segment 1-3 via surface sheet flow and underground seepage.

Segment 1-2

Open Drainage Segment 1-2 appears to be a constructed diversion ditch that developed into a vegetated headwater drainage collecting runoff from the graded terrace upslope. The channel is characterized by presence of a small bed and banks. The OHWM is characterized by scour and sediment deposits. At the time of the survey, no flowing water but soil moisture was present. Given substantial rainfall throughout the weeks before the delineation, lack of flowing or standing water indicates a likely ephemeral flow regime. This drainage segment is dominated by ruderal vegetation, predominantly pampas grass. No hydrophytic plants were observed in the channel. Segment 1-2 conveys ephemeral flows to Segment 1-3.

Segment 1-3

Open Drainage Segment 1-3 is a constructed diversion ditch running parallel to the slope collecting runoff and seepage from the terrace upslope, the slope to the north, and from Segment 1-2 and Segment 2-1. The channel is characterized by presence of a bed and shallow banks. Due to the very minimal longitudinal gradient, the OHWM is not characterized by scour, but by suppression of vegetation due to seasonal ponding. At the time of the survey, standing water was present for large areas of the segment, indicating an intermittent hydrological regime. No hydrophytic plants were observed in the channel. Segment 1-3 conveys ephemeral flows to Segment 1-4.

Segment 1-5

Open Drainage Segment 1-5 is a constructed diversion ditch connecting flows from Segment 1-4 to the natural remnant creek channel, Segment 1-5. The channel is characterized by presence of a narrow bed and cut banks. The OHWM is not characterized by scour. At the time of the survey, no standing or flowing water was present, indicating an ephemeral hydrological regime. No hydrophytic plants were observed in the channel.

Segment 1-5 and Segment 1-6

Open Drainage Segment 1-5 and Segment 1-6 are part of a natural second order stream that conveys flows from all the headwater sections upslope as shown on Exhibit 3. The channel is characterized by presence of relatively wide bed and banks. The OHWM is characterized by scour and sediment deposits. At the time of the survey, no flowing water but soil moisture was present. Given substantial rainfall throughout the weeks before the delineation, lack of flowing or standing water indicates a likely ephemeral flow regime. This drainage segment is located under predominantly closed canopy of shrub and tree cover, including coast live oak, and a robust population of willow. Understory is very sparse and where present, ruderal. No hydrophytic plants were observed in the channel. Segment 1-6 terminates at a culvert inlet to convey flows under Sir Francis Drake Boulevard to the lagoon of Remillard Park, an artificial impoundment of San Francisco Bay.

Segment 2-1, Segment 3-1, and Segment 4-1

Open Drainage Segment 2-1, Segment 3-1, and Segment 4-1 are natural first order tributary channels terminating in various segments of Tributary 1 as shown on Exhibit 3. These segments are characterized by presence of incised bed and banks. The OHWM of these channels are characterized by scour and sediment deposits. At the time of the survey, no flowing water but soil moisture was present. Given substantial rainfall throughout the weeks before the delineation, lack of flowing or standing water indicates a likely ephemeral flow regime of these channels. Theses drainages are lined with vegetation similar to the surrounding areas, comprising of predominantly coyote brush, French broom, and coast live oak. Understory is sparse and ruderal and dominated by a mix of non-native upland grasses and forbs. No hydrophytic plants were observed in the channels.

Segment 5-1 and Segment 5-3

Open Drainage Segment 5-1 and Segment 5-2 are part of a small open drainage channels now vegetated but originally constructed to drain the northern hillside and the graded central terrace. The channel is characterized by presence of bed and banks. Sediment deposits are present. At the time of the survey, no standing or flowing water was present, indicating an ephemeral hydrological regime. No hydrophytic plants were observed in the channel. Segment 5-3 terminates at Culvert 5-4.

5.2.2 - Culverts

Culvert 5-2 and Culvert 5-4

Culvert 5-2 is a corrugated pipe that hydrologically connects Segment 5-2 to Segment 5-3. Culvert 5-4 conveys flow from Segment 5-3 under Sir Francis Drake Boulevard to the lagoon of Remillard Park, an artificial impoundment of San Francisco Bay.

5.3 - United States Fish and Wildlife Service National Wetland Inventory and MarinMap Results

The USFWS NWI (and subsequently the MarinMap Wetland layer, which integrates NWI data), depicts a 0.98-acre freshwater emergent wetland within the Study Area, located south and southwest of drainage channel Segments 1-5, 1-6, and 4-1.[13] However, per the NWI, this determination was only made based on high altitude imagery, and according to the NWI Data Limitations information, "a margin of error is inherent in the use of imagery; thus, detailed on the ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis." Additionally, the USFWS clarifies that NWI mapping is not adequate to be used to establish regulatory boundaries or jurisdiction.

However, presence of NWI-mapped wetlands could indicate potential presence of actual existing jurisdictional wetlands, if confirmed on the ground through protocol-level delineation field work. Therefore, FCS established two wetland sample points within and near the area of question (Appendix C; SP-1 and SP-2). The results demonstrate that the area does not meet the USACE and RWQCB definitions of a wetland, specifically, the area lacks the required combination of sufficient hydrophytic vegetation, hydrology indicators, and/or hydrophytic soil indicators. Absence of wetland indicators were not caused by abnormally dry conditions, because the delineation was conducted during the wet season and following a period of normal aggregate rainfall as demonstrated by the WETS analysis (see Section 5.1 and Appendix B).

These results, supported by the observation that the area consists of a slope readily drained by channel Segments 1-5, 1-6, and 4-1, FCS concludes that the wetland currently mapped by the NWI should be considered a "false-positive" artifact generated by over-interpretation of aerial imagery. No freshwater emergent wetland is currently present at this area (or at other locations in the Study Area; as demonstrated through an additional wetland sample point, SP-3).

Additionally, linear wetland/water features shown by NWI and MarinMapper within the Study Area are inconsistent with conditions on the ground as established through the protocol-level wetland/water delineation presented here, and are therefore not considered adequate to determine location and extent of potential jurisdictional aquatic resources.

5.4 - Proposed Jurisdictional Determination

5.4.1 - Proposed United States Army Corps of Engineers Jurisdiction

For the purpose of this analysis, FCS assumes that the August 30, 2021, action by the U.S. District Court for the District of Arizona to vacate and remand the Navigable Water Protection Rule means that current federal jurisdictional determinations of what constitutes a water of the United States follows implementation and interpretation of *Rapanos v. United States* and C*arabell v. United States*.

[13] United States Fish and Wildlife Service (USFWS). National Wetland Inventory (NWI). Website: https://www.fws.gov/wetlands/data/mapper.html. Accessed December 2021.

Per USACE and EPA guidance related to these cases, as summarized in a Memorandum dated December 2, 2008, and entitled "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States," FCS assumes that the USACE will decide jurisdiction over non-navigable tributaries that are not relatively permanent, based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water.

Given that the drainages delineated within the Study Area appear to be hydrologically connected to a potential jurisdictional water of the United States formed by the lagoon of Remillard Park, an impoundment of San Francisco Bay, and presumably then to San Francisco Bay itself, a Traditional Navigable Water of the United States (TNW), a significant nexus between the drainages (i.e., tributaries) and a TNW is likely present.

Therefore, the drainages as shown on Exhibit 3 are potential waters of the United States. Note that a binding significant nexus analysis and final JD can only be made by the USACE and/or the EPA following verification.

5.4.2 - Proposed Regional Water Quality Control Board Jurisdiction

Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (Water Code § 13050(e)), and are under the jurisdiction of the RWQCB. Therefore, FCS proposes that that all drainages within the Study Area boundary as shown on Exhibit 3 would fall under the jurisdiction of the RWQCB. This proposed JD is preliminary until confirmed by the RWQCB.

5.4.3 - California Department of Fish and Wildlife Streambed Alteration Program Considerations

Because of the presence of drainage beds and banks, it is expected that the CDFW will assert regulatory oversight over potential impacts on all drainage channels and associated vegetation pursuant to California Fish and Game Code Section 1602 *et seq*. (Streambed Alteration Program). It is expected that the CDFW will classify all vegetation in the drainages and trees with canopies overhanging the drainages, and all willow trees associated with Drainage Segment 1-5 and Segment 1-6 as "riparian vegetation." It is expected that the CDFW will require a Notification of Streambed Alteration and subsequent Streambed Alteration Agreement for any work that could adversely affect the drainages on-site and associated riparian vegetation.

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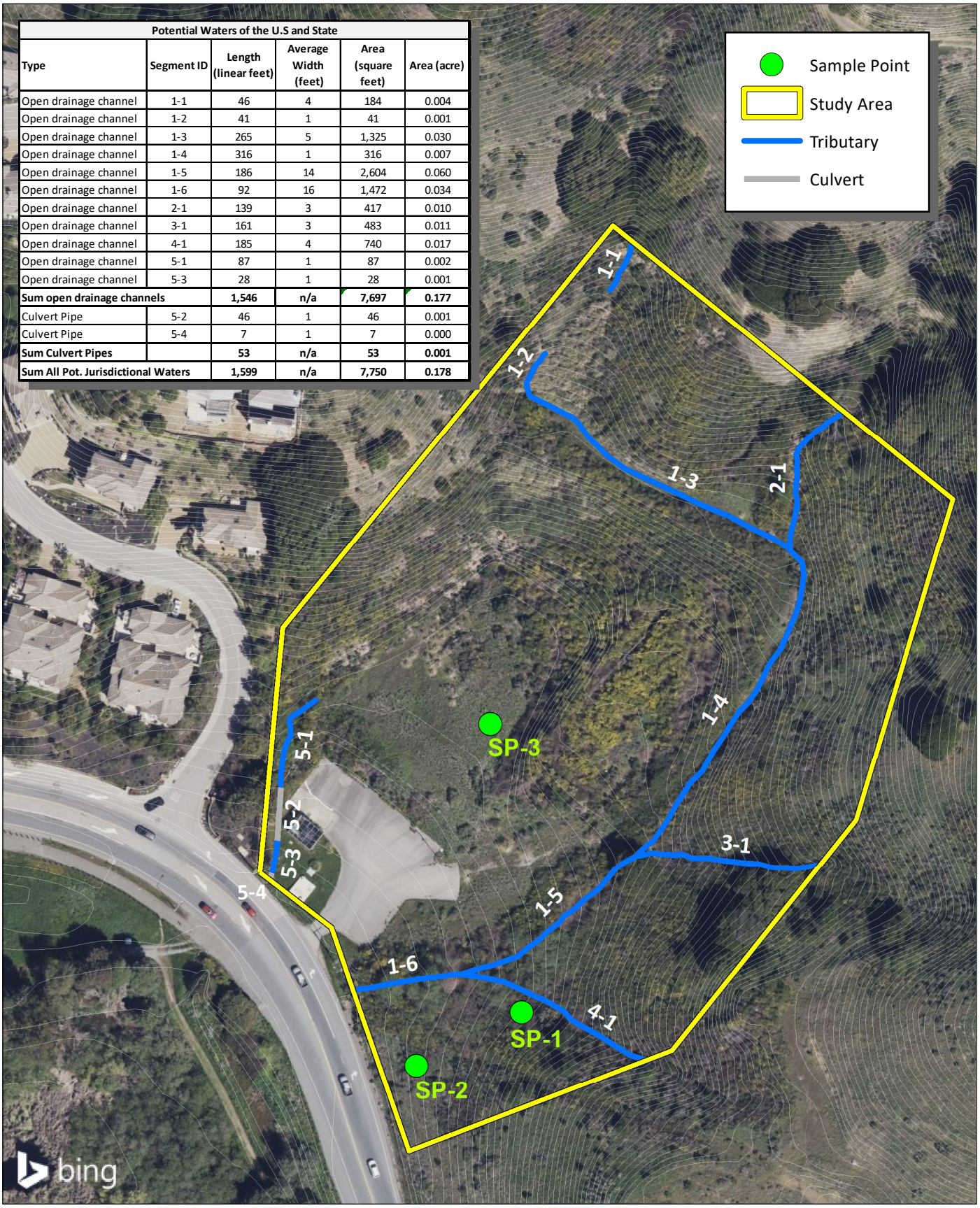
Potential Waters of the U.S and State					
Type	Segment ID	Length (linear feet)	Average Width (feet)	Area (square feet)	Area (acre)
Open drainage channel	1-1	46	4	184	0.004
Open drainage channel	1-2	41	1	41	0.001
Open drainage channel	1-3	265	5	1,325	0.030
Open drainage channel	1-4	316	1	316	0.007
Open drainage channel	1-5	186	14	2,604	0.060
Open drainage channel	1-6	92	16	1,472	0.034
Open drainage channel	2-1	139	3	417	0.010
Open drainage channel	3-1	161	3	483	0.011
Open drainage channel	4-1	185	4	740	0.017
Open drainage channel	5-1	87	1	87	0.002
Open drainage channel	5-3	28	1	28	0.001
Sum open drainage channels		**1,546**	**n/a**	**7,697**	**0.177**
Culvert Pipe	5-2	46	1	46	0.001
Culvert Pipe	5-4	7	1	7	0.000
Sum Culvert Pipes		**53**	**n/a**	**53**	**0.001**
Sum All Pot. Jurisdictional Waters		**1,599**	**n/a**	**7,750**	**0.178**



Source: FCS

FIRSTCARBON SOLUTIONS™

50 25 0 50
Feet

Exhibit 3
Aquatic Resources Delineation

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SECTION 6: CONCLUSION

The Study Area includes five open and vegetated ephemeral and intermittent channels that function as tributaries (and two segments consisting of connecting culvert pipes) for a total length of 1,599 feet of tributary, covering an aggregate area of approximately 7,750 square feet (0.178 acre), as shown on Exhibit 3. No additional aquatic features, including wetlands, were observed within the Study Area. All tributaries are likely regulated as waters of the United States and State.

Additionally, any impacts on drainage channels and associated riparian vegetation are expected to be regulated by the CDFW pursuant to the Streambed Alteration Program, California Fish and Game Code Section 1602 *et seq*.

The findings and conclusions presented in this report, including the location and extent of waters subject to regulatory jurisdiction, represent the professional opinion of FCS. These findings and conclusions should be considered preliminary until confirmed by the USACE, RWQCB, and CDFW.

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Appendix A: Photographs

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Photograph 1: Looking east, riparian willows along drainage channel segment 1-5.

Photograph 2: Upland shrubs on hillside at location of SP-1, looking south.

Photograph 3: Conditions at location of SP-1, looking north.

Photograph 4: Herbaceous cover at location of SP-2, looking west at Sir Francis Drake Boulevard

Photograph 5: Conditions at location of SP-2, looking south at Sir Francis Drake B

Photograph 6: Constructed diversion ditch (drainage segment 1-4) along access road (left side of photograph). Photo facing southwest.

Photograph 7: Scour in Drainage Segment 1-4.

Photograph 8: Standing water in constructed diversion ditch parallel to the eastern slope (drainage segment 1-3). Facing northeast.

Photograph 9: Standing water in constructed diversion ditch parallel to the eastern slope (drainage segment 1-3). Facing northwest.

Photograph 10: Drainage segment 5-1 looking south.

Photograph 11: Culvert draining into Segment 5-3 facing south towards Sir Francis Drake Boulevard

Photograph 12: Culvert at bottom of Drainage Segment 5-1.

Photograph 13: Overhead view of conditions at location of SP-3.

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Appendix B:
WETS Analysis

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WETS Analysis for Oakhill Apartment Project JD, Marin County, CA
based on 30 year averages of Kentfield, Marin WETS Station

Month	30% Chance Precipitation is less or equal than (in)	Average	30% Chance Precipitation more than (in)	Observed rainfall (inch)	Condition (dry, wet, normal)	Condition Value*	Weighting Factor	Product of previous 2 columns
November	2.18	4.66	5.69	4.25	normal	2	3	6
October	0.52	2.59	2.37	20.4	wet	3	2	6
September	0.00	0.09	0.06	0	dry	1	1	1
							Sum=**	**13**

**If sum is:	
6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

*Condition Values:
Dry=1
Normal=2
Wet=3

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Appendix C:
Wetland Delineation Data Forms

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Quentin City/County: Marin Sampling Date: 12/10/21
Applicant/Owner: Thompson Dorfman, LLC State: CA Sampling Point: 1
Investigator(s): B. Warzecha, R. Carroll, A. Villarreal Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slope Slope (%): 3
Subregion (LRR): _____ Lat: 37°56'37.22" N Long: 122°30'4.77" W 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 ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 25 ft²)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 75 ft²)			
1. Baccharis pilularis	50	Y	UPL
2. Genista monospessulana	25	Y	UPL
3.			
4.			
5.			
	75 = Total Cover		
Herb Stratum (Plot size: 25 ft²)			
1. Chlorogalum pomeridianum	5		UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (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: 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12	10YR 5/4	93	5YR 4/6	7	C	M	clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Does not meet criteria of F6. Boundaries between matrix and redox color are not clearly defined.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ 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: Oak Hill SFR Quentin City/County: Marin Sampling Date: 12/10/12
Applicant/Owner: Thompson Dorfman, LLC State: CA Sampling Point: 3
Investigator(s): B. Warzecha, R. Carroll, A. Villanueva Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slope Slope (%): 2
Subregion (LRR): Lat: 37°56'36.71"N Long: 122°30'5.96"W 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 ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 25 ft²)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 25 ft²)			
1. Baccharis pilularis	20	Y	UPL
2. Genista monospessulana	50	Y	UPL
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 25 ft²)			
1. Dipsacus fullonum	7		FAC
2. Bromus sp.	10	Y	FACU
3. Chlorogalum pomeridianum	1		UPL
4. Geranium dissectum	3		FAC
5. Poa sp.	10	Y	N/A
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (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:
Poa sp. not able to be identified to species at the time of delineation.

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12	10 YR 4/4	100					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, 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 Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ 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: Oak Hill Sc. City/County: Marin Sampling Date: 12/10/21

Applicant/Owner: Thompson Dortmon, LLC State: CA Sampling Point: 3

Investigator(s): R. Warzecha, R. Carroll, A. Villemaire Section, Township, Range: N/A

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

Subregion (LRR): ______ Lat: 37°56'38" N Long: 122°30'5.20" W 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 ___	Is the Sampled Area within a Wetland? Yes ___ No ✓
Hydric Soil Present?	Yes ___ No ✓	
Wetland Hydrology Present?	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: 25 ft²)			
1. Dipsacus fullonum	40	Y	FAC
2. Polypogon sp.	50	Y	FAC
3. Carduus pycnocephalus	10		UPL
4.			
5.			
6.			
7.			
8.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	90	x 3 = 270
FACU species		x 4 =
UPL species	10	x 5 = 50
Column Totals:	100 (A)	330 (B)

Prevalence Index = B/A = 3.3

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: 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
3	10YR/4/2	100					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: gravel fill

Depth (inches): 3

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 Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ____ No ✓ 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 D:
USACE Preliminary Jurisdictional Determination

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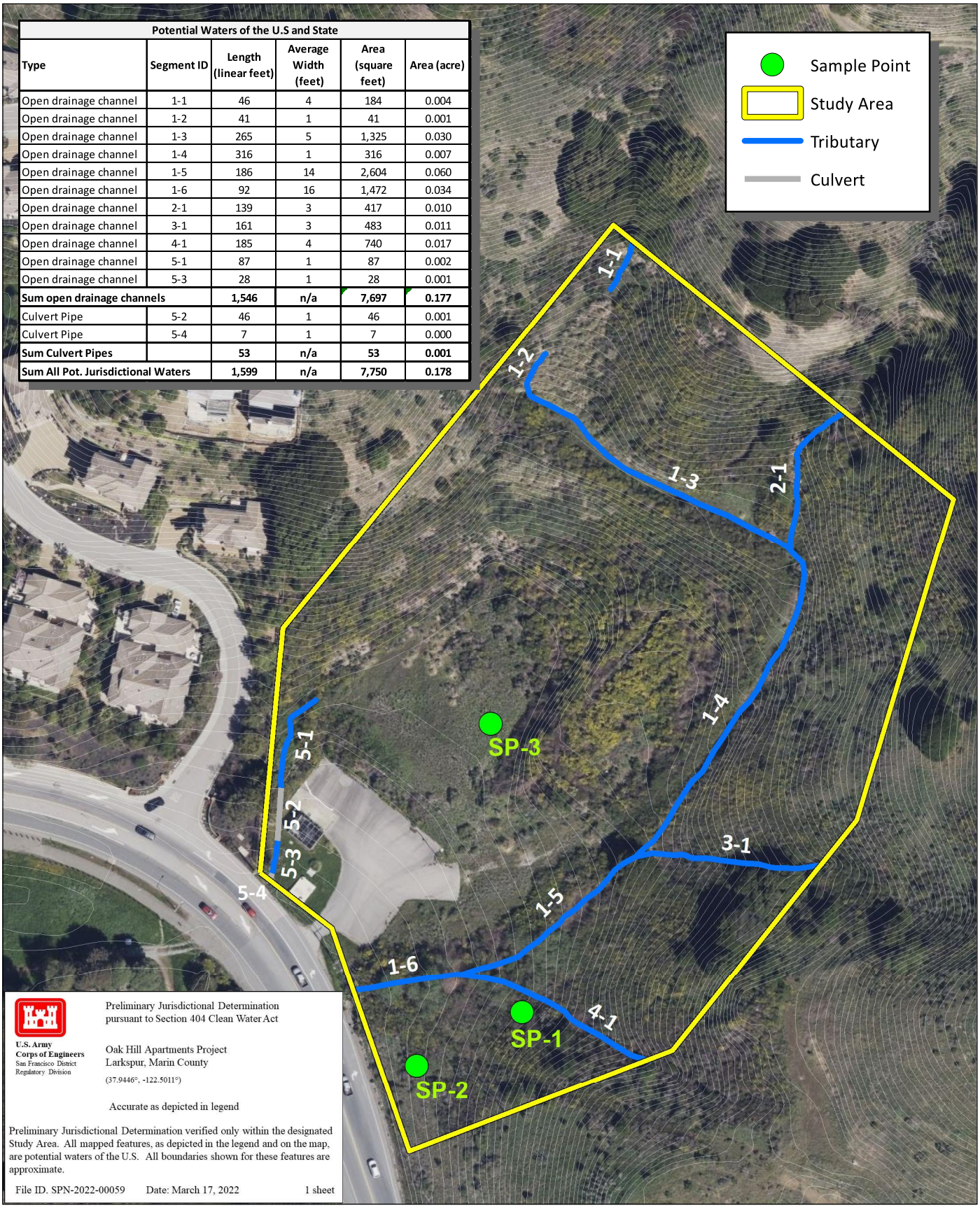

Source: FCS

FIRSTCARBON SOLUTIONS™

50 25 0 50 Feet

Exhibit 3
Aquatic Resources Delineation

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Appendix E:
Preliminary Arborist Report

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Preliminary Arborist Report

Oak Hill Apartments
Marin County, CA

PREPARED FOR:
First Carbon Solutions
1350 Treat Blvd., Suite 380
Walnut Creek, CA 94597

PREPARED BY:
HortScience | Bartlett Consulting
325 Ray Street
Pleasanton, CA 94566

February 2022

HORT SCIENCE
BARTLETT CONSULTING
Divisions of The F.A. Bartlett Tree Expert Company

Preliminary Arborist Report

Oak Hill Apartments
Marin County, CA

Table of Contents

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Assessment Methods	1
Description of Trees	2
Suitability for Preservation	4
Preliminary Evaluation of Impacts and Recommendations	5
Preliminary Tree Preservation Guidelines	7

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Table 1. Condition ratings and frequency of occurrence of trees	2
Table 2. Tree suitability for preservation	5
Table 3. Preliminary tree disposition	6

Attachments

Tree Assessment Form

Tree Assessment Plan

Preliminary Arborist Report

Oak Hill Apartments
Marin County, CA

Introduction and Overview

First Carbon Solutions (FCS), working with Eden Housing and Education Housing Partners, Inc., is preparing plans for a 6.7-acre site in Marin County. The undeveloped site is located across from Remillard Park on East Sir Francis Drake Blvd. (near San Quentin). HortScience | Bartlett Consulting (Divisions of The F.A. The Bartlett Expert Tree Company) was asked to prepare a **Preliminary Arborist Report** for the site.

This report provides the following information:

1. A survey of trees within and adjacent to the proposed project area.
2. An assessment of each tree's health, structure, and protected or heritage status.
3. An assessment of each tree's suitability for preservation based on their health, structure, and potential longevity.
4. Preliminary recommendations for action based on conceptual plans.

Assessment Methods

Trees were assessed on January 13 and 19, 2022. All trees measuring 4 inches or greater in diameter, within the project area or with portions of their crowns extending into the project area, were included in the assessment per Marin County Code 24.04. The assessment procedure consisted of the following steps:

1. Identifying the tree species.
2. Verifying or tagging trees and recording locations on a map.
3. Measuring the trunk diameter at a point 54 inches above grade.
4. Evaluating the health and structural condition using a scale of 1 – 5:
    - ***5*** - A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.
    - ***4*** - Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
    - ***3*** - Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.
    - ***2*** - Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
    - ***1*** - Tree in severe decline, dieback of scaffold branches and/or trunk; most of foliage from epicormics; extensive structural defects that cannot be abated.
5. Rating the suitability for preservation as "high", "moderate" or "low". Suitability for preservation considers the health, age and structural condition of the tree, and its potential to remain an asset to the site for years to come.
    - ***High***: Trees with good health and structural stability that have the potential for longevity at the site.
    - ***Moderate***: Trees with somewhat declining health and/or structural defects than can be abated with treatment. The tree will require more intense management, monitoring, and may have shorter life span than those in 'high' category.
    - ***Low***: Trees in poor health or with significant structural defects that cannot be mitigated. Tree is expected to continue to decline, regardless of treatment. The species or individual may have characteristics that are undesirable for landscapes, and generally are unsuited for use areas.

Description of Trees

Seventeen (17) trees (numbered #301-317) were assessed, representing 3 species. Lombardy poplar, an ornamental species, was growing close to the road and represented the only non-native tree on the site. Coast live oak and arroyo willow are native to the Marin County area and these 16 trees may have been indigenous. Trees were in clusters around the perimeter of the site. Coast live oak #306 was located off-site with a portion of its canopy extending into the proposed project area. Overall, five trees were in good condition, nine were in fair condition, and three were in poor condition (Table 1). Descriptions of each tree can be found in the ***Tree Assessment Form*** and approximate locations are shown on the ***Tree Assessment Plan*** (see *Attachments*).

Table 1: Condition ratings and frequency of occurrence of trees Oak Hill Apartments Marin County, CA

Common Name	Scientific Name	Condition			Total
		Poor (1-2)	Fair (3)	Good (4-5)	
Lombardy poplar	*Populus nigra* 'Italica'	-	1	-	**1**
Coast live oak	*Quercus agrifolia*	1	8	5	**14**
Arroyo willow	*Salix lasiolepis*	2	-	-	**2**
Total		**3**	**9**	**5**	**17**

Among the 14 coast live oaks, five were in good condition, eight were in fair condition, and tree #315 was poor. Trees ranged in development from young to mature with trunk diameters ranging from 6 to 36 inches.

Structural issues were common among the oaks including narrow branch unions with included bark, slight to severe lean, and multi-stems that arose close to the ground. None of the oaks had good structure free of defects (Photo 1).

While most oaks had vigorous canopies, trees #305, #312, and #314 had thinning canopies with some leaf chlorosis. Tree #315 was in poor condition with a thinning canopy and twig and branch dieback. It had significant decayed and dead wood in the lower canopy that was laying directly on the ground (Photo 2). The tree had sunken areas in the bark and very little visible root flare (Photo 3).

Photo 1: Looking north along the property boundary at coast live oak #305. This tree had fused codominant stems arising from the base. It also had multiple attachments arising from 5' on its northern stem.

Photo 2 (left): Looking north at coast live oak #315. Most of the canopy was in decline with many limbs sitting directly on the ground and decaying.

Photo 3 (below): Looking southeast at arroyo willow #302. The tree is surrounded by branches and twigs from past failures.

Arroyo willows #301 and #302 were located in a creek channel on the southeastern end of the property, closer to East Sir Francis Drake Blvd. Tree #301 was located directly in front of a culvert. Both trees had codominant stems or multiple attachments which arose between the ground and 2 feet. The trees were semi-mature in development with stems that ranged in size from 5 to 9 inches. They were in poor condition with mostly dead branches and twigs. Tree #302 had multiple failed stems and branches (Photo 3).

Lombardy poplar #304 was planted at the southwest corner of the property closest to East Sir Francis Drake Blvd. The tree was semi-mature in development and had multiple attachments which ranged in diameter from 1 to 9 inches. Codominant stems arose from the base and split into multiple attachments at 3 feet (Photo 4).

Marin County Ordinance Article IV Chapter 22.62 defines certain native species with diameters of 6 inches or greater as *protected* and 18 inches or greater as *heritage*. Based on this definition, eleven of the trees, including both arroyo willows (#301 and #302) and nine of the coast live oaks, qualified as *protected*. An additional five coast live oaks qualified as *heritage*. Oaks represented the only *heritage* trees on-site. *Protected* and *heritage* trees are identified in the ***Tree Assessment Form*** (see Exhibits).

Photo 4: Looking west at Lombardy poplar #304 with East Sir Francis Drake Blvd in the background.

Suitability for Preservation

Before evaluating the impacts that will occur during development, it is important to consider the quality of the tree resource itself, and the potential for individual trees to function well over an extended length of time. Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment, and perform well in the landscape. Our goal is to identify trees that have the potential for long-term health, structural stability, and longevity within the proposed development.

Evaluation of suitability for preservation considers several factors:

- **Tree health**
  Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees. For example, the arroyo willows had low vigor with significant dieback and are less likely to tolerate construction impacts than coast live oaks #307, 308, and 309.

- **Structural integrity**
  Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely. The arroyo willows had significant dieback and decay with recent failures.

- **Species response**
  There is a wide variation in the response of individual species to construction impacts and changes in the environment. Arroyo willow and Lombardy poplar tolerate construction impacts moderately well while coast live oak is generally intolerant of construction impacts.

- **Tree age and longevity**
  Old trees, while having significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change.

- **Invasiveness**
  Species that spread across a site and displace desired vegetation are not always appropriate for retention. This is particularly true when indigenous species are displaced. The California Invasive Plant Inventory Database (http://www.cal-ipc.org/paf/) lists species identified as being invasive. Marin County is part of the Central West Floristic Province. None of the species onsite pose an invasive threat at this time.

Each tree was rated for suitability for preservation based upon its age, health, structural condition, and ability to safely coexist within a development environment (Table 2). We consider trees with high suitability for preservation to be the best candidates for preservation. We do not recommend retention of trees with low suitability for preservation in areas where people or property will be present. Retention of trees with moderate suitability for preservation depends upon the intensity of proposed site changes.

Table 2: Tree suitability for preservation
Oak Hill Apartments Marin County, CA

High	Trees in this category had good health and structural stability that have the potential for longevity at the site. No trees onsite had high suitability for preservation.
Moderate	Trees in this category have fair health and/or structural defects that may be abated with treatment. Trees in this category require more intense management and monitoring and may have shorter lifespans than those in the "high" category. Nine coast live oaks and Lombardy poplar #304 had moderate suitability for preservation.
Low	Trees in this category are in poor health or have significant defects in structure that cannot be abated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess either characteristics that are undesirable in landscape settings or be unsuited for use areas. Five coast live oaks and arroyo willows #301 and #302 had low suitability for preservation.

Preliminary Evaluation of Impacts and Recommendations

Appropriate tree retention requires a practical match between the location and intensity of construction activities with the quality and health of trees. The tree assessment was the reference point for tree condition and quality. Impacts from the proposed project were assessed using a conceptual site plan dated 11/04/21. Plans did not include surveyed trunk locations. In addition, grading, drainage, stormwater, utility, and landscape plans that could impact trees have yet to be prepared and were not reviewed for this report. When those plans are prepared, a more comprehensive assessment of impacts to trees and designation of tree protection measures can be prepared.

Development will build a large housing project on the property with associated grading and landscaping. Based on my observations and assessment, I recommend:

- Preservation of Lombardy poplar #304 and coast live oaks #305 and 311.
- Removal of 14 trees (Table 3).

Recommendations for action are considered preliminary.

Arroyo willows #301 and #302 as well as 12 coast live oaks appear to be within or abutting the development area. All 14 trees which were in this construction area were *protected* while coast live oaks #307, #310, and #315 were *heritage*.

Lombardy poplar #304 and coast live oaks #305 and #311 were likely located outside of the development area and could be preserved. Their preservation would be predicated on strict adherence to the ***Preliminary Tree Preservation Guidelines***. Both oaks were *protected* and tree #311 qualifies as *heritage*. Trees located outside of the project area will likely not be impacted. However, there is a possibility that trees along the access paths and or areas identified for construction staging may be impacted. These impacts are difficult to predict without surveyed trunk locations and more conclusive plans.

Table 3: Preliminary disposition
Oak Hill Apartments Marin County, CA

Tree No.	Species	Trunk Diameter (in.)	Protected Tree? / Heritage Status	Condition 1=poor 5=excellent	Suitability for Preservation	Disposition	Comments
301	Arroyo willow	9,5	Yes	1	Low	Remove	Within development area
302	Arroyo willow	9,9,8,7,6	Yes	1	Low	Remove	Within development area.
303	Coast live oak	8	Yes	3	Moderate	Remove	Within development area.
304	Lombardy poplar	9,8,7,2,2, 1,1	No	3	Moderate	Preserve	Likely outside of development area.
305	Coast live oak	19,10,8	Yes, Heritage	3	Moderate	Preserve	Likely outside of development area.
306	Coast live oak	6,3,2	Yes	3	Low	Remove	Offsite; canopy extends over property line by 2'; edge of development area.
307	Coast live oak	24	Yes, Heritage	4	Moderate	Remove	Within development area.
308	Coast live oak	6	Yes	4	Moderate	Remove	Within development area.
309	Coast live oak	7	Yes	4	Moderate	Remove	Within development area.
310	Coast live oak	34	Yes, Heritage	3	Moderate	Remove	Within development area.
311	Coast live oak	27	Yes, Heritage	4	Moderate	Preserve	Likely outside of development area.
312	Coast live oak	10	Yes	3	Low	Remove	Likely within development area.
313	Coast live oak	6,4	Yes	3	Low	Remove	Likely within development area.
314	Coast live oak	10,9	Yes	3	Low	Remove	Likely on edge of development area.
315	Coast live oak	36	Yes, Heritage	2	Low	Remove	Likely on edge of development area.
316	Coast live oak	7	Yes	3	Moderate	Remove	Within development area.
317	Coast live oak	11	Yes	4	Moderate	Remove	Within development area.

Preliminary Tree Preservation Guidelines

The goal of tree preservation is not merely tree survival during development but maintenance of tree health and beauty for many years. Trees retained on sites that are either subject to extensive injury during construction or are inadequately maintained become a liability rather than an asset. The response of individual trees will depend on the amount of excavation and grading, the care with which demolition is undertaken, and the construction methods. Coordinating any construction activity inside the **TREE PROTECTION ZONE** can minimize these impacts.

The following recommendations will help reduce impacts to trees from development and maintain and improve their health and vitality through the clearing, grading, and construction phases. Plans for development have not yet been finalized.

Tree should be preserved in groups where possible. Trees should be planted in raised boxes or with asphalt sounding them should be preserved in the planter. The following are recommendations for design and construction phases that will assist in successful tree preservation.

Design recommendations

1. Design improvements to remain as far away from coast live oak #311 as possible. Intrusion into the dripline should be avoided.
2. Any changes to the plans affecting the trees should be reviewed by the Project Arborist with regard to tree impacts. These include, but are not limited to, site plans, improvement plans, utility and drainage plans, grading plans, landscape and irrigation plans, and demolition plans.
3. Plan for tree preservation by designing adequate space around trees to be preserved. This area is called the **TREE PROTECTION ZONE:** No grading, excavation, construction or storage of materials should occur within that zone. Route underground services including utilities, sub-drains, water or sewer around the **TREE PROTECTION ZONE**. The tree protection zone shall be ten times the diameter or the entire dripline, whichever is larger. Areas of the **TREE PROTECTION ZONE** should be fenced to minimize impacts and staging in the **TREE PROTECTION ZONE**. To recommend **TREE PROTECTION ZONE** more conclusive plans will need to be reviewed.
4. Irrigation systems must be designed so that no trenching severs roots larger than 1 inch in diameter within the **TREE PROTECTION ZONE**.
5. Tree Preservation Guidelines prepared by the Project Arborist, which include specifications for tree protection during demolition and construction, should be included on all plans.
6. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use.
7. Do not lime the subsoil within 50 feet of any tree. Lime is toxic to tree roots.
8. Ensure adequate but not excessive water is supplied to trees; in most cases, occasional irrigation will be required. Avoid directing runoff toward trees.

Pre-demolition and pre-construction treatments and recommendations

1. The demolition and construction superintendents shall meet with the Project Arborist before beginning work to review all work procedures, access routes, storage areas, and tree protection measures.

2. Portions of the **TREE PROTECTION ZONE** should be fenced. Trees adjacent to demolition may require limb and trunk protection. This may be accomplished using foam wrapped with waddle and orange snow fencing to protect the areas where the limb (or trunk) is exposed to incidental contact.

    a. Prune trees to be preserved to clean the crown of dead branches 1 inch and larger in diameter, raise canopies as needed for construction activities. All pruning shall be done by a State of California Licensed Tree Contractor (C61/D49). All pruning shall be done by Certified Arborist or Certified Tree Worker in accordance with the Best Management Practices for Pruning (International Society of Arboriculture, 2002) and adhere to the most recent editions of the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300). The Project Arborist will provide pruning specifications prior to site demolition.

    b. Structures and underground features to be removed within the **TREE PROTECTION ZONE** shall use equipment that will minimize damage to trees above and below ground, and operate from outside the **TREE PROTECTION ZONE**. The Project Arborist shall be on site during all operations within the **TREE PROTECTION ZONE** to monitor demolition activity.

    c. All tree work shall comply with the Migratory Bird Treaty Act as well as California Fish and Wildlife code 3503-3513 to not disturb nesting birds. To the extent feasible tree pruning and removal should be scheduled outside of the breeding season. Breeding bird surveys should be conducted prior to tree work. Qualified biologists should be involved in establishing work buffers for active nests.

Recommendations for tree protection during construction

1. Any approved grading, construction, demolition or other work within the **TREE PROTECTION ZONE** should be monitored by the Project Arborist.
2. All contractors shall conduct operations in a manner that will prevent damage to trees to be preserved.
3. Tree protection devices are to remain until all site work has been completed within the work area. Fences or other protection devices may not be relocated or removed without permission of the Project Arborist.
4. Construction trailers, traffic and storage areas must remain outside **TREE PROTECTION ZONE** at all times.
5. Any root pruning required for construction purposes shall receive the prior approval of and be supervised by the Project Arborist. Roots should be cut with a saw to provide a flat and smooth cut. Removal of roots larger than 2 inches in diameter should be avoided.
6. If roots 1 inches and greater in diameter are encountered during site work and must be cut to complete the construction, the Project Arborist must be consulted to evaluate effects on the health and stability of the tree and recommend treatment.
7. Spoil from trench, footing, utility or other excavation shall not be placed within the **TREE PROTECTION ZONE**, neither temporarily nor permanently.
8. All grading within the dripline of trees shall be done using the smallest equipment possible. The equipment shall operate perpendicular to the tree and operate from outside the **TREE PROTECTION ZONE**. Any modifications must be approved and monitored by the Project Arborist.

9. All trees shall be irrigated on a schedule to be determined by the Project Arborist (every 3 to 6 weeks is typical). Each irrigation shall wet the soil within the **TREE PROTECTION ZONE** to a depth of 18-24 inches.
10. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Project Arborist so that appropriate treatments can be applied.
11. No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the **TREE PROTECTION ZONE**.
12. Any additional tree pruning needed for clearance during construction must be performed by a Certified Arborist and not by construction personnel or certified tree climber.
13. Trees that accumulate a sufficient quantity of dust on their leaves, limbs and trunk as judged by the Project Arborist shall be spray-washed at the direction of the Project Arborist.

Maintenance of impacted trees

Trees should be monitored and inspected annually and after major storms to identify conditions requiring treatment to manage risk associated with tree failure.

Preserved trees will experience a physical environment different from that pre-development. As a result, tree health and structural stability should be monitored. Occasional pruning, fertilization, mulch, pest management, replanting and irrigation may be required. In addition, provisions for monitoring both tree health and structural stability following construction must be made a priority. Inspect trees annually and following major storms to identify conditions requiring treatment to manage risk associated with tree failure.

Our procedures included assessing trees for observable defects in structure. This is not to say that trees without significant defects will not fail. Failure of apparently defect-free trees does occur, especially during storm events. Wind forces, for example, can exceed the strength of defect-free wood causing branches and trunks to break. Wind forces coupled with rain can saturate soils, reducing their ability to hold roots, and blow over defect-free trees. Although we cannot predict all failures, identifying those trees with observable defects is a critical component of enhancing public safety.

Furthermore, trees change over time. Our inspections represent the condition of the tree at the time of inspection. As trees age, the likelihood of failure of branches or entire trees increases. Annual tree inspections are recommended to identify changes to tree health and structure. In addition, trees should be inspected after storms of unusual severity to evaluate damage and structural changes. Initiating these inspections is the responsibility of the client and/or tree owner.

If you have any questions regarding my observations or recommendations, please contact me.

HortScience | Bartlett Consulting

Allegra Mautner, Consulting Arborist & Urban Forester
ISA Certified Arborist No. WE-10369A
ISA Tree Risk Assessment Qualified

Attachments

Tree Assessment Plan

Tree Assessment Form

Tree Assessment

First Carbon Solutions
Marin County, CA
February 2022

HORT SCIENCE
BARTLETT CONSULTING
Divisions of The F.A. Bartlett Tree Expert Company

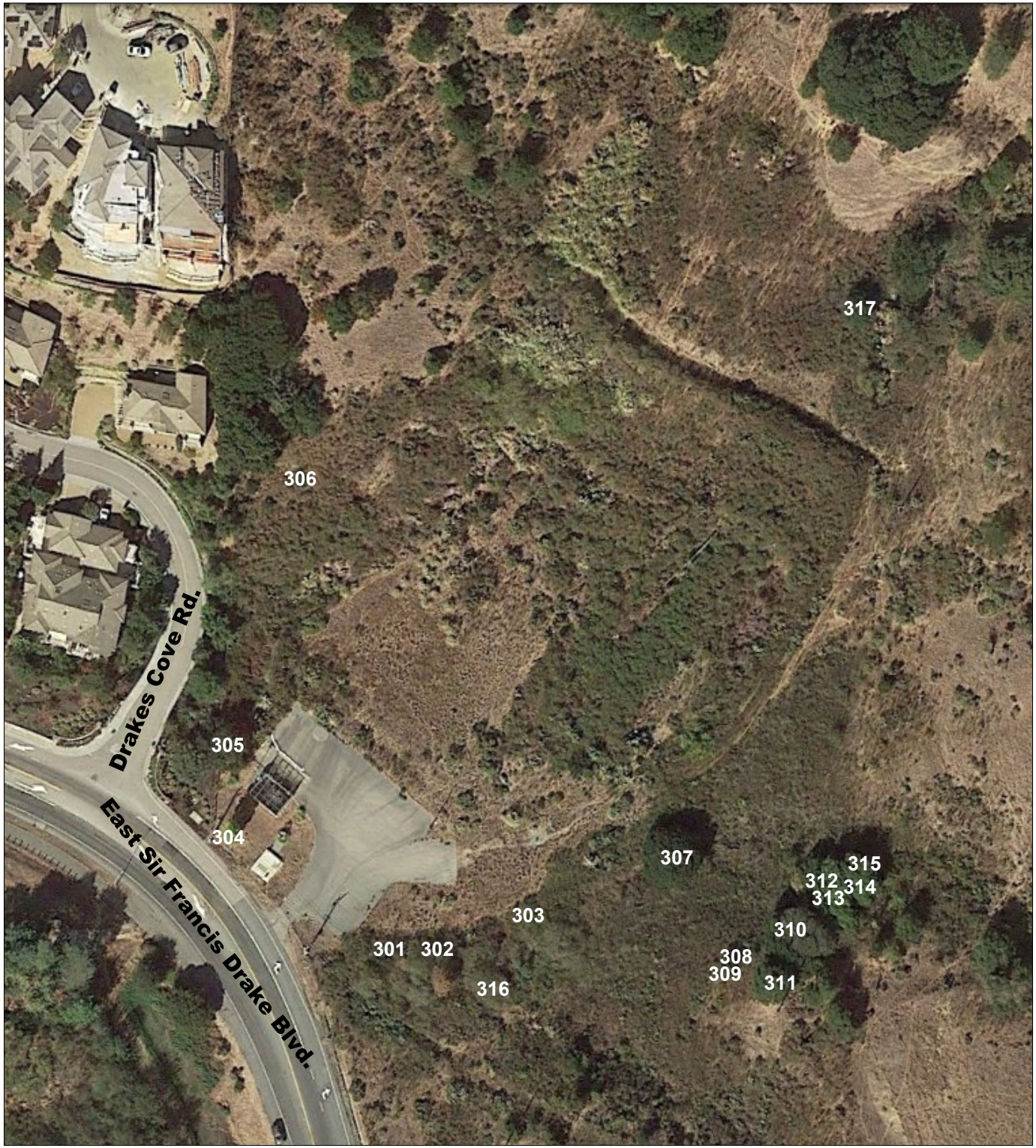
Tree No.	Species	Trunk Diameter (in.)	Protected Tree? / Heritage?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
301	Arroyo willow	9,5	Yes	1	Low	In opening in front of culvert; codominant stems arise from 2'; under high-voltage lines; multiple failed branches and stems; mostly dead twigs and branches.
302	Arroyo willow	9,9,8,7,6	Yes	1	Low	In channel; multiple stems arise from base; 9" stem laying on ground; mostly dead branches and twigs.
303	Coast live oak	8	Yes	3	Moderate	DBH below fused trunks; codominant stems arise from 3'; vigorous canopy; slight lean to SE.
304	Lombardy poplar	9,8,7,2,2,1,1	No	3	Moderate	Codominant stems arise from base; multiple attachments arise from 3'; vigorous canopy; upright structure; tight branch unions.
305	Coast live oak	19,10,8	Yes, Heritage	3	Moderate	3' from property fence in open landscape; codominant stems arise from base; S. stem forks at 2'; N. stem multiple attachments at 5'; thinning canopy with leaf chlorosis; S. stem slight S. lean; N. stem upright structure.
306	Coast live oak	6,3,2	Yes	3	Low	Offsite; no tag; open landscape; codominant stems arise from base; spreading canopy; canopy extends over property line by 2'; conflicting stems.
307	Coast live oak	24	Yes, Heritage	4	Moderate	Open grown in channel; large branch arise from 1' with included bark and seam; multiple attachments arise from 7' & 9' with included bark; wide, spreading canopy; vigorous foliage.
308	Coast live oak	6	Yes	4	Moderate	In small stand with 2 other oaks; single stem with branch arise from 1' with included bark; slight N lean from competing oak to S.; vigorous canopy.

Tree Assessment

First Carbon Solutions
Marin County, CA
February 2022

HORT SCIENCE
BARTLETT CONSULTING
Divisions of The F.A. Bartlett Tree Expert Company

Tree No.	Species	Trunk Diameter (in.)	Protected Tree? / Heritage?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
309	Coast live oak	7	Yes	4	Moderate	In small stand with 2 other oaks; multiple attachments arise from 5' with included bark; slight S.E. lean from competing oak to N.; vigorous canopy.
310	Coast live oak	34	Yes, Heritage	3	Moderate	Open grown on steep slope; multiple attachments at 4'; thinning, spreading canopy.
311	Coast live oak	27	Yes, Heritage	4	Moderate	Open grown on steep slope; multiple attachments at base with included bark; vigorous, spreading canopy.
312	Coast live oak	10	Yes	3	Low	Overtopped by #311 & #315; codominant stems arise from 4'; N. lean with sinuous stems; thin canopy.
313	Coast live oak	6,4	Yes	3	Low	Suppressed by #314 on N. side; codominant stems arousing at 2'; seeping on smaller S. stem; lopsided canopy.
314	Coast live oak	10,9	Yes	3	Low	Suppressed by #313 & #315; codominant stems arise from 1' with 1' seam; included bark on upright branches throughout canopy; thin & small canopy.
315	Coast live oak	36	Yes, Heritage	2	Low	On channel side; multiple attachments arise from 5'; sunken divots in bark; limbs branching to ground; dead and decaying lower canopy; thinning upper canopy; spreading canopy; twig & branch dieback; slight S.W. lean into
316	Coast live oak	7	Yes	3	Moderate	Could not access; trunk not visible; no tag; healthy crown.
317	Coast live oak	11	Yes	4	Moderate	Open grown; on slope; codominant stems at 3' & 5' with included bark; slightly thin canopy; spreading canopy.



Tree Assessment Plan

Oak Hill Apartments
Marin County, CA

Prepared for:
First Carbon Solutions
Walnut Creek, CA

January 2022

No Scale

Notes:
Base map provided by:
Google Earth

Numbered tree locations are approximate

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C.2 - Special-status Species Occurrence Evaluation

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Table 1: Special-status Plant Species Occurrence Evaluation

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Bryophytes					
Entosthodon kochii Koch's cord moss	—	—	1B.3	Cismontane woodland. Moss growing on soil on river banks. Elevation: 185-365 m. Bloom period: N/A	**None.** The project site does not contain cismontane woodland or streambed habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Fissidens pauperculus minute pocket moss	—	—	1B.2	North coast coniferous forest. Moss growing on damp soil along the coast. In dry streambeds and on stream banks. Elevation: 30-1025 m. Bloom period: N/A	**None.** The project site does not contain cismontane woodland or streambed habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Mielichhoferia elongate elongate copper moss	—	—	4.3	Cismontane woodland. Moss growing on very acidic, metamorphic rock or substrate; usually in higher portions in fens. Often on substrates naturally enriched with heavy metals (e.g. copper) such as mine tailings. Elevation: 5-1085 m. Bloom period: N/A	**None.** The project site does not contain cismontane woodland or very acidic metamorphic rock substrate, fens or mining tailings. Not observed during appropriately timed protocol-level rare plant surveys.
Triquetrella californica coastal triquetrella	—	—	1B.2	Coastal bluff scrub, coastal scrub. Grows within 30 m. from the coast in coastal scrub, grasslands and in open gravels on roadsides, hillsides, rocky slopes, and fields. On gravel or thin soil over outcrops. Elevation: 20-1175 m. Bloom period: N/A	**None.** The project site is located mora than 30 m. from the coast. Not observed during appropriately timed protocol-level rare plant surveys.
Dicots					
Amorpha californica var. napensis Napa false indigo	—	—	1B.2	Openings in broad-leafed upland forest, chaparral, and cismontane woodland. Elevation: 30-735 m. Bloom period: April-July	**None.** The project site does not contain broad-leafed upland forest or and cismontane woodland. Not observed during appropriately timed protocol-level rare plant surveys.
Amsinckia lunaris bent-flowered fiddleneck	—	—	1B.2	Cismontane woodland, valley and foothill grassland, coastal bluff scrub. Elevation: 3-795 m. Bloom period: March-June	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Arctostaphylos franciscana Franciscan manzanita	FE	—	1B.1	Chaparral. Serpentine outcrops in chaparral. Elevation: 30-215 m. Bloom period: February-April	**None.** The project site does not contain serpentine soils/substates. Not observed during appropriately timed protocol-level rare plant surveys.
Arctostaphylos montana ssp. montana Mt. Tamalpais manzanita	—	—	1B.3	Chaparral, valley and foothill grassland. Serpentine slopes in chaparral and grassland. Elevation: 150-680 m. Bloom period: February-April	**None.** The project site does not contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.
Arctostaphylos montana ssp. ravenii Presidio manzanita	FE	SE	1B.1	Chaparral, coastal prairie, coastal scrub. Open, rocky serpentine slopes. Elevation: 20-215 m. Bloom period: February-March	**None.** The project site does not contain serpentine soils/substates. Not observed during appropriately timed protocol-level rare plant surveys.
Arctostaphylos virgata Marin manzanita	—	—	1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, north coast coniferous forest on sandstone or granitic substrates. Elevation: 1-800 m. Bloom period: January-March	**None.** The project site does not contain broadleafed upland forest, closed-cone coniferous forest. Not observed during appropriately timed protocol-level rare plant surveys.
Arenaria paludicola marsh sandwort	FE	SE	1B.1	Marshes and swamps. Growing up through dense mats of *Typha, Juncus, Scirpus*, etc. in freshwater marsh. Sandy soil. Elevation: 3-170 m. Bloom period: May-August	**None.** The project site does not contain coastal freshwater marsh habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Astragalus pycnostachyus var. pycnostachyus coastal marsh milk-vetch	—	—	1B.2	Coastal dunes, marshes and swamps, coastal scrub. Mesic sites in dunes or along streams or coastal salt marshes. Elevation: 0-155 m. Bloom period: (April)June-October	**None.** The project site does not contain coastal dunes or salt marsh habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Astragalus tener var. tener alkali milk-vetch	—	—	1B.2	Alkali playa, valley and foothill grassland. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. Elevation: 0-168 m. Blooming period: March-June	**None.** The project site does not contain grassland, alkali playas or vernal pool habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Calystegia purpurata ssp. saxicola coastal bluff morning-glory	—	—	1B.2	Coastal dunes, coastal scrub, coastal bluff scrub, north coast coniferous forest. Elevation: 4-165 m. Blooming period: (March)April-September	**None.** The project site does not contain coastal dunes, coastal scrub or coniferous forests. Not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Cardamine angulate seaside bittercress	—	—	2B.1	North coast coniferous forest, lower montane coniferous forest. Wet areas, streambanks. Elevation: 5-515 m. Bloom period: March-July	**None.** The project site does not contain wet coniferous forests. Not observed during appropriately timed protocol-level rare plant surveys.
Castilleja affinis var. neglecta Tiburon paintbrush	FE	ST	1B.2	Valley and foothill grassland. Rocky serpentine sites. Elevation: 120-400 m. Bloom period: April-June	**None.** The project site does not contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.
Ceanothus decornutus Nicasio ceanothus	—	—	1B.2	Chaparral. Maritime chaparral; serpentinite, rocky, sometimes clay. Elevation: 235-290 m. Bloom period: March-May	**None.** The project site does not contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.
Ceanothus masonii Mason's ceanothus	—	CR	1B.2	Chaparral. Serpentine ridges or slopes in chaparral or transition zone. Elevation: 180-460 m. Bloom period: March-April	**None.** The project site does not contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	—	—	1B.2	Coastal salt marsh usually with *Salicornia*, *Distichlis*, *Jaumea*, *Spartina*, etc. Elevation: 0-115 m. Blooming period: June-November	**None.** The project site does not contain coastal salt marsh habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Chorizanthe cuspidata var. cuspidata San Francisco Bay spineflower	—	—	1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Closely related to *C. pungens*. Sandy soil on terraces and slopes. Elevation: 2-550 m. Bloom period: April-July(August)	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Cirsium andrewsii Franciscan thistle	—	—	1B.2	Coastal bluff scrub, broadleafed upland forest, coastal scrub, coastal prairie. Sometimes serpentine seeps. Elevation: 0-295 m. Bloom period: March-July	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Cirsium hydrophilum var. vaseyi Mt. Tamalpais thistle	—	—	1B.2	Broadleafed upland forest, chaparral, meadows and seeps. Serpentine seeps and streams in chaparral and woodland. Elevation: 180-610 m. Bloom period: May-August	**None.** The project site does not broadleafed upland forest/woodlands or contain serpentine soils/substates. The project site is below the elevation this species is known to occur. Not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Clarkia franciscana Presidio clarkia	FE	SE	1B.1	Coastal scrub, valley and foothill grassland. Serpentine outcrops in grassland or scrub. Elevation: 20-305 m. Bloom period: May-July	**None.** The project site does not contain serpentine soils. Not observed during appropriately timed protocol-level rare plant surveys.
Collinsia corymbose round-headed Chinese-houses	—	—	1B.2	Coastal dunes. Elevation: 0-30 m. Bloom period: April-June	**None.** The project site does not contain coastal dune habitat. Not observed during appropriately timed protocol-level rare plant surveys.
Collinsia multicolor San Francisco collinsia	—	—	1B.2	Closed-cone coniferous forest, coastal scrub. On decomposed shale (mudstone) mixed with humus; sometimes grows on serpentine soils. Elevation: 10-275 m. Blooming period: (February)March-May	**None.** The project site does contain coastal scrub/chaparral habitat and shale soils/substrates. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Dirca occidentalis western leatherwood	—	—	1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland. On brushy slopes, mesic sites; mostly in mixed evergreen & foothill woodland communities. Elevation: 20-640 m. Blooming period: January-March(April)	**None:** The project site does not contain suitable boradleafed or coniferous forest habitat to support this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Eriogonum luteolum var. caninum Tiburon buckwheat	—	—	1B.2	Chaparral, valley and foothill grassland, cismontane woodland, coastal prairie. Serpentine soils; sandy to gravelly sites. Elevation: 60-640 m. Bloom period: May-September	**None.** The project site does not contain serpentine soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Gilia capitata ssp. chamissonis blue coast gilia	—	—	1B.1	Coastal dunes, coastal scrub. Elevation: 3-200 m. Bloom period: April-July	**None.** The project site does not contain coastal dune habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Gilia capitata ssp. tomentosa woolly-headed gilia	—	—	1B.1	Coastal bluff scrub, valley and foothill grassland, riparian woodland. Rocky outcrops, sometimes serpentine. Elevation: 6-290 m. Bloom period: May-July	**None.** The project site does not contain serpentine soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Gilia millefoliata dark-eyed gilia	—	—	1B.2	Coastal dunes. Elevation: 1-60 m. Bloom period: April-July	**None.** The project site does not contain coastal dune habitat. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Grindelia hirsutula var. maritima San Francisco gumplant	—	—	3.2	Coastal scrub, coastal bluff scrub, valley and foothill grassland. Sandy or serpentine slopes, sea bluffs. Elevation: 15-305 m. Bloom period: June-September	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Helianthella castanea Diablo helianthella	—	—	1B.2	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade. Elevation: 45-1070 m. Bloom period: March-June	**None.** Species not observed during appropriately timed protocol-level rare plant surveys.
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	—	—	1B.2	Valley and foothill grassland. Grassy valleys and hills, often in fallow fields; sometimes along roadsides. Elevation: 5-520 m. Bloom period: April-November	**None.** The project site contains some disturbed grassland habitat. However, this species was not observed during appropriately timed protocol-level rare plant surveys.
Hesperolinon congestum Marin western flax	FT	ST	1B.1	Chaparral, valley and foothill grassland. In serpentine barrens and in serpentine grassland and chaparral. Elevation: 60-400 m. Bloom period: April-July	**None.** The project site does not contain serpentine soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Holocarpha macradenia Santa Cruz tarplant	FT	SE	1B.1	Coastal prairie, coastal scrub, valley and foothill grassland. On light, sandy soil or sandy clay; found often with non-natives. Elevation: 10-275 m. Blooming period: June-October	**None.** The project site does contain coastal scrub/chaparral habitat. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Horkelia cuneata var. sericea Kellogg's horkelia	—	—	1B.1	Closed-cone coniferous forest, coastal scrub, coastal dunes, chaparral. Old dunes, coastal sandhills; openings. Sandy or gravelly soils. Elevation: 5-430 m. Bloom period: April-September	**None.** The project site does not contain coniferous forest or coastal dunes with sandy or gravelly soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Horkelia marinensis Point Reyes horkelia	—	—	1B.2	Coastal dunes, coastal prairie, coastal scrub. Sandy flats and dunes near coast; in grassland or scrub plant communities. Elevation: 2-775 m. Bloom period: May-September	**None.** The project site does not contain coastal dunes or scrub/prairie vegetation with sandy soils. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Horkelia tenuiloba thin-lobed horkelia	—	—	1B.2	Broad-leafed upland forest, chaparral, valley and foothill grassland with sandy soils. Often found in mesic habitats. Elevation: 45-640 m. Bloom period: May-July (August)	**None:** The project site does not contain mesic boradleafed forest or grassland vegetation with sandy soils. Species not observed during appropriately timed protocol-level rare plant surveys.
Kopsiopsis hookeri small groundcone	—	—	2B.3	North coast coniferous forest. Open woods, shrubby places, generally on Gaultheria shallon. Elevation: 120-1435 m. Bloom period: April-August	**None.** The project site does not contain coniferous forests or woodland. The project site is below the elevation this species is known to occur. Species not observed during appropriately timed protocol-level rare plant surveys.
Layia carnosa beach layia	FE	SE	1B.1	Coastal dunes, coastal scrub. On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. Elevation: 3-30 m. Bloom period: March-July	**None.** The project site does not contain coastal dune habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Leptosiphon rosaceus rose leptosiphon	—	—	1B.1	Coastal bluff scrub. Elevation: 10-140 m. Bloom period: April-July	**None.** The project site does not contain coastal bluff scrub. Species not observed during appropriately timed protocol-level rare plant surveys.
Lessingia germanorum San Francisco lessingia	FE	SE	1B.1	Coastal scrub. On remnant dunes. Open sandy soils relatively free of competing plants. Elevation: 3-155 m. Bloom period: (June)July-November	**None.** The project site does not contain coastal dune habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Lessingia micradenia var. micradenia Tamalpais lessingia	—	—	1B.2	Chaparral, valley and foothill grassland. Usually on serpentine, in serpentine grassland or serpentine chaparral. Often on roadsides. Elevation: 60-305 m. Bloom period: (June)July-October	**None.** The project site does not contain serpentine soils. The project site is below the elevation this species is known to occur. Species not observed during appropriately timed protocol-level rare plant surveys.
Microseris paludosa marsh microseris	—	—	1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation: 3-610 m. Bloom period: April-June (July)	**None.** The project site does not contain coniferous forests, woodland, but could support grassland habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Navarretia rosulata Marin County navarretia	—	—	1B.2	Closed-cone coniferous forest, chaparral. Dry, open rocky places; can occur on serpentine. Elevation: 185-640 m. Bloom period: May-July	**None.** The project site does not contain coniferous forests or open rocky places. The project site is below the elevation this species is known to occur. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Pentachaeta bellidiflora white-rayed pentachaeta	FE	SE	1B.1	Valley and foothill grassland, cismontane woodland. Open dry rocky slopes and grassy areas, often on soils derived from serpentine bedrock. Elevation: 35-610 m. Bloom period: March-May	**None.** The project site does not contain serpentine soils/substrates. There is one occurrence located approximately 1,100 feet north of the project site, however agencies believe this species to be extirpated from this area. Species not observed during appropriately timed protocol-level rare plant surveys.
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	—	—	1B.2	Chaparral, coastal scrub, coastal prairie. Mesic sites. Elevation: 5-705 m. Bloom period: March-June	**None.** Suitable chaparral/coastal scrub habitat is present on-site. However, the nearest know occurrence of this species are located across San Francisco Bay. Species not observed during appropriately timed protocol-level rare plant surveys.
Plagiobothrys diffuses San Francisco popcornflower	—	SE	1B.1	Valley and foothill grassland, coastal prairie. Historically from grassy slopes with marine influence. Elevation: 45-360 m. Bloom period: March-June	**None.** The project site does have a maritime climate however it could contain grassland vegetation. Species not observed during appropriately timed protocol-level rare plant surveys.
Plagiobothrys glaber hairless popcornflower	—	—	1A	Meadows and seeps, marshes and swamps. Coastal salt marshes and alkaline meadows. Elevation: 5-125 m. Bloom period: March-May	**None.** The project site does not contain coastal salt marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Polemonium carneum Oregon polemonium	—	—	2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Elevation: 15-1525 m. Blooming period: April-September	**None:** The project site does not contain coastal prairie or coniferous forest vegetation. Species not observed during appropriately timed protocol-level rare plant surveys.
Polygonum marinense Marin knotweed	—	—	3.1	Marshes and swamps. Coastal salt marshes and brackish marshes. Elevation: 0-10 m. Bloom period: (April)May-August(October)	**None.** The project site does not contain coastal salt marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Quercus parvula var. tamalpaisensis Tamalpais oak	—	—	1B.3	Lower montane coniferous forest, cismontane woodland. Elevation: 200-640 m. Bloom period: March-April	**None.** Project site below known elevation for this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Sanicula maritima adobe sanicle	—	—	1B.1	Meadows and seeps, valley and foothill grassland, chaparral, coastal prairie. Moist clay or ultramafic soils. Elevation: 15-215 m. Bloom period: February-May	**None.** The project site does not contain meadow, seeps or prairie/grassland vegetation or contain ultramafic soils. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	—	—	1B.2	Marshes and swamps. Freshwater marshes near the coast. Elevation: 5-95 m. Bloom period: April-September	**None.** The project site does not contain coastal freshwater marsh habitat.
Sidalcea hickmanii ssp. viridis Marin checkerbloom	—	—	1B.1	Chaparral. Serpentine or volcanic soils; sometimes appears after burns. Elevation: 1-425 m. Bloom period: May-June	**None.** The project site does not contain serpentine or volcanic soils.
Silene scouleri ssp. scouleri Scouler's catchfly	—	—	2B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland. Elevation: 5-315 m. Bloom period: (March)June-August(September)	**None.** The project site does not contain coastal prairie, but contains patches of grassland habitat. Species was not observed during appropriately timed protocol-level rare plant surveys.
Silene verecunda ssp. verecunda San Francisco campion	—	—	1B.2	Coastal scrub, valley and foothill grassland, coastal bluff scrub, chaparral, coastal prairie. Often on mudstone or shale; one site on serpentine. Elevation: 30-645 m. Bloom period: February (March)-July(August)	**None.** The project site contains chaparral/scrub habitat and shale soils/substrates. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Spergularia macrotheca var. longistyla long-styled sand-spurrey	—	—	1B.2	Alkaline marshes and swamps, meadows and seeps. Elevation: 0-220 m. Blooming period: February-May	**None.** The project site does not contain alkaline freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Stebbinsoseris decipiens Santa Cruz microseris	—	—	1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. Open areas in loose or disturbed soil, usually derived from sandstone, shale or serpentine, on seaward slopes. Elevation: 90-750 m. Blooming period: April-May	**None.** The project site contains suitable chaparral/scrub habitat and shale soils/substrates. Project site shows evidence of previous disturbance and human use. Species not observed during appropriately timed protocol-level rare plant surveys.
Streptanthus batrachopus Tamalpais jewelflower	—	—	1B.3	Closed-cone coniferous forest, chaparral. Talus serpentine outcrops. Elevation: 335-670 m. Bloom period: April-July	**None.** The project site does not contain closed-cone coniferous forest or serpentine soils/substrates. The project site is below the elevation this species is known to occur. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Streptanthus glandulosus ssp. niger Tiburon jewelflower	FE	SE	1B.1	Valley and foothill grassland. Shallow, rocky serpentine slopes. Elevation: 30-150 m. Bloom period: May-June	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Streptanthus glandulosus ssp. pulchellus Mt. Tamalpais bristly jewelflower	—	—	1B.2	Chaparral, valley and foothill grassland. Serpentine slopes. Elevation: 125-670 m. Bloom period: May-July(August)	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Symphyotrichum lentum Suisun Marsh aster	—	—	1B.2	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with *Phragmites*, *Scirpus*, blackberry, *Typha*, etc. Elevation: 0-15 m. Blooming period: May-November	**None.** The project site does not contain brackish or freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Trifolium amoenum two-fork clover	FE	—	1B.1	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite) Elevation: 5-415 m. Bloom period: April–June	**None.** The project site does contain some disturbed grassland habitat, but no serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Trifolium hydrophilum saline clover	—	—	1B.2	Mesic, alkaline sites such as marshes and swamps, valley and foothill grassland, vernal pools. Elevation: 1-335 m. Blooming period: April-June	**None.** The project site does not contain alkaline marshes vernal pools or other mesic habitats. Species not observed during appropriately timed protocol-level rare plant surveys.
Triphysaria floribunda San Francisco owl's-clover	—	—	1B.2	Coastal prairie, coastal scrub, valley and foothill grassland. On serpentine and non-serpentine substrate (such as at Pt. Reyes). Elevation: 1-150 m. Bloom period: April-June	**None.** The project site does not contain coastal prairie or suitable grassland habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Lichens					
Hypogymnia schizidiata island tube lichen	—	—	1B.3	Chaparral, closed-cone coniferous forest. On bark and wood of hardwoods and conifers. Elevation: 255-545 m. Bloom period: N/A	**None.** Project site below known elevation for this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Monocots					

Scientific Name Common Name	Status			Habitat Description[4]	Occurrence Determination and Rationale
	USFWS[1]	CDFW[2]	CNPS[3]		
Alopecurus aequalis var. sonomensis Sonoma alopecurus	FE	—	1B.1	Freshwater marshes and swamps, riparian scrub, and riparian banks, with other wetland species. Elevation: 5-360 m. Bloom period: May-July	**None.** The project site does not contain freshwater marsh or riparian habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Calamagrostis crassiglumis Thurber's reed grass	—	—	2B.1	Coastal scrub, marshes and swamps. Usually in marshy swales surrounded by grassland or coastal scrub. Elevation: 5-50 m. Bloom period: May-August	**None.** The project site does not contain coastal freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Calochortus tiburonensis Tiburon mariposa-lily	—	—	1B.1	Valley and foothill grassland. On open, rocky, slopes in serpentine grassland. Elevation: 50-150 m. Bloom period: March-June	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Carex comosa bristly sedge	—	—	2B.1	Marshes and swamps, coastal prairie, valley and foothill grassland. Lake margins, wet places. Elevation: 0-1010 m. Bloom period: May-September	**None.** The project site does not contain suitable wetland habitat to support this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Carex lyngbyei Lyngbye's sedge	—	—	2B.2	Marshes and swamps (brackish or freshwater). Elevation: 0-200 m. Bloom period: April-August	**None.** The project site does not contain brackish or freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Carex praticola northern meadow sedge	—	—	2B.2	Wet meadows and seeps. Elevation: 15-3200 m. Blooming period: May-July	**None.** The project site does not contain suitable wetland habitat to support this species. Species not observed during appropriately timed protocol-level rare plant surveys.
Fritillaria lanceolata var. tristulis Marin checker lily	—	—	1B.1	Coastal bluff scrub, coastal scrub, coastal prairie. Occurrences reported from canyons and riparian areas as well as rock outcrops; often on serpentine. Elevation: 5-305 m. Bloom period: February-May	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.
Fritillaria liliacea fragrant fritillary	—	—	1B.2	Coastal scrub, valley and foothill grassland, coastal prairie, cismontane woodland. Often grows on serpentine soils. Can grow on other soil types such as clay soils in grassland habitats. Elevation: 3-385 m. Blooming period: February-April	**None.** The project site does not contain serpentine soils/substrates. Species not observed during appropriately timed protocol-level rare plant surveys.

Scientific Name Common Name	Status USFWS[1]	Status CDFW[2]	Status CNPS[3]	Habitat Description[4]	Occurrence Determination and Rationale
Heteranthera dubia water star-grass	—	—	2B.2	Marshes and swamps. Alkaline, still or slow-moving water. Requires a pH of 7 or higher, usually in slightly eutrophic waters. Elevation: 15-1510 m. Bloom period: July-October	**None.** The project site does not contain alkaline marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.
Pleuropogon hooverianus North Coast semaphore grass	—	ST	1B.1	Broadleafed upland forest, meadows and seeps, north coast coniferous forest. Wet grassy, usually shady areas, sometimes freshwater marsh; associated with forest environments. Elevation: 45-1160 m. Bloom period: April-June	**None.** The project site does not contain broadleafed upland forest, coniferous forest or freshwater marsh habitat. Species not observed during appropriately timed protocol-level rare plant surveys.

Code Designations

[1] Federal Status: 2020 USFWS Listing

- **ESU** = Evolutionary Significant Unit is a distinctive population.
- **FE** = Listed as endangered under the FESA.
- **FT** = Listed as threatened under the FESA.
- **FC** = Candidate for listing (threatened or endangered) under FESA.
- **FD** = Delisted in accordance with the FESA.
- **FPD** = Federally Proposed to be Delisted.
- **MBTA** = protected by the Migratory Bird Treaty Act
- **—** = Not federally listed

[2] State Status: 2020 CDFW Listing

- **SE** = Listed as endangered under the CESA.
- **ST** = Listed as threatened under the CESA.
- **SSC** = Species of Special Concern as identified by the CDFW.
- **FP** = Listed as fully protected under FGC.
- **CFG** = FGC =protected by FGC 3503.5
- **CR** = Rare in California.
- **—** = Not state listed

[3] CNPS: 2020 CNPS Listing

- **Rank 1A** = Plants species that presumed extinct in California.
- **Rank 1B** = Plant species that are rare, threatened, or endangered in California and elsewhere.
- **Rank 2** = Plant species that are rare, threatened, or endangered in California, but more common elsewhere.
- **Rank 3** = Plants about which we need more information—A Review List
- **Rank 4** = Plants of limited distribution—A Watch List

Blooming period: Months in parentheses are uncommon.

[4] **Habitat Description**: Habitat description adapted from CNDDB and CNPS online inventory or other specified source.

Sources:

California Department of Fish and Wildlife (CDFW). 2021. CNDDB RareFind 5 California Natural Diversity Database Query for Special-Status Species. Website: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx. Accessed July 28, 2021.
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Natural Resources Conservation Service (NRCS). 2020. Web Soil Survey (WSS). United States Department of Agriculture (USDA). Website: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed July 28, 2021.
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Table 2: Special-status Wildlife Species Occurrence Evaluation

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Amphibians				
Dicamptodon ensatus California giant salamander	— 	— SSC	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.	**None.** The project parcel does not contain suitable habitat to support this species. No wet forests or cold, clear streams are on site or in dispersal distance. Closest known occurrence is from 1954 associated with Larkspur Creek. None observed during several surveys.
Rana boylii foothill yellow-legged frog	—	FE SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in forests, chaparral, and woodlands. Needs at least some cobble-sized substrate for egg-laying.	**None.** The project parcel does not contain suitable aquatic or riparian habitat to support this species. All known historic occurrences of this species within 4 miles are considered extirpated (CNDDB). None observed during several surveys.
Rana draytonii California red-legged frog	FT	— SSC	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.	**None.** The project parcel does not contain suitable aquatic or riparian habitat to support this species. Closest known occurrences are northeast of San Rafael, more than twice the dispersal range, including substantial barriers. None observed during several surveys.
Birds				
Accipiter cooperii Cooper's hawk	— MBTA	— WL FGC	Prefers woodland habitat, chiefly of open, interrupted or marginal type, including cismontane woodlands, riparian forests/woodlands and upper montane coniferous forest. May also occur near parks and residential areas. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	**Low.** The few trees located on the project site or within disturbance distance have the potential to supporting nesting. Not observed during several surveys.
Asio flammeus short-eared owl	— MBTA	— SSC FGC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Needs tule patches/tall grass for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	**None.** The project does not contain suitable nesting habitat in the form of tule patches or tall grass. None observed during several surveys.
Athene cunicularia burrowing owl	— MBTA	— SSC FGC	Found in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. A subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	**None.** Site lacks habitat features required for this species, including burrow complexes, open and short grassland cover. No signs of this species were observed during several surveys.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Charadrius nivosus nivosus western snowy plover	FT MBTA	— SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**None.** The project site lacks suitable nesting habitat in the form of sandy or gravelly beaches, levees or lake shores.
Circus hudsonius northern harrier	— MBTA	— SSC	Found in coastal salt and freshwater marshes. Ground nester in shrubby vegetation usually at marsh edge.	**None.** Site does not contain marsh or marsh edge. No suitable nesting habitat present. Species not observed during several surveys.
Cypseloides niger black swift	— MBTA	— SSC	Coastal belt of Santa Cruz and Monterey counties; central & southern Sierra Nevada; San Bernardino & San Jacinto mountains. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.	**None.** The project site does not contain suitable nesting habitat in the form of cliffs, deep canyons or bluffs. None observed during several surveys.
Elanus leucurus white-tailed kite	— MBTA	— FP	Often found near foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland or isolated dense-topped trees for nesting and perching. Forages in open grasslands, meadows, or marshes.	**Low.** The project site contains a few suitable nesting trees. Suitable grassland and saltmarsh foraging habitat can be found nearby. None observed during several surveys.
Falco peregrinus anatum American peregrine falcon	FD MBTA	SD FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	**None.** The project site does not contain cliffs or tall man-made structures suitable for nesting. None observed during several surveys.
Geothlypis trichas sinuosa saltmarsh common yellowthroat	— MBTA	— SSC	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.	**None.** The project site lacks suitable salt marsh habitat to support this species. None observed during several surveys.
Laterallus jamaicensis coturniculus California black rail	— MBTA	ST FP	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.	**None.** The project site lacks marsh or meadow habitat to support this species.
Melospiza melodia pusillula Alameda song sparrow	— MBTA	— SSC	Resident of salt marshes bordering south arm of San Francisco Bay. Inhabits *Salicornia* marshes; nests low in *Grindelia* bushes (high enough to escape high tides).	**None.** The project site lacks suitable salt marsh habitat to support this species. None observed during several surveys.
Melospiza melodia samuelis San Pablo song sparrow	— MBTA	— SSC	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.	**None.** The project site lacks suitable salt marsh habitat to support this species. None observed during several surveys.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Phalacrocorax auratus double-crested cormorant	— MBTA	— WL	Requires large water bodies big enough to support their mostly fish diet. However, they may roost and form breeding colonies on smaller lagoons or ponds. In addition to fishing waters, cormorants need high, airy perches to dry off and digest their meals (rocks, wires, tops of dead trees, ship masts). This species tend to form breeding colonies in clusters of trees in or near water. Nests can be on the ground, on rocks or reefs with no vegetation, or atop trees.	**None.** The project site lacks suitable nesting habitat in the form of tree clusters, rocks or reefs. None observed during several surveys.
Rallus obsoletus obsoletus California Ridgway's rail	FE MBTA	SE FP	Salt and brackish marshes in the vicinity of the San Francisco Bay. Associated with abundant *Salicornia*.	**None.** The project site lacks suitable salt marsh habitat to support this species. None observed during several surveys.
Riparia riparia bank swallow	— MBTA	ST	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.	**None.** The project site lacks suitable nesting habitat in the form of riparian banks or cliffs. None observed during several surveys.
Strix occidentalis caurina northern spotted owl	FT MBTA	ST FGC	Old-growth conifer or redwood forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. High, multistory canopy dominated by big trees, many trees with cavities or broken tops, woody debris, and space under canopy.	**None (nesting).** Known to occur in Marin, including the San Anselmo and Corte Madera Area, so it is possible that a vagrant dispersing individual may at some point visit the project site. However, the project does not contain suitable nesting habitat, and no nests are known to occur within disturbance distance. Project site may constitute a population sink for this species. This species was not observed during several surveys.
Crustaceans				
Syncaris pacifica California freshwater shrimp	FE	SE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from main streamflow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**None.** The project site lacks suitable aquatic habitat to support this species.
Fish				
Eucyclogobius newberryi tidewater goby	FE	—	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.	**None.** The project site lacks suitable aquatic habitat to support this species.
Lavinia symmetricus ssp. 2 Tomales roach	—	— SSC	Found within tributaries to Tomales Bay.	**None.** The project site lacks suitable aquatic habitat to support this species.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Oncorhynchus kisutch (pop. 4) coho salmon (central California coast ESU) [1]	FE	SE	Preferred habitat consists of low-gradient coastal streams. Species requires beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water & sufficient dissolved oxygen.	**None.** The project site lacks suitable aquatic habitat to support this species.
Oncorhynchus mykiss irideus (pop. 8) steelhead (central California coast DPS)[2]	FT	—	Steelhead require cool, swift, shallow water & clean loose gravel for spawning, & suitably large pools in which to spend the summer. Minimum water depth for upstream migration is 18 cm. Water velocities greater than 3-4 m/sec may impede upstream progress.	**None.** The project site lacks suitable aquatic habitat to support this species.
Pogonichthys macrolepidotus Sacramento splittail	—	— SSC	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.	**None.** The project site lacks suitable aquatic habitat to support this species.
Spirinchus thaleichthys longfin smelt	FC	ST	Bays, estuaries, and nearshore coastal areas, and migrate into freshwater rivers to spawn. Spawning occurs primarily from January through March.	**None.** The project site lacks suitable aquatic habitat to support this species.
Thaleichthys pacificus eulachon	FT	—	Found in Klamath River, Mad River, Redwood Creek, and in small numbers in Smith River and Humboldt Bay tributaries. Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand, and woody debris.	**None.** The project site lacks suitable aquatic habitat to support this species.
Insects				
Danaus plexippus (pop. 1) monarch butterfly (California overwintering population)	FC	—	Roosts located in wind protected Eucalyptus, Monterey pine, and Cypress tree groves with nectar and water sources nearby.	**None.** The project site does not contain suitable tree groves to support overwintering populations of this species. No known overwintering site known nearby. No monarch hostplants (*Asclepius* spp.) present on site.
Euphydryas editha bayensis Bay checkerspot butterfly	FT	—	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. *Plantago erecta* is the primary host plant; *Orthocarpus densiflorus* & *O. purpurscens* are the secondary host plants.	**None.** The project site does not contain serpentine soils necessary to support this species' host plants.

[1] Federal listing = pops between Punta Gorda & San Lorenzo River. State listing = pops south of Punta Gorda. Source: CNDDB 2021.
[2] 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. Source: CNDDB 2021.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Plebejus icarioides missionensis Mission blue butterfly	FE	—	Inhabits grasslands of the San Francisco peninsula. Three larval host plants: *Lupinus albifrons*, *L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.	**None.** Site outside known range for this species.
Speyeria callippe callippe callippe silverspot butterfly	FE	—	Restricted to the northern coastal scrub of the San Francisco peninsula. Hostplant is *Viola pedunculata*. Most adults found on east facing slopes; males congregate on hilltops in search of females.	**None.** Site outside known range for this species.
Mammals				
Antrozous pallidus pallid bat	—	— SSC	Inhabits low elevation (below 1,830 m./6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forests (below 2,100 m./7,000 feet). Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees, and various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings.	**Low.** The project site contains a few trees which may provide suitable roosting habitat.
Aplodontia rufa phaea Point Reyes mountain beaver	—	— SSC	Coastal area of Point Reyes in areas of springs or seepages. North-facing slopes of hills and gullies in areas overgrown with sword ferns and thimbleberries.	**None.** The project site does not contain suitable habitat and is located outside the know range of this species.
Corynorhinus townsendii Townsend's big-eared bat	—	— SSC	Found throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. This species is extremely sensitive to human disturbance.	**Low.** The project site contains a few trees which may provide suitable roosting habitat. Disturbance levels likely too high at the site for this species.
Enhydra lutris nereis southern sea otter	FT	— FP	Nearshore marine environments from about Ano Nuevo, San Mateo Co. to Point Sal, Santa Barbara Co. Needs canopies of giant kelp & bull kelp for rafting & feeding. Prefers rocky substrates with abundant invertebrates.	**None.** The project site does not contain suitable marine habitat to support this species. The project site is cut off from Bay shore via Sir Francis Drake Boulevard.
Eumetopias jubatus Steller (northern) sea-lion	FD	—	Breeds on Ano Nuevo, San Miguel and Farallon islands, Point St. George, & Sugarloaf. Hauls-out on islands & rocks. Needs haul-out and breeding sites with unrestricted access to water, near aquatic food supply and with no human disturbance.	**None.** The project site does not contain suitable marine habitat to support this species. The project does not border the ocean.
Lasiurus blossevillii western red bat	—	— SSC	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	**Low.** The project site contains a few trees which may provide suitable roosting habitat.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		
Microtus californicus sanpabloensis San Pablo vole	—	— SSC	Saltmarshes of San Pablo Creek, on the south shore of San Pablo Bay. Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow.	**None.** The project site does not contain saltmarsh habitat to support this species.
Reithrodontomys raviventris salt-marsh harvest mouse	FE	SE FP	Saline emergent wetlands of San Francisco Bay and it's tributaries. *Salicornia* is primary habitat but may occur in other marsh vegetation types.	**None.** The project site does not contain aquatic habitat with *Salicornia* present.
Sorex ornatus sinuosus Suisun shrew	—	— SSC	Tidal marshes of the northern shores of San Pablo and Suisun bays. Require dense low-lying cover and driftweed and other litter above the mean hightide line for nesting and foraging.	**None.** The project site does not contain saltmarsh habitat to support this species.
Sorex vagrans halicoetes salt-marsh wandering shrew	—	— SSC	Salt marshes of the southern portion of the San Francisco Bay. Marsh, wetland, or swamps with Salicornia and abundant driftwood	**None:** The project site does not contain aquatic habitat with *Salicornia* present.
Taxidea taxus *American badger*	—	— SSC	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 large burrows.	**None.** No suitable habitat present. Site isolated from in-migration from known occurrences. No signs of badger dens observed during multiple surveys.
Zapus trinotatus orarius *Point Reyes jumping mouse*	—	— SSC	Primarily in bunch grass marshes on the uplands of Point Reyes. Also present in coastal scrub, grassland, and meadows. Eats mainly grass seeds w/ some insects & fruit taken. Builds grassy nests on ground under vegetation, burrows in winter.	**None.** The project site lacks bunch grass marshes and is located outside of the known range of this species.
Reptiles				
Emys marmorata western pond turtle	—	— SSC	Occurs in 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.	**None.** The project parcel does not contain suitable aquatic to support this species.

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale[4]
	USFWS[1]	CDFW[2]		

Code Designations

[1] Federal Status: 2020 USFWS Listing		[2] State Status: 2020 CDFW Listing	
ESU	= Evolutionary Significant Unit is a distinctive population.	**SE**	= Listed as endangered under the CESA.
FE	= Listed as endangered under the FESA.	**ST**	= Listed as threatened under the CESA.
FT	= Listed as threatened under the FESA.	**SSC**	= Species of Special Concern as identified by the CDFW.
FC	= Candidate for listing (threatened or endangered) under FESA.	**FP**	= Listed as fully protected under FGC.
FD	= Delisted in accordance with the FESA.	**CFG**	= FGC =protected by FGC 3503.5
FPD	= Federally Proposed to be Delisted.	**CE**	= Candidate endangered under the CESA.
MBTA	= protected by the Migratory Bird Treaty Act	**WL**	= Species monitored by CDFW "Watch List".
—	= Not federally listed	**—**	= Not state listed

[3] **Habitat Description**: Habitat description adapted from CNDDB or other specified source*.
[4] **Potential to Occur and Rationale**: Location of recorded species occurrences determined by geospatial information from BIOS 5 or other specified source*.

Sources:

California Department of Fish and Wildlife (CDFW). 2021. CNDDB RareFind 5 California Natural Diversity Database Query for Special-Status Species. Website: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx. Accessed July 28, 2021.
California Department of Fish and Wildlife (CDFW). 2021. Biogeographic Information and Observation System (BIOS 5). Website: https://map.dfg.ca.gov/bios/. Accessed July 28, 2021.
iNaturalist. 2021. Observations: northern spotted owl (*Strix occidentalis caurina*) https://www.inaturalist.org/. Accessed July 28, 2021.

C.3 - Plant List

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Plant species observed during botanical surveys at the Oak Hill site, Marin County, California, on February 25, April 25, and June 23 (2022), by Dr. Chris DiVittorio and Dr. Zoya Akulova.

Scientific name & CNPS Status (if any)	Common name	Native
Acmispon parviflorus	Hill lotus	yes
Aira caryophyllea	Silver hairgrass	no
Artemisia californica	California sagebrush	yes
Avena fatua	Wild oats	no
Baccharis pilularis ssp. *consanguinea*	Coyote brush	yes
Bellardia trixago	Mediterranean lineseed	no
Brachypodium distachyon	False brome	no
Briza maxima	Rattlesnake grass	no
Briza minor	Little quacking grass	no
Bromus caroli-henrici	Weedy brome	no
Bromus diandrus	Ripgut brome	no
Bromus hordeaceus	Soft chess	no
Bromus madritensis	Madrid brome	no
Calendula arvensis	Field marigold	no
Calystegia occidentalis	Bush morning glory	yes
Cardamine oligosperma	Bitter cress	yes
Carduus pycnocephalus	Italian thistle	no
Carex densa	Dense sedge	yes
Carex gracilior	Slender sedge	yes
Carex tumulicola	Split awn sedge	yes
Chlorogalum pomeridianum var. *pomeridianum*	Soap plant	yes
Cirsium vulgare	Bull thistle	no
Conium maculatum	Poison hemlock	no
Convolvulus arvensis	Field bindweed	no
Cordyline australis	Cabbage tree	no
Cortaderia jubata	Pampas grass	no
Cotoneaster lacteus	Milkflower cotoneaster	no
Cotoneaster pannosus	Woolly cotoneaster	no
Cotula coronopifolia	Brass buttons	no
Cynosurus echinatus	Dog tail	no
Cyperus eragrostis	Tall flatsedge	yes
Danthonia californica	California oat grass	yes
Dipsacus sativus	Teasel	no
Dittrichia graveolens	Stinkwort	no
Ehrharta erecta	Panic veldtgrass	no
Eleocharis macrostachya	Common spikerush	yes
Elymus triticoides	Creeping wildrye	yes
Erodium botrys	Broad leaf filaree	no
Erodium cicutarium	Redstem filaree	no
Erodium moschatum	Whitestem filaree	no
Eschscholzia californica	California poppy	yes
Festuca bromoides	Brome fescue	no
Festuca perennis	Italian ryegrass	no

Foeniculum vulgare	Sweet fennel	no
Galium aparine	Common bedstraw	yes
Gastridium phleoides	Nit grass	no
Genista monspessulana	French broom	no
Geranium dissectum	Cut-leaf geranium	no
Geranium molle	Woodland geranium	no
Hedypnois rhagadioloides	Crete weed	no
Helminthotheca echioides	Prickly x-tongue	no
Hemizonia congesta ssp. *lutescens*	Hayfield tarweed	yes
Hirschfeldia incana	Short-pod mustard	no
Hordeum brachyantherum	Meadow barley	yes
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	no
Hordeum murinum ssp. *leporinum*	Lepor barley	no
Hypochaeris glabra	Smooth cat's ears	no
Hypochaeris radicata	Rough cat's ears	no
Juncus bufonius	Toad rush	yes
Juncus patens	Common rush	yes
Juncus tenuis	Path rush	yes
Koeleria gerardii	Annual June grass	no
Linum bienne	Narrowleaf flax	no
Logfia gallica	Narrow-leaf cottonrose	no
Lotus corniculatus	Bird's foot trefoil	no
Lysimachia arvensis	Scarlet pimpernel	no
Lythrum hyssopifolia	Hyssop loosestrife	no
Madia gracilis	Grassy tarweed	yes
Medicago polymorpha	Bur-clover	no
Melica californica	California melic grass	yes
Melilotus indicus	Annual yellow sweetclover	no
Mentha pulegium	Pennyroyal	no
Parentucellia viscosa	Yellow glandweed	no
Phalaris aquatica	Harding grass	no
Plantago coronopus	Buckhorn plantain	no
Plantago lanceolata	English plantain	no
Polypodium calirhiza	Licorice fern	yes
Polypogon monspeliensis	Rabbitsfoot grass	no
Populus nigra 'Italica'	Lombardy poplar	no
Prunus cerasifera	Wild plum	no
Pseudognaphalium californicum	California cudweed	yes
Pseudognaphalium luteoalbum	Jersey cudweed	no
Pyracantha fortuneana	Firethorn	no
Quercus agrifolia	Coast live oak	yes
Quercus berberidifolia	Scrub oak	yes
Raphanus sativus	Wild radish	no
Rosa spp.	Cultivated rose	no
Rubus armeniacus	Himalayan blackberry	no
Rumex crispus	Curly dock	no
Salix lasiolepis	Arroyo willow	yes
Sanicula bipinnatifida	Purple sanicle	yes
Scrophularia californica	Bee plant	yes

Sisyrinchium bellum	Blue-eyed grass	yes
Solanum americanum	Small-flowered Nightshade	yes
Sonchus asper ssp. *asper*	Prickly sow thistle	no
Sonchus oleraceus	Common sow thistle	no
Stipa pulchra	Purple needle grass	yes
Symphoricarpos mollis	Snowberry	yes
Symphyotrichum chilense	California aster	yes
Taraxia ovata	Sun cups	yes
Toxicodendron diversilobum	Poison oak	yes
Trifolium campestre	Field clover	no
Trifolium dubium	Little hop clover	no
Trifolium hirtum	Rose clover	no
Trifolium subterraneum	Subterranean clover	no
Triteleia laxa	Ithuriel's spear	yes
Vicia sativa	Common vetch	no
Wyethia angustifolia	Narrow leaf mule's ears	yes
Zeltnera muehlenbergii	Muehlenberg's centaury	yes

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C.4 - Aquatic Resources Delineation

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Aquatic Resources Delineation Report
Oak Hill Apartment Project
Marin County, California

Prepared for:
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39 Forrest Street
Mill Valley, CA 94941

Prepared by:
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Date: January 12, 2022

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SECTION 1: INTRODUCTION

At the request of the project applicant, Thompson Dorfman, LLC, FirstCarbon Solutions (FCS) completed a delineation of aquatic resources and proposes a Jurisdictional Determination (JD) for the Oak Hill Apartment Project Study Area (Study Area) as depicted on Exhibit 1 through Exhibit 3.

The purpose of this report is to support jurisdictional determinations by the United States Army Corps of Engineers (USACE) and the Regional Water Quality Control Board (RWQCB); to support California Department of Fish and Wildlife (CDFW) evaluation pursuant to Fish and Game Code Sections 1602 *et seq*. (Streambed Alteration Program); and to support the project applicant's planning and permitting efforts for a proposed development project.

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SECTION 2: ENVIRONMENTAL SETTING

2.1 - Location

The 6.7-acre Study Area is located in unincorporated Marin County, California and borders the City of Larkspur, California. The Study Area is located across the street from Remillard Park, north of Sir Francis Drake Boulevard. The Study Area is centered around 37.944566° latitude and -122.501095 longitude. The regional location of the Study Area is within the northern San Francisco Bay region, as shown on Exhibit 1, and the Study Area boundary on a recent high-resolution aerial image is shown on Exhibit 2.

2.2 - Vegetation and Land Cover Types

Vegetation of different areas of the Study Area is dominated by typical upland vegetation for this location, including non-native annual grassland, French broom (*Genista monspessulana*), coyote brush (*Baccharis pilularis*), coast live oak (*Quercus agrifolia*), pampas grass (*Cortaderia selloana*) and others. A robust small stand of willows (*Salix* sp.) is located along the lower reach of one of the drainages. Vegetation associated with open drainage channels is described for each feature in more detail, below. No obligate wetland plant species were observed in the channels or anywhere within the Study Area.

2.3 - Topography and Hydrogeomorphology

The Study Area is located on the toe of a ridge forming a peninsular extending into the northern San Francisco Bay. The western part of the Study Area consists of a relatively steep slope, while the eastern part consists of a terrace, including an area graded to accommodate a shooting range in the past. Elevations range from 20 feet above mean sea level (MSL) on the western boundary, to 145 feet MSL on the eastern hill slope. Subsequently, the site drains direct precipitation from the slopes west and south of the Study Area through the site via a network of first and second order ephemeral drainage channels and conveys collected runoff through two channels and culverts under Sir Francis Drake Boulevard to the lagoon at Remillard Park, an artificial impoundment of San Francisco Bay.

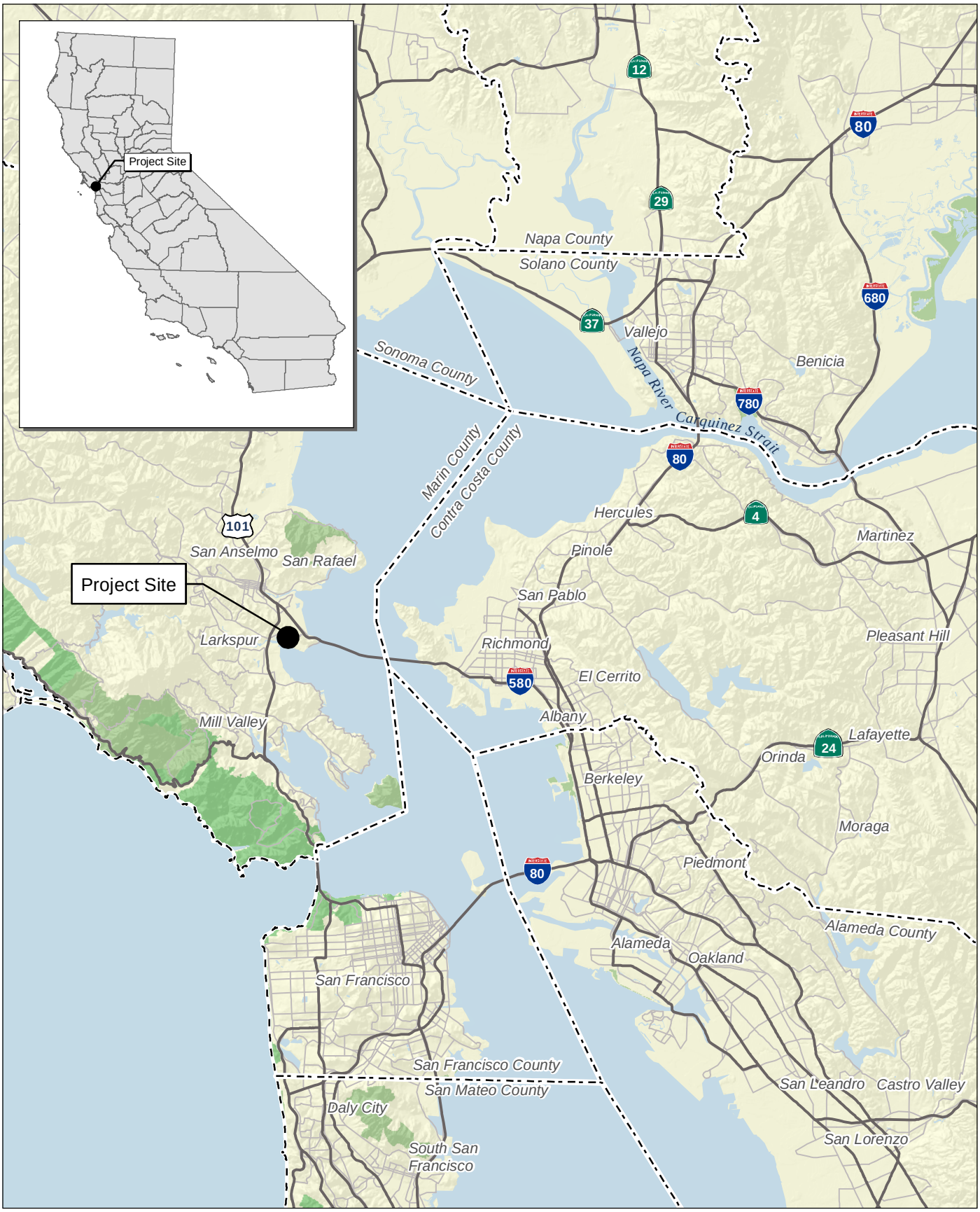
The natural drainage channel alignment and subsequently hydrogeomorphology was substantially altered in the past, including the grading and fill of approximately 2 acres in the center of the site, resulting in removal of the natural drainage channel segment in this area; and excavation of artificial diversion channels, one that now runs parallel to the western slope (channel Segment 1-3; Exhibit 3); and channel Segment 1-4, which connects the diverted flows to the remaining natural channel (segments 1-5 and 1-6).

2.4 - Soils

The soils of 95 percent of the Study Area are mapped by Natural Resources Conservation Service (NRCS) as *Tocaloma-Saurin association, steep*. Approximately 0.5 acre of the Study Area along Sir Francis Drake Boulevard were mapped as *Xerorthents, fill*. However, field sampling indicates that a larger area, potentially up to 2 acres, was likely subject to fill, either imported or spread deposits

derived from igneous, metamorphic, and sedimentary rock. Regardless, none of the soil types mapped or observed are classified as hydric soils.[1]

[1] United States Department of Agriculture (USDA), Natural Resources Conservation Service. 2020. Web Soil Survey 3.3.2. Website: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed October 2020.



Source: Census 2000 Data, The California Spatial Information Library (CaSIL).

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5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

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OAK HILL APARTMENTS
AQUATIC RESOURCES DELINEATION

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Source: FCS

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60 30 0 60
Feet

Exhibit 2
Study Area Boundary

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SECTION 3: REGULATORY SETTING

3.1 - Federal

3.1.1 - Clean Water Act

The USACE administers Section 404 of the federal Clean Water Act (CWA), which regulates the discharge of dredge and fill material into waters of the United States.

As of the date of this report, the United States Environmental Protection Agency (EPA) and USACE (hereafter the agencies) are in receipt of the U.S. District Court for the District of Arizona's August 30, 2021 order vacating and remanding the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. In light of this order, these agencies have halted implementation of the Navigable Waters Protection Rule and are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice.[2]

Therefore, since the agencies are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice, our analysis follows 40 CFR 230.3(s), which defines "waters of the United States" as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:
    a) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    b) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    c) Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
6. The territorial sea;

[2] United States Environmental Protection Agency (EPA). 2021. https://www.epa.gov/wotus/current-implementation-waters-united-states. Accessed September 9, 2021.

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 Code of Federal Regulations 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the EPA and/or USACE.

"Wetland" refers to areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and seasonal wetlands. Wetlands are considered jurisdictional if they fall under one of the categories of waters of the United States defined above.

In general, a USACE permit must be obtained before placing fill in wetlands or other waters of the United States. The type of permit depends on the acreage involved, the purpose of the proposed fill, and other factors. Additionally, Section 401 of the CWA states that "any applicant for a federal permit for activities that involve a discharge to waters of the State, shall provide the federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the federal Clean Water Act." Therefore, applicants seeking to fill waters of the United States are required to obtain a CWA Section 401 Water Quality Certification from the RWQCB.

3.2 - State

3.2.1 - California Porter-Cologne Water Quality Control Act

The RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the State" (Water Code § 13260(a)), pursuant to provisions of the Porter-Cologne Water Quality Act. "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (Water Code § 13050(e)). In 2019, the California State Water Resources Control Board (State Water Board) published the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (Procedures) to guide wetland waters of the State determinations and the permitting process.[3]

3.2.2 - California Fish and Game Code

Sections 1600-1607 of the California Fish and Game Code require that a Notification of Lake or Streambed Alteration be submitted to the CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or

[3] California State Water Resources Control Board (State Water Board). 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. April 2, 2019.

lake." The CDFW reviews the proposed actions in the Notification and, if necessary, prepares a Lake or Streambed Agreement that includes measures to protect fish and wildlife resources.

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SECTION 4: METHODS

FCS Senior Biologist and Certified Wetland Delineator, Bernhard Warzecha, MS, assisted by FCS Biologists Robert Carroll and Alec Villanueva, surveyed the Study Area on December 10, 2021, as described in the following section.

4.1 - Wetlands

The presence/absence of wetlands was determined based on the requirements of the *Corps of Engineers Wetlands Delineation Manual* and revised procedures in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*.[4,5] These procedures include standards that define wetlands, including specific saturation and/or ponding regimes, and evaluate hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland indicator status of vegetation follows the 2018 National Wetland Plant List for the Arid West Region.[6]

4.2 - Drainage Channels and Tributaries

Drainage channels were characterized through presence/absence of bed, bank, and ordinary high water mark (OHWM); hydrology; and hydrological connectivity. The OHWM is determined and characterized using definitions and guidance of *A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States*.[7] A discussion of what constitutes a potentially jurisdictional "tributary," and which features, such as features without a significant nexus, may be excluded from the definition of waters of the United States is provided in Section 5, below.

Culverted drainage sections were examined for evidence of concentrated flow, including presence of water stains, mineral or sediment deposits, and biofilm.

4.2.1 - Definitions of Hydrological Regimes

An ephemeral stream is defined as a watercourse that carries only surface runoff and flows during and immediately after periods of precipitation. An intermittent stream is defined as a watercourse that is temporally intermittent or seasonal and that flows during the wet season, continues to flow after the period of precipitation, and ceases surface flow during at least part of the dry season. Intermittent streams are typically shown as a dashed blue line on United States Geological Survey (USGS) quadrangle maps.

A perennial stream is a watercourse that flows throughout the year. Riparian vegetation is defined as vegetation associated with a watercourse and relying on the higher level of water provided by the watercourse. Riparian vegetation can include trees, shrubs, and/or herbaceous plants.

---

4 Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1.
5 United States Army Corps of Engineers (USACE). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28.
6 The National Wetland Plant List–Arid West Version 1. 2018. United States Army Corps of Engineers.
7 Lichvar, R.W. and S.M. McColley. 2008. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States.

4.3 - Additional Background Information Review

Additional relevant information about the Study Area was reviewed including current and historical aerial imagery, the Watershed Assessment, Tracking and Environmental Results System (WATERS), the EPA's National Hydrography Data Set Plus (NHDPlus Version 2), the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI),[8] and the NRCS Web Soil Survey and Climate Analysis for Wetlands (WETS).[9,10,11] Specifically, the standard NRCS WETS analysis includes a weighted comparison of historical rainfall to observed rainfall for the 3-month period before a wetland delineation field survey in order to evaluate if abnormal rainfall patterns may have contributed to observed presence or absence of wetland indicators.[12] The WETS analysis is based on data from the nearest WETS-listed station located in Kentfield, Marin County. Additionally, the United States Drought Monitor data for Marin County were incorporated into the analysis.

[8] United States Fish and Wildlife Service (USFWS). National Wetland Inventory. Website: https://www.fws.gov/wetlands/data/mapper.html. Accessed December 2021.

[9] United States Environmental Protection Agency (EPA). Watershed Assessment, Tracking, and Environmental Results System (WATERS) Website: https://www.epa.gov/waterdata/waters-watershed-assessment-tracking-environmental-results-system. Accessed December 2021.

[10] United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2020. Web Soil Survey 3.3.2. Website: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed December 2021.

[11] United States Department of Agriculture (USDA), Natural Resources Conservation Service. 1997. Part 650 Engineering Field Handbook - Chapter 19: Hydrology Test for Wetland Determination.

[12] Ibid.

SECTION 5: RESULTS

The following section describes the results of both the background research and analysis, and the results of the protocol-level delineation field work. Representative photographs of current site conditions are included in Appendix A.

5.1 - Climatic Conditions

Results of the WETS analysis (Appendix B) indicate that conditions during the delineation survey were normal for the 3-month period prior the delineation (i.e., September through November 2021). The last rain event prior to the delineation occurred in November 2021 with an accumulated precipitation volume of 3.95 inch for the month, based on data of the nearest publicly available weather station located at the Greenbrae Boardwalk. However, Marin County experienced drought conditions throughout the Water Year 2020/2021, and the United States Drought Monitor ranked the conditions in Marin County as *D3-Extreme Drought*.

5.2 - Aquatic Resources

Aquatic resources are shown in Exhibit 3. Dimensions of all aquatic resources occurring within the Study Area boundary are presented in Table 1, and described in more detail below.

Table 1: Summary of Aquatic Resources Within the Study Area

Type	Segment ID	Length (linear feet)	Width (feet)	Area (square feet)	Area (acre)
Open Drainage Channel	1-1	46	4	184	0.004
Open Drainage Channel	1-2	41	1	41	0.001
Open Drainage Channel	1-3	265	5	1,325	0.030
Open Drainage Channel	1-4	316	1	316	0.007
Open Drainage Channel	1-5	186	14	2,604	0.060
Open Drainage Channel	1-6	92	16	1,472	0.034
Open Drainage Channel	2-1	139	3	417	0.010
Open Drainage Channel	3-1	161	3	483	0.011
Open Drainage Channel	4-1	185	4	740	0.017
Open Drainage Channel	5-1	87	1	87	0.002
Open Drainage Channel	5-3	28	1	28	0.001
Sum open drainage channels	–	**1,546**	**n/a**	**7,697**	**0.177**
Culvert Pipe	5-2	46	1	46	0.001
Culvert Pipe	5-4	7	1	7	0.000
Sum Culvert Pipes	–	**53**	**n/a**	**53**	**0.001**

Type	Segment ID	Length (linear feet)	Width (feet)	Area (square feet)	Area (acre)
Sum All Potentially Jurisdictional Waters	–	**1,599**	**n/a**	**7,750**	**0.178**

5.2.1 - Open Drainage Channels

The following is a description and discussion of all observed open drainage channel segments. Dimensions of each segment are listed in Table 1, and locations are shown on Exhibit 3. A definition of ephemeral and intermittent flow regimes is provided in Section 4.2.1.

Segment 1-1

Open Drainage Segment 1-1 is a naturally occurring ephemeral headwater drainage. The channel is characterized by presence of incised bed and banks. The OHWM is characterized by scour and sediment deposits. At the time of the survey, no flowing water but soil moisture was present. Given substantial rainfall throughout the weeks before the delineation, lack of flowing or standing water indicates a likely ephemeral flow regime. This drainage segment is located under predominantly closed canopy of coast live oak. Understory is sparse and ruderal and dominated by a mix of non-native upland grasses and forbs. No hydrophytic plants were observed in the channel. Segment 1-1 terminates at a vegetated terrace (potentially graded in the past). No bed or banks connect Segment 1-1 to Segment 1-2; however, it is assumed that any surface flow from Segment 1-1 reach Segment 1-2 and Segment 1-3 via surface sheet flow and underground seepage.

Segment 1-2

Open Drainage Segment 1-2 appears to be a constructed diversion ditch that developed into a vegetated headwater drainage collecting runoff from the graded terrace upslope. The channel is characterized by presence of a small bed and banks. The OHWM is characterized by scour and sediment deposits. At the time of the survey, no flowing water but soil moisture was present. Given substantial rainfall throughout the weeks before the delineation, lack of flowing or standing water indicates a likely ephemeral flow regime. This drainage segment is dominated by ruderal vegetation, predominantly pampas grass. No hydrophytic plants were observed in the channel. Segment 1-2 conveys ephemeral flows to Segment 1-3.

Segment 1-3

Open Drainage Segment 1-3 is a constructed diversion ditch running parallel to the slope collecting runoff and seepage from the terrace upslope, the slope to the north, and from Segment 1-2 and Segment 2-1. The channel is characterized by presence of a bed and shallow banks. Due to the very minimal longitudinal gradient, the OHWM is not characterized by scour, but by suppression of vegetation due to seasonal ponding. At the time of the survey, standing water was present for large areas of the segment, indicating an intermittent hydrological regime. No hydrophytic plants were observed in the channel. Segment 1-3 conveys ephemeral flows to Segment 1-4.

Segment 1-5

Open Drainage Segment 1-5 is a constructed diversion ditch connecting flows from Segment 1-4 to the natural remnant creek channel, Segment 1-5. The channel is characterized by presence of a narrow bed and cut banks. The OHWM is not characterized by scour. At the time of the survey, no standing or flowing water was present, indicating an ephemeral hydrological regime. No hydrophytic plants were observed in the channel.

Segment 1-5 and Segment 1-6

Open Drainage Segment 1-5 and Segment 1-6 are part of a natural second order stream that conveys flows from all the headwater sections upslope as shown on Exhibit 3. The channel is characterized by presence of relatively wide bed and banks. The OHWM is characterized by scour and sediment deposits. At the time of the survey, no flowing water but soil moisture was present. Given substantial rainfall throughout the weeks before the delineation, lack of flowing or standing water indicates a likely ephemeral flow regime. This drainage segment is located under predominantly closed canopy of shrub and tree cover, including coast live oak, and a robust population of willow. Understory is very sparse and where present, ruderal. No hydrophytic plants were observed in the channel. Segment 1-6 terminates at a culvert inlet to convey flows under Sir Francis Drake Boulevard to the lagoon of Remillard Park, an artificial impoundment of San Francisco Bay.

Segment 2-1, Segment 3-1, and Segment 4-1

Open Drainage Segment 2-1, Segment 3-1, and Segment 4-1 are natural first order tributary channels terminating in various segments of Tributary 1 as shown on Exhibit 3. These segments are characterized by presence of incised bed and banks. The OHWM of these channels are characterized by scour and sediment deposits. At the time of the survey, no flowing water but soil moisture was present. Given substantial rainfall throughout the weeks before the delineation, lack of flowing or standing water indicates a likely ephemeral flow regime of these channels. Theses drainages are lined with vegetation similar to the surrounding areas, comprising of predominantly coyote brush, French broom, and coast live oak. Understory is sparse and ruderal and dominated by a mix of non-native upland grasses and forbs. No hydrophytic plants were observed in the channels.

Segment 5-1 and Segment 5-3

Open Drainage Segment 5-1 and Segment 5-2 are part of a small open drainage channels now vegetated but originally constructed to drain the northern hillside and the graded central terrace. The channel is characterized by presence of bed and banks. Sediment deposits are present. At the time of the survey, no standing or flowing water was present, indicating an ephemeral hydrological regime. No hydrophytic plants were observed in the channel. Segment 5-3 terminates at Culvert 5-4.

5.2.2 - Culverts

Culvert 5-2 and Culvert 5-4

Culvert 5-2 is a corrugated pipe that hydrologically connects Segment 5-2 to Segment 5-3. Culvert 5-4 conveys flow from Segment 5-3 under Sir Francis Drake Boulevard to the lagoon of Remillard Park, an artificial impoundment of San Francisco Bay.

5.3 - United States Fish and Wildlife Service National Wetland Inventory and MarinMap Results

The USFWS NWI (and subsequently the MarinMap Wetland layer, which integrates NWI data), depicts a 0.98-acre freshwater emergent wetland within the Study Area, located south and southwest of drainage channel Segments 1-5, 1-6, and 4-1.[13] However, per the NWI, this determination was only made based on high altitude imagery, and according to the NWI Data Limitations information, "a margin of error is inherent in the use of imagery; thus, detailed on the ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis." Additionally, the USFWS clarifies that NWI mapping is not adequate to be used to establish regulatory boundaries or jurisdiction.

However, presence of NWI-mapped wetlands could indicate potential presence of actual existing jurisdictional wetlands, if confirmed on the ground through protocol-level delineation field work. Therefore, FCS established two wetland sample points within and near the area of question (Appendix C; SP-1 and SP-2). The results demonstrate that the area does not meet the USACE and RWQCB definitions of a wetland, specifically, the area lacks the required combination of sufficient hydrophytic vegetation, hydrology indicators, and/or hydrophytic soil indicators. Absence of wetland indicators were not caused by abnormally dry conditions, because the delineation was conducted during the wet season and following a period of normal aggregate rainfall as demonstrated by the WETS analysis (see Section 5.1 and Appendix B).

These results, supported by the observation that the area consists of a slope readily drained by channel Segments 1-5, 1-6, and 4-1, FCS concludes that the wetland currently mapped by the NWI should be considered a "false-positive" artifact generated by over-interpretation of aerial imagery. No freshwater emergent wetland is currently present at this area (or at other locations in the Study Area; as demonstrated through an additional wetland sample point, SP-3).

Additionally, linear wetland/water features shown by NWI and MarinMapper within the Study Area are inconsistent with conditions on the ground as established through the protocol-level wetland/water delineation presented here, and are therefore not considered adequate to determine location and extent of potential jurisdictional aquatic resources.

5.4 - Proposed Jurisdictional Determination

5.4.1 - Proposed United States Army Corps of Engineers Jurisdiction

For the purpose of this analysis, FCS assumes that the August 30, 2021, action by the U.S. District Court for the District of Arizona to vacate and remand the Navigable Water Protection Rule means that current federal jurisdictional determinations of what constitutes a water of the United States follows implementation and interpretation of *Rapanos v. United States* and C*arabell v. United States*.

[13] United States Fish and Wildlife Service (USFWS). National Wetland Inventory (NWI). Website: https://www.fws.gov/wetlands/data/mapper.html. Accessed December 2021.

Per USACE and EPA guidance related to these cases, as summarized in a Memorandum dated December 2, 2008, and entitled "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States," FCS assumes that the USACE will decide jurisdiction over non-navigable tributaries that are not relatively permanent, based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water.

Given that the drainages delineated within the Study Area appear to be hydrologically connected to a potential jurisdictional water of the United States formed by the lagoon of Remillard Park, an impoundment of San Francisco Bay, and presumably then to San Francisco Bay itself, a Traditional Navigable Water of the United States (TNW), a significant nexus between the drainages (i.e., tributaries) and a TNW is likely present.

Therefore, the drainages as shown on Exhibit 3 are potential waters of the United States. Note that a binding significant nexus analysis and final JD can only be made by the USACE and/or the EPA following verification.

5.4.2 - Proposed Regional Water Quality Control Board Jurisdiction

Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (Water Code § 13050(e)), and are under the jurisdiction of the RWQCB. Therefore, FCS proposes that that all drainages within the Study Area boundary as shown on Exhibit 3 would fall under the jurisdiction of the RWQCB. This proposed JD is preliminary until confirmed by the RWQCB.

5.4.3 - California Department of Fish and Wildlife Streambed Alteration Program Considerations

Because of the presence of drainage beds and banks, it is expected that the CDFW will assert regulatory oversight over potential impacts on all drainage channels and associated vegetation pursuant to California Fish and Game Code Section 1602 *et seq*. (Streambed Alteration Program). It is expected that the CDFW will classify all vegetation in the drainages and trees with canopies overhanging the drainages, and all willow trees associated with Drainage Segment 1-5 and Segment 1-6 as "riparian vegetation." It is expected that the CDFW will require a Notification of Streambed Alteration and subsequent Streambed Alteration Agreement for any work that could adversely affect the drainages on-site and associated riparian vegetation.

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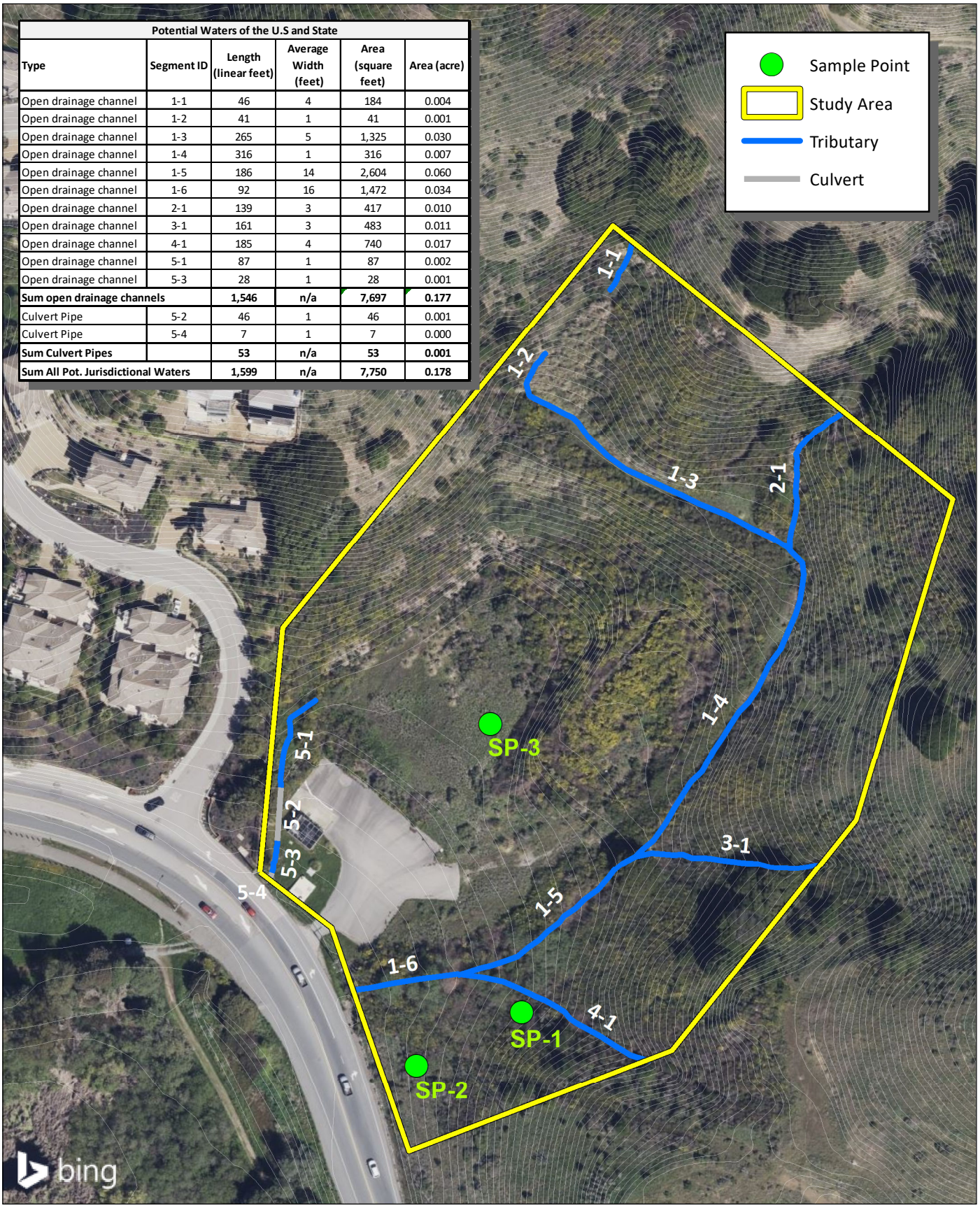
Potential Waters of the U.S and State					
Type	Segment ID	Length (linear feet)	Average Width (feet)	Area (square feet)	Area (acre)
Open drainage channel	1-1	46	4	184	0.004
Open drainage channel	1-2	41	1	41	0.001
Open drainage channel	1-3	265	5	1,325	0.030
Open drainage channel	1-4	316	1	316	0.007
Open drainage channel	1-5	186	14	2,604	0.060
Open drainage channel	1-6	92	16	1,472	0.034
Open drainage channel	2-1	139	3	417	0.010
Open drainage channel	3-1	161	3	483	0.011
Open drainage channel	4-1	185	4	740	0.017
Open drainage channel	5-1	87	1	87	0.002
Open drainage channel	5-3	28	1	28	0.001
Sum open drainage channels		**1,546**	**n/a**	**7,697**	**0.177**
Culvert Pipe	5-2	46	1	46	0.001
Culvert Pipe	5-4	7	1	7	0.000
Sum Culvert Pipes		**53**	**n/a**	**53**	**0.001**
Sum All Pot. Jurisdictional Waters		**1,599**	**n/a**	**7,750**	**0.178**



Source: FCS

FIRSTCARBON SOLUTIONS™

50 25 0 50
Feet

Exhibit 3
Aquatic Resources Delineation

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SECTION 6: CONCLUSION

The Study Area includes five open and vegetated ephemeral and intermittent channels that function as tributaries (and two segments consisting of connecting culvert pipes) for a total length of 1,599 feet of tributary, covering an aggregate area of approximately 7,750 square feet (0.178 acre), as shown on Exhibit 3. No additional aquatic features, including wetlands, were observed within the Study Area. All tributaries are likely regulated as waters of the United States and State.

Additionally, any impacts on drainage channels and associated riparian vegetation are expected to be regulated by the CDFW pursuant to the Streambed Alteration Program, California Fish and Game Code Section 1602 *et seq*.

The findings and conclusions presented in this report, including the location and extent of waters subject to regulatory jurisdiction, represent the professional opinion of FCS. These findings and conclusions should be considered preliminary until confirmed by the USACE, RWQCB, and CDFW.

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Appendix A: Photographs

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Photograph 1: Looking east, riparian willows along drainage channel segment 1-5.

Photograph 2: Upland shrubs on hillside at location of SP-1, looking south.

Photograph 3: Conditions at location of SP-1, looking north.

Photograph 4: Herbaceous cover at location of SP-2, looking west at Sir Francis Drake Boulevard

Photograph 5: Conditions at location of SP-2, looking south at Sir Francis Drake B

Photograph 6: Constructed diversion ditch (drainage segment 1-4) along access road (left side of photograph). Photo facing southwest.

Photograph 7: Scour in Drainage Segment 1-4.

Photograph 8: Standing water in constructed diversion ditch parallel to the eastern slope (drainage segment 1-3). Facing northeast.

Photograph 9: Standing water in constructed diversion ditch parallel to the eastern slope (drainage segment 1-3). Facing northwest.

Photograph 10: Drainage segment 5-1 looking south.

Photograph 11: Culvert draining into Segment 5-3 facing south towards Sir Francis Drake Boulevard

Photograph 12: Culvert at bottom of Drainage Segment 5-1.

Photograph 13: Overhead view of conditions at location of SP-3.

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Appendix B:
WETS Analysis

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WETS Analysis for Oakhill Apartment Project JD, Marin County, CA
based on 30 year averages of Kentfield, Marin WETS Station

Month	30% Chance Precipitation is less or equal than (in)	Average	30% Chance Precipitation more than (in)	Observed rainfall (inch)	Condition (dry, wet, normal)	Condition Value*	Weighting Factor	Product of previous 2 columns
November	2.18	4.66	5.69	4.25	normal	2	3	6
October	0.52	2.59	2.37	20.4	wet	3	2	6
September	0.00	0.09	0.06	0	dry	1	1	1
							Sum=**	**13**

**If sum is:	
6-9	prior period has been drier than normal
10-14	prior period has been normal
15-18	prior period has been wetter than normal

*Condition Values:
Dry=1
Normal=2
Wet=3

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Appendix C:
Wetland Delineation Data Forms

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Quentin City/County: Marin Sampling Date: 12/10/21
Applicant/Owner: Thompson Dorfman, LLC State: CA Sampling Point: 1
Investigator(s): B. Warzecha, R. Carroll, A. Villarreal Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slope Slope (%): 3
Subregion (LRR): _____ Lat: 37°56'37.22" N Long: 122°30'4.77" W 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 ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 25 ft²)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 75 ft²)			
1. Baccharis pilularis	50	Y	UPL
2. Genista monospessulana	25	Y	UPL
3.			
4.			
5.			
	75 = Total Cover		
Herb Stratum (Plot size: 25 ft²)			
1. Chlorogalum pomeridianum	5		UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (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: 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12	10YR 5/4	93	5YR 4/6	7	C	M	clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Does not meet criteria of F6. Boundaries between matrix and redox color are not clearly defined.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ 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: Oak Hill SFR Quentin City/County: Marin Sampling Date: 12/10/12
Applicant/Owner: Thompson Dorfman, LLC State: CA Sampling Point: 3
Investigator(s): B. Warzecha, R. Carroll, A. Villanueva Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slope Slope (%): 2
Subregion (LRR): Lat: 37°56'36.71"N Long: 122°30'5.96"W 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 ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 25 ft²)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 25 ft²)			
1. Baccharis pilularis	20	Y	UPL
2. Genista monospessulana	50	Y	UPL
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 25 ft²)			
1. Dipsacus fullonum	7		FAC
2. Bromus sp.	10	Y	FACU
3. Chlorogalum pomeridianum	1		UPL
4. Geranium dissectum	3		FAC
5. Poa sp.	10	Y	N/A
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (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:
Poa sp. not able to be identified to species at the time of delineation.

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12	10 YR 4/4	100					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, 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 Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ 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: Oak Hill S. City/County: Marin Sampling Date: 12/10/21
Applicant/Owner: Thompson Dorfman, LLC State: CA Sampling Point: 3
Investigator(s): E. Warzecha, B. Carroll, A. Villemur Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): ________ Lat: 37°56'38"N Long: 122°30'5.20"W 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 ____	Is the Sampled Area within a Wetland?	Yes ____ No ✓
Hydric Soil Present?	Yes ____ No ✓		
Wetland Hydrology Present?	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: 25 ft²)			
1. Dipsacus fullonum	40	Y	FAC
2. Polypogon sp.	50	Y	FAC
3. Carduus pycnocephalus	10		UPL
4.			
5.			
6.			
7.			
8.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	90	x 3 = 270
FACU species		x 4 =
UPL species	10	x 5 = 50
Column Totals:	100 (A)	330 (B)

Prevalence Index = B/A = 3.3

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: 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
3	10YR/4/2	100					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: gravel fill

Depth (inches): 3

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 Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ____ No ✓ 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:

C.5 - USACE Preliminary Jurisdictional Determination

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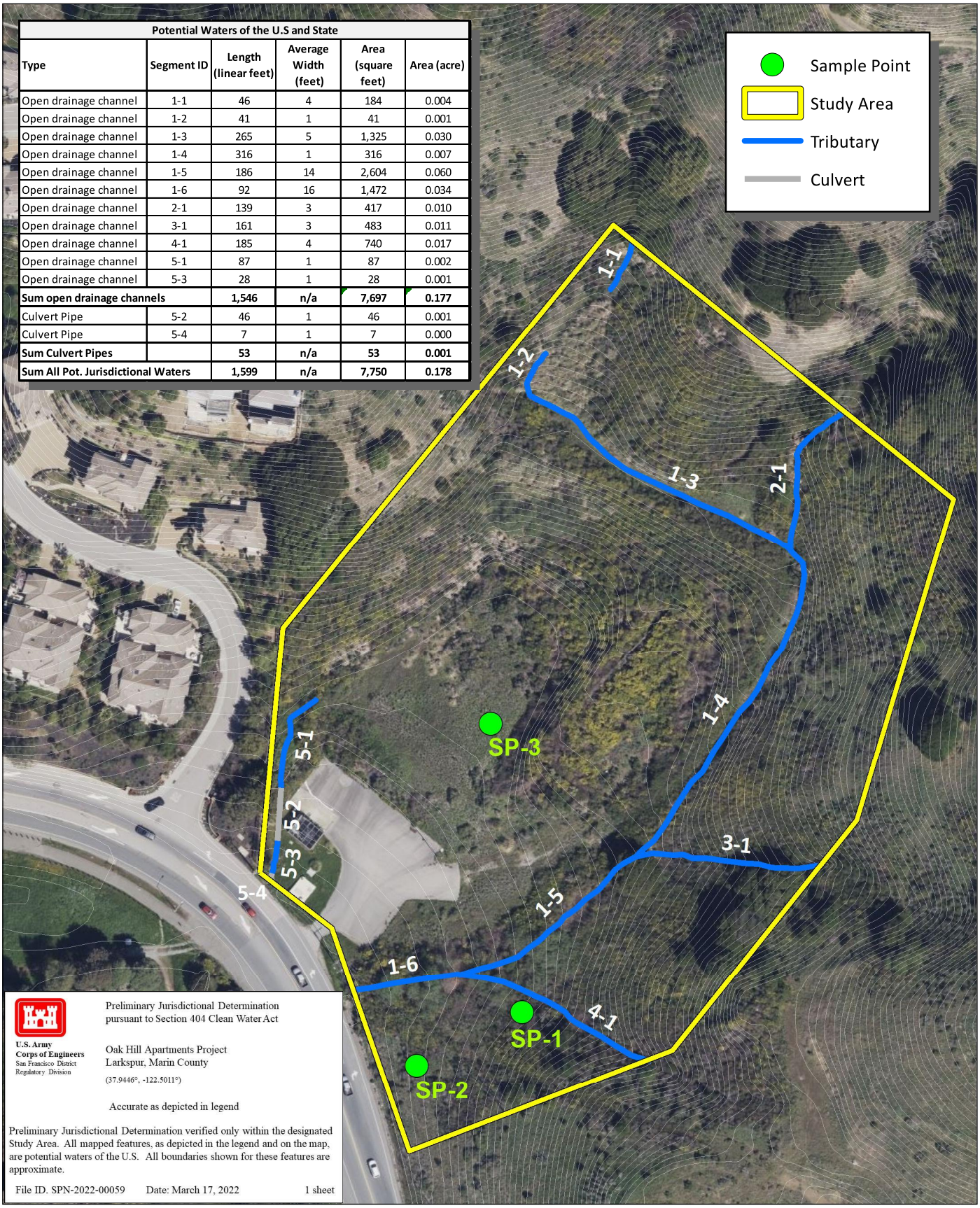

Source: FCS

FIRSTCARBON SOLUTIONS™

50 25 0 50 Feet

Exhibit 3
Aquatic Resources Delineation

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C.6 - Preliminary Arborist Report

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Preliminary Arborist Report

Oak Hill Apartments
Marin County, CA

PREPARED FOR:
First Carbon Solutions
1350 Treat Blvd., Suite 380
Walnut Creek, CA 94597

PREPARED BY:
HortScience | Bartlett Consulting
2550 Ninth Street, Suite 112
Berkeley, CA 94710-2552

October 2022

HORT SCIENCE
BARTLETT CONSULTING
Divisions of The F.A. Bartlett Tree Expert Company

Preliminary Arborist Report

Oak Hill Apartments
Marin County, CA

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Preliminary Evaluation of Impacts and Recommendations	6
Preliminary Tree Preservation Guidelines	10

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Exhibits

Tree Assessment Plan

Tree Assessment Form

Preliminary Arborist Report

Oak Hill Apartments
Marin County, CA

Introduction and Overview

First Carbon Solutions (FCS), working with Eden Housing and Education Housing Partners, Inc., is preparing plans for a 6.7-acre site in Marin County. The undeveloped site is located across from Remillard Park on East Sir Francis Drake Boulevard (near San Quentin). HortScience | Bartlett Consulting (Divisions of The F.A. The Bartlett Expert Tree Company) was asked to prepare a **Preliminary Arborist Report** for the site and that report was completed in February of 2022. We were asked to increase the scope of work to a new study area encompassing 10.43 acres in September of 2022.

This report provides the following information:

1. A survey of trees within and adjacent to the proposed project area.
2. An assessment of each tree's health, structure, and protected or heritage status.
3. An assessment of each tree's suitability for preservation based on their health, structure, and potential longevity.
4. Preliminary recommendations for action based on conceptual plans.

Assessment Methods

Trees were assessed on January 13, January 19, September 13, and September 21, 2022. All trees measuring 6 in. or greater in diameter, within the project area or with portions of their crowns extending into the project area, were included in the assessment per Marin County Code 24.04. The assessment procedure consisted of the following steps:

1. Identifying the tree species.
2. Verifying or tagging trees and recording locations on a map.
3. Measuring the trunk diameter at a point 54 inches above grade.
4. Evaluating the health and structural condition using a scale of 1 – 5:
   - ***5*** - A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.
   - ***4*** - Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
   - ***3*** - Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.
   - ***2*** - Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
   - ***1*** - Tree in severe decline, dieback of scaffold branches and/or trunk; most of foliage from epicormics; extensive structural defects that cannot be abated.
5. Rating the suitability for preservation as "high", "moderate" or "low". Suitability for preservation considers the health, age and structural condition of the tree, and its potential to remain an asset to the site for years to come.
   - ***High***: Trees with good health and structural stability that have the potential for longevity at the site.
   - ***Moderate***: Trees with somewhat declining health and/or structural defects than can be abated with treatment. The tree will require more intense management, monitoring, and may have shorter life span than those in 'high' category.
   - ***Low***: Trees in poor health or with significant structural defects that cannot be mitigated. Tree is expected to continue to decline, regardless of treatment. The species or individual may have characteristics that are undesirable for landscapes, and generally are unsuited for use areas.

Description of Trees

Sixty-one (61) trees (numbered #136 - 179 and #301 - 317) were assessed, representing 3 species. Lombardy poplar, an ornamental species, was growing close to the road and represented the only non-native tree surveyed. Coast live oak and arroyo willow are native to the Marin County area and these 60 trees may have been indigenous to the site. Trees were in clusters around the perimeter of the project area (Photo 1). Four off-site trees are listed in the report based on their proximity to the development site. Overall, 23 trees were in good condition, 33 were in fair condition, and five were poor (Table 1). Descriptions of each tree can be found in the ***Tree Assessment Form*** and approximate locations are shown on the ***Tree Assessment Plan*** (see *Exhibits*).

Photo 1: Looking northeast at several stands of oaks on the northern edge of the project site. The eucalyptus on the ridgeline were outside of the project boundaries.

Table 1: Condition ratings and frequency of occurrence of trees Oak Hill Apartments Marin County, CA

Common Name	Scientific Name	Condition			Total
		Poor (1-2)	Fair (3)	Good (4-5)	
Lombardy poplar	*Populus nigra* 'Italica'	-	1	-	**1**
Coast live oak	*Quercus agrifolia*	3	32	23	**58**
Arroyo willow	*Salix lasiolepis*	2	-	-	**2**
Total		**5**	**33**	**23**	**61**

Among the 58 coast live oaks, 23 were in good condition, 32 were in fair condition, and three were poor. Trees ranged in development from young to mature with trunk diameters from 6 to 36 in. Structural issues common among the oaks included narrow branch unions with included bark, slight to severe lean, and multi-stems that arose close to the ground (Photo 2). Tree #148 was the only oak which had good structure and was generally free of defects. Oaks in fair condition tended to have thinning canopies with some leaf chlorosis. Trees in poor condition tended to have significant decay and very thin crowns (Photo 3).

Photo 1 (above): Looking north along the property boundary at coast live oak #305. This tree had fused codominant stems arising from the base. It also had multiple attachments arising from 5' on its northern stem.

Photo 2 (left): Looking north at coast live oak #315. Most of the crown was in decline with many limbs sitting directly on the ground and decaying.

Arroyo willows #301 and #302 were located in a creek channel on the southeastern end of the property, close to East Sir Francis Drake Blvd. Tree #301 was located directly in front of a culvert. Both trees had codominant stems or multiple attachments which arose between the ground and 2 feet. The trees were semi-mature in development with stems that ranged in size from 5 to 9 inches. They were in poor condition with mostly dead branches and twigs. Tree #302 had multiple failed stems and branches (Photo 3).

Photo 3: Looking southeast at arroyo willow #302. The tree is surrounded by branches and twigs from past failures.

Lombardy poplar #304 was planted at the southwest corner of the property closest to East Sir Francis Drake Blvd. The tree was semi-mature in development and had multiple attachments which ranged in diameter from 1 to 9 in. Codominant stems arose at the base and split into multiple attachments at 3 ft. (Photo 4).

Photo 4: Looking west at Lombardy poplar #304 with East Sir Francis Drake Blvd in the background.

Marin County Ordinance Article IV Chapter 22.130.030 defines certain native species of good or fair quality with diameters of 6 in. or greater as *protected* and 18 in. or greater as *heritage*. Based on this definition, 36 trees are *protected*. Nineteen (19) coast live oaks qualified as *heritage*. *Protected* and *heritage* trees are identified in the ***Tree Assessment Form*** (see Exhibits).

Suitability for Preservation

Before evaluating the impacts that will occur during development, it is important to consider the quality of the tree resource itself, and the potential for individual trees to function well over an extended length of time. Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment, and perform well in the landscape. Our goal is to identify trees that have the potential for long-term health, structural stability, and longevity within the proposed development.

Evaluation of suitability for preservation considers several factors:

- **Tree health**
  Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees. For example, the arroyo willows and coast live oaks #315, 144 and 165 had low vigor with significant dieback and are less likely to tolerate construction impacts than coast live oaks #307 – 309 and others with a condition rating of 4 or higher in the ***Tree Assessment Form***.

- **Structural integrity**
  Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely. For example, arroyo willows had significant dieback and decay with recent failures while oak #165 had internal decay at the low 3-stem branch union and will likely fail in the future.

- **Species response**
  There is a wide variation in the response of individual species to construction impacts and changes in the environment. Arroyo willow and Lombardy poplar are moderate in tolerance of construction impacts while coast live oak is tolerant.

- **Tree age and longevity**
  Old trees, while having significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change.

- **Invasiveness**
  Species that spread across a site and displace desired vegetation are not always appropriate for retention. This is particularly true when indigenous species are displaced. The California Invasive Plant Inventory Database (http://www.cal-ipc.org/paf/) lists species identified as being invasive. Marin County is part of the Central West Floristic Province. None of the species onsite pose an invasive threat at this time.

Each tree was rated for suitability for preservation based upon its age, health, structural condition, and ability to safely coexist within a development environment (Table 2). We consider trees with high suitability for preservation to be the best candidates for preservation. We do not normally recommend retention of trees with low suitability for preservation in areas where people or property will be present. Retention of trees with moderate suitability for preservation depends upon the intensity of proposed site changes.

Table 2: Tree suitability for preservation
Oak Hill Apartments Marin County, CA

High	Trees in this category had good health and structural stability that have the potential for longevity at the site. Twelve (12) coast live oak trees had high suitability for preservation.
Moderate	Trees in this category have fair health and/or structural defects that may be abated with treatment. Trees in this category require more intense management and monitoring and may have shorter lifespans than those in the “high” category. Thirty-two (32) coast live oaks and Lombardy poplar #304 had moderate suitability for preservation.
Low	Trees in this category are in poor health or have significant defects in structure that cannot be abated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess either characteristics that are undesirable in landscape settings or be unsuited for use areas. Fifteen (15) coast live oaks and arroyo willows #301 and #302 had low suitability for preservation.

Preliminary Evaluation of Impacts and Recommendations

Appropriate tree retention requires a practical match between the location and intensity of construction activities with the quality and health of trees. The tree assessment was the reference point for tree condition and quality. Impacts from the proposed project were assessed using a conceptual site plan dated 11/04/21 and Study Area plan dated 8/29/22. Plans did not include surveyed trunk locations. In addition, grading, drainage, stormwater, utility, and landscape plans that could impact trees have yet to be prepared and were not reviewed for this report. When those plans are prepared, a more comprehensive assessment of impacts to trees and designation of tree protection measures can be prepared.

Development will build a large housing project on the property with associated grading and landscaping. Based on my observations and assessment, I recommend preservation of Lombardy poplar #304 and 29 coast live oaks (Table 3). Trees to be preserved were likely located outside of the development area. Their preservation would be predicated on strict adherence to the ***Preliminary Tree Preservation Guidelines***. The 29 oaks all had *protected* status and ten oaks were considered *heritage*. Additionally, I recommend removal of 29 coast live oaks (26 *protected* and 9 *heritage*) and arroyo willows #301 and 302. These 31 trees were either located within or immediately adjacent to areas of construction or were in poor condition.

Recommendations for action are considered preliminary. Trees located outside of the project area will likely not be impacted. However, there is a possibility that trees along the access paths or located in areas identified for construction staging may be impacted. These impacts are difficult to predict without surveyed trunk locations and more definitive plans.

Table 3: Preliminary disposition. Oak Hill Apartments. Marin County, CA

Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Disposition	Comments
136	Coast live oak	6	Yes	Preserve	Outside of grading area; w/in project site
137	Coast live oak	33	Heritage	Preserve	Outside of grading area; w/in project site
138	Coast live oak	34	Heritage	Preserve	Outside of grading area; w/in project site.
139	Coast live oak	6,4	Yes	Preserve	Outside of grading area; w/in project site.
140	Coast live oak	8	Yes	Preserve	Outside of grading area; w/in project site.
141	Coast live oak	25,22,22,20,16,16,13	Heritage	Preserve	Outside of grading area; w/in project site.
142	Coast live oak	17,14,13,12	Heritage	Preserve	Outside of grading area; w/in project site.
143	Coast live oak	9,9,6,6,5	Heritage	Preserve	Outside of grading area; w/in project site.
144	Coast live oak	9,9,8,7,5,4	No	Remove	Outside of grading area; w/in project site.
145	Coast live oak	7,5	Yes	Preserve	Outside of grading area; w/in project site.
146	Coast live oak	11	Yes	Preserve	Outside of grading area; w/in project site.
147	Coast live oak	9,7,4	Heritage	Preserve	Outside of grading area; w/in project site.
148	Coast live oak	6	Yes	Preserve	Outside of grading area; w/in project site.
149	Coast live oak	24	Heritage	Preserve	Adjacent to project site.
150	Coast live oak	6,4,4,2	Yes	Preserve	Outside of grading area; w/in project site.
151	Coast live oak	11,9	Heritage	Preserve	Outside of grading area; w/in project site.
152	Coast live oak	8,3,2	Yes	Preserve	Outside of grading area; w/in project site.
153	Coast live oak	9	Yes	Preserve	Outside of grading area; w/in project site.
154	Coast live oak	14	Yes	Preserve	Outside of grading area; w/in project site.
155	Coast live oak	8	Yes	Preserve	Outside of grading area; w/in project site.
156	Coast live oak	9,7	Yes	Preserve	Outside of grading area; w/in project site.
157	Coast live oak	8,6,5	Heritage	Preserve	Outside of grading area; w/in project site.
158	Coast live oak	7,3	Yes	Preserve	Outside of grading area; w/in project site.
159	Coast live oak	14	Yes	Preserve	Outside of grading area; w/in project site.

Table 3, continued: Preliminary disposition. Oak Hill Apartments. Marin County, CA

Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Disposition	Comments
160	Coast live oak	9	Yes	Preserve	Outside of grading area; w/in project site.
161	Coast live oak	7,6,5	Heritage	Remove	W/in grading area.
162	Coast live oak	7	Yes	Preserve	Adjacent grading area.
163	Coast live oak	15,14,7,6	Heritage	Remove	W/in grading area.
164	Coast live oak	25	Heritage	Remove	W/in grading area.
165	Coast live oak	26,22,16	No	Remove	W/in grading area.
166	Coast live oak	9,6	Yes	Remove	W/in grading area.
167	Coast live oak	15	Yes	Remove	W/in grading area.
168	Coast live oak	30,24	Heritage	Remove	W/in grading area.
169	Coast live oak	23,18	Heritage	Remove	W/in grading area.
170	Coast live oak	7	Yes	Preserve	At edge of grading area.
171	Coast live oak	12	Yes	Preserve	At edge of grading area.
172	Coast live oak	8,5	Yes	Remove	At edge of grading area.
173	Coast live oak	8,4	Yes	Remove	W/in grading area.
174	Coast live oak	8,4	Yes	Remove	W/in grading area.
175	Coast live oak	10	Yes	Remove	W/in grading area.
176	Coast live oak	8,7	Yes	Remove	W/in grading area.
177	Coast live oak	6,5,4	Yes	Remove	W/in grading area.
178	Coast live oak	7,5	Yes	Remove	W/in grading area.
179	Coast live oak	9	Heritage	Remove	W/in grading area.
301	Arroyo willow	9,5	No	Remove	W/in grading area.
302	Arroyo willow	9,9,8,7,6	No	Remove	W/in grading area.

Table 3, continued: Preliminary disposition. Oak Hill Apartments. Marin County, CA

Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Disposition	Comments
303	Coast live oak	8	Yes	Remove	W/in grading area.
304	Lombardy poplar	9,8,7,2,2,1,1	No	Preserve	Outside of grading area; w/in project site.
305	Coast live oak	19,10,8	Heritage	Preserve	Adjacent project area.
306	Coast live oak	6,3,2	Yes	Preserve	Offsite; canopy extends over property line by 2'; edge of development area.
307	Coast live oak	24	Heritage	Remove	W/in grading area.
308	Coast live oak	6	Yes	Remove	W/in grading area.
309	Coast live oak	7	Yes	Remove	W/in grading area.
310	Coast live oak	34	Heritage	Remove	W/in grading area.
311	Coast live oak	27	Heritage	Remove	W/in grading area.
312	Coast live oak	10	Yes	Remove	W/in grading area.
313	Coast live oak	6,4	Yes	Remove	W/in grading area.
314	Coast live oak	10,9	Heritage	Remove	W/in grading area.
315	Coast live oak	36	No	Remove	W/in grading area.
316	Coast live oak	7	Yes	Remove	W/in grading area.
317	Coast live oak	11	Yes	Remove	W/in grading area.

Preliminary Tree Preservation Guidelines

The goal of tree preservation is not merely tree survival during development but maintenance of tree health and beauty for many years. Trees retained on sites that are either subject to extensive injury during construction or are inadequately maintained become a liability rather than an asset. The response of individual trees will depend on the amount of excavation and grading, the care with which demolition is undertaken, and the construction methods. Coordinating any construction activity inside the **TREE PROTECTION ZONE** can minimize these impacts.

The following recommendations will help reduce impacts to trees from development and maintain and improve their health and vitality through the clearing, grading, and construction phases. Plans for development have not yet been finalized.

Tree should be preserved in groups where possible. Trees should be planted in raised boxes or with asphalt sounding them should be preserved in the planter. The following are recommendations for design and construction phases that will assist in successful tree preservation.

Design recommendations

1. Design improvements to remain outside the dripline of coast live oak #311.
2. Any changes to the plans affecting the trees should be reviewed by the Project Arborist with regard to tree impacts. These include, but are not limited to, site plans, improvement plans, utility and drainage plans, grading plans, landscape and irrigation plans, and demolition plans.
3. Plan for tree preservation by designing adequate space around trees to be preserved. This area is called the **TREE PROTECTION ZONE:** No grading, excavation, construction or storage of materials should occur within that zone. Route underground services including utilities, sub-drains, water or sewer around the **TREE PROTECTION ZONE**. The tree protection zone shall be ten times the diameter or the entire dripline, whichever is larger. Areas of the **TREE PROTECTION ZONE** should be fenced to minimize impacts and staging in the **TREE PROTECTION ZONE**. To recommend **TREE PROTECTION ZONE** more conclusive plans will need to be reviewed.
4. Irrigation systems must be designed so that no trenching severs roots larger than 1 inch in diameter within the **TREE PROTECTION ZONE**.
5. Tree Preservation Guidelines prepared by the Project Arborist, which include specifications for tree protection during demolition and construction, should be included on all plans.
6. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use.
7. Do not lime the subsoil within 50 feet of any tree. Lime is toxic to tree roots.
8. Ensure adequate but not excessive water is supplied to trees; in most cases, occasional irrigation will be required. Avoid directing runoff toward trees.

Pre-demolition and pre-construction treatments and recommendations

1. The demolition and construction superintendents shall meet with the Project Arborist before beginning work to review all work procedures, access routes, storage areas, and tree protection measures.
2. Portions of the **TREE PROTECTION ZONE** should be fenced. Trees adjacent to demolition may require limb and trunk protection. This may be accomplished using

foam wrapped with waddle and orange snow fencing to protect the areas where the limb (or trunk) is exposed to incidental contact.

a. Trees to be preserved may require pruning to clean the crown of dead branches 1 inch and larger in diameter and raise canopies as needed for construction activities. All pruning shall be done by a State of California Licensed Tree Contractor (C61/D49). All pruning shall be done by Certified Arborist or Certified Tree Worker in accordance with the Best Management Practices for Pruning (International Society of Arboriculture, 2002) and adhere to the most recent editions of the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300). The Project Arborist will provide pruning specifications prior to site demolition.

b. Structures and underground features to be removed within the **TREE PROTECTION ZONE** shall use equipment that will minimize damage to trees above and below ground, and operate from outside the **TREE PROTECTION ZONE**. The Project Arborist shall be on site during all operations within the **TREE PROTECTION ZONE** to monitor demolition activity.

c. All tree work shall comply with the Migratory Bird Treaty Act as well as California Fish and Wildlife code 3503-3513 to not disturb nesting birds. To the extent feasible tree pruning and removal should be scheduled outside of the breeding season. Breeding bird surveys should be conducted prior to tree work. Qualified biologists should be involved in establishing work buffers for active nests.

Recommendations for tree protection during construction

1. Any approved grading, construction, demolition or other work within the **TREE PROTECTION ZONE** should be monitored by the Project Arborist.
2. All contractors shall conduct operations in a manner that will prevent damage to trees to be preserved.
3. Tree protection devices are to remain until all site work has been completed within the work area. Fences or other protection devices may not be relocated or removed without permission of the Project Arborist.
4. Construction trailers, traffic and storage areas must remain outside **TREE PROTECTION ZONE** at all times.
5. Any root pruning required for construction purposes shall receive the prior approval of and be supervised by the Project Arborist. Roots should be cut with a saw to provide a flat and smooth cut. Removal of roots larger than 2 inches in diameter should be avoided.
6. If roots 1 inches and greater in diameter are encountered during site work and must be cut to complete the construction, the Project Arborist must be consulted to evaluate effects on the health and stability of the tree and recommend treatment.
7. Spoil from trench, footing, utility or other excavation shall not be placed within the **TREE PROTECTION ZONE**, neither temporarily nor permanently.
8. All grading within the dripline of trees shall be done using the smallest equipment possible. The equipment shall operate perpendicular to the tree and operate from outside the **TREE PROTECTION ZONE**. Any modifications must be approved and monitored by the Project Arborist.

9. All trees shall be irrigated on a schedule to be determined by the Project Arborist (every 3 to 6 weeks is typical). Each irrigation shall wet the soil within the **TREE PROTECTION ZONE** to a depth of 18-24 inches.
10. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Project Arborist so that appropriate treatments can be applied.
11. No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the **TREE PROTECTION ZONE**.
12. Any additional tree pruning needed for clearance during construction must be performed by a Certified Arborist and not by construction personnel or certified tree climber.
13. Trees that accumulate a sufficient quantity of dust on their leaves, limbs and trunk as judged by the Project Arborist shall be spray-washed at the direction of the Project Arborist.

Maintenance of impacted trees
Trees should be monitored and inspected annually and after major storms to identify conditions requiring treatment to manage risk associated with tree failure.

Preserved trees will experience a physical environment different from that pre-development. As a result, tree health and structural stability should be monitored. Occasional pruning, fertilization, mulch, pest management, replanting and irrigation may be required. In addition, provisions for monitoring both tree health and structural stability following construction must be made a priority. Inspect trees annually and following major storms to identify conditions requiring treatment to manage risk associated with tree failure.

Our procedures included assessing trees for observable defects in structure. This is not to say that trees without significant defects will not fail. Failure of apparently defect-free trees does occur, especially during storm events. Wind forces, for example, can exceed the strength of defect-free wood causing branches and trunks to break. Wind forces coupled with rain can saturate soils, reducing their ability to hold roots, and blow over defect-free trees. Although we cannot predict all failures, identifying those trees with observable defects is a critical component of enhancing public safety.

Furthermore, trees change over time. Our inspections represent the condition of the tree at the time of inspection. As trees age, the likelihood of failure of branches or entire trees increases. Annual tree inspections are recommended to identify changes to tree health and structure. In addition, trees should be inspected after storms of unusual severity to evaluate damage and structural changes. Initiating these inspections is the responsibility of the client and/or tree owner.

If you have any questions regarding my observations or recommendations, please contact me.

HortScience | Bartlett Consulting

Allegra Mautner, Consulting Arborist & Urban Forester
ISA Certified Arborist No. WE-10369A
ISA Tree Risk Assessment Qualified
American Society of Consulting Arborists, Member

Exhibits

Tree Assessment Plan

Tree Assessment Form

Tree Assessment Plan

Oak Hill Apartments
Marin County, CA

Prepared for:
First Carbon Solutions
Walnut Creek, CA

January 2022/Updated October 2022

No Scale

Notes:
Base map provided by:
Google Earth

Numbered tree locations are approximate

HORT SCIENCE
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Tree Assessment

Oak Hill Apartments
San Quentin, CA
September 2022

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Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
136	Coast live oak	6	Yes	3	Low	Codominant trunks arise from 6'; jog in trunk at base; sinuous trunk; vigorous dense crown.
137	Coast live oak	33	Heritage	4	Moderate	Multiple trunks arise from 4'; measured below union; seam in union; unbalanced crown to W; dense spreading crown.
138	Coast live oak	34	Heritage	3	Low	Multiple trunks arise from 5'; burl at base; branch and twig dieback; limbs touching ground; thinning unbalance crown to SW.
139	Coast live oak	6,4	Yes	3	Moderate	Codominant trunks arise from 4'; lean and bow to S; unbalanced crown from crowding with #140.
140	Coast live oak	8	Yes	4	High	Codominant trunks arise from 6'; unbalanced crown to E from crowding with #138.
141	Coast live oak	25,22,22,20, 16,16,13	Heritage	3	Moderate	Offsite; multiple trunks arise from base; estimated trunk sizes; under fence; slightly thin spreading crown.
142	Coast live oak	17,14,13,12	Heritage	3	Low	Codominant trunks arise from 1'; multiple trunks arise from 4'; seam in union; very thin crown on N side; wide spreading crown with overextended branches.
143	Coast live oak	9,9,6,6,5	Heritage	3	Moderate	Codominant trunks arise from 1'; codominant trunks arise from 2' on each stem; spreading dense crown; good young tree.
144	Coast live oak	9,9,8,7,5,4	No	2	Low	Codominant trunks arise from base with seam; codominant trunks arise from 4' on N stem; crown dieback to ends; conflicting branches.
145	Coast live oak	7,5	Yes	4	High	Codominant trunks arise from base; good young tree.

Tree Assessment

Oak Hill Apartments
San Quentin, CA
September 2022

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Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
146	Coast live oak	11	Yes	4	High	Multiple trunks arise from 6'; good young tree.
147	Coast live oak	9,7,4	Heritage	4	High	Multiple trunks arise from 3.5'; some small conflicting branches; good young tree.
148	Coast live oak	6	Yes	4	High	Good young tree.
149	Coast live oak	24	Heritage	3	Moderate	Offsite; no tag; multiple trunks arise from 2'; estimated DBH below union; overextended limb over fence; dense spreading crown.
150	Coast live oak	6,4,4,2	Yes	4	Moderate	Codominant trunks arise from 1' and 3'; growing in rock; dense spreading crown.
151	Coast live oak	11,9	Heritage	4	Moderate	Codominant trunks arise from 3' and 5' with seams; slightly thin narrow and upright crown.
152	Coast live oak	8,3,2	Yes	3	Low	Codominant trunks arise from base; codominant trunks arise from 3' on S stem; unbalanced crown to SW from crowding with #151; sinuous trunk.
153	Coast live oak	9	Yes	4	High	Codominant trunks arise from 5'; good young tree.
154	Coast live oak	14	Yes	3	Moderate	Codominant trunks arise from 4.5'; slightly thin upright and narrow crown.
155	Coast live oak	8	Yes	3	Low	Multiple trunks arise from 4.5'; slightly thin unbalanced crown to W from crowding.
156	Coast live oak	9,7	Yes	4	High	Codominant trunks arise from 2'; codominant trunks arise from 6' on S stem; good young tree.
157	Coast live oak	8,6,5	Heritage	3	Moderate	Multiple trunks arise from 3' with seam; slightly thin spreading crown.

Tree Assessment

Oak Hill Apartments
San Quentin, CA
September 2022

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Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
158	Coast live oak	7,3	Yes	3	Moderate	Codominant trunks arise from 3'; bow on main stem to W; unbalanced crown from crowding with #157.
159	Coast live oak	14	Yes	4	High	Multiple trunks arise from 6'; great structure; dense vigorous upright crown.
160	Coast live oak	9	Yes	3	Moderate	Multiple trunks arise from 5'; good young tree.
161	Coast live oak	7,6,5	Heritage	3	Moderate	Codominant trunks arise from 1.5' and 3'; unbalanced crown to S; dense vigorous crown.
162	Coast live oak	7	Yes	3	Moderate	Codominant trunks arise from 5'; narrow upright crown due to crowding with adjacent trees; vigorous crown.
163	Coast live oak	15,14,7,6	Heritage	3	Low	Multiple trunks arise from 2'; root crown buried by sediment on uphill side; uncorrected lean to W; thinning crown with growth at branch ends.
164	Coast live oak	25	Heritage	4	Moderate	Multiple trunks arise from 6'; slightly thin spreading crown; foliage at end of branches; sediment on uphill side with large root lifting from soil.
165	Coast live oak	26,22,16	No	2	Low	Codominant trunks arise from base; multiple trunks arise from 5'; multiple stem failures; smallest stem on ground; rot in center at union; unbalanced vigorous crown to W; in watercourse.
166	Coast live oak	9,6	Yes	4	High	Codominant trunks arise from 1' with seam; weeping on E side of trunk at union; good young tree.
167	Coast live oak	15	Yes	4	Moderate	Multiple trunks arise from 5' with seam; dense vigorous spreading crown.

Tree Assessment

Oak Hill Apartments
San Quentin, CA
September 2022

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Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
168	Coast live oak	30,24	Heritage	4	Moderate	Offsite; no tag; codominant trunks arise from 4'; twig and branch dieback in interior crown; sediment washing out on downhill side; unbalanced thinning crown to W.
169	Coast live oak	23,18	Heritage	3	Moderate	Codominant trunks arise from 2' with good union; thinning spreading crown with foliage at ends of branches.
170	Coast live oak	7	Yes	3	Moderate	Multiple trunks arise from 5'; unbalanced thin crown to N; sinuous trunk; root crown buried on uphill side.
171	Coast live oak	12	Yes	3	Moderate	Multiple trunks arise from 5'; lean and bow to NW with unbalanced crown; thinning foliage; root crown buried on uphill side.
172	Coast live oak	8,5	Yes	3	Low	Codominant trunks arise from 3'; narrow thinning upright crown from crowding with adjacent trees.
173	Coast live oak	8,4	Yes	4	High	Codominant trunks arise from base; good young tree.
174	Coast live oak	8,4	Yes	3	Low	Codominant trunks arise from 3'; narrow upright unbalanced crown to S due to crowding with #173.
175	Coast live oak	10	Yes	3	Moderate	Unbalanced crown to S; jog in trunk at 8'; dense upright crown.
176	Coast live oak	8,7	Yes	3	Moderate	Codominant trunks arise from base; narrow upright crown; some stunted growth at branch tips.
177	Coast live oak	6,5,4	Yes	3	Moderate	Multiple trunks arise from 2'; narrow upright crown; suppressed under #176.
178	Coast live oak	7,5	Yes	4	High	Codominant trunks arise from 1'; good young tree.
179	Coast live oak	9	Yes	4	High	Multiple trunks arise from 6'; good young tree.

Tree Assessment

Oak Hill Apartments
San Quentin, CA
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Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
301	Arroyo willow	9,5	No	1	Low	In opening in front of culvert; codominant stems arise from 2'; under HV lines; multiple failed branches and stems; mostly dead twigs and branches.
302	Arroyo willow	9,9,8,7,6	No	1	Low	In channel; multiple stems arise from base; 9" stem laying on ground; mostly dead branches and twigs.
303	Coast live oak	8	Yes	3	Moderate	DBH below fused trunks; codominant stems arise from 3'; vigorous canopy; slight lean to SE.
304	Lombardy poplar	9,8,7,2,2,1,1	No	3	Moderate	Codominant stems arise from base; multiple attachments arise from 3'; vigorous canopy; upright structure; tight branch unions.
305	Coast live oak	19,10,8	Heritage	3	Moderate	3' from property fence in open landscape; codominant stems arise from base; S stem forks at 2'; N stem multiple attachments at 5'; thinning canopy with leaf chlorosis; S stem slight S lean; N stem upright structure.
306	Coast live oak	6,3,2	Yes	3	Low	Offsite; no tag; open landscape; codominant stems arise from base; spreading canopy; canopy extends over property line by 2'; conflicting stems.
307	Coast live oak	24	Heritage	4	Moderate	Open grown in channel; large branch arise from 1' with included bark and seam; multiple attachments arise from 7' & 9' with included bark; wide, spreading canopy; vigorous foliage.
308	Coast live oak	6	Yes	4	Moderate	In small stand with 2 other oaks; single stem with branch arise from 1' with included bark; slight N lean from competing oak to S; vigorous canopy.

Tree Assessment

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Tree No.	Species	Trunk Diameter (in.)	Protected Tree?	Condition 1=poor 5=excellent	Suitability for Preservation	Comments
309	Coast live oak	7	Yes	4	Moderate	In small stand with 2 other oaks; multiple attachments arise from 5' with included bark; slight SE lean from competing oak to N; vigorous canopy.
310	Coast live oak	34	Heritage	3	Moderate	Open grown on steep slope; multiple attachments at 4'; thinning, spreading canopy.
311	Coast live oak	27	Heritage	4	Moderate	Open grown on steep slope; multiple attachments at base with included bark; vigorous, spreading canopy.
312	Coast live oak	10	Yes	3	Low	Overtopped by #311 & #315; codominant stems arise from 4'; N lean with sinuous stems; think canopy.
313	Coast live oak	6,4	Yes	3	Low	Suppressed by #314 on N side; codominant stems arousing at 2'; seeping on smaller S stem; lopsided canopy.
314	Coast live oak	10,9	Heritage	3	Low	Suppressed by #313 & #315; codominant stems arise from 1' with 1' seam; included bark on upright branches throughout canopy; thin & small canopy.
315	Coast live oak	36	No	2	Low	On channel side; multiple attachments arise from 5'; sunken divots in bark; limbs branching to ground; dead and decaying lower canopy; thinning upper canopy; spreading canopy; twig & branch dieback; slight SW lean into channel; no root flare on uphill side.
316	Coast live oak	7	Yes	3	Moderate	Could not access; trunk not visible; no tag; healthy crown.
317	Coast live oak	11	Yes	4	Moderate	Open grown; on slope; codominant stems at 3' & 5' with included bark; slightly thin canopy; spreading canopy.