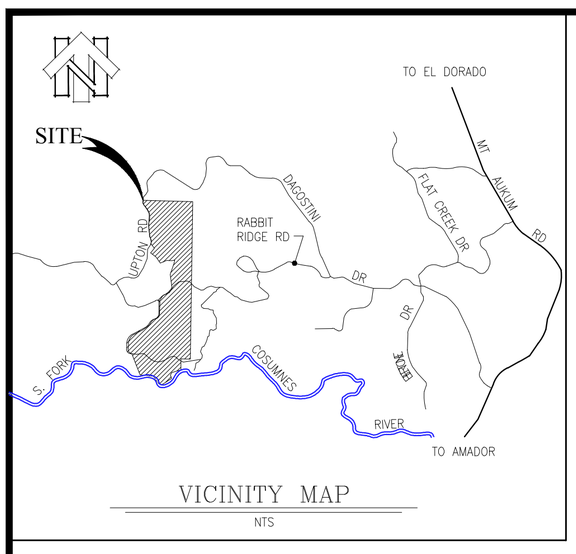

VICINITY MAP
NTS

TENTATIVE PARCEL MAP

SUNSHINE RANCH

COUNTY OF EL DORADO FEBRUARY, 2020 STATE OF CALIFORNIA

0 100' 200' 400'
SCALE: 1" = 200'

APPLICANT/ OWNERS OF RECORD

HELWIG VINEYARDS LLC
10391 VALLEY DR
PLYMOUTH, CA 95669

cta Engineering & Surveying
Civil Engineering ■ Land Surveying ■ Land Planning
3233 Monier Circle, Rancho Cordova, CA 95742
T (916) 638-0919 ■ F (916) 638-2479 ■ www.ctaes.net

MAP SCALE

1" = 200'

CONTOUR INTERVAL

CONTOUR INTERVAL = 2 FEET (FIELD SURVEY TOPO)
CONTOUR INTERVAL = 40 FEET (QUAD TOPO)

SOURCE OF TOPOGRAPHY

(USGS QUAD MAP/TOPOGRAPHIC SURVEY)

SECTION, TOWNSHIP and RANGE

SECTIONS 8,9,16 & 17, T.8 (N)., R.11 (E). M.D.B.&M.

ASSESSOR'S PARCEL NUMBERS

A.P.N. 046-071-040

PROPOSED ZONING

PA-20/ LA-40

PRESENT ZONING

PA-20/ LA-40

TOTAL AREA

166.83 ACRES

TOTAL NUMBER OF PARCELS

2 - RESIDENTIAL LOTS

MINIMUM LOT AREA

59.90 ACRES

WATER SUPPLY and SEWAGE DISPOSAL

PRIVATE WELL & SEPTIC

PROPOSED STRUCTURAL FIRE PROTECTION

PIONEER FPD

DATE OF PREPARATION

FEBRUARY, 2020

PHASING PLAN NOTICE

THE SUBDIVIDER MAY FILE MULTIPLE FINAL MAPS FOR THIS PROJECT. THE SUBDIVIDER SHALL NOT BE REQUIRED TO DEFINE THE NUMBER OR CONFIGURATION OF THE PROPOSED MULTIPLE FINAL MAPS. (PER THE SUBDIVISION MAP ACT, SECTION 66456.1)

ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THE LAND DEVELOPMENT KNOWN AS "SUNSHINE RANCH" HAS BEEN DESIGNED IN ACCORDANCE WITH THE SPECIFICATIONS AND GUIDELINES ESTABLISHED BY THE COUNTY OF EL DORADO.

BRIAN M. ALLEN P.E. 60764

LEGEND

———	BOUNDARY	- - - - -	(E) EASEMENT
— — — —	(E) LOT LINES	SS	(F) SANITARY SEWER
—— — ——	(E) CL	W	(E) WELL
———	LOT LINE		JURISDICTIONAL WATERS SEE REPORT PREPARED BY BARNETT ENVIRONMENTAL FOR ADDITIONAL INFORMATION
P-3	PERC TEST LOCATION		

CURVE TABLE			
CURVE #	LENGTH	RADIUS	DELTA
C1	140.08'	200.00'	40°59'57"
C2	369.40'	400.00'	55°00'01"
C3	138.92'	400.00'	20°00'01"
C4	104.42'	400.00'	15°00'00"
C5	143.15'	150.00'	57°00'04"
C6	158.65'	250.00'	36°59'58"
C7	95.40'	250.00'	21°59'56"
C8	71.76'	70.00'	61°40'14"
C9	235.11'	200.00'	71°59'55"
C10	185.41'	300.00'	36°00'00"
C11	86.58'	200.00'	25°00'04"
C12	355.28'	350.00'	61°00'02"
C13	222.94'	150.00'	95°59'53"

GROSS & NET LOT AREAS		
LOT NO.	GROSS AREA (AC)	NET AREA (AC)
1	59.90	53.74
2	106.93	96.89

NOTE:
SEE AERIAL MAP FOR APPROXIMATE LOCATION OF EXISTING STRUCTURES ON PARCEL 1.

1
59.90 AC

2
106.93 AC

HUCKABY
046-720-012

GAUDIO
046-720-013

UPTON ROAD

BAILEY WAY

50' ROAD & P.U.E. PER P.M. 47-95

APPROXIMATE LOCATION (E) SEPTIC SYSTEM

APPROXIMATE LOCATION OF JURISDICTIONAL WATER FLAT CREEK

(F) LEACH FIELD

(F) LEACH FIELD REPLACEMENT AREA

(F) SEPTIC TANK LOCATION

(F) APPROXIMATE BUILDING SITE

CL (E) PRIVATE ROAD

046-070-053
TRACT 2
R.S. 31-62
LLA PER 2008-056655

PUNCH
046-071-022
TRACT 1
R.S. 23-42

ARPAJIAN
046-071-041
PARCEL 7
P.M. 47-95

NIETERT
014-030-061

EKSTROM
014-030-062

CONSUMES RIVER

EL DORADO COUNTY
AMADOR COUNTY

PLANNING COMMISSION: _____

APPROVAL/DENIAL DATE: _____

BOARD OF SUPERVISORS: _____

APPROVAL/DENIAL DATE: _____

Wetlands & Biological Resources Assessment of APN 046-071-040-000 at Approximately 6100 Bailey Way in Plymouth/Somerset, CA 95623

Prepared By:

BARNETT ENVIRONMENTAL

Prepared For:
Helwig Properties, LLC
10391 Valley Drive
Plymouth, CA 95669

P20-0001

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FIGURES

APPENDICES

1.0 Introduction

Barnett Environmental has conducted a Wetlands & Biological Resource Assessment (W/BRA) of a ± 166.83-acre property ("Study Area") at approximately 6100 Bailey Way in Plymouth/Somerset, California (APN: 046-071-040-000), near the intersection of D'Agostini and Big Horn Roads in western El Dorado County (Figure 1). It is located within the Section 9, Township 8 North, Range 11 East of the Fiddletown California 7.5-minute USGS quadrangle (Figure 1) and lies within the Upper Cosumnes River watershed (HUC 18040013) at approximately 1,375 to 1,925 feet elevation above mean sea level (msl) and centered at 38° 33' 53" North latitude and 120° 46' 12" West longitude. The property remains largely undeveloped, except for several vineyards in the northeastern portion of the parcel. While this assessment generally covers the entire ~166-acre Study Area, it concentrates on the 10-acre, previously cleared central portion of this parcel that is targeted for construction of a single-family residence.

Beyond GPS mapping of the single, perennial waterway flowing in an East-West direction on the northern side of the 10-acre construction area, this report:

- Identifies and describes the vegetation communities present;
- Records all plant and animal species observed during the field survey(s);
- Evaluates and identifies sensitive habitats and special status plant and animal species that may occur in the Study Area and could be affected by project activities; and
- Provides conclusions and recommendations for mitigating potential adverse impacts to identified resources.

2.0 Regulatory Setting

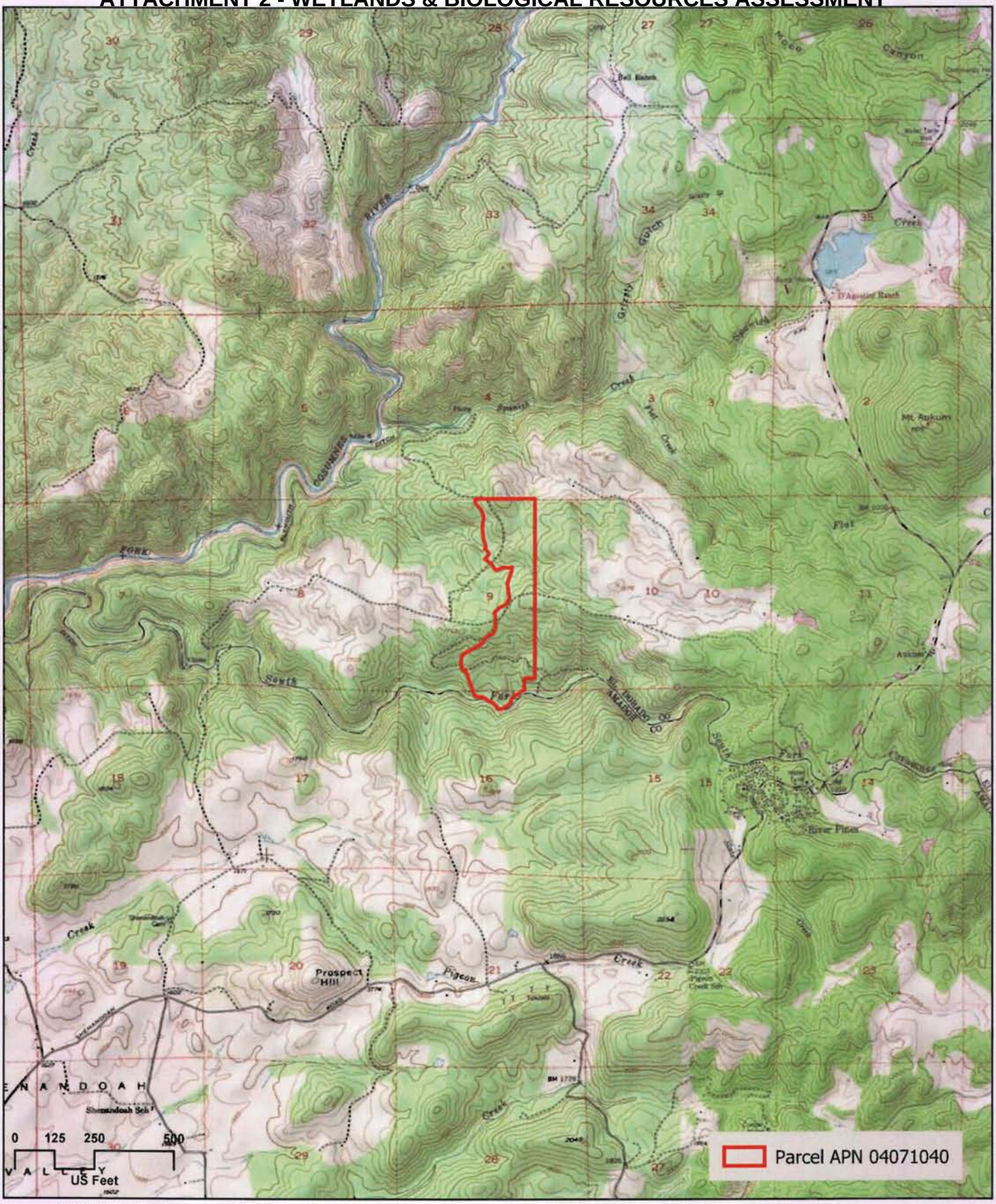
The following federal laws, regulations and/or policies provide the legal framework guiding the protection of biological resources. We have included those laws most relevant to biological and wetland resources in and around the Study Area.

2.1 Federal Laws & Regulations

Federal Endangered Species Act (FESA)

The FESA, enacted in 1973, prohibits the taking, possession, sale, or transport of endangered species. Under the FESA, the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered. Both the National Marine Fisheries Service (NMFS) and the U.S. Fish & Wildlife Service (USFWS) administer FESA. NMFS is accountable for animals that are threatened or endangered (16 United States Code [USC] 1533[c]) and spend most of their lives in marine waters, including marine fish, most marine mammals, and anadromous fish such as Pacific salmon. The USFWS is accountable for all other federally listed plants and animals.

Pursuant to the requirements of FESA, a federal agency reviewing a project within its jurisdiction must determine whether any federally listed threatened or endangered species could be present in the Study Area and whether the project will have a potentially significant impact on such species. In addition, federal agencies are required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]).



Source: USGS 7.5-Minute Topographic Quads Fiddletown & Aukum, El Dorado County,CA

FIGURE 1 - PROJECT AREA LOCATION

BAILEY WAY PROJECT • EL DORADO COUNTY, CA

Date: December 10, 2019

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Projects that would result in a "take" of any federally-listed threatened or endangered species are required to obtain authorization from NMFS and/or USFWS through either Section 7 (interagency consultation) or section 10(a) (incidental take permit) of FESA, depending on whether the federal government is involved in permitting or funding the project. The Section 7 authorization process is used to determine if a project with a federal nexus would jeopardize the continued existence of a listed species and what mitigation measures would be required to avoid jeopardizing the species. The Section 10(a) process allows take of endangered species or their habitat in non-federal activities.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) regulates or prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50 Code of Federal Regulations (CFR) Section 10.13. The MBTA is an international treaty for the conservation and management of bird species that migrate through more than one country and is enforced in the United States by the USFWS. Hunting of specific migratory game birds is permitted under the regulations listed in Title 50 CFR 20. The MBTA was amended in 1972 to include protection for migratory birds of prey (raptors).

Bald and Golden Eagle Protection Act

The federal Bald and Golden Eagle Protection Act regulates or prohibits taking, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). "Take" includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb (16 U.S.C. 668c; 50 CFR 22.3).

Federal Clean Water Act (CWA)

Section 404

Section 404 of the CWA identifies the U.S. Army Corps of Engineers (USACE) as the principal authority to regulate activity that could discharge fill or dredge material or otherwise adversely modify wetlands or Waters of the U.S. (WOUS). The USACE implements the federal policy embodied in Executive Order 11990, which, when implemented, is intended to result in no net loss of wetland values or function. U.S. Congress has authorized the Environmental Protection Agency (EPA) to have a specific oversight role over USACE's authority.

Section 401

The State Water Resources Control Board (SWRCB) has authority over wetlands through Section 401 of the CWA, as well as the Porter-Cologne Act, California Code of Regulations Section 3831(k), and California Wetlands Conservation Policy.

The CWA requires that an applicant for a Section 404 permit (to discharge dredged or fill material into waters of the United States) first obtain a certificate from the appropriate state agency stating that the fill is consistent with the State's water quality standards and criteria. In California, the authority to either grant certification or waive the requirement for permits is delegated by the SWRCB to the nine regional boards. The Central Valley Regional Water Quality Control Board (CVRWQCB) is the appointed authority for Section 401 compliance in the project site. A request for certification or waiver is submitted to the Regional Board at the same time an application is

filed with the USACE. The regional board has 60 days to review the application and act on it. Because no USACE permit is valid under the CWA unless "certified" by the state, these boards may effectively veto or add conditions to any USACE permit.

2.2 State Laws & Regulations

California Endangered Species Act (CESA)

The CESA was enacted in 1984. Under the CESA, the California Fish and Wildlife Commission (CFWC) has the responsibility for maintaining a list of threatened and endangered species, while The California Department of Fish & Wildlife (CDFW) is responsible for enforcement. CDFW also maintains lists of species of special concern. A Species of Special Concern (CSC) is a species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

- is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role;
- is listed as Federally-, but not State-, threatened or endangered;
- meets the State definition of threatened or endangered but has not formally been listed;
- is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status;
- has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status.

CESA prohibits the take of California listed animals and plants in most cases, but CDFW may issue incidental take permits under special conditions. Pursuant to the requirements of CESA, a State agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species could be present in the project site and determine whether the project would have a potentially significant impact on such species. In addition, CDFW encourages consultation on any project that could affect a listed or candidate species.

Fish and Game Code – Sections 1600-1616

Under Sections 1600-1616 of the California Fish and Game Code, the CDFW regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. The limits of CDFW's jurisdiction are defined in the code as the *"... bed, channel or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit ..."* (Section 1601). In practice, the CDFW usually marks its jurisdictional limit at the top of the stream or bank, or at the outer edge of the riparian vegetation, whichever is wider.

The CDFW also derives its authority to oversee activities that affect wetlands from state legislation. This authority includes Sections 1600-1616 of the Fish and Game Code (lake and streambed alteration agreements), Section 30411 of the California Coastal Act (CDFW becomes the lead agency for the study and identification of degraded wetlands within the Coastal Zone), CESA (protection of state listed species and their habitats - which could include wetlands), and the Keene-Nejedly California Wetlands Preservation Act of 1976 (states a need for an affirmative and sustained public policy program directed at wetlands preservation, restoration, and enhancement). In general, the CDFW asserts authority over wetlands within the state either through review and comment on USACE Section

404 permits, review and comment on CEQA documents, preservation of state listed species, or through stream and lakebed alteration agreements.

Fish and Game Code – Sections 1900-1913

These Sections embody the Native Plant Protection Act, which is intended to preserve, protect, and enhance endangered or rare native plants in the state. The act directs CDFW to establish criteria for determining what native plants are rare or endangered. Under Section 1901, a species is endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more causes. A species is rare when, although not threatened with immediate extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens. Under the act, CDFW may adopt regulations governing the taking, possessing, propagation or sale of any endangered or rare native plant.

Section 1913 of that Act allows landowners in conducting certain activities to take actions that will destroy rare or endangered plants, provided that, where the Department of Fish and Game (DFG) has previously notified the owner "that rare or endangered plants are growing" on his or her land, the owner notifies CDFW "at least 10 days in advance of changing the land" to allow the state agency to come and "salvage" the plants. Subject to this requirement, section 1913 states that "the presence of rare or endangered plants" on a property shall not restrict (1) timber operations conducted pursuant to an approved timber harvest plan, (2) "required mining assessment work pursuant to federal or state mining laws," (3) "the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, other right-of-way by the owner of the land or his agent," or (4) "the performance by a public agency or publicly or privately owned public utility of its obligation to provide service to the public."

Fish and Game Code – Sections 3503, 3503.5, 3513

Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Fish and Game Code Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act.

Fish and Game Code – Sections 3511, 4700, 5050, and 5515

Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code designate certain species as "fully protected." Fully protected species, or parts thereof, may not be taken or possessed at any time, and no provision of the CFWC or any other law may be construed to authorize the issuance of permits of licenses to take any fully protected species. No such permits or licenses heretofore issued may have any force or effect for any such purpose, except that the CFGC may authorize the collecting of such species for necessary scientific research. Legally imported and fully protected species or parts thereof ay be possessed under a permit issued by CDFW. Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act established the SWRCB and each Regional Water Quality Control Board (RWQCB) as the principal state agencies for coordinating and controlling water quality in California. Responsibility for the protection of water quality in California rests with the SWRCB and nine RWQCBs. The

SWRCB establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and state water quality statutes and regulations. Pursuant to the Act, each of California's nine regional boards must prepare and periodically update basin plans that set forth water quality standards for surface and groundwater, as well as actions to control point and non-point sources of pollution to achieve and maintain these standards. Basin plans offer an opportunity to achieve wetlands protection through enforcement of water quality standards.

The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the State are privileges, not rights." Waters of the State are defined in Section 13050(e) of the Porter-Cologne Water Quality Control Act as "...any surface water or groundwater, including saline waters, within the boundaries of the state." All dischargers are subject to regulation under the Porter-Cologne Water Quality Control Act, including both point and nonpoint source dischargers. The RWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within its jurisdiction, which would include the project site. As noted above, the RWQCB is the appointed authority for Section 401 compliance in the project site. If the USACE determines that they have no regulatory authority on the project site and they also determine that a CWA Section 404 permit is not required, the project proponent could still be responsible for obtaining the appropriate CWA Section 401 permit or waiver from RWQCB for impacts to Waters of the State.

California Environmental Quality Act

Although specific federal and state statutes protect threatened and endangered species, California Environmental Quality Act (CEQA) Guidelines Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals and allows a public agency to undertake a review to determine if a significant effect on a species that has not yet been listed by either the USFWS or CDFW (i.e., species of concern) would occur. Whether a species is rare, threatened, or endangered can be legally significant because, under CEQA Guidelines Section 15065, an agency must find an impact to be significant if a project would "substantially reduce the number or restrict the range of an endangered, rare, or threatened species." Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

2.3 Local Laws & Regulation

El Dorado County General Plan

El Dorado County General Plan Policy 7.3.3.5 establishes that rivers, streams, lakes and ponds, and wetlands shall be integrated into new development in such a way that they enhance the aesthetic and natural character of the site while disturbance to the resource is avoided or minimized and fragmentation is limited.

El Dorado County Oak Tree Ordinance

El Dorado County Ordinance No. 5061 (2017) establishes new standards for implementing the County's Oak Resources Management Plan (ORMP) in compliance with General Plan Policy 7.4.4.4 and Implementation Measure CO-P. Pursuant to Section 130.10.040.C of the Zoning Ordinance, projects in progress do not need to

comply with this new ordinance, but instead should comply with the 2004 El Dorado County General Plan Policy 7.4.4.4, requiring 200 one-gallon oak trees per acre of impact to existing oak canopy.

El Dorado County Site Planning and Project Design Standards

Title 13, Section 130.30.030 of the county's site planning and design standards requires the following:

a. Ministerial development, including single family dwellings and accessory structures, shall be set back a distance of 25 feet from any intermittent stream, wetland or sensitive riparian habitat, or a distance of 50 feet from any perennial lake, river or stream. This standardized setback may be reduced or grading within the setback may be allowed if a biological resource evaluation is prepared which indicates that a reduced setback would be sufficient to protect the resources.
b. All discretionary development which has the potential to impact wetlands or sensitive riparian habitat shall require a biological resource evaluation to establish the area of avoidance and any buffers or setbacks required to reduce the impacts to a less than significant level. Where all impacts are not reasonably avoided, the biological resource evaluation shall identify mitigation measures that may be employed to reduce the significant effects. These mitigation measures may include the requirement for compliance with the mitigation requirements of a state or federal permit, if required for the proposed development activity.
c. Any setback or buffer required by this subsection shall be measured from the ordinary high-water mark of a river, perennial or intermittent stream, and the ordinary high-water mark or spillway elevation of a lake or reservoir.
d. Except where otherwise provided in this section, filing, grading, excavating, or obstructing streambeds is prohibited except where necessary for placement of storm drain and irrigation outflow structures approved by the county; placement of public and private utility lines; construction of bridges and connecting roadways; maintenance activities necessary to protect public health and safety; and creek restoration and improvement projects.

3.0 Methodology

Prior to our field surveys, we queried the U.S. Fish & Wildlife Service's National Wetland Inventory (NWI; Figure 2); EcoAtlas' *California Aquatic Resources Inventory* (CARI; Figure 3); *NRCS Web Soil Survey* (Appendix A; Figure 4); and *Hydric Soil Map Units* for El Dorado County, California to determine whether any wetlands or "other waters of the U.S.", "waters of the State", or soils compatible with wetland resources had been historically recorded on or around, or are likely to occur on the site, as defined by the 1987 U.S. Army Corps of Engineers (USACE, 1987) *Wetlands Delineation Manual* and its 2008 *Arid West Regional Supplement*. We also assessed potentially federal and/or state jurisdictional wetlands and "other waters of the U.S." in the Study Area in accordance with the 2014 Corps *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) for Non-perennial Streams in the Arid West Region of the Western United States.*

To provide a vision of what potential biological resources may be present on the property, we queried the following online sources for information on the Study Area's potential plant and wildlife communities.

1. California Department of Fish & Wildlife's Natural Diversity Database (RareFind 5) for observations of special status plant and animal species within five miles of the Study Area (Figure 6; Appendix D),
2. U.S. Fish and Wildlife Service's iPac Database of federally-listed special status species in El Dorado County (Appendix E),
3. The California Native Plant Society's Inventory of Rare & Endangered Plants in California

A Barnett Environmental biologist surveyed the Study Area on November 26, 2019 for special status plant and wildlife species and their habitats that could be supported onsite. The survey included recorded observations of: (1) dominant plant communities, (2) plant and animal species (with emphasis on rare and endangered species) observed or their sign (nests, burrows, tracks, scat) and (3) the suitability of onsite habitats and those immediately adjoining the Study Area to support special status plant or animal species. We used generalized plant community classification schemes to classify onsite habitat types (Sawyer, Keeler-Wolf, and Evens, 2009).

4.0 Existing Conditions

4.1 Soils

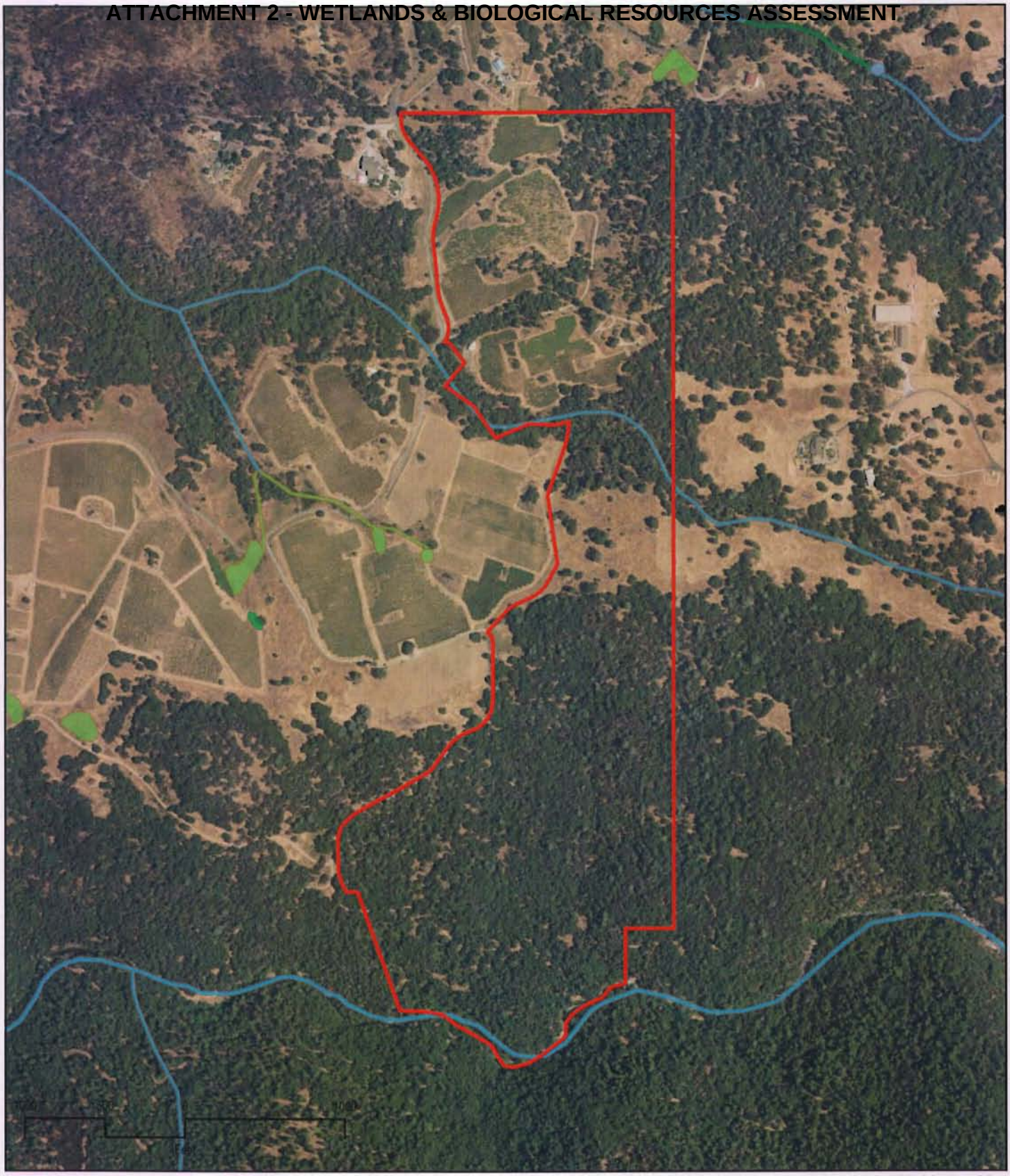
According to Natural Resource Conservation Service (NRCS), the Study Area is comprised of four soil types (Figure 4 and Appendix A), including:

- Ahwahnee very rocky coarse sandy loam – Typically found on hills with 30-50 percent slopes. A typical profile consists of coarse sandy loam, sandy loam, and weathered bedrock. Permeability of the soils is moderately high with a high surface runoff.
- Sierra rocky sandy loam, 5 to 15 percent slopes (SgC) – Typically found on ridges with a typical profile of sandy loam, loam, clay loam, and weathered bedrock. Sierra rocky sandy loam has a low to moderately low permeability with a moderate runoff.
- Sierra very rocky sandy loam, 15 to 30 percent slopes (ShD) – Typically found on ridges and is similar to Sierra Rocky sandy loam, but with a higher percentage of rock outcrop.
- Sierra very rocky sandy loam, 30 to 50 percent slopes (ShE) – Similar to Sierra very rocky sandy loam, 15 to 30 percent slopes.

The Study Area does not contain any ultramafic or serpentinitic soils – a requisite substrate for many special status plant species. As shown in Figure 4b, the nearest record of ultramafic and serpentinitic soils are 1.5 mile southeast of the Study Area. Therefore, special status plant species that require these specialized soils would not be found within or in proximity of this site.

4.2 Hydrology

The Study Area is located in the western foothills of the Sierra Nevada Mountains at an elevation between 1,350 and 1,750 feet above mean sea level (msl) within the Upper Cosumnes River watershed (HUC 18040013). Topography of the site is dominated by a roughly east–west trending ridgeline. Wooded canyon slopes to the south of this ridge



Parcel APN 04071040
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

U. S. Fish and Wildlife Service. Publication date October 2018. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/. Accessed May 9, 2019. Base Map Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USDA Farm Service Agency. Scale 1:10,000 original report (8.5 x 11).

FIGURE 2 - NATIONAL WETLANDS INVENTORY (NWI) WETLANDS

BAILEY WAY PROJECT • EL DORADO COUNTY, CA

Date: December 08, 2019

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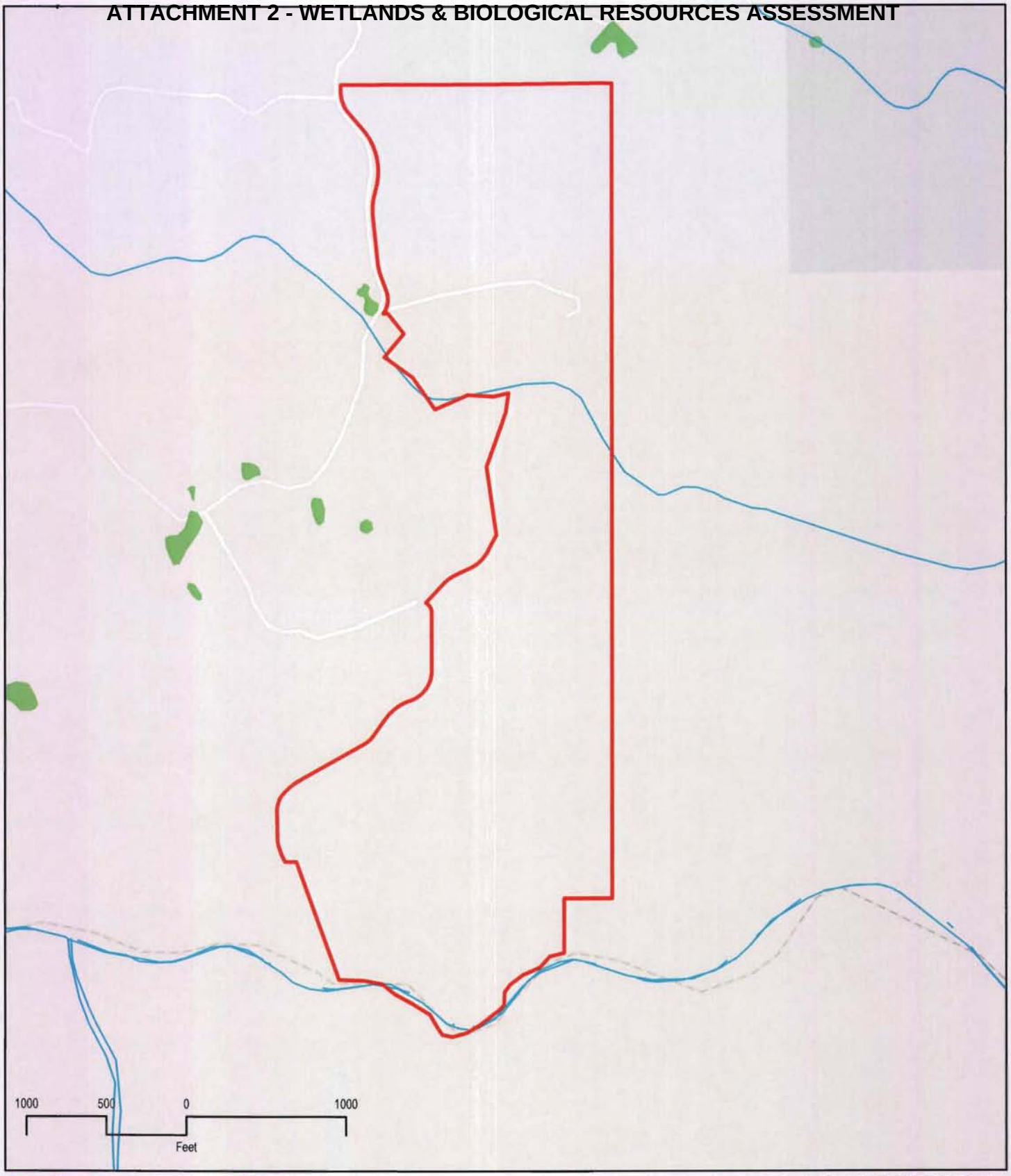


Parcel APN 04071040

Pond and associated vegetation

Fluvial Natural

San Francisco Estuary Institute (SFEI). "California Aquatic Resource Inventory (CARI) version 0.3." Accessed June 9, 2018. Original report (8.5 x 11) scale 1:10,000.

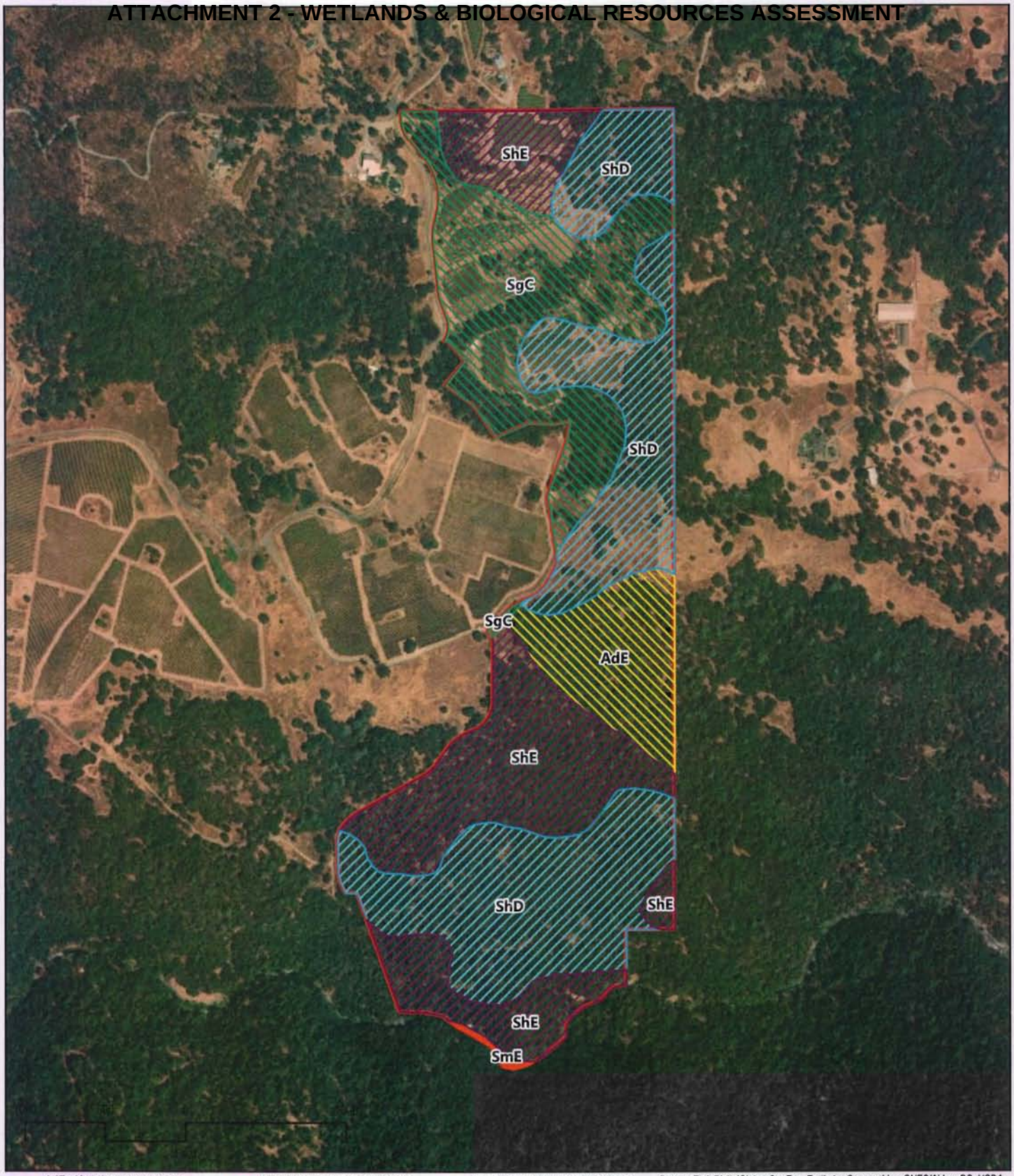
FIGURE 3 - CALIFORNIA AQUATIC RESOURCES INVENTORY (CARI) WETLANDS

BAILEY WAY PROJECT • EL DORADO COUNTY, CA

Date: December 08, 2019

N

BARNETT ENVIRONMENTAL



AdE- Ahwahnee very rocky coarse sandy loam, 30 to 50 percent slopes

Sgc- Sierra rocky sandy loam, 5 to 15 percent slopes

ShD- Sierra very rocky sandy loam, 15 to 30 percent slopes

ShE- Sierra very rocky sandy loam, 30 to 50 percent slopes

SmE- Sierra very rocky coarse sandy loam, moderately deep, 31 to 51 percent slopes

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USDA Farm Service Agency. USDA NRCS Soil Survey accessed 12/8/19, https://datagateway.nrcs.usda.gov/GDGOrder.aspx. Original report scale 1:10,000, 8.5x11.

FIGURE 4 - SOILS MAP

BAILEY WAY PROJECT • EL DORADO COUNTY, CA

Date: December 08, 2019

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drain steeply to the South Fork Cosumnes River, and more gradual slopes to the north of the ridge drain eventually into the Middle Fork Cosumnes River.

The portion of the parcel in the Middle Fork drainage also contains an intermittent tributary that is unnamed on the USGS Fiddletown 7.5-minute quadrangle but is locally known as Flat Creek. This small stream course is confined by steep canyon slopes on its north and south sides. Surface flows are likely present only during and shortly after heavy winter and spring rainstorms.

4.3 Wetlands and Other Waters of the U.S.

A total of 0.276 acre of "other waters of the U.S." (Flat Creek) was mapped within Study Area (see Table 1 and Figure 5).

Table 1 Mapped Wetlands by Type

Name	Area (SF)	Area (acres)
Flat Creek	12,037	0.276
Total	**12,037**	**0.099**

The tributary of Flat Creek flowing east to west through the north-central portion of the property and forming the northern boundary of the 10-acre site planned for residential development ranges in width from six to eight feet in width. The stream has a moderately steep gradient with a channel dominated by boulders and cobbles with occasional shallow lenses of sand and gravel.

The portion of the creek through the Study Area is delimited by the OHWM on either bank of the channel and the downstream property boundary. The was determined by a break in slope, change in type and amount of vegetative cover, and amount of surface litter.

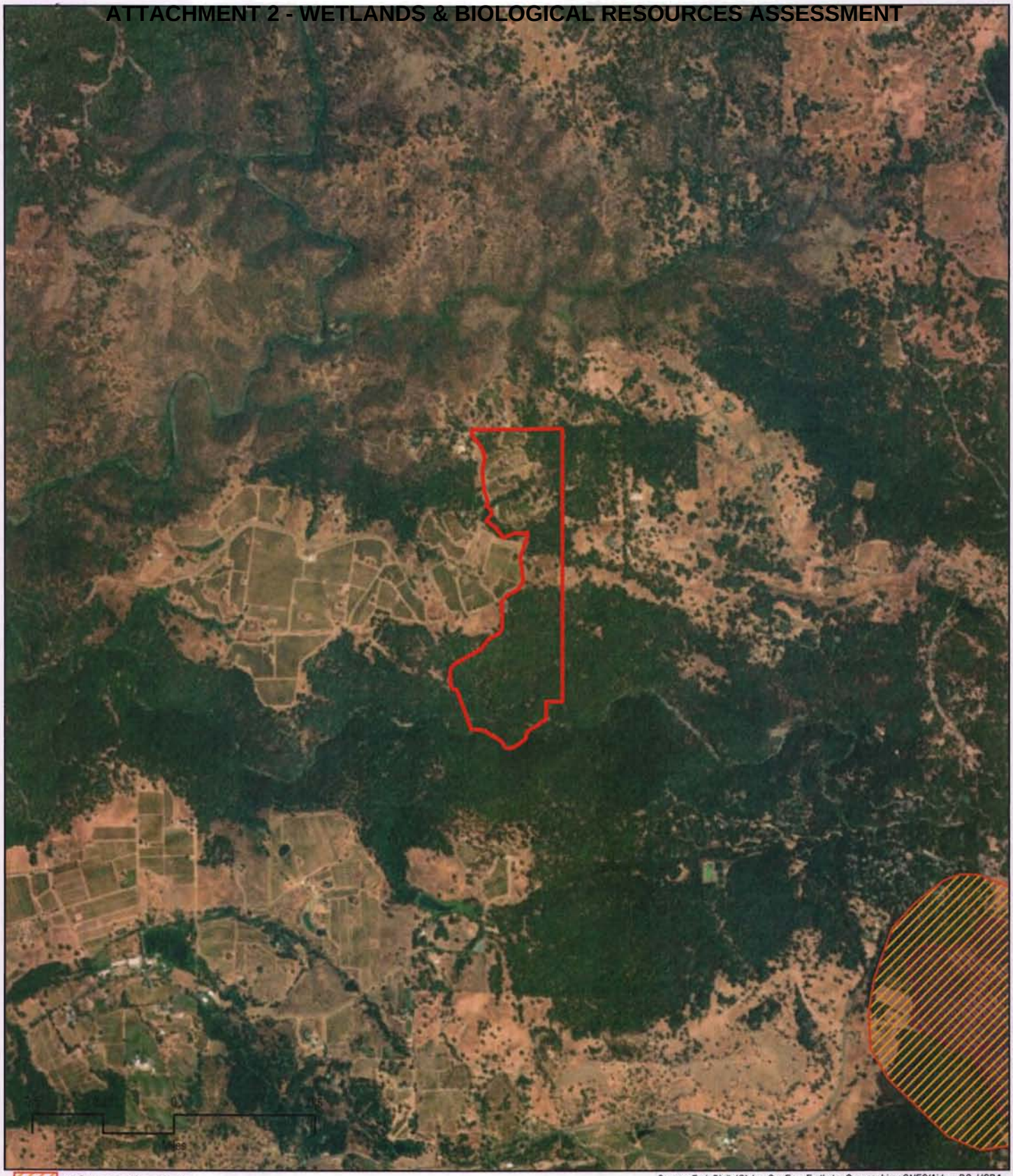
4.4 Vegetation Communities

Vegetation varies throughout the site, as shown in Figure 5.

The northern 56.6 acres of the site is predominantly vineyards interspersed with stands of mixed hardwood conifer woodland containing interior live (*Quercus wislizeni*) and black oaks (*Quercus velutina*), and conifers such as Ponderosa pine (*Pinus ponderosa*) and incense cedar (*Calodecrus decurrens*).

The approximately ten-acre central portion of the parcel targeted for single-family residential development had been cleared of most gray/ghost (*Pina sabiniana)* and Ponderosa pine (*Pinus ponderosa*) trees by the time of the survey with a few remaining large interior live (*Quercus wislizeni*) and black oaks (*Quercus velutina*) along its periphery.

The southwest 55.9 acres of the property support a mixed hardwood conifer woodland with no shrub understory and limited herbaceous groundcover. The dominant overstory species include black (*Quercus velutina*) and



Ultramafic Soils
Serpentinitic Soils

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USDA Farm Service Agency. USDA NRCS Soil Survey accessed 12/8/19, https://datagateway.nrcs.usda.gov/GDGOrder.aspx. Original report scale 1:30,000, 8.5x11.

FIGURE 4b - Serpentinitic and Ultramafic Soils

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Date: December 08, 2019

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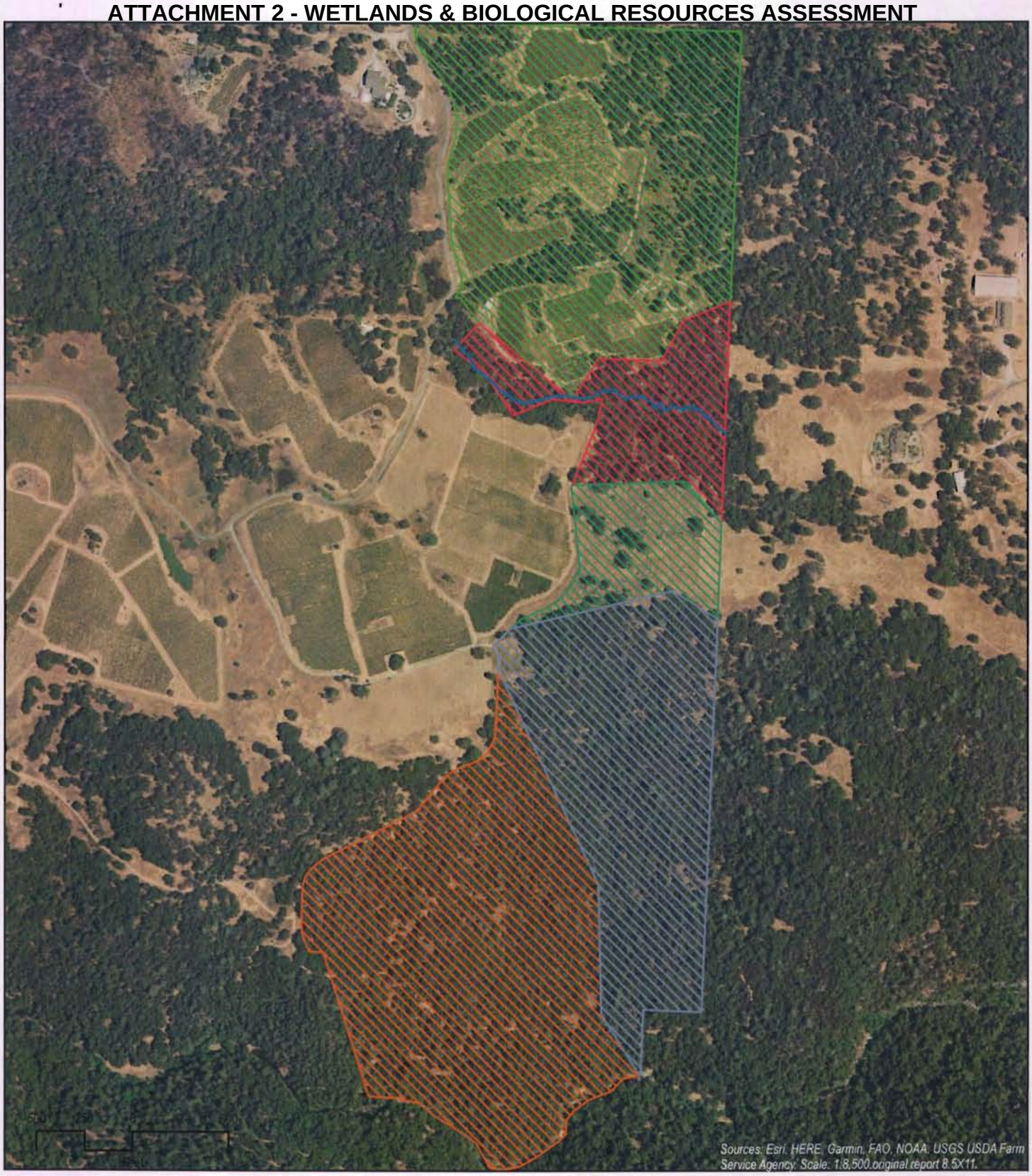
BARNETT ENVIRONMENTAL

P20-0001 SUNSHINE RANCH PARCEL MAP
ATTACHMENT 2 - WETLANDS & BIOLOGICAL RESOURCES ASSESSMENT



Flat Creek

Central (Project Area) 10.8 acres

Mixed Hardwood Conifer (55.9 acres)

Mixed Hardwood Conifer/ Chaparral (38.4 Acres)

Riparian/Mixed Hardwood Conifer (15.1 acres)

Vineyard/Mixed Hardwood Conifer (56.6 acres)

FIGURE 5 - VEGETATION AND "OTHER WATERS OF THE U.S."

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Date: December 16, 2019

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BARNETT ENVIRONMENTAL

interior live (*Quercus wislizeni*) oaks, occasional Ponderosa (*Pinus ponderosa*) and gray (ghost; *Pina sabiniana)* pine trees, with some buckeye (*Aesculus glabra*) in those areas with a more open canopy.

The southeast 38.4 acres of the Study Area support a mixed hardwood conifer woodland with a dominant overstory of interior live (*Quercus wislizeni*), occasional blue (*Quercus doglasii)* and black (*Quercus velutina*) oaks with gray (ghost; *Pina sabiniana*) and Ponderosa (*Pinus ponderosa*) pines. There is also a distinct shrub understory in this community of common (*Arctostaphylos manzanita*) and whiteleaf (*A. viscida*) manzanita and toyon berry chaparral (*Hetermoles arbutifolia).*

A list of vascular plant species observed on the project site is provided in Appendix D.

4.5 Wildlife

The predominant hardwood-conifer and riparian habitats (within the deeper ravines within the Study Area) onsite have a high wildlife value and provide cover, nesting habitat, and foraging habitat for many species, including migratory songbirds such as belted kingfishers (*Ceryle alcyon*), Anna's hummingbirds (*Calypte anna*), American bushtits (*Psaltriparus minimus*), ruby-crowned kinglets (*Regulus calendula*), Wilson's warblers (*Cardellina pusilla*), yellow warblers (*Dendroica petechia*), and lesser goldfinches (*Carduelis psaltria*). The only amphibian species encountered during our field survey were Pacific treefrogs (*Hyla regilla*). Common mammals such as raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), predators such as coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), the occasional mountain lion and large ungulates such as mule deer (*Odocoileus hemionus*) also frequent these woodlands and riparian corridors.

5.0 Special Status Species

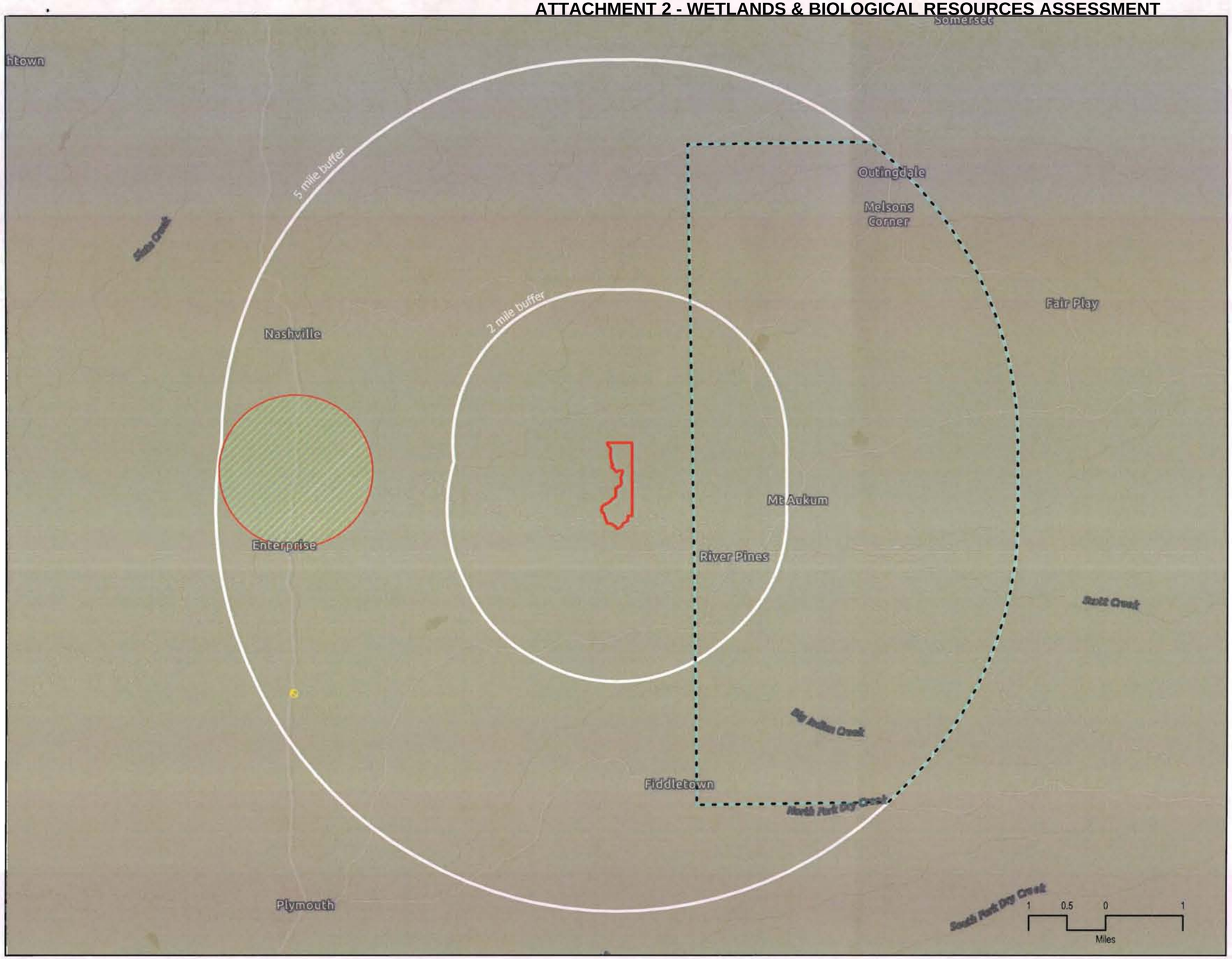
Special status species are those that fall into one or more of the following categories:

- Listed as endangered or threatened under the Federal Endangered Species Act (FESA) (50 CFR 17.11/17.12) (or formally proposed for listing) (64 FR 205, October 25, 1999; 57533-57547),
- Listed as endangered or threatened under the California Endangered Species Act (CESA) (or proposed for listing) (14 California Code of Regulations [CCR] 670.5),
- Designated as rare, protected, or fully protected pursuant to California Fish and Game Code (FGC, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).
- Designated a Species of Concern by the California Department of Fish and Game,
- Defined as rare or endangered under the California Environmental Quality Act (CEQA), or
- Occurring on List 1 or 2 maintained by the California Native Plant Society.

We reviewed California Natural Diversity Database (CNDDB), CNPS, and iPAC databases for special status species potentially occurring within the vicinity (i.e. within a five-mile radius of the Study Area). While there may be a number of plant and animal species occurring within a 5-mile radius of the Study Area (Figure 6), we can better refine the list of those species with any real potential of occurring in the Study Area by filtering for relevant onsite habitats, locations, and elevations. A summary of the results is given in (Table 2).

Table 2: Special Status Species with Potential to Occur in the Study Area

Species	Federal	State	CNPS	Habitat	Potential for Occurrence	Rationale for Assessing Potential of Occurrence
Plants						
Brandagee's clarkia *Clarkia biloba ssp. brandegeeae*	None	None	1B Rare	Occurs in chaparral, cismontane woodland, and lower montane coniferous forest.	Very low	The Study Area does contain suitable habitat for the species, but there are no CNDDB documented occurrences within five miles of the Study Area and no Brandagee's Clarkia was observed during the November 2019 site survey.
Species	Federal	State	CNPS	Habitat	Potential for Occurrence	Rationale for Assessing Potential of Occurrence
Amphibians						
California red legged frog *Rana draytonii*	FT	None	NA	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation; wetlands, marshes, natural ponds, artificial flowing waters, diversion canals and artificial standing waters such as dams and impoundments.	Low	The tributary of Flat Creek through the center of the site does provide marginal habitat for this species. There is a single CNNDB occurrence recorded in 1942 approximately four miles from the Study Area. This species was not observed during the November 2019 site survey.
California yellow legged frog *Rana Boylii*	None	CE	NA	Partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats.	Low	The Study Area does support suitable habitat for the species (Flat Creek tributary). However, there are no documented CNDDB occurrences within five miles of the Study Area and no California yellow-legged frogs were observed during the November 2019 site survey.



Detail Map

- Parcel APN 04071040
- California red-legged frog
- great gray owl
- western pond turtle

CNDDB version 12/2019. Please Note: The occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not yet been surveyed and/or mapped. Lack of information in the CNDDB about a species or an area can never be used as proof that no special status species occur in an area California Department of Fish and Wildlife. https://www.wildlife.ca.gov/Data/CNDDB, December 8, 2019. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USDA Farm Service Agency Scale

FIGURE 6 - CALIFORNIA NATIONAL DIVERSITY DATABASE (CNDDB) RECORDED SPECIES OBSERVATION

BAILEY WAY PROJECT • EL DORADO COUNTY, CA

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Date: December 08, 2019

Species	Federal	State	CNPS	Habitat	Potential for Occurrence	Rationale for Assessing Potential of Occurrence
Amphibians						
Western Pond Turtle *Actinemys marmorata*	None	SSC	NA	Found in ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation below 6000ft elevation.	Low	There is suitable stream habitat onsite that is intermittent in nature. There has been only one CNNDB reported occurrence within five miles. The species was observed in 2002 at approximately 4.5 miles from the site. None were observed during the November 2019 site survey.
Birds						
Great Grey Owl *Strix nebulosa*	None	CE	NA	Found in wet meadows, Aspen meadows, Douglas Firs, and late serial and mature conifer forests.	Low	Tree species provide a suitable habitat for the owl, but there are no wet open meadows on the Study Area. There are three documented CNDDB occurrences 0.8 miles to the east of the Study Area. However, no signs of this species were found during the November 2019 site survey.

Special Status Species Codes:

Federal: *FE = Federal Endangered.* *FT = Federal Threatened*

State: *SSC = California Species of Special Concern* *CE = California Endangered*

CFP = California Fully Protected *CT = California Threatened*

SCT = State Candidate California Threatened

SCE = State Candidate California Endangered

CNPS: *1B = Rare or Threatened in CA and elsewhere* *2B = Rare, Threatened, or Endangered in CA, but more common elsewhere*

Potential for Occurrence Codes:

None: *No suitable habitat for the special status species within the Study Area*

Very Low: *Either the special status species is known to occur within five miles and there is marginal suitable habitat exists in the Study Area, or the Study Area provides suitable habitat, but the species is not known to occur within a five-mile radius.*

Low — *Marginally suitable habitat exists in the Study Area and the special status species occurs within 5 miles but surrounding urban land use conditions and regularity of human activity make it unlikely that the species occurs in the Study Area.*

Moderate: — *The special status species is known to occur within a five-mile radius and the Study Area contains suitable habitat, however surrounding urban land use conditions and onsite disturbance reduce the likelihood of occurrence.*

High: — *The Study area provides suitable habitat and there is either documentation of species occurrence within a five-mile radius or evidence gathered by a professional surveyor during an onsite field assessment.*

Present: — *Species known to occur within the Study Area based on record search and/or evidence collect during onsite field surveys.*

5.1 Critical Habitat for Special Status Species

The Federal Endangered Species Act (FESA) requires the federal government to designate critical habitat for any listed species. Critical habitat is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. There is no designated critical habitat within the Study Area (Appendix C) and the nearest potential critical habitat (for the California red-legged frog; PLA-1) is 12.2 miles northeast of the Study Area.

5.2 Special Status Plants and Wildlife

The Study Area does not contain ultramafic or serpentinitic soils and the nearest such potential for such soils are approximately 1.5 miles southeast of the Study Area (see Figure 4b). Consequently, no special status plants requiring this substrate are expected to occur within or in close proximity to the Study Area. Only one special status plant species has potential to occur in the Study Area.

Brandagee's Clarkia – (*Clarkia Biloba ssp. brandagee; CNPS List 1B*) is a small (less than 3.5 feet tall) herbaceous annual with pink to purple flowers that bloom between May to July. It has no state or federal status, but it is on the CNPS List 2B. It is generally found in elevations from 804 to 2,904 feet in chaparral and woodland habitats. The elevation and vegetation of the Study Area provide a suitable habitat for this species. However, there are no documented CNDDB occurrences within five miles of the Study Area and this species was not observed during the November 2019 site survey. which has a very low potential to occur within the Study Area. Therefore, brandagee's clarkia has a very low potential to occur within the Study Area.

5.3 Special Status Wildlife

Federally Listed Species

A single federally listed animal species, California red-legged frog, has the potential to occur, but are not known to occur within the Project Area (Appendix B, Table 2).

1. **California red-legged frog** (*Rana draytonii*) – California red-legged frog is federally listed as a threatened species. It prefers slow-moving or standing deep ponds, pools, and streams with surrounding tall vegetation (e.g. grasses, cattails, and shrubs) that provide protection from predators and the sun. This species has a low potential to occur in the Study Area given the marginal riparian habitat and there was a single species occurrence four miles to the west back in 1942 (Figure 6). Additionally, according to USFWS, the nearest designated critical habitat is 12.2 miles northeast of the Study Area). No red-legged frogs were observed during the December 2019 site survey.

State Listed Species

There are three state listed animal species that have the potential to occur but are not known to occur within the Study Area (Appendix B, Table 2), including the:

1. **Foothill yellow-legged frog** (*Rana boyii*) – This amphibian can be found in rocky streams, rivers, and open sunny banks in chaparral, forest, and woodland habitats. The Study Area does contain an intermittent stream that could provide suitable habitat when it contains water, it is dry for most of the summer and fall and would not likely support much amphibian fauna. There is no designated critical habitat for foothill yellow-legged frog (*Rana boyii*) within the Study Area. According to CNDDB there were no recorded occurrence within five miles of the Study Area. This species was not observed during December 2019 site survey. Therefore, there is a very low potential for foothill yellow-legged frogs to occur within the Study Area.
2. **Western pond turtle** (*Emmys marmorata*) – This turtle is approximately eight inches long and occurs in ponds and other perennial surface waters with aquatic vegetation. They require basking sites and suitable upland habitat for egg laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks. The steep slopes of the stream course may preclude this species from the Study Area. In addition, there has been only one occurrence (2002) within five miles reported to the CNNDB (Figure 6). No western pond turtles were observed during the field survey conducted in Novemberr 2019. A survey during their active period (spring – fall) would more definitively determine their presence or absence. Therefore, western pond turtles have a very low potential for occurrence within the Study Area.
3. **Great gray owl** (*Strix nebulosa*) – The great gray owl is a California endangered species. This species nests in dense boreal and coniferous forest often adjoining areas like bogs, muskegs, or meadows. Breeding occurs from March through May where the females lays an average of four eggs. Incubation period is about 30 days with the young fledging several months after hatching. Great gray owls have a low potential to occur, given the Study Area contains suitable habitat and there are three documented CNDDB occurrences within five miles of the Study Area with the nearest occurrence 0.8 miles east (Figure 6). No great gray owls were observed during the December 2019 field survey.

6.0 Effects of Proposed Action

6.1 Effects of Proposed Action on Wetlands and "Other Waters of the U.S."

Any direct and/or indirect impacts on up to 0.276-acre of the tributary to Flat Creek ("other waters of the U.S.") on the north side of the 10-acre construction area would require U.S. Clean Water Act, Section 404 permitting with the U.S. Army Corps of Engineers, Section 401 Water Quality Certification with the Central Valley Regional Water Quality Control Board, and a Lake & Streambed Alteration Agreement (1602) with the California Department of Fish & Wildlife. The developer of the property would therefore pursue U.S. Clean Water Act permitting with these resource agencies prior to development of the site and mitigate any losses through purchase of equivalent wetland credits at an approved Mitigation/Conservation Bank within the project's service area.

6.2 Effects of Proposed Action on Rare Plants and Habitat

The following discussion of biological resources impacts and mitigation measures is based on implementation of the proposed project in comparison to existing conditions.

Brandagee's Clarkia According to CNDDB and CNPS records, there are no occurrence of this species within five miles of the Study Area. Barnett conducted a biological assessment in November 2019 and did not find any presence of this species. However, the blooming period for the brandagee's clarkia is May through July. Therefore, a protocol level survey will need to be conducted during this species blooming period prior to the start of construction to determine the presence within the Study Area.

Oak Trees

All required oak tree mitigation will be covered in a separate arborist report conducted by California Tree and Landscape.

6.3 Effects of Proposed Action on Wildlife and Habitat

Foothill Yellow-Legged Frog

The Study Area does provide suitable pond habitat for this species; however, no foothill yellow-legged frogs were observed during the November 2019 field survey. According to the CNDDB, there are no recorded occurrence of this species within five miles of the Study Area. However, a pre-construction survey could be conducted two weeks prior to the proposed disturbance, to ensure no foothill yellow-legged frogs would be adversely affected.

Western pond turtle

No western pond turtle was observed during the November 2019 site survey. The CNDDB record search revealed a single recorded occurrence approximately 4.5 miles east Study Area. However, a pre-construction survey will be conducted by a qualified biologist at least 15 days prior to construction. The biologist will survey all active work areas during the morning hours following any measurable precipitation events. Once the biologist has confirmed the absences of western pond turtle within the Study Area than construction will commence. If a western pond turtle is found within the Study Area than the California Department of Fish and Wildlife will be contacted, and proper mitigation measures will be put into action.

Special Status Bird Species, Nesting Raptors, and Migratory Bird

Barnett's November 2019 site survey did not reveal any occurrences of special status bird species within the Study Area. However, there are three CNDDB occurrences of great gray owl within five miles of the Study Area. Additionally, the Study Area does provide suitable habitat for the great gray owl. To ensure no future construction activities occasion to affect this bird or its nest, the following measures are proposed:

1. If any site disturbance or construction activity for any phase of development begins outside the February 1 to August 31 breeding season, a preconstruction survey for active nests shall not be required.
2. If any site disturbance or construction activity for any phase of development is scheduled to begin between February 1 and August 31, a qualified biologist shall conduct a preconstruction survey for active tree nests and ground nests from publicly accessible areas within 14 days prior to site disturbance for any phase of development. The survey area shall cover the construction site and a 300-foot radius for passerines, 500-foot radius for small raptors, and a 1000-foot radius for larger raptors surrounding the construction site . If no nesting migratory birds are found, then further mitigation measures are not necessary.
3. If an active nest of a migratory bird, or other CDFW-protected bird is discovered that may be adversely affected by any site disturbance, or an injured or killed bird is found, the project applicant shall immediately:

- Stop all work within a 500-foot radius of the discovery.
- Notify the County of El Dorado.
- Do not resume work within the 500-foot radius until authorized by the biologist.
- The biologist shall establish a minimum 300-foot Environmentally Sensitive Area (ESA) around the nest for passerine species, 500-foot for raptor species. The ESA may be reduced if the biologist determines that a smaller ESA would still adequately protect the active nest. Further work may not occur within the ESA until the biologist determines that the nest is no longer active.

7.0 Conclusions

The Study Area contains approximately 0.276-acre of "other waters of the *United States" and "waters of the State" in the form a tributary to Flat Creek.* Activities that affect this area would likely require a permit from the U.S. Army Corps of Engineers pursuant to Section 404 of the federal Clean Water Act (CWA), from the Regional Water Quality Control Board pursuant to Section 401 (Water Quality Certification) of the federal Clean Water Act and a Lake & Streambed (California Fish & Game Code, Section 1602) Agreement with the California Department of Fish & Wildlife.

Impacts to this waterway would also be subject to the State Water Resources Board's new Dredge & Fill procedures if entitlements are sought after May 28, 2020. Considering the potential costs and delays of permitting impacts to this stream, full avoidance of this waterway is highly recommended.

The California Natural Diversity Database (Rarefind) contains no records of any species of special concern within the 6100 Bailey way Study Area. While the species listed in Table 2 may occur within the vicinity of the Study Area,

two special status amphibians species, the western pond turtle and foothill yellow-legged frog; and one special status plant, brandagee's clarkia, and one bird, great gray owl have the potential to occur within onsite habitats, elevation, or nearby (within five miles) observations. In order to confirm presence or absence of these species, a pre-construction survey should be conducted no more than two weeks prior to construction.

8.0 References

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Appendix A:
NRCS Soil Report

United States Department of Agriculture

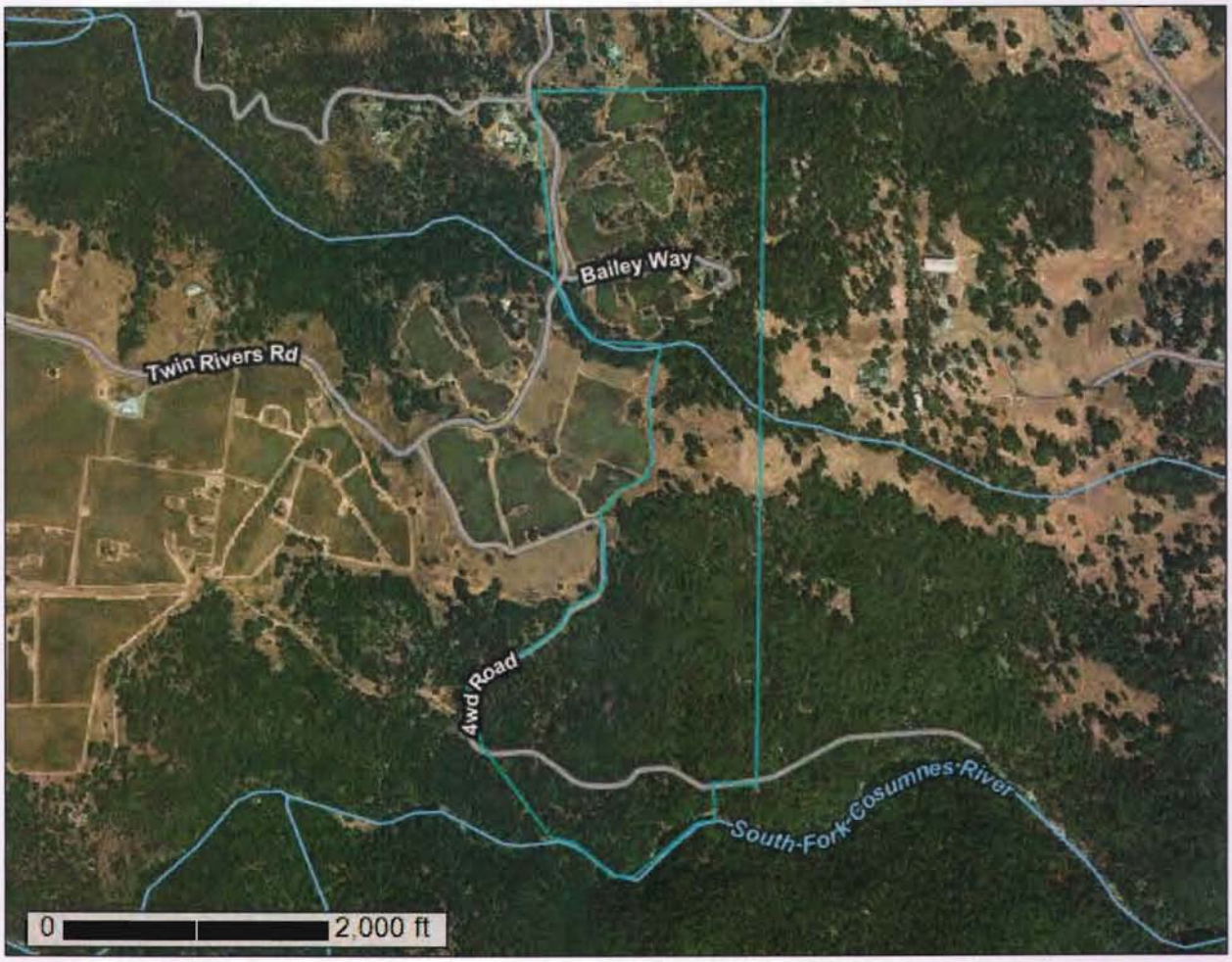
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for El Dorado Area, California

6100 Bailey Way, Somerset CA



September 19, 2019

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

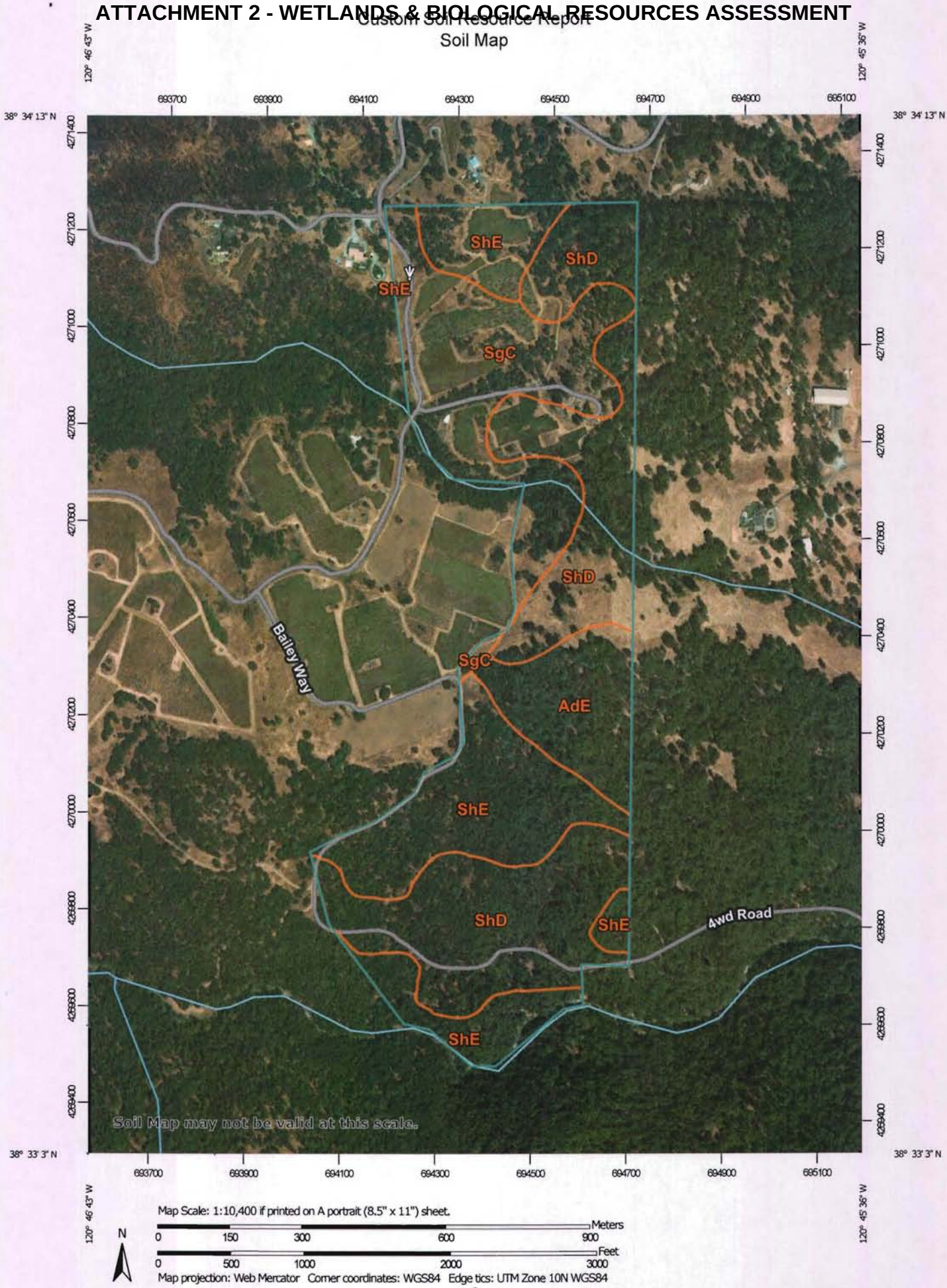
alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Soil Map

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

Custom Soil Resource Report
Soil Map



MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Dorado Area, California
Survey Area Data: Version 10, Sep 12, 2018

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

Date(s) aerial images were photographed: May 3, 2015—Mar 11, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AdE	Ahwahnee very rocky coarse sandy loam, 30 to 50 percent slopes	18.5	9.9%
SgC	Sierra rocky sandy loam, 5 to 15 percent slopes	42.7	22.9%
ShD	Sierra very rocky sandy loam, 15 to 30 percent slopes	74.1	39.7%
ShE	Sierra very rocky sandy loam, 30 to 50 percent slopes	51.4	27.5%
Totals for Area of Interest		**186.7**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

El Dorado Area, California

AdE—Ahwahnee very rocky coarse sandy loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hhy3
Elevation: 200 to 2,800 feet
Mean annual precipitation: 25 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 175 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Ahwahnee and similar soils: 75 percent
Rock outcrop: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ahwahnee

Setting

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

Typical profile

H1 - 0 to 8 inches: coarse sandy loam
H2 - 8 to 26 inches: sandy loam
H3 - 26 to 30 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 26 to 30 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Thermic Granitic Foothills 27-40 PZ (F018XI205CA)
Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

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

Auburn
Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

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

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

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

SgC—Sierra rocky sandy loam, 5 to 15 percent slopes

Map Unit Setting
National map unit symbol: hj1f
Elevation: 200 to 3,500 feet
Mean annual precipitation: 20 to 38 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 170 to 270 days
Farmland classification: Farmland of statewide importance

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

Description of Sierra

Setting
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, interfluve

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 25 inches: loam
H3 - 25 to 80 inches: clay loam
H4 - 80 to 84 inches: weathered bedrock

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 80 to 84 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Thermic Granitic Foothills 27-40 PZ (F018XI205CA)
Hydric soil rating: No

Minor Components

Rock outcrop

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

Auberry

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

Ahwahnee

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

Unnamed

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

Musick

Percent of map unit: 1 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Hydric soil rating: No

Argonaut

Percent of map unit: 1 percent
Landform: Ridges

Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

ShD—Sierra very rocky sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hj1g
Elevation: 200 to 4,000 feet
Mean annual precipitation: 8 to 38 inches
Mean annual air temperature: 45 to 63 degrees F
Frost-free period: 110 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Sierra and similar soils: 75 percent
Rock outcrop: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sierra

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 25 inches: loam
H3 - 25 to 80 inches: clay loam
H4 - 80 to 84 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 80 to 84 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Thermic Granitic Foothills 27-40 PZ (F018XI205CA)
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 4 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Ahwahnee

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

Auberry

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

Musick

Percent of map unit: 2 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Hydric soil rating: No

Holland

Percent of map unit: 2 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Josephine

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

ShE—Sierra very rocky sandy loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hj1h
Elevation: 200 to 4,000 feet
Mean annual precipitation: 8 to 38 inches
Mean annual air temperature: 45 to 63 degrees F
Frost-free period: 110 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Sierra and similar soils: 75 percent
Rock outcrop: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sierra

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 22 inches: loam
H3 - 22 to 40 inches: clay loam
H4 - 40 to 60 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C

Ecological site: Mesic Steep Convex Slopes 31-40 PZ bordering thermic (R018XI105CA)
Hydric soil rating: No

Description of Rock Outcrop

Typical profile
H1 - 0 to 4 inches: unweathered bedrock

Properties and qualities
Slope: 30 to 50 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: High
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

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

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

Musick
Percent of map unit: 2 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Hydric soil rating: No

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

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Appendix B: CNDDB

Multiple Occurrences per Page

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Fiddletown (3812057) OR Aukum (3812056)) AND Elevation IS greater than OR equal to "1000" AND Elevation IS less than OR equal to "2000" AND Habitat IS (Aquatic OR Broadleaved upland forest OR Chaparral OR Cismontane woodland OR Lower montane coniferous forest OR Meadow & seep OR Riparian forest OR Riparian scrub OR Riparian woodland OR Sacramento/San Joaquin flowing waters OR Ultramafic OR Valley & foothill grassland OR Wetland)

6100 Bailey Way, Somerset CA

Rana boylii **Element Code:** AAABH01050

foothill yellow-legged frog

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G3
	State:	Candidate Threatened		**State:**	S3
	Other:	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened, USFS_S-Sensitive			
Habitat:	**General:**	PARTLY-SHADED, SHALLOW STREAMS AND RIFFLES WITH A ROCKY SUBSTRATE IN A VARIETY OF HABITATS.			
	Micro:	NEEDS AT LEAST SOME COBBLE-SIZED SUBSTRATE FOR EGG-LAYING. NEEDS AT LEAST 15 WEEKS TO ATTAIN METAMORPHOSIS.			

Occurrence No.	103	**Map Index:** 30236	**EO Index:**	14412	**Element Last Seen:**	1994-08-23
Occ. Rank:	Fair		**Presence:**	Presumed Extant	**Site Last Seen:**	1994-08-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1994-09-08

Quad Summary: Aukum (3812056), Camino (3812066)

County Summary: El Dorado

Lat/Long:	38.62524 / -120.70156	**Accuracy:**	80 meters
UTM:	Zone-10 N4277696 E700083	**Elevation (ft):**	1690
PLSS:	T09N, R12E, Sec. 19, NW (M)	**Acres:**	0.0

Location: MIDDLE FORK OF COSUMNES RIVER, AT THE MT AUKUM ROAD BRIDGE CROSSING, 1.5 MILES SSW OF SOMERSET.

Detailed Location:

Ecological: STREAM CHANNEL IS DOMINATED BY SHEET BEDROCK, IN A SHALLOW CANYON WITH FAIRLY STEEP SLOPES. ALDER TREES ARE THE DOMINANT RIPARIAN VEGETATION.

General: 10+ TADPOLES OBSERVED ON 23 AUG 1994.

Owner/Manager: UNKNOWN

Multiple Occurrences per Page

California Department of Fish and Wildlife

California Natural Diversity Database

Clarkia biloba ssp. brandegeeae **Element Code:** PDONA05053

Brandegee's clarkia

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4G5T4
	State:	None		**State:**	S4
	Other:	Rare Plant Rank - 4.2, BLM_S-Sensitive			
Habitat:	**General:**	CHAPARRAL, CISMONTANE WOODLAND, LOWER MONTANE CONIFEROUS FOREST.			
	Micro:	OFTEN IN ROADCUTS. 75-915 M.			

Occurrence No.	80	**Map Index:** 78899	**EO Index:** 79880	**Element Last Seen:**	2009-05-24
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	2009-05-24
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2010-05-25

Quad Summary:	Fiddletown (3812057)
County Summary:	El Dorado

Lat/Long:	38.59961 / -120.79701	**Accuracy:**	nonspecific area
UTM:	Zone-10 N4274648 E691841	**Elevation (ft):**	1700
PLSS:	T09N, R11E, Sec. 29, SW (M)	**Acres:**	18.0

Location:	SAND RIDGE ROAD, 3.3 MILES EAST OF THE COSUMNES RIVER AND CA-49.
Detailed Location:	MAPPED BY CNDDB ALONG SAND RIDGE RD ~3.3 ROAD MILES EAST OF THE COSUMNES RIVER IN VICINITY OF THE GIVEN ELEVATION OF 521 M (1700 FT).
Ecological:	OAK WOODLAND WITH MUCH MANZANITA.
General:	OCCASIONAL ALONG THE ROADSIDE BANK IN 2009. ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 2009 HELMKAMP & HELMKAMP COLLECTION.
Owner/Manager:	UNKNOWN

Appendix C: U.S. Fish and Wildlife Service iPAC

P20-0001 SUNSHINE RANCH PARCEL MAP
ATTACHMENT 2 - WETLANDS & BIOLOGICAL RESOURCES ASSESSMENT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Amador and El Dorado counties, California

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

P20-0001 SUNSHINE RANCH PARCEL MAP
ATTACHMENT 2 - WETLANDS & BIOLOGICAL RESOURCES ASSESSMENT

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Amphibians

NAME	STATUS

California Red-legged Frog Rana draytonii — Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/2891

Fishes

NAME	STATUS
Delta Smelt Hypomesus transpacificus	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/321

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

MIGRATORY BIRD INFORMATION IS NOT AVAILABLE AT THIS TIME

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from

certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

R3UBH
R4SBC

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. 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.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix D:
Botanical Survey Plant List

Appendix E: Site Photos

Appendix F: Datasheets

California Tree and Landscape Consulting, Inc.

Arborist Report

January 15, 2020

Helwig Properties LLC
10391 Valley Drive
Plymouth, CA 95669
Attn: David Helwig

Work location
Sunshine Ranch
Plymouth, CA

Arborist Report for Oak Resources Conservation plan for proposed townhome development

APN No.
046-071-040

Prepared by:
Gordon Mann, Consulting Arborist

P20-0001

!243 High Street, Auburn, CA 95603 Office: (530) 475-4086; Direct: (650) 740-3461

Helwig Property Development, Plymouth, CA
Oak Resources Conservation Plan January 15, 2020

Arborist Disclosure Statement

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatment, pruning and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, and other issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist should then be expected to reasonably rely upon the completeness and accuracy of the information provided.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

Assignment

The subject site is proposed for development of a single-family home and outbuildings on a portion of an approximately 166.83 acres called Sunshine Ranch, Plymouth, CA. The client contacted our office on November 8, 2019 and requested we provide confirmation of the oak canopy cover and verify the calculations to meet the County of El Dorado's Oak Tree requirements under General Plan Ordinance 5061, The Oak Resources Management Plan. The client requested we provide the information required to satisfy the County of El Dorado's Oak Woodland Resources, determining the oak woodland area, identifying all native oak trees in the woodland area 24 inches in diameter and greater, all Heritage Trees 36 inches in diameter and greater, and any individual oak trees 6 inches and greater located outside of the woodland designation for tree removal and will need mitigation based on the County ORMP Oak Resources requirements and Ordinance No. 5061. This report is the result of the onsite inspection performed on January 3, 2020, and the use of aerial imagery.

This report is based on the current County ORMP ordinance No. 5061 and mitigation requirements.

Assignment limits

All the trees were observed while standing on the ground. Data collected is limited to a visual ground inspection. The aerial image was created using google maps and outlining the canopy. The canopy area was verified in the field inspection which also assessed the actual site conditions. Ground inspections were used to confirm and ensure the accuracy of the canopy area and proposed planting area.

containing oak woodland, vineyards, and open pastures around the property. The part of the properl for proposed development is approximately 16 acres, located in the open area in the middle of the long parcel along the road into the property. There is a part of the oak woodland included in the site assessment around the proposed area for development, along with some individual trees along the road into the property. The tree inventory performed only included the trees on both sides of the proposed work and along the road. There is no proposed development or impact to the remainder o the oak woodland on the property.

There has not been routine maintenance performed on most of the trees growing on the property. Tl condition ratings were: 2 in Good condition; 7 in Fair condition; 19 in Poor condition; 8 in Very Poor condition; and 1 Dead. The overall condition of the trees is comparable to the conditions expected c unmanaged trees growing in unmaintained areas. The data is shown on the attached Helwig Proper Development Oak Tree List.

There are no trees proposed for removal on the subject property development site. There are three trees proposed for removal along the road entering the site. The property owner will be removing these three trees due to poor condition that are allowable based on ORMP Section 130.39.050 **I. Dead, Dying, or Diseased Trees.** Individual native oak tree removal (including individual valley oak trees and valley oak trees within valley oak woodlands) is exempted from the mitigation requirement included in this Chapter when:

1. The tree is dead, dying, or diseased, as documented in writing by a Certified Arborist or Registere Professional Forester; and/or

2. The tree exhibits high failure potential with the potential to injure persons or damage property, as documented in writing by a Certified Arborist or Registered Professional Forester.

The three trees that meet this criteria are trees: #2696, a 36.3" diameter Interior Live Oak in Very Poor Condition; #2698, a 12.9" diameter Interior Live Oak in Poor condition; and #2699, 28.8" diameter Blue Oak in poor condition. The total inches to be removed is 78 diameter inches.

Technical Recommendations

It is recommended that all tree care follow specifications written in accordance with ANSI A-300 standards. Pruning of the trees should be performed in the outer portion of the canopy to reduce leverage and end weights and allow the center of the canopies to grow and fill in with foliage. It is al recommended that when root pruning, the smallest size roots as possible be pruned, cuts be performed with handsaws, loppers, or chainsaws appropriate for the size of the root being cut. The roots should be exposed by excavating prior to cutting. Roots should be pruned prior to root remova within the tree protection area to limit the damage and tearing of roots back towards the tree. Root pruning should be overseen by a qualified arborist.

Tree protection for all trees growing below the proposed buildings and roads can be achieved by running a fence along the property below the house construction at the outside edge of the tree canopies, or where approved encroachment is allowed, before any clearing, grubbing, or constructiq

Current Existing Tree Status (general)

is started. The tree protection shall be written on the construction plans so the workers are aware of the tree protection zone.

Tree planting should follow the specifications included in Appendix A.

General Tree Care and Maintenance

The appendix information is given so that an onsite landscape manager can properly take care of the retained trees, and newly planted trees. Established native oak trees do not like to have the base of the trunk or their roots and the surrounding soil disturbed or tampered with. Applying or having unintentional landscape water in the root zone can cause catastrophic and negative affects to most species of native oak trees. Newly planted oak trees do need their root balls watered until established and then may need supplemental watering during extended periods of dry or hot weather. It is, therefore, recommended that the landscape be designed using drought tolerant plants that will require little to no watering after establishment. Irrigation should be delivered using an on-surface drip type system that does not require trenching around the oak trees to install. The plants should be spaced at least 6 feet away from the trunk of native oak trees, and the drainage from irrigation should be managed so water does not flow to the trunks of the oak trees. Trees that are growing in high use areas should be inspected by a qualified arborist for tree risk on a routine basis, the frequency depending on site use and tree condition.

Observations

The site was inspected on January 3, 2020 to verify the canopy information and capture the tree data. The oak woodland trees surrounding the development area were inspected for diameter and condition. The individual trees along the road and in the center of the property were included in the inspection. All trees 24 inches in diameter or greater and all Heritage Trees, trees 36 inches in diameter and greater, growing on the development site were identified and included in the inspection. Two trees were found to be in Good condition, 7 trees were found to be in Fair condition, 19 trees were found to be in poor condition, 8 trees were found to be in poor condition and 1 tree was found to be dead. Thirty-five trees were found to be greater than 24 inches in diameter. Five Heritage Trees were found to be in fair or better condition.

There are no trees proposed to be removed for the proposed development. Three trees in poor and very poor condition are proposed to be removed to improve the road into the property. The canopy and impact have been calculated for mitigation. Each inspected tree was tagged, measured for diameter, assessed for condition, the number of stems present, and notes explaining the tree characteristics affecting condition were recorded. The tree data is shown on the attached Helwig Property Development Oak Tree List.

The tree condition rating is a combination of vigor, structure, trunk, branches, trunk flare, live tissue, and defects and decay or pests. It is described in % and range term. The rating scale is:

	Range	# Rating	Description
5	Excellent	81-100	Found to have none to few defects or decay, and high vigor
4	Good	61-80	Found to have few defects or decay, and above average vigor
3	Fair	41-60	Found to have mitigatable defects, limited decay, and average vigor
2	Poor	21-40	Found to have significant defects, decay, and lower vigor
1	Very poor	1-20	Found to have significant defects, decay, and low declining vigor

0 Dead 0 Found to be dead

Diameter at Breast Height (DBH) is the industry standard for measuring trunk diameter. For trees with straight trunks and normal taper, the measurement is taken at 4.5 feet above grade. When a swollen area, flare from branching, multiple stems, or other abnormal growth is present, the diameter at 4.5 feet would not be characteristic of the subject tree. Therefore, the measurement is taken at the most appropriate location for determining the reasonable trunk diameter, and the height the measurement was taken is listed with the diameter measurement if not at 4.5 feet. The final diameter size of the trees was measured with a diameter tape. The initial measurements of the trees to identify trees greater than 24 inches in diameter or Heritage Trees were taken with a Biltmore Stick. For all trees found to be close to 24 inches diameter or greater, a second more accurate measurement was taken with a diameter tape. Heritage Trees diameters were confirmed with a diameter tape. For individual oak trees found greater than 5 inches in diameter, a measurement was taken with a diameter tape to confirm the tree diameter and include all trees 6 inches diameter and greater. Trees with multiple stems that were obviously Heritage Trees were only measured with the Biltmore Stick, and measured with a diameter tape when they were found to be in a condition to be considered for mitigation.

Other testing or examination:

No additional testing or examination was requested at the time of the inspection or found necessary.

Discussion:

The total project site is approximately 166.83 acres and contains 2 large areas of oak woodland to the north and south separated by an open area where the development is proposed. The total oak woodland is approximately 133.90 acres. The site is bordered by oak woodland, vineyards and large properties.

The oak trees on the property were inspected adjacent to the area proposed for development. The property is very large and only about 10% of the total parcel area is proposed for development and no oak trees in the oak woodland are proposed for removal. The site plan was reviewed to identify those trees that are adjacent to the proposed development. There are no oak trees in the oak woodland impacted by the proposed site development. There are three oak trees, considered individual oak trees, along the road that are proposed for removal to improve the road for fire access outside of the oak woodland. These trees should not require mitigation. All oak woodland canopy area, and Heritage Trees located in the oak woodland and individual oak trees were evaluated for mitigation requirements. Heritage Trees in poor or worse condition were not included in the mitigation calculations.

The El Dorado County Oak Resource Mitigation calculation is based on the area of oak woodland impacted, the percent of oak woodland being impacted, the individual oak trees growing outside of oak woodland being impacted, and Heritage Trees both in oak woodlands and individual trees being impacted. The total project area is 7,265,808 square feet or 166.8 acres. The total oak woodland on the property is 5,832,684 square feet or 133.9 acres. The oak woodland coverage is 80.3% of the total site area.

The total oak woodland proposed for removal is 0 square feet or 0 acres, 0%. There are 3 individual oak trees being removed that two are in poor condition and one is in very poor condition along the

road into the property. The total oak woodland area requiring mitigation is 0 square feet or 0 acres. The total amount of oak woodland impacted by the development is 0%. The Oak Woodland Mitigation Ratio is determined by the amount of existing Oak Woodland canopy being impacted. The mitigation ratio chart for El Dorado County ORMP is:

Percent of Oak Woodland Impact	Oak Woodland Mitigation Ratio
0-50%	1:1
50.1 – 75%	1.5:1
75.1-100%	2:1

The proposed oak woodland impact of 0% falls into the Oak Woodland Impact range of 0-50%. The proposed oak woodland impact requires a 1:1 mitigation ratio. The total mitigation acres for the impacted oak woodland acres is 0 total acres required for Oak Mitigation.

The proposed 0 impacted acres of oak woodland will require mitigation at the cost of $8,285.00 per acre at the 1:1 mitigation ratio rate, for a total acreage of 0 acres and a total mitigation fee of $0.

There were no impacted healthy individual oak trees and therefore no required individual oak tree mitigation. The canopy area of the three trees was added to the canopy area mitigation for the project.

There were no impacted healthy Heritage Trees and therefore no required Heritage Tree mitigation.

The total mitigation fee for the proposed project will be $0.

The oak woodland mitigation requirements for the project was calculated based on the following information:

Total area of the project area: 7,265,808 square feet, or 166.8 acres
Total area of oak woodland: 5,832,684 square feet, or 133.90 acres
Total percent of existing oak woodland: 80.3%
Total area of total oak woodland to be removed: 0 square feet, or 0 acres
Total percent of oak woodland to be removed: 0%
Oak Woodland Mitigation Ratio: 1:1
Oak woodland area of sick/dying trees exempt from mitigation 0 square feet or 0 acre
Total area of Oak Woodland to be mitigated: 0 acres
Total number and diameter inches of healthy individual oak trees to be removed: 0 trees, 0 diameter inches
Individual poor condition trees exempt from mitigation 3 trees totaling 78 diameter inches
Total number and diameter inches of healthy Heritage Trees to be removed: 0 trees, 0 diameter inches
Total area of pre-mitigated oak canopy to be removed: 0 sq. ft.
Total area of oak canopy required to be mitigated: 0 square feet, or 0 acres
Total Oak Woodland Area Impacted Mitigation: 0 acres @ $8,285 per acre = $0
Individual Oak tree Impacted Mitigation: 0 trees, 0 inches, $153 per inch: $0
Heritage Tree Impacted Mitigation: 0 trees, 0 inches, $459 per inch: $0
Total Amount of Oak Resource Mitigation: $0

With the proposed mitigation, the proposed project is in compliance with the Ordinance 5061, Oak Resources Conservation.

The project is in compliance with General Plan Policy 7.4.5.2 by preserving native oaks wherever possible on the site. There are large expanses of oak woodland and oak corridors on this property and they will not be impacted by the development. This report also provides information how trees in the vicinity of the project or construction site will be protected and by following approved preservation methods specified in the County's required mitigation measures.

It has been determined that the proposed project would result in less than significant impacts to oak woodland resources with incorporation of mitigation measures listed below.

For long term maintenance and the changes in site use, some pruning should be performed to larger trees close to the proposed structures, driveway and yard areas. The pruning should be performed to remove large dead branches, shorten and reduce end weights, and reduce the risk of branch failure while retaining as large a foliar crown as possible.

Conclusion:

The proposed development will not impact the existing oak woodland. Per the El Dorado County Oak Resources Conservation Ordinance mitigation will be required for 1 of the three potential 3 impacts:

1. Oak woodland is proposed to be impacted. There are 0 acres of Oak Woodland proposed to be impacted, and this is 0% of the total oak woodland area. The mitigation ratio is 1:1 times the acreage impacted, equaling 0 acres of oak woodland mitigation required. The cost of the 0 acres at $8,285 per acre amounts to $0 in mitigation fees.
2. There are 0 healthy individual oak trees proposed to be impacted with 0 total inches of diameter. The cost for mitigation is $153 per inch. The cost of the 0 trees is $0 in mitigation fees. There is 3 individual trees being removed by the property owner that are in poor condition and should not require mitigation. There is 0 acres of impacted oak woodland required for mitigation.
3. There are 0 healthy Heritage Trees, trees with a single, or multiple combined, trunk diameter of 36 inches or greater, in fair and better condition, proposed to be impacted. The cost for mitigation is $459 per inch. The cost of the 0 trees is $0.

The total mitigation cost of proposed oak impacts is $0.

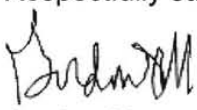
The mitigation proposed will meet the required mitigation based on the El Dorado County ORMP Oak Resources requirements and Ordinance No. 5061.

Please contact Gordon Mann, of California Tree and Landscape Consulting, Inc., if there are any questions about this report.

Disclaimer: Gordon Mann, has analyzed the situation, applied the proper method(s) utilized within the profession, and performed a reasonableness test to support the project tree related decisions. I, nor the employees or subcontractors of California Tree and Landscape Consulting, Inc., may be held liable for the misuse or misinterpretation of this report. As the author of this report, I do hereby certify

that all the statements of fact in this report are true, complete, and correct to the best of my knowledge and belief, and that they are made in good faith.

Respectfully submitted,



Gordon Mann
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ISA TRAQ Qualified Tree Risk Assessor
California Tree and Landscape Consulting, Inc.
Gordon@caltlc.com
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Attachments:
Aerial images
Appendix A Tree Planting Specifications
Appendix B Nursery Stock and Tree Planting
Appendix C Tree Protection
Appendix D Avoiding Damage During Construction
Resume for Gordon Mann
Helwig Property Development Oak Tree List
Oak Tree Woodland Retention Plan

Aerial Images

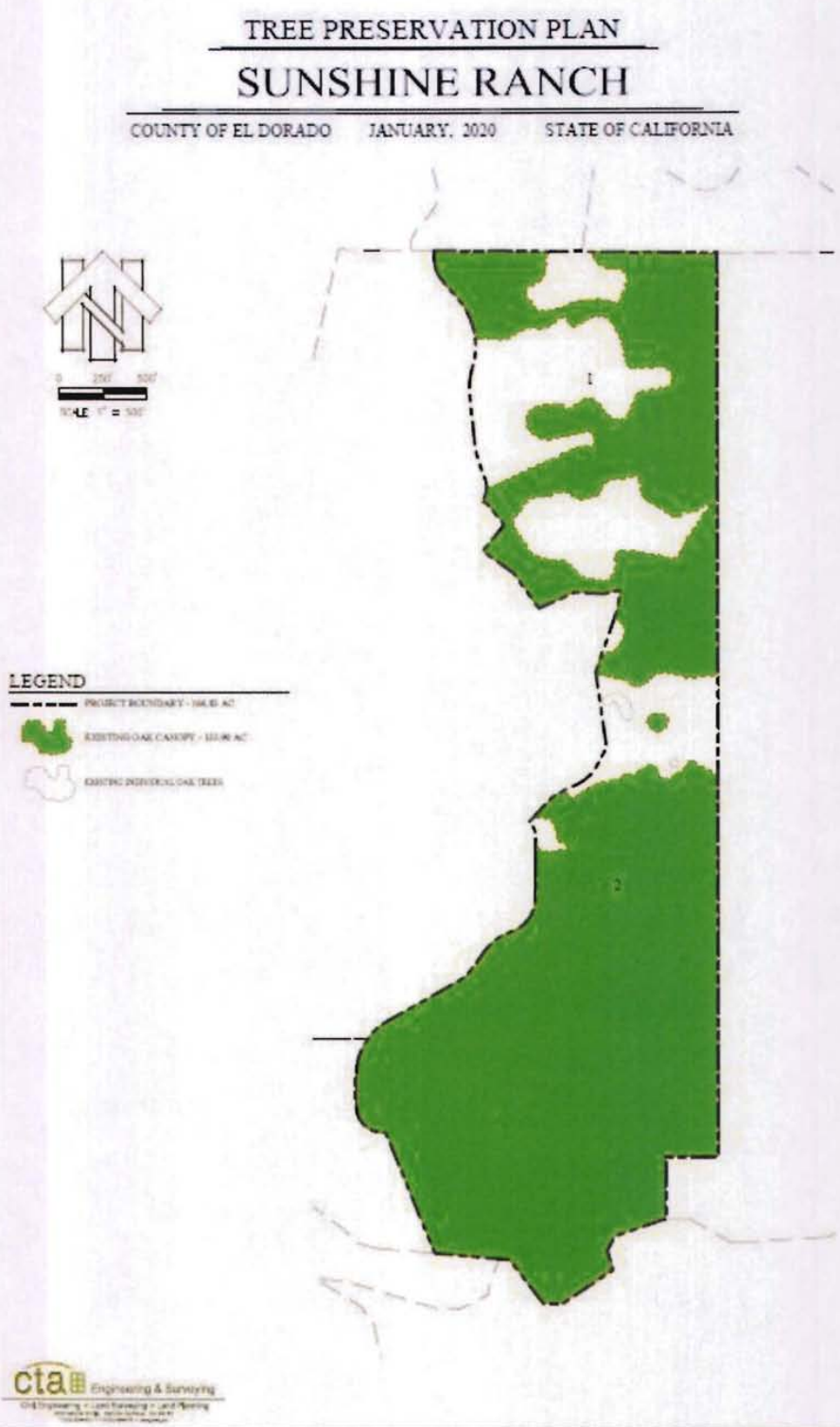
Aerial image showing proposed development area and edge of north and south oak woodlands included in the development area

All trees inspected at edge of oak woodland in the proposed development area, includes 5 individual trees in lower left-hand area long road

Aerial image enlarged with tree numbers in approximate locations; 5 individual trees in lower left along road

Aerial image enlarged with tree numbers in approximate locations

Aerial image enlarged with tree numbers in approximate locations



Tree Preservation Plan showing the oak woodland canopy on the property

Appendix A
Tree Planting Specifications

Trees shall be free of major injury such as scrapes that remove greater than 20% of the bark circumference, a broken central leader, or constrictions from staking or support. The graft, if present, shall be consistent for the production of the cultivar or species. The trunk flare shall be at grade, not buried by soil, and adventitious roots shall not be growing from above the trunk flare.

The tree shall not be root bound in the container, and the trunk diameter relative to the container sizes, within the limits of American National Standards Institute (ANSI) Z-60 Nursery Standards.

Prior to acceptance, upon delivery, trees may be pulled from the container, so the rootball can be inspected for compliance with the specifications. An agreed upon maximum percent of trees may be checked for compliance. The nursery should provide post delivery care specifications to keep the trees in optimum condition until planting.

Tree Planting

1.0 INSPECT THE TREE

1.1 Carefully remove the soil at the top of the container to locate the trunk flare. Check for girdling roots and damage to the root system and lower trunk.
1.2 Until a relationship is established with the supplying nursery, randomly select an acceptable sample for the delivery. Inspect the root system by taking the rootball out of the container, and remove all the soil from the root system. Inspect the inner roots to verify that the roots were properly pruned when moved from the initial container to the next larger size. Keep the root system moist during the check. If the roots were properly pruned during container transfer, and the roots have been kept moist, the tree can be planted as a bare root tree.
1.3 If the trees are acceptable, each tree shall be removed from the container prior to digging the hole, and the depth of the rootball from the trunk flare to the bottom of the rootball shall be measured. This measurement, less 1" is the depth the pedestal in the center of the planting hole shall be excavated to.

2.0 DIG THE HOLE

2.1 Shave and discard grass and weeds from the planting site.
2.2 The hole should be a minimum 3 times the diameter of the container diameter.
2.2.1 Square containers shall be dug with a circular hole 3 times the container measurement.
2.3 Dig the hole, leaving an undisturbed pedestal in the center that the root ball will be set on.
2.4 The pedestal shall be excavated to the depth measurement determined above

3.0 ROOT BALL PREPARATION

3.1 Loosen and straighten outside and bottom roots prior to placing the rootball on the pedestal. The trunk flare (the point where the trunk meets the roots) should be 1" above ground level.
3.2 Winding and girdling roots shall be pruned to either the point they are perpendicular to the root ball, or a point where they can be straightened and placed perpendicular to the rootball.
3.3 Keep the roots moist during this process so they do not dry out.

4.0 BACKFILL

4.1 Hold the tree so the trunk and central leader are in a straight upright position.
4.2 Backfill soil with the soil you removed around the base of the pedestal and rootball no higher than 2/3, so the tree stands in the upright position
4.3 Tamp the soil to remove air gaps, or fill with water and allow soil to settle and drain. Continue to fill the entire hole with existing soil in layers and tamping, up to finished grade. Backfill soil shall not be placed on top of the rootball.
4.4 Build a berm at the outside edge of the rootball. The berm shall be a minimum 3 inches high and wide.
4.5 Cover the remainder of the backfill soil outside the berm with a set level of mulch (2 to 4 inches deep).

5.0 STAKING

5.1 Remove the nursery stake (the thin stake tied to the trunk) that is secured to the tree.
5.2 Install the appropriate number of stakes – for example, two stakes on the windward and leeward side of the tree, set at least 2 feet into the native soil outside the rootball.

5.2.1If the area is exceptionally windy, high traffic, or when specified, install 3 or 4 stakes spaced evenly around the circumference, outside the rootball.
5.3 One tie per stake shall be placed at the lowest point on the trunk where the tree crown stands upright. Ties shall be placed using a "figure 8" crossing pattern wrapped around the trunk and firmly tied or attached to the stake.
5.3.1 Ties shall be loose enough so the tree crown moves up to 3 times the trunk diameter in the wind, and taut enough that the trunk does not rub the stakes during movement.
5.4 The stakes shall be cut off above the tie point so branches do not rub the stake above the tie point.
5.5 Check the stakes and ties periodically, removing them when the tree is able to stand on its own.
5.6 If a leader that should be vertical is drooping, the leader may be temporarily straightened using a bamboo or small diameter wood splint approximately 25% longer than the drooping section of stem, tied to the stem at the top and bottom of the splint to hold the stem vertical. The splint shall be removed prior to girdling or constricting the stem, and may be re-installed as necessary.

6.0 MULCH

6.1 Apply a set depth (2 to 4 inches) of wood chips or other organic mulch over the planting hole excavated soil.
6.2 Mulch may be placed inside the berm and shall be kept at least 4" away from the trunk flare.
6.3 The soil area of the planting hole shall be kept clear of grass and landscape plantings.

7.0 WATER/IRRIGATION

7.1 Apply water using a low pressure application, i.e.: trickle from a hose, soaker hose, or bubbler.
7.2 Use low water volume to apply the water. Add water long enough to saturate the rootball and planting area.
7.2.1 Lawn sprinklers shall not be considered an acceptable method of applying irrigation to newly planted trees.
7.3 The initial watering frequency shall be checked by monitoring the soil moisture. Based on the temperature and humidity, learn how long the soil retains the moisture.
7.4 After the soil is below field capacity, and before it dries out, repeat the watering process, every so determined days.
7.4.1 As the weather and seasons change, the irrigation frequency may change. This will be evaluated by checking soil moisture following water application.
7.4.1.1 For example: you may learn irrigation should be applied twice a week during the fall, except in cool or rainy weather. Irrigation may need to be applied every two days during hot dry summer periods.
7.5 Irrigation shall be continued for the first three years after planting.
7.5.1 Avoiding drying out the rootball and adjacent soil is critcal for tree growth and establishment.

8.0 PROTECT THE TRUNK

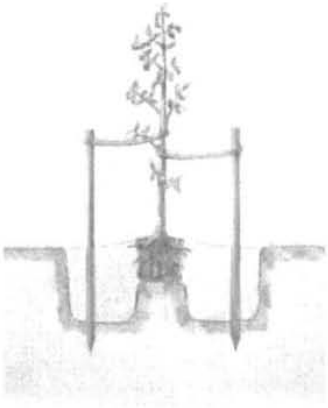
8.1 Avoid damage from mowers and string trimmers to the tender bark of the young tree.
8.2 Maintain a clear area free of vegetation around the trunk in the berm or basin area.
8.3 Keep the set depth of mulch (2 to 4 inches) coverage of the area around the tree.
8.4 Retain temporary low branches along the trunk to shade and feed the trunk.

9.0 PRUNING NEWLY PLANTED TREES

9.1 Broken and dead branches shall be pruned.
9.2 A central leader shall be identified and retained if present. If co-dominant leaders are present, they shall be pruned to be shorter than the central leader by 20%.
9.3 All low temporary branches on the lower trunk shall be retained, and if needed shortened for clearance.

10. FUTURE CARE

10.1 During subsequent years, the berm should be enlarged or removed to in order to provide water to the increasing root growth. The watering area should target new root growth and projected root growth.
10.2 Pruning should retain a dominant central leader; and retain low temporary branches until trunk bark hardens or remove before branch diameter becomes too large.



Detail for #1, #5 and #15 container planting stock

Appendix B

Nursery Stock and Tree Planting

Nursery Stock purchase

Trees purchased for the subject project shall be the Genus, species, and cultivar specified in the purchase documents. Trees shall be grown to be free of bound root systems caused by winding roots or kinked roots from a previous smaller container. As trees are moved to larger containers, circling roots shall be either pruned to a point where they can grow straight, straightened in the new container, or removed. Kinked roots shall be pruned to a point where they will grow straight outward or downward.

The trunk and branches shall be of a structure where a central leader is defined, or the central leader can be easily selected. The competing leaders have a smaller diameter, and can be pruned shorter.

Appendix C

Tree Protection

The edge of the tree canopy outside of the construction area shall be fenced off with construction fencing, either temporary orange fence or chain link fence. The fence shall be placed as far from the trees as possible, targeting outside the dripline. If the fence cannot be placed outside of the dripline, the project arborist shall determine if the distance is acceptable or some other soil protection is necessary. A certified arborist must approve the placement of the tree fence. The fence will be marked with weather appropriate signage clearly stating the area as "Protected! Do not enter! Tree preservation zone." Sign(s) will be placed on every face or direction of fence line.

When excavating or trenching adjacent to trees, roots 2 inches and greater encountered in the trench shall be cleanly severed at the trench side closest to the tree, and then excavated, so the roots are not torn back towards the tree. Cut exposed roots ends or exposed roots shall be covered with moist soil or moist burlap and kept moist until the soil is backfilled.

No storage of supplies or materials, parking, or other construction activity shall occur within the fenced area. If a construction activity is required within the construction area, specific specifications and mitigation shall be written to cover

the work, and the fencing may be entered during the necessary construction activity, then the fencing shall be replaced after the activity is completed for the day.

The construction protection shall remain in place until the project is completed, including landscape activities. Landscape activities shall have specifications that protect the trees during the landscape activities.

Any bare soil around protected trees should be covered with a 4-inch layer of mulch consisting of ground-up tree parts.

If the protected trees appear to show signs of yellowing leaves, dead leaves, or other abnormal appearance, contact the project arborist for inspection and mitigation.

Long Term Landscape Maintenance Plan and Specifications

General

This plan and specifications are intended to promote the optimum landscape growth and lifespan. Individual tree planting in specific sites in the parking lot are intended to provide a large shade canopy over time covering 50% or greater of the parking lot. The border and natural screening plantings are overplanted and intended to fill the space initially, and have the weaker trees removed over time, to create the space and site resources necessary for the remaining trees. Trees initially will be planted on approximate 10 foot centers, with the long term spacing to be approximately 20 foot centers. As trees are thinned, they may be transplanted or removed, as best suited to the remaining trees on the site.

These trees shall be pruned to establish a central leader, to provide the best structure by managing size relationships between parent and subordinate trunk and branches, and to encourage growth into a large shade canopy. These trees shall not be topped or rounded over. Trees may have competing leaders headed back to promote the strong central leader necessary to eliminate co-dominant stems and weak branching.

Design Intent

The trees planted around the perimeter and alongside the sidewalk or street are intended to replicate natural areas and to screen the project and adjacent properties. The native oaks shall be more tightly spaced at planting and thinned over time to promote the growth of the final or climax trees on the site. The thinning for spacing shall be performed as the trees get larger and their crowns begin to overlap. When the desired tree crowns are being impacted by an adjacent tree, the adjacent tree should either be pruned or removed, to provide the optimum screening while enhancing the desired tree growth. Pruning shall retain a dominant central leader and for decurrent tree structures, remove competing leaders, and maintain the appropriate size relationships between parent and subordinate trunk and branches.

Pruning Small Trees

Branches are to be pruned by either reduction, thinning, or raising cuts to achieve the appropriate clearance over the area. The smallest diameter branches should be removed, working from the branch tips towards the center, removing none to minimal interior foliage inside the final outward branch cut. Trees shall be cleaned to remove dead branches, weakly attached branches, and branches where significant damage has occurred by rubbing, animals, insects, or critical disease. All pruning cuts shall be made in accordance with American National Standards Institute (ANSI) A300 Part 1 Pruning Standards and International Society of Arboriculture (ISA) Best Management Practices for Pruning.

On trees up to six inches in diameter, all dead branches greater than one-half inch diameter shall be removed. All weakly attached branches and potential co-dominant branches shall either be reduced by at least 20% or be removed, as most appropriate for the long term structure of the tree. The weakest or most damaged branch of a pair or group of rubbing branches shall be shortened to avoid rubbing, or removed. All temporary branches along the trunk should be retained and shortened to obtain necessary clearance. When either temporary branches exceed one-inch diameter, or the trunk forms mature bark, the temporary branches should be removed.

Stakes shall be installed as necessary to support a straight growing tree, and reduce crooked growth caused by high wind. The trunk shall be supported at the lowest point to keep the crown supported straight, and the portions of the stake above the tie point cut off to avoid rubbing branches. After the tree becomes firmly rooted, and the stake is no longer necessary to support the tree, the stakes shall be removed.

Depending on the location and site needs, clearance should be performed by pruning the smallest branches inward from the branch tips until the permanent branches are in place. Clearance minimums should be set, for example: 7.5' over sidewalks, 10 feet over parking spaces, and 14.5 feet over truck traffic streets. Clearance pruning shall be carefully performed until the permanent branches are identified. Up to 25% of the total foliage on any tree should be the maximum removed during any planned pruning cycle. Follow-up pruning for structure or clearance on young trees can be performed at any time if pruning small amounts of foliage (up to 10%) and retaining the central leader and branch size relationships.

Pruning Large Trees

Branches are to be pruned by either reduction, thinning, or raising cuts to achieve the appropriate clearance over the area. The smallest diameter branches should be removed, working from the branch tips towards the center, removing none to minimal interior foliage inside the final outward branch cut. Trees shall be cleaned to remove dead branches, weakly attached branches, and branches where significant damage has occurred by rubbing, animals, insects, or critical disease. All pruning cuts shall be made in accordance with American National Standards Institute (ANSI) A300 Part 1 Pruning Standards and International Society of Arboriculture (ISA) Best Management Practices for Pruning.

On trees larger than six inches in diameter, all dead branches greater than one-inch diameter shall be removed. Long heavy branches that are either growing flat or bending down shall have approximately 15% of the end weight reduced, accomplished by a combination of pruning the downward growing branches, shortening long tips, and thinning endweights. If any structural issues are observed by the climber working in the tree, they shall notify the property manager immediately to discuss the tree's needs.

Depending on the location and site needs, clearance should be performed by pruning the smallest branches inward from the branch tips until the permanent branches are in place. Clearance minimums should be set, for example: 7.5' over sidewalks, 10 feet over parking spaces, and 14.5 feet over truck traffic streets. Clearance pruning shall be carefully performed until the permanent branches are identified. Up to 25% of the total foliage on any tree should be the maximum removed during any planned pruning cycle.

Any special site issues for utility clearance or conflicts with other objects shall be managed by early pruning to direct growth away from the target lines, overhead lights, flags, or buildings.

Thinning of Dense Planting

Many landscape plantings and natural landscape areas are over-planted by installing a greater number of plants at closer spacing than optimum for the full-sized plants. Over time, plants will grow into each other, the crowns will conflict, and the spacing will need to be corrected. Correct spacing is obtained by removing the least desirable plants to meet the final spacing target, within reasonable tolerances.

If conflicting plants are all healthy, it won't matter which plants are removed to achieve the spacing distances. Spaced thinning should be performed before the foliar crowns are intertwined or overlapping. The thinning may be performed over two or three cycles as the trees grow over time, depending on the density and desired final spacing.

The trees initially will be planted on approximate 10 foot centers, with the long term spacing to be approximately 20 foot centers. The healthiest and best specimens should be retained on site. As trees are thinned, they may be transplanted or removed, as best suits the remaining trees on the site.

Appendix D

Avoiding Tree Damage During Construction

Copied and Edited from the ISA's tree protection guidelines

As cities and suburbs expand, wooded lands are being developed into commercial and residential sites. Homes are constructed in the midst of trees to take advantage of the aesthetic and

environmental value of the wooded lots. Wooded properties can be worth as much as 20 percent more than those without trees, and people value the opportunity to live among trees.

Unfortunately, the processes involved with construction can be deadly to nearby trees. Unless the damage is extreme, the trees may not die immediately but could decline over several years. With this delay in symptom development, you may not associate the loss of the tree with the construction.

It is possible to preserve trees on building sites if the right measures are taken. The most important step is to hire a professional arborist during the planning stage. An arborist can help you decide which trees can be saved and can work with the builder to protect the trees throughout each construction phase.

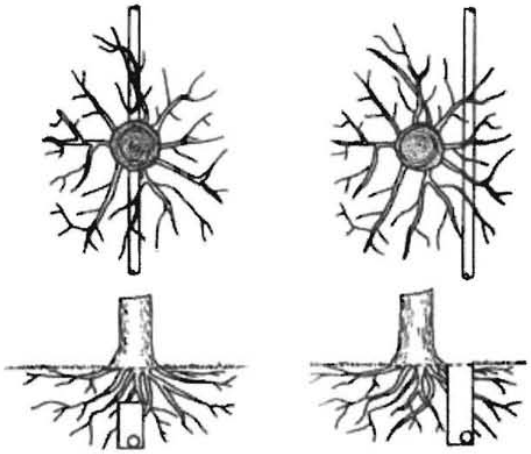
How Trees Are Damaged During Construction

Physical Injury to Trunk and Crown. Construction equipment can injure the aboveground portion of a tree by breaking branches, tearing the bark, and wounding the trunk. These injuries are permanent and, if extensive, can be fatal.

Cutting of Roots. The digging and trenching that are necessary to construct a house and install underground utilities will likely sever a portion of the roots of many trees in the area. It is easy to appreciate the potential for damage if you understand where roots grow. The roots of a tree are found mostly in the upper 6 to 24 inches of the soil. In a mature tree, the roots extend far from the trunk. In fact, roots typically are found growing a distance of one to three times the height of the tree. The amount of damage a tree can suffer from root loss depends, in part, on how close to the tree the cut is made. Severing one major root can cause the loss of 5 to 20 percent of the root system.

The roots of a tree extend far from the trunk and are found mostly in the upper 6 to 12 inches of soil.

Another problem that may result from root loss caused by digging and trenching is that the potential for the trees to fall over is increased. The roots play a critical role in anchoring a tree. If the major support roots are cut on one side of a tree, the tree may fall or blow over.



Less damage is done to tree roots if utilities are tunneled under a tree (right, top and bottom) rather than across the roots (left, top and bottom).

Less damage is done to tree roots if utilities are tunneled under a tree rather than across the roots.

Soil Compaction. An ideal soil for root growth and development is about 50 percent pore space. These pores—the spaces between soil particles—are filled with water and air. The heavy equipment used in construction compacts the soil and can dramatically reduce the amount of pore space. This compaction not only inhibits root growth and penetration but also decreases oxygen in the soil that is essential to the growth and function of the roots, and water infiltration.

Smothering Roots by Adding Soil. Most people are surprised to learn that 90 percent of the fine roots that absorb water and minerals are in the upper 6 to 12 inches of soil. Roots require space, air, and water. Roots grow best where these requirements are met, which is usually near the soil surface. Piling soil over the root system or increasing the grade smothers the roots. It takes only a few inches of added soil to kill a sensitive mature tree.

Exposure to the Elements. Trees in a forest grow as a community, protecting each other from the elements. The trees grow tall, with long, straight trunks and high canopies. Removing neighboring trees or opening the shared canopies of trees during construction exposes the remaining trees to sunlight and wind. The higher levels of sunlight may cause sunscald on the trunks and branches. Also, the remaining trees are more prone to breaking from wind or ice loading.

Getting Advice

Hire a professional arborist in the early planning stage. Many of the trees on your property may be saved if the proper steps are taken. Allow the arborist to meet with you and your building contractor. Your arborist can assess the trees on your property, determine which are healthy and structurally sound, and suggest measures to preserve and protect them.

One of the first decisions is determining which trees are to be preserved and which should be removed. You must consider the species, size, maturity, location, and condition of each tree. The largest, most mature trees are not always the best choices to preserve. Younger, more vigorous trees usually can survive and adapt to the stresses of construction better. Try to maintain diversity of

species and ages. Your arborist can advise you about which trees are more sensitive to compaction, grade changes, and root damage.

Planning

Your arborist and builder should work together in planning the construction. The builder may need to be educated regarding the value of the trees on your property and the importance of saving them. Few builders are aware of the way trees' roots grow and what must be done to protect them.

Sometimes small changes in the placement or design of your house can make a great difference in whether a critical tree will survive. An alternative plan may be more friendly to the root system. For example, bridging over the roots may substitute for a conventional walkway. Because trenching near a tree for utility installation can be damaging, tunneling under the root system may be a good option.

Erecting Barriers

Because our ability to repair construction damage to trees is limited, it is vital that trees be protected from injury. The single most important action you can take is to set up construction fences around all of the trees that are to remain. The fences should be placed as far out from the trunks of the trees as possible. As a general guideline, allow 1 foot of space from the trunk for each inch of trunk diameter. The intent is not merely to protect the aboveground portions of the trees but also the root systems. Remember that the root systems extend much farther than the drip lines of the trees.

Instruct construction personnel to keep the fenced area clear of building materials, waste, excess soil, and equipment. No digging, trenching, or other soil disturbance such as driving vehicles and equipment over the soil should be allowed in the fenced area.

Protective fences should be erected as far out from the trunks as possible in order to protect the root system prior to the commencement of any site work, including grading, demolition, and grubbing.

Limiting Access

If at all possible, it is best to allow only one access route on and off the property. All contractors must be instructed where they are permitted to drive and park their vehicles. The construction access drive should be the route for utility wires; underground water, sewer, or storm drain lines; roadways; or the driveway.

Protective fences should be erected as far out from the trunks as possible in order to protect the root systems.

Specify storage areas for equipment, soil, and construction materials. Limit areas for burning (if permitted), cement wash-out pits, and construction work zones. These areas should be away from protected trees.

Specifications

Specifications are to be put in writing. All of the measures intended to protect your trees must be written into the construction specifications. The written specifications should detail exactly what can and cannot be done to and around the trees. Each subcontractor must be made aware of the barriers, limitations, and specified work zones. It is a good idea to post signs as a reminder.

Fines and penalties for violations should be built into the specifications. Not too surprisingly, subcontractors are much more likely to adhere to the tree preservation clauses if their profit is at stake. The severity of the fines should be proportional to the potential damage to the trees and should increase for multiple infractions.

Maintaining Good Communications

It is important to work together as a team. You may share clear objectives with your arborist and your builder, but one subcontractor can destroy your prudent efforts. Construction damage to trees is often irreversible.

Visit the site at least once a day if possible. Your vigilance will pay off as workers learn to take your wishes seriously. Take photos at every stage of construction. If any infraction of the specifications does occur, it will be important to prove liability.

Final Stages

It is not unusual to go to great lengths to preserve trees during construction, only to have them injured during landscaping. Installing irrigation systems and roto-tilling planting beds are two ways the root systems of trees can be damaged. Remember also that small increases in grade (as little as 2 to 6 inches) that place additional soil over the roots can be devastating to your trees. ANSI A300

Standards Part 5 states that tree protection shall be in place for the landscape phase of the site development. Landscape tree protection may be different than other construction process tree protection, and a conference with the landscape contractor should be held prior to the commencement of the landscape work. Careful planning and communicating with landscape designers and contractors is just as important as avoiding tree damage during construction.

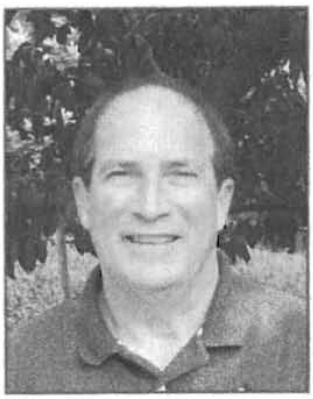
Post-Construction Tree Maintenance

Your trees may require several years to adjust to the injury and environmental changes that occur during construction. The better construction impacts are avoided, the less construction stress the trees will experience. Stressed trees are more prone to health problems such as disease and insect infestations. Talk to your arborist about continued maintenance for your trees. Continue to monitor your trees, and have them periodically evaluated for declining health or safety hazards.

Despite the best intentions and most stringent tree preservation measures, your trees still might be injured from the construction process. Your arborist can suggest remedial treatments to help reduce stress and improve the growing conditions around your trees. In addition, the International Society of Arboriculture offers a companion to this brochure titled "Treatment of Trees Damaged by Construction".

California Tree and Landscape Consulting, Inc.

GORDON MANN



EDUCATION AND QUALIFICATIONS

1977	Bachelor of Science, Forestry, University of Illinois, Champaign.
1982 - 1985	Horticulture Courses, College of San Mateo, San Mateo.
1984	Certified as an Arborist, WE-0151A, by the International Society of Arboriculture (ISA).
2004	Certified as a Municipal Specialist, WE-0151AM, by the ISA.
2011	Registered Consulting Arborist, #480, by the American Society of Consulting Arborists (ASCA).
2003	Graduate of the ASCA Consulting Academy.
2006	Certified as an Urban Forester, #127, by the California Urban Forests Council (CaUFC).
2011	TRACE Tree Risk Assessment Certified, continued as an ISA Qualified Tree Risk Assessor (T.R.A.Q.).

PROFESSIONAL EXPERIENCE

2016 – Present CALIFORNIA TREE AND LANDSCAPE CONSULTING, INC (CalTLC). President and Consulting Arborist.
Auburn. Mr. Mann provides consultation to private and public clients in health and structure analysis, inventories, management planning for the care of trees, tree appraisal, risk assessment and management, and urban forest management plans.

1986 - Present MANN MADE RESOURCES. Owner and Consulting Arborist. Auburn.
Mr. Mann provides consultation in municipal tree and risk management, public administration, and developing and marketing tree conservation products.

2015 – 2017 CITY OF RANCHO CORDOVA, CA. Contract City Arborist.
Mr. Mann serves as the City's first arborist, developing the tree planting and tree maintenance programs, performing tree inspections, updating ordinances, providing public education, and creating a management plan,

1984 – 2007 CITY OF REDWOOD CITY, CA. City Arborist, Arborist, and Public Works Superintendent.
Mr. Mann developed the Tree Preservation and Sidewalk Repair Program, supervised and managed the tree maintenance program, performed inspections and administered the Tree Preservation Ordinance. Additionally, he oversaw the following Public Works programs: Streets, Sidewalk, Traffic Signals and Streetlights, Parking Meters, Signs and Markings, and Trees.

1982 – 1984 CITY OF SAN MATEO, CA. Tree Maintenance Supervisor.
For the City of San Mateo, Mr. Mann provided supervision and management of the tree maintenance program, and inspection and administration of the Heritage Tree Ordinance.

1977 – 1982 VILLAGE OF BROOKFIELD, IL. Village Forester.
Mr. Mann provided inspection of tree contractors, tree inspections, managed the response to Dutch Elm Disease. He developed an in-house urban forestry program with leadworker, supervision, and management duties to complement the contract program.

1979 - Present INTERNATIONAL SOCIETY OF ARBORICULTURE. Member.

- Board of Directors (2015 - Present)

- True Professional of Arboriculture Award (2011); In recognition of material and substantial contribution to the progress of arboriculture and having given unselfishly to support arboriculture.

1982 - Present WESTERN CHAPTER ISA (WCISA). Member.

- Chairman of the Student Committee (2014 - 2017)
- Member of the Certification Committee (2007 - Present)
- Chairman of the Municipal Committee (2009 - 2014) • Award of Merit (2016) In recognition of outstanding meritorious service in advancing the principles, ideals and practices of arboriculture.
- Annual Conference Chair (2012)
- Certification Proctor (2010 – Present)
- President (1992 - 1993)
- Award of Achievement and President's Award (1990)

1985 - Present CALIFORNIA URBAN FORESTS COUNCIL (CaUFC). Member; Board Member (2010 - Present)

1985 - Present SOCIETY OF MUNICIPAL ARBORISTS (SMA). Member. e Legacy Project of the Year (2015) o In recognition of outstanding meritorious service in advancing the principles, ideals and practices of arboriculture.

- Board Member (2005 - 2007)

2001 - Present AMERICAN SOCIETY OF CONSULTING ARBORISTS.
Member. e Board of Directors (2006 - 2013)
• President (2012)

2001 - Present CAL FIRE. Advisory Position.
• Chairman of the California Urban Forestry Advisory Committee (2014 - 2017)

2007 – Present AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI): A300 TREE MAINTENANCE STANDARDS
COMMITTEE. SMA Representative and Alternate.

- Alternative Representative for SMA (2004 - 2007; 2012 - Present)
- Representative for SMA (2007 - 2012)

2007 - Present SACRAMENTO TREE FOUNDATION. Member and Employee.

- Co-chair/member of the Technical Advisory Committee (2012 - Present)
- Urban Forest Services Director (2007 - 2009) e Facilitator of the Regional Ordinance Committee (2007 - 2009)
- 1988 - 1994 TREE CLIMBING COMPETITION.
  - Chairman for Northern California (1988 - 1992)
  - Chairperson for International (1991 - 1994)

PUBLICA TIONS AND LECTURES

Mr. Mann has authored numerous articles in newsletters and magazines such as Western Arborist, Arborist News, City Trees, Tree Care Industry Association, Utility Arborists Association, CityTrees, and Arborists Online, covering a range of topics on Urban Forestry, Tree Care, and Tree Management. He has developed and led the training for several programs with the California Arborist Association. Additionally, Mr. Mann regularly presents at numerous professional association meetings on urban tree management topics.

Assumptions and Limiting Conditions

1. Consultant assumes that any legal description provided to Consultant is correct and that title to property is good and marketable. Consultant assumes no responsibility for legal matters. Consultant assumes all property appraised or evaluated is free and clear, and is under responsible ownership and competent management.
2. Consultant assumes that the property and its use do not violate applicable codes, ordinances, statutes or regulations.
3. Although Consultant has taken care to obtain all information from reliable sources and to verify the data insofar as possible, Consultant does not guarantee and is not responsible for the accuracy of information provided by others.
4. Client may not require Consultant to testify or attend court by reason of any report unless mutually satisfactory contractual arrangements are made, including payment of an additional fee for such Services as described in the Consulting Arborist Agreement.
5. Unless otherwise required by law, possession of this report does not imply right of publication or use for any purpose by any person other than the person to whom it is addressed, without the prior express written consent of the Consultant.
6. Unless otherwise required by law, no part of this report shall be conveyed by any person, including the Client, the public through advertising, public relations, news, sales or other media without the Consultant's prior express written consent.
7. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event or upon any finding to be reported.
8. Sketches, drawings and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by Consultant as to the sufficiency or accuracy of the information.
9. Unless otherwise agreed, (1) information contained in this report covers only the items examined and reflects the condition of those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing or coring. Consultant makes no warranty or guarantee, express or implied that the problems or deficiencies of the plans or property in question may not arise in the future.
10. Loss or alteration of any part of this Agreement invalidates the entire report.

Certificate of Performance

I, Gordon Mann, certify that:

I have personally inspected the trees and site referred to in this report, and have stated my findings accurately. The extent of the inspection is stated in the attached report under Assignment;

I have no current or prospective interest in the vegetation, or the property that is the subject of this report and have no personal interest or bias with respect to the parties involved;

The analysis, opinions and conclusions stated herein are my own and are based on current scientific procedures and facts;

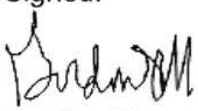
My analysis, opinions, and conclusions were developed, and this report has been prepared according to commonly accepted arboricultural practices;

No one provided significant professional assistance to me, except as indicated within the report;

My compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client, or any other party, nor upon the results of the assignment, the attainment of stipulated results, or the occurrence of any subsequent events.

I further certify that I am a member in good standing of the International Society of Arboriculture (ISA) and an ISA Certified Arborist and Municipal Specialist. I am also a Registered Consulting Arborist member in good standing of the American Society of Consulting Arborists. I have been involved in the practice of arboriculture and the care and study of trees for over 41 years.

Signed:



Gordon Mann
Date: January 15, 2020

GEOTECHNICAL ENGINEERING STUDY
FOR
SUNSHINE RANCH

6100 Bailey Way
Mt. Aukum, California

Project No. E19418.000
January 2020

YOUNGDAHL
ESTABLISHED 1984

P20-0001

YOUNGDAHL CONSULTING GROUP, INC.
ESTABLISHED 1984

1234 Glenhaven Court, El Dorado Hills, CA 95762
4300 Anthony Court, Unit D, Rocklin, CA 95677
ph 916.933.0633 fx 916.933.6482
www.youngdahl.net

Helwig Properties, LLC
10391 Valley Drive
Plymouth, California 95669

Project No. E19418.000
10 January 2020

Attention: Mr. David Helwig

Subject: **SUNSHINE RANCH GES**
6100 Bailey Way, Mt. Aukum, El Dorado, California
GEOTECHNICAL ENGINEERING STUDY

References: 1. Proposal and contract, prepared by Youngdahl Consulting Group, Inc., executed 19 November 2019 (Proposal No. PE19-611).

Dear Mr. Helwig:

In accordance with your authorization, Youngdahl Consulting Group, Inc. has performed a Geotechnical Engineering Study for the project site located at 6100 Bailey Way in Mt Aukum, California (APN 046-071-040). The purpose of this study was to perform a subsurface exploration and evaluate the surface and subsurface soil conditions at the site and provide geotechnical information and design criteria for the proposed project. Our scope was limited to a subsurface investigation, laboratory testing and preparation of this report per the Reference 1 proposal.

Based upon our site reconnaissance and subsurface exploration program, it is our opinion that the primary geotechnical issues to be addressed consist of overexcavation of loose/soft surface soils and recompaction as engineered fills, overexcavation and backfill of tree root ball systems and drainage related to the shallow bedrock and other geologic features. Due to the non-uniform nature of soils, other geotechnical issues may become more apparent during grading operations which are not listed above. The descriptions, findings, conclusions, and recommendations provided in this report are formulated as a whole; specific conclusions or recommendations should not be derived or used out of context. Please review the limitations and uniformity of conditions section of this report.

This report has been prepared for the exclusive use of Helwig Properties, LLC and their consultants, for specific application to this project, in accordance with generally accepted geotechnical engineering practice. Should you have any questions or require additional information, please contact our office at your convenience.

Very truly yours,
Youngdahl Consulting Group, Inc.

Matt Gessner
Staff Engineer

Reviewed By:

John C. Youngdahl, P.E.
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

Distribution: PDF to Client

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GEOTECHNICAL ENGINEERING STUDY
FOR
SUNSHINE RANCH

1.0 INTRODUCTION

This report presents the results of our Geotechnical Engineering Study performed for the proposed single-family residence planned to be constructed along Bailey Way in Mt. Aukum, California. An annotated vicinity map is provided on Figure A-1 to identify the approximate project location.

Purpose and Scope

The purpose of this study was to explore and evaluate the surface and subsurface conditions at the site, to provide geotechnical information and design criteria, and to develop geotechnical recommendations for the proposed project. The scope of this study includes the following:

- A review of geotechnical and geologic data available to us at the time of our study;
- A field study consisting of a site reconnaissance, followed by an exploratory test pit program to observe and characterize the subsurface conditions;
- A laboratory testing program performed on representative samples collected during our field study;
- Engineering analysis of the data and information obtained from our field study, laboratory testing, and literature review;
- Development of geotechnical recommendations regarding earthwork construction including, site preparation and grading, excavation characteristics, soil moisture conditions, compaction equipment, engineered fill criteria, slope configuration and grading and drainage;
- Development of geotechnical design criteria for seismic conditions, shallow foundations, differential support conditions, retaining walls, and slabs on grade;
- Preparation of this report summarizing our findings, conclusions, and recommendations regarding the above described information.

Project Understanding

We understand that the proposed development will consist of the construction of a custom single-family home, barn, and vineyard at the project site. We anticipate that the proposed structures will be of wood frame construction and supported by conventional shallow foundations with concrete slab-on-grade floors. Additionally, based on conversation with your representative at the time of our field study we further understand that the residence may include a basement.

Please note that grading plans were not available at the time of preparation of this report; however, we anticipate that site development will likely include cuts and fills on the order of 10 feet or less to generate the proposed building pads and promote positive site drainage. Recommendations provided in this report may need to be modified based on the proposed development once plans are completed. We should be afforded the opportunity to review the project plans once completed.

Background

Based on a limited review of satellite imagery dating back to 1993, the site has remained undeveloped since that time. Imagery from 2018 shows a dirt access road on the property and evidence of relatively recent site clearing.

If studies or plans pertaining to the site exist and are not cited as a reference in this report, we should be afforded the opportunity to review and modify our conclusions and recommendations as necessary.

2.0 FINDINGS

The following section describes our findings regarding the site conditions that we observed during our site reconnaissance and subsequent subsurface exploration. In addition, this section also provides the results of our laboratory testing, geologic review, and engineering assessment related to the project site.

Surface Observations

The project site is located northwest of 6100 Bailey Way in Mt. Aukum, California. The site consists of undeveloped land bounded by a vineyard to the west, a residence to the south, and open land to the north and east.

The site is situated at the top and side of a hill and the terrain slopes to the north and west at varying gradients with a maximum gradient of approximately 3H:1V (Horizontal: Vertical) observed on the west half of the site. The project area is heavily vegetated with medium seasonal grasses and several collections of oak trees and bushes. Small rock outcroppings were observed throughout the property.

At the time of our field study piles of brush and fallen trees were observed west of the location of the proposed residence indicating that some site clearing including tree removal had occurred recently. A dirt road accesses the property at the southwest corner and continues north to the approximate center of the west property line. At this location the road continues east through the middle of the site. A septic facility was observed in the northwest quadrant of the site.

Subsurface Conditions

Our field study included a site reconnaissance by a representative of our firm followed by a subsurface exploration program conducted on 17 December 2019. The exploration program included the excavation of 3 exploratory test pits under the direction of our representative at the approximate locations shown on Figure A-2, Appendix A. A description of the field exploration program is provided in Appendix A.

Subsurface conditions were generally consistent at the locations explored and included SILT above SAND over BEDROCK. The upper soil layers consisted of sandy SILT and were observed to be soft and moist to depths up to 2 feet. Beneath the SILT, silty SAND and SAND was encountered in a medium dense to dense and moist to slightly moist condition down to the BEDROCK contact.

The BEDROCK at the site was encountered at 7 feet deep in Test Pit TP-1 and 8 feet deep in Test Pits TP-2 and TP-3. The BEDROCK materials consisted of granitic BEDROCK in a completely to highly weathered condition.

A more detailed description of the subsurface conditions encountered during our subsurface exploration is presented graphically on the "Exploratory Test Pit Logs", Figures A-3 through A-5, Appendix A. These logs show a graphic interpretation of the subsurface profile, and the location and depths at which samples were collected.

Groundwater Conditions
Groundwater conditions were not observed at excavated test pit locations. Generally, subsurface water conditions vary in the foothill regions because of many factors such as, the proximity to bedrock, fractures in the bedrock, topographic elevations, and proximity to surface water. Some evidence of past repeated exposure to subsurface water may include black staining on fractures, clay deposits, and surface markings indicating previous seepage. Based on our experience in the area, at varying times of the year water may be perched on less weathered rock and/or present in the fractures and seems of the weathered rock found beneath the site.

Geologic Conditions
The geologic portion of this report included a review of geologic data pertinent to the site and an interpretation of our observations of the surface exposures and our observations in our exploratory test pits excavated during the field study.

The site is located within the western foothills region of the Sierra Nevada Mountain Range. According to the Geologic Map of the Sacramento Quadrangle (D.L. Wagner, et. al., 1981) this portion of the foothills and the project area are underlain by granitic rocks of Mesozoic age.

Seismicity
According to the Fault Activity Map of California and Adjacent Areas (Jennings, 2010) and the Peak Acceleration from Maximum Credible Earthquakes in California (CDMG, 2007), no active faults or Earthquake Fault Zones (Special Studies Zones) are located on the project site. Additionally, no evidence of recent or active faulting was observed during our field study. The nearest mapped potentially active and active faults pertinent to the site are summarized in the following table.

Table 1: Local Active and Potentially Active Faults

Activity	Fault Name	Distance, Direction
Active	Dunnigan Hills	90 km NW
Active	North Tahoe Fault	86 km NE
Active	West Tahoe Fault	80 km NE
Potentially Active	Bear Mountains Fault Zone - West	30 km SW
Potentially Active	Bear Mountains Fault Zone - East	25 km SW
Potentially Active	Maidu Fault	40 km NW
Potentially Active	Melones - West	60 km SE
Potentially Active	Melones - East	55 km SE

Based on our literature review of shear-wave velocity characteristics of geologic units in California (Wills and Silva; August 1998: Earthquake Spectra, Volume 14, No. 3) and subsurface interpretations, we recommend that the project site be classified as Site Class C in accordance with Section 1613.3.2 of the 2019 CBC and Table 20.3-1 of ASCE 7-16.

Earthquake Induced Liquefaction, Surface Rupture Potential, and Settlement
Liquefaction is the sudden loss of soil shear strength and sudden increase in porewater pressure caused by shear strains, as could result from an earthquake. Research has shown that saturated, loose to medium-dense sands with a silt content less than about 25 percent and located within the top 40 feet are most susceptible to liquefaction and surface rupture/lateral spreading.

Due to the absence of permanently elevated groundwater table, the relatively low seismicity of the area and the relatively shallow depth to rock, the potential for seismically induced damage due to liquefaction, surface ruptures, and settlement is considered negligible. For the above-mentioned reasons mitigation for these potential hazards is not required for the development of this project.

Static and Earthquake Induced Slope Instability

The existing slopes on the project site were observed to have adequate vegetation on the slope face, appropriate drainage away from the slope face, and no apparent tension cracks or slump blocks in the slope face or at the head of the slope. No other indications of slope instability such as seeps or springs were observed. Additionally, due to the absence of permanently elevated groundwater table, the relatively low seismicity of the area, and the relatively shallow depth to rock, the potential for seismically induced slope instability for the existing slopes is considered negligible.

Laboratory Testing

Laboratory testing of the collected samples was directed towards determining the physical and engineering properties of the soil underlying the site. A description of the tests performed for this project and the associated test results are presented in Appendix B. In summary, the following tests were performed for the preparation of this report:

Table 2: Laboratory Tests

Laboratory Test	Test Standard	Summary of Results	
Direct Shear	ASTM D3080	TP-1 @ 2-3 feet:	Φ = 35.1°, c = 206 psf, (90% RC)
Maximum Dry Density	ASTM D1557	TP-1 @ 2-3 feet:	DD = 127.3 pcf, MC = 10.4 %
Expansion Index	ASTM D4829	TP-1 @ 2 feet:	EI = 26 (Low)

Soil Expansion Potential

The results of our laboratory testing program indicate that the surficial sandy SILT at the site has a low expansion potential. The materials encountered in our explorations were generally non-plastic (rock, sand, and non-plastic silt). The non-plastic materials are generally considered to be non-expansive; therefore, we do not anticipate that special design considerations for expansive soils will be required for the design or construction of the proposed improvements. If necessary, recommendations can be made based on our observations at the time of construction should expansive soils be encountered at the project site which were not encountered during our study.

Naturally Occurring Asbestos

Asbestos is classified by the EPA as a known human carcinogen. Naturally occurring asbestos (NOA) has been identified as a potential health hazard. The California Geological Survey published a map in 2000 (Open File Report 2000-02) that qualitatively indicates the likelihood for NOA in western El Dorado County. The project site is identified as not being in an NOA review zone based on the published map.

3.0 DISCUSSION AND CONCLUSIONS

General

Based upon the results of our field explorations, findings, and analysis described above, it is our opinion that construction of the proposed improvements is feasible from a geotechnical standpoint, provided the recommendations contained in this report are incorporated into the design plans and implemented during construction. The native soils and rock, once

overexcavated and recompacted as recommended below may be considered "engineered" and suitable for support of the planned improvements.

Grading Operations
The existing native surficial soils are relatively loose/soft and are not considered suitable for support of the proposed improvements in their current condition. Recommendations are presented in Section 4.0 below for the overexcavation and recompaction of the soft/loose native materials on the site.

Based on our field study and review of satellite imagery we understand that the proposed building area was recently cleared including the removal of trees; however, the removal of tree root ball systems was not evident at the site. If tree root ball systems are not completely removed during site clearing, they will eventually decay and create voids beneath the ground surface which leads to an increased potential for settlement. To reduce the potential for settlement due to subsurface voids, the tree root ball systems should be overexcavated and completely removed and the resulting depressions should be backfilled with engineered fill as detailed in Section 4.0 below. Alternatively, if proper grading techniques are employed, the removal of tree root ball systems may be accomplished by keying and benching into the existing hillside during fill placement as detailed in Section 4.0 below.

Foundations
In our opinion, conventional shallow foundations such as isolated pad footings or continuous footings will provide adequate support for the proposed residence if the site grades are properly prepared as described in the Site Grading and Improvement section. Recommendations regarding foundation design parameters, including allowable bearing capacity, lateral resistance, and foundation configuration are provided in Section 5.0 of this report.

Drainage
Proper application of drainage practices is considered to be of paramount concern for effective development of the project site. The site is located on a hillside and had bedrock materials with staining indicative of subsurface water. We recommend the use of proper surface drainage, and careful installation of the subdrain and back of wall drains detailed in this report to provide long term stability of the structural improvements as well as mitigate nuisance seepage.

It has also been our experience that potential sources of groundwater may not be present or observed during the site grading procedures, but can appear later as more persistent seepage as water becomes perched or flows through fractures of the relatively shallow rock horizon. These conditions generally become more prevalent following up gradient development and the addition of moisture sources (i.e. landscape irrigation, run-off, etc.). Where this condition arises, drainage measures may be necessary on an as requested basis to mitigate seepage conditions that were not initially observed during the site grading activities and site development.

4.0 SITE GRADING AND EARTHWORK IMPROVEMENTS

Site Preparation
Preparation of the project site should involve site drainage controls, dust control, clearing and stripping, overexcavation and recompaction of existing shallow loose/soft native soils, and exposed grade compaction considerations. The following paragraphs state our geotechnical comments and recommendations concerning site preparation.

Site Drainage Controls: We recommend that initial site preparation involve intercepting and diverting any potential sources of surface or near-surface water within the construction zones.

Because the selection of an appropriate drainage system will depend on the water quantity, season, weather conditions, construction sequence, and methods used by the contractor, final decisions regarding drainage systems are best made in the field at the time of construction. All drainage and/or water diversion performed for the site should be in accordance with the Clean Water Act and applicable Storm Water Pollution Prevention Plan.

Dust Control: Dust control provisions should be provided for as required by the local jurisdiction's grading ordinance (i.e. water truck or other adequate water supply during grading).

Clearing and Stripping: Clearing and stripping operations should include the removal of all organic laden materials including trees, bushes, root balls, root systems, and any soft or loose soil generated by the removal operations. Surface grass stripping operations are necessary based upon our observations during our site visit. Short or mowed dry grasses may be pulverized and lost within fill materials provided no concentrated pockets of organics result. It is the responsibility of the grading contractor to remove excess organics from the fill materials. **No more than 2 percent of organic material, by weight, should be allowed within the fill materials at any given location.**

General site clearing should also include removal of any loose or saturated materials within the proposed structural improvement and pavement areas. A representative of our firm should be present during site clearing operations to identify the location and depth of potential fills not disclosed by this report, to observe removal of deleterious materials, and to identify any existing site conditions which may require mitigation or further recommendations prior to site development. Preserved trees may require tree root protection which should be addressed on an individual basis by a qualified arborist.

Overexcavation and Recompaction of Loose/Soft Native Soils: Following general site clearing, all loose/soft soils should be overexcavated down to firm native materials. Reference should be made to the site description and exploratory test pit logs for anticipated locations of loose/soft soils. Any depressions extending below final grade resulting from the removal of loose/soft materials or other deleterious materials should be properly prepared as discussed below and backfilled with engineered fill.

Exposed Grade Compaction: Exposed soil grades following initial site preparation activities and overexcavation operations should be scarified to a minimum depth of 8 inches and compacted to the requirements for engineered fill. Prior to placing fill, the exposed subgrades should be in a firm and unyielding state. Any localized zones of soft or pumping soils observed within a subgrade should either be scarified and recompacted or be overexcavated and replaced with engineered fill as detailed in the engineered fill section below.

Overexcavation and Recompaction of Test Pits: Three exploratory test pits were excavated and loosely backfilled during our field study in the locations shown on the site plan presented on Figure A-2, Appendix A. Following general site clearing, the test pits should be overexcavated down to their original depth and backfilled with engineered fill as detailed below.

Excavation Characteristics

The exploratory test pits were excavated using a John Deere 410L backhoe equipped with an 18-inch-wide bucket. The degree of difficulty encountered in excavating our test pits is an indication of the effort that will be required for excavation during construction. Based on our test pits, we expect that the site soils can be excavated using conventional earthmoving equipment such as a

Caterpillar D6 to D8 for grading and rubber tired backhoe for trench excavations not extending to the underlying bedrock materials.

Where hard rock cuts in fractured rock are proposed, the orientation and direction of ripping will likely play a large role in the rippability of the material. When hard rock is encountered, we should be contacted to provide additional recommendations prior to performing an alternative such as blasting.

Soil Moisture Considerations
The near-surface soils may become partially or completely saturated during the rainy season. Grading operations during this time period may be difficult since compaction efforts may be hampered by saturated materials. Therefore, we suggest that consideration be given to the seasonal limitations and costs of winter grading operations on the site. Special attention should be given regarding the drainage of the project site.

If the project is expected to work through the wet season, the contractor should install appropriate temporary drainage systems at the construction site and should minimize traffic over exposed subgrades due to the moisture-sensitive nature of the on-site soils. During wet weather operations, the soil should be graded to drain and should be sealed by rubber tire rolling to minimize water infiltration.

Compaction Equipment
In areas to receive structural soil fill, we anticipate that a large vibratory padded drum compactor or approved equivalent will be capable of achieving the compaction requirements for engineered fill provided the soil is placed and compacted within 0 to 3 percent over the optimum moisture content as determined by the ASTM D1557 test method and in lifts not greater than 8 inches in uncompacted thickness. The use of handheld equipment such as jumping jack or plate vibration compactors may require thinner lifts of 6 inches or less to achieve the desired relative compaction parameters.

Engineered Fill Criteria
All materials placed as fills on the site should be placed as "Engineered Fill" which is observed, tested, and compacted as described in the following paragraphs.

Suitability of Onsite Materials: We expect that soil generated from excavations on the site, excluding deleterious material, may be used as engineered fill provided the material does not exceed 8 inches maximum dimension.

Import Materials: If imported fill material is needed for this project, import material should be approved by our firm prior to transporting it to the project. It is preferable that import material meet the following requirements:

1. Plasticity index not to exceed 12;
2. An angle of friction equal to or greater than 34 degrees;
3. Should not contain rocks larger than 8 inches in diameter (maximum dimension);
4. Not more than 15 percent passing through the No. 200 sieve.

If these requirements are not met, additional testing and evaluation may be necessary to determine the appropriate design parameters for foundations, pavement, and other improvements.

Fill Placement and Compaction: All areas proposed to receive fill should be scarified to a minimum depth of 8 inches, moisture conditioned as necessary, and compacted to at least 90 percent of the maximum dry density based on the ASTM D1557 test method. The fill should be placed in thin horizontal lifts not to exceed 8 inches in uncompacted thickness. The fill should be moisture conditioned as necessary and compacted to a relative compaction of not less than 90 percent based on the ASTM D1557 test method. The upper 8 inches of fills placed under proposed pavement areas should be compacted to a relative compaction of not less than 95 percent based on the ASTM D1557 test method. Expansive clays, if encountered, should be mixed thoroughly with less expansive on site materials (silts, sands, and gravels) and should not be present in concentration within 5 feet of the building envelope, either vertically or laterally. Proper disposition of clays on site should be documented by a representative of Youngdahl Consulting Group, Inc.

To mitigate the potential for deep fill settlement, all fills placed deeper than 10 feet from finished grade should be compacted to a minimum of 95 percent relative compaction. The fills should be placed at a minimum of two percent over optimum moisture content.

Fill soil compaction should be evaluated by means of in-place density tests performed during fill placement so that adequacy of soil compaction efforts may be determined as earthwork progresses.

Slope Configuration and Grading

The project site is proposed to have cuts and fill with a maximum slope orientation of 2H:1V (Horizontal: Vertical). Generally, a cut slope orientation of 2H:1V is considered stable with the material types encountered on the site. A fill slope constructed at the same orientation is considered stable if compacted to the engineered fill recommendations as stated in the recommendations section of this report. All slopes should have appropriate drainage and vegetation measures to minimize erosion of slope soils.

Placement of Fills on Slopes: Placement of fill material on natural slopes should be stabilized by means of keyways and benches. Where the slope of the original ground equals or exceeds 5H:1V, a keyway should be constructed at the base of the fill. The keyway should consist of a trench excavated to a depth of at least two feet into firm, competent materials. The keyway trench should be at least 10 feet wide or as designated by our firm based on the conditions at the time of construction. Benches should be cut into the original slope as the filling operation proceeds. Each bench should consist of a level surface excavated at least six feet horizontally into firm soils or four feet horizontally into rock. The rise between successive benches should not exceed 36 inches. The need for subdrainage should be evaluated at the time of construction. Refer to Figure C-1 in Appendix C for typical keyway and bench construction.

Slope Face Compaction: All slope fills should be laterally overbuilt and cut back such that the required compaction is achieved at the proposed finish slope face. As a less preferable alternative, the slope face could be track walked or compacted with a wheel. If this second alternative is used, additional slope maintenance may be necessary.

Slope Drainage: Surface drainage should not be allowed to flow uncontrolled over any slope face. Adequate surface drainage control should be designed by the project civil engineer in accordance with the latest applicable edition of the CBC. All slopes should have appropriate drainage and vegetation measures to minimize erosion of slope soils.

5.0 DESIGN RECOMMENDATIONS

Seismic Criteria

Based on the 2019 California Building Code, Chapter 16, and our site investigation findings, the following seismic parameters are recommended from a geotechnical perspective for structural design. The final choice of design parameters, however, remains the purview of the project structural engineer.

Table 3: Seismic Design Parameters

2019 CBC	ASCE 7-16	Seismic Parameter	Recommended Value
	Table 20.3-1	Site Class	C
**	Figure 22-1	Short-Period MCE at 0.2s, S_S	0.388g
**	Figure 22-2	1.0s Period MCE, S_1	0.195g
Table 1613.2.3(1)		Site Coefficient, F_a	1.300
Table 1613.2.3(2)		Site Coefficient, F_v	1.500
Equation 16-36		Adjusted MCE Spectral Response Parameters, $S_{MS} = F_aS_s$	0.505g
Equation 16-37		Adjusted MCE Spectral Response Parameters, $S_{M1} = F_vS_1$	0.292g
Equation 16-39		Design Spectral Acceleration Parameters, $S_{DS} = ⅔S_{MS}$	0.337g
Equation 16-40		Design Spectral Acceleration Parameters, $S_{D1} = ⅔S_{M1}$	0.195g
Table 1613.2.5(1)		Seismic Design Category (Short Period), Occupancy I to III	C
Table 1613.2.5(1)		Seismic Design Category (Short Period), Occupancy IV	D
Table 1613.2.5(2)		Seismic Design Category (1-Second Period), Occupancy I to III	D
Table 1613.2.5(2)		Seismic Design Category (1-Second Period), Occupancy IV	D
	Figure 22-7	Maximum Considered Earthquake Geometric Mean (MCE_G) PGA	0.165g
	Table 11.8-1	Site Coefficient F_{PGA}	1.235
	Equation 11.8-1	$PGA_M = F_{PGA}$ PGA	0.203g

*Based on the online calculator available at http://earthquake.usgs.gov/designmaps/us/application.php
** Section 1613.1 of the CBC indicates that either Section 1613 or ASCE 7-16 may be used for determination of seismic design categories.

Shallow Conventional Foundations

We offer the following comments and recommendations for purposes of design and construction of shallow continuous and/or isolated pad foundations. The provided minimums do not constitute a structural design of foundations which should be performed by the structural engineer. Our firm should be afforded the opportunity to review the project grading and foundation plans to confirm the applicability of the recommendations provided below. Modifications to these recommendations may be made at the time of our review. In addition to the provided recommendations, foundation design and construction should conform to applicable sections of the 2019 California Building Code.

Foundation Bearing Capacities: An allowable dead plus live load bearing pressure of 2,000 psf may be used for design of conventional shallow foundations based on firm native soils or engineered fills and 4,000 psf for foundations based on weathered bedrock. The allowable pressures are for support of dead plus live loads and may be increased by 1/3 for short-term wind and seismic loads.

Foundation Lateral Pressures: Lateral forces on structures may be resisted by passive pressure acting against the sides of shallow footings and/or friction between the foundation bearing material and the bottom of the footing. For resistance to lateral loads, a friction factor of 0.35 may be utilized for sliding resistance at the base of conventional shallow foundations in firm native materials or engineered fill, and 0.45 for weathered rock. A passive resistance of 300 pcf equivalent fluid weight may be used against the side of conventional shallow footings in firm native soil or engineered fill, and 400 pcf for weathered bedrock conditions. If friction and passive pressures are combined, the lesser value should be reduced by 50 percent.

Foundation Settlement: A total settlement of less than 1 inch is anticipated; a differential settlement of 0.5 inches in 25 feet is anticipated where foundations are bearing on like materials. Where foundations will span from bearing on non-like materials such as weathered bedrock to engineered fill, or vice versa, differential settlement may approach 0.75 inches in 25 feet. The settlement criteria are based upon the assumption that foundation will be sized and loaded in accordance with the recommendations in this report.

Foundation Configuration: Conventional shallow foundations should be a minimum of 12 inches wide and founded a minimum of 12 inches below the lowest adjacent soil grade for one and two-story slab-on-grade residences (one supported floor). Isolated pad foundations should be a minimum of 24 inches in plan dimension. A grade beam, having the same depth as the continuous footings, should also be cast across the vehicle opening of the residence garage.

Foundation reinforcement should be provided by the Structural Engineer. The reinforcement schedule should account for typical construction issues such as load consideration, concrete cracking, and the presence of isolated irregularities. At a minimum, we recommend that continuous footing foundations for single family residences be reinforced with two No. 4 reinforcing bars, one located near the bottom of the footing and one near the top of the stem wall. Where foundations are constructed within a cut-fill transition, soil to rock interface, or over minor surface irregularities (i.e. point load conditions within resistant bedrock), as a consideration to span these localized differential irregularities, we suggest that structural footing reinforcing steel be doubled top and bottom (minimum, four No. 4 reinforcing bars, two each top and bottom) extending a minimum of 10 feet continuous length on both sides of the transition/irregularity.

All footings should be founded below an imaginary 2H:1V plane projected up from the bottoms of adjacent footings and/or parallel utility trenches, or to a depth that achieves a minimum horizontal clearance of 6 feet from the outside toe of the footings to the slope face, whichever requires a deeper excavation.

Subgrade Conditions: Footings should never be cast atop soft, loose, organic, slough, debris, nor atop subgrades covered by ice or standing water. A representative of our firm should be retained to observe all subgrades during footing excavations and prior to concrete placement so that a determination as to the adequacy of subgrade preparation can be made.

Shallow Footing / Stemwall Backfill: All footing/stemwall backfill soil should be compacted to at least 90 percent of the maximum dry density (based on ASTM D1557).

Differential Support Conditions: Differential support conditions may be a concern where fills are placed and compacted for construction of a building pad and the proposed building will span from a native to deep fill condition (i.e. fills greater than 10 feet). In order to mitigate the potential for differential settlement, overexcavation of the cut portion of the building pad, deepening of the foundations or adjustment of compaction requirements may be recommended. We should be afforded the opportunity to review the construction plans in order to develop site specific recommendations regarding differential conditions.

Retaining Walls

Our design recommendations and comments regarding retaining walls for the project site are discussed below.

Foundation Design Parameters: An allowable dead plus live load bearing pressure of 2,000 psf may be used for design of conventional shallow foundations based on firm native soils or engineered fills and 4,000 for foundation based on weathered bedrock. The allowable pressures are for support of dead plus live loads and may be increased by 1/3 for short-term seismic loads.

Foundation Lateral Pressures: Lateral forces on structures may be resisted by passive pressure acting against the sides of shallow footings and/or friction between the soil and the bottom of the footing. For resistance to lateral loads, a friction factor of 0.35 may be utilized for sliding resistance at the base of conventional shallow foundations in firm native materials or engineered fill and 0.45 for weathered rock. A passive resistance of 300 pcf equivalent fluid weight may be used against the side of conventional shallow footings in firm native soil or engineered fill and 400 pcf for weathered bedrock conditions. If friction and passive pressures are combined, the lesser value should be reduced by 50 percent.

Retaining Wall Lateral Pressures: Based on our observations and testing, the retaining wall should be designed to resist lateral pressure exerted from a soil media having an equivalent fluid weight provided in Table 6, below. In accordance with Section 1803.5.12.1 of the 2019 California Building Code, application of the seismic design values for earthquake loading are required for retaining walls supporting more than 6 feet of backfill.

Table 4: Retaining Wall Pressures

Wall Type	Wall Slope Configuration	Equivalent Fluid Weight (pcf)	Surcharge Load (psf)*	Lateral Pressure Coefficient	Earthquake Loading (plf)***	
Free Cantilever	Flat	40	per structural	0.28	$4H^2$	Applied 0.6H above the base of the wall
	2H:1V	50	per structural	0.42		
Restrained**	Flat	55	per structural	0.44	$13H^2$	

* The surcharge loads should be applied as uniform loads over the full height of the walls as follows: Surcharge Load (psf) = (q) (K), where q = surcharge in psf, and K = coefficient of lateral pressure. Final design is the purview of the project structural engineer.

** Restrained conditions shall be defined as walls which are structurally connected to prevent flexible yielding, or rigid wall configurations (i.e. walls with numerous turning points) which prevent the yielding necessary to reduce the driving pressures from an at-rest state to an active state.

*** Section 1803.5.12 of the 2019 California Building Code states that a determination of lateral pressures on basement and retaining walls due to earthquake loading shall be provided for structures to be designed in Seismic Design Categories D, E or F (Load value derived from Wood (1973) and modified by Whitman (1991)).

Mechanically Stabilized Earth Walls: If keyed or interlocking non-mortared walls such as Keystone, Baselite, Allen Block, or rockery walls are utilized, the following soil parameters would be applicable for design within on-site, native materials:

Table 5: Modular Retaining Wall Design Parameters

Internal Angle of Friction	Cohesion	Bulk Unit Weight
34°	0 psf	125 psf

Site Wall Drainage: The above criteria are based on fully drained conditions as detailed in the attached Figure C-2, Appendix C. For these conditions, we recommend that a blanket of filter material be placed behind all proposed walls. The blanket of filter material should be a minimum of 12 inches thick and should extend from the bottom of the wall to within 12 inches of the ground surface. The filter material should conform to Class One, Type B permeable material as specified in Section 68 of the California Department of Transportation Standard Specifications, current edition. A clean ¾ inch crushed rock is also acceptable, provided filter fabric is used to separate the open graded gravel/rock from the surrounding soils. The top 12 inches of wall backfill should consist of a compacted soil cap. A filter fabric should be placed on top of the gravel filter material to separate it from the soil cap. A 4 inch diameter drain pipe should be installed near the bottom of the filter blanket with perforations facing down. The drainpipe should be underlain by at least 4 inches of filter-type material. An adequate gradient should be provided along the top of the foundation to discharge water that collects behind the retaining wall to a controlled discharge system.

The configuration of a long retaining wall generally does not allow for a positive drainage gradient within the perforated drain pipe behind the wall since the wall footing is generally flat with no gradient for drainage. Where this condition is present, to maintain a positive drainage behind the walls, we recommend that the wall drains be provided with a discharge to an appropriate non-erosive outlet a maximum of 50 feet on center. **In addition, if the wall drain outlets are temporarily stubbed out in front of the walls for future connection during home construction, it is imperative that the outlets be routed into the tight pipe area drainage system and not buried and rendered ineffective.**

Basement Wall Drainage: Based on our experience in the project area, excavation into bedrock to create a daylight basement condition may have the potential for creating moisture related problems within the underlying slab on grade areas of the daylight basement (i.e. wet slab conditions associated with seepage through bedrock fractures, perched groundwater, etc.). The following recommendations have been provided to mitigate the potential for the abovementioned moisture related issues.

The configuration of a long retaining wall generally does not allow for a positive drainage gradient within the perforated drain pipe behind the wall since the wall footings are generally flat with no gradient for drainage. Where this condition is present, to maintain positive drainage behind the walls, we recommend that the length of the wall drain be broken up into segments of 20 foot lengths that will allow for drainage outlets within the central portion of the drain segment. To accomplish this, we recommend that the perforated pipe be installed in contact with the top of the footing and sleeved with a tight pipe through the footing as detailed on Figure C-3, Appendix C. The drain should be installed in a trench and directed to a non-erosive outlet. Once the drain enters the footing, the perforated drain pipe should transition to a non-perforated rigid wall pipe. A second perforated pipe should be installed within the trench as detailed on Figure C-3, Appendix C. The trench should be backfilled with crushed rock up to finished pad grade so that it contacts the crushed rock beneath the slab and functions as a slab underdrain system. The drain trenches should be excavated to a depth such that they are below any plumbing trenches, so that any water that may accumulate in those trenches can also be drained.

The final drainage configuration should be addressed prior to the completion of pad grading operations, so that a determination can be made, based on the geotechnical and/or geologic conditions observed, where installation of the wall drain outlets/slab underdrain system would be most beneficial.

Slab-on-Grade Construction

It is our opinion that soil-supported slab-on-grade floors could be used for the main floor of the residential structure, contingent on proper subgrade preparation. Often the geotechnical issues regarding the use of slab-on-grade floors include proper soil support and subgrade preparation, proper transfer of loads through the slab underlayment materials to the subgrade soils, and the anticipated presence or absence of moisture at or above the subgrade level. We offer the following comments and recommendations concerning support of slab-on-grade floors. The slab design (concrete mix, reinforcement, joint spacing, moisture protection, and underlayment materials) is the purview of the project Structural Engineer.

Slab Subgrade Preparation: All subgrades proposed to support slab-on-grade floors should be prepared and compacted to the requirements of engineered fill as discussed in the Site Grading and Improvements section of this report.

Slab Underlayment: For residential construction, the concrete slab underlayment should be constructed in accordance with Section 4.505.2.1 of the 2019 California Green Code. As a minimum for slab support conditions, the slab should be underlain by a minimum 4-inch thick crushed rock layer and covered by a minimum 10-mil thick moisture retarding plastic membrane. An optional 1-inch thick blotter sand layer above the plastic membrane is sometimes used to aid in curing of the concrete in commercial structures. The blotter layer can become a reservoir for excessive moisture if inclement weather occurs prior to pouring the slab, excessive water collects in it from the concrete pour, or an external source of water enters above or bypasses the membrane. The membrane may only be functional when it is above the vapor sources. The bottom of the crushed rock layer should be above the exterior grade to act as a capillary break and not a reservoir, unless it is provided with an underdrain system. The slab design and underlayment should be in accordance with ASTM E1643 and E1745.

If the blotter sand layer is omitted (as may be required if slab design and construction is to be performed according to the 2019 Green Building Code), special wet curing procedures will be necessary. In all cases, development of appropriate slab mix design and curing procedures remains the purview of the project Structural Engineer.

Slab Moisture Protection: Due to the potential for landscape to be present directly adjacent to the slab edge/foundation or for drainage to be altered following our involvement with the project, varying levels of moisture below, at, or above the pad subgrade level should be anticipated. The slab designer should include the potential for moisture vapor transmission when designing the slab. Our experience has shown that vapor transmission through concrete is controlled through slab thickness as well as proper concrete mix design.

It should be noted that placement of the recommended plastic membrane, proper mix design, and proper slab underlayment and detailing per ASTM E1643 and E1745 will not provide a waterproof condition. If a waterproof condition is desired, we recommend that a waterproofing expert be consulted for slab design.

Slab Thickness and Reinforcement: Geotechnical reports have historically provided minimums for slab thickness and reinforcement for general crack control. The concrete mix design and

construction practices can additionally have a large impact on concrete crack control. All concrete should be anticipated to crack. As such, these minimums should not be considered to be stand alone items to address crack control, but are suggested to be considered in the slab design methodology.

In order to help control the growth of cracks in interior concrete from becoming significant, we suggest the following minimums. Interior concrete slabs-on-grade not subject to heavy loads should be a minimum of 4 inches thick. A 4 inch thick slab should be reinforced. A minimum of No. 3 deformed reinforcing bars placed at 24 inches on center both ways, at the center of the structural section is suggested. Joint spacing should be provided by the structural engineer. Troweled joints recovered with paste during finishing or "wet sawn" joints should be considered every 10 feet on center. Expansion joint felt should be provided to separate floating slabs from foundations and at least at every third joint. Cracks will tend to occur at recurrent corners, curved or triangular areas and at points of fixity. Trim bars can be utilized at right angle to the predicted crack extending 40 bar diameters past the predicted crack on each side.

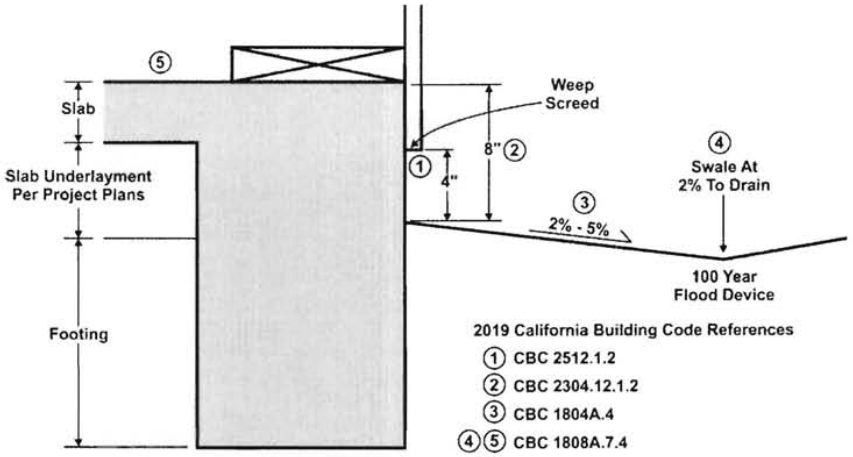
Vertical Deflections: Soil-supported slab-on-grade floors can deflect downward when vertical loads are applied, due to elastic compression of the subgrade. For design of concrete floors, a modulus of subgrade reaction of k = 150 psi per inch would be applicable for native soils and engineered fills.

Exterior Flatwork: Exterior concrete flatwork is recommended to have a 4 inch rock cushion. This could consist of vibroplate compacted crushed rock or compacted ¾ inch aggregate baserock.

If exterior flatwork concrete is against the floor slab edge without a moisture separator it may transfer moisture to the floor slab. Expansion joint felt should be provided to separate exterior flatwork from foundations and at least at every third joint. Contraction / groove joints should be provided to a depth of at least 1/4 of the slab thickness and at a spacing of less than 30 times the slab thickness for unreinforced flatwork, dividing the slab into nearly square sections. Cracks will tend to occur at recurrent corners, curved or triangular areas and at points of fixity. Trim bars can be utilized at right angle to the predicted crack extending 40 bar diameters past the predicted crack on each side.

Drainage Adjacent to Slabs: All grades should provide rapid removal of surface water runoff; ponding water should not be allowed on building pads or adjacent to foundations or other structural improvements (during and following construction). All soils placed against foundations during finish grading should be compacted to minimize water infiltration. Finish and landscape grading should include positive drainage away from all foundations. Section 1808.7.4 of the 2019 California Building Code (CBC) states that for graded soil sites, the top of any exterior foundation shall extend above the elevation of the street gutter at the point of discharge or the inlet of an approved drainage device a minimum of 12 inches plus 2 percent. If overland flow is not achieved adjacent to buildings, the drainage device should be designed to accept flows from a 100 year event. Grades directly adjacent to foundations should be no closer than 8 inches from the top of the slab (CBC 2304.12.1.2), and weep screeds are to be placed a minimum of 4 inches clear of soil grades and 2 inches clear of concrete or other hard surfacing (CBC 2512.1.2). From this point, surface grades should slope a minimum of 2 percent away from all foundations for at least 5 feet but preferably 10 feet, and then 2 percent along a drainage swale to the outlet (CBC

1804.4). Downspouts should be tight piped via an area drain network and discharged to an appropriate non-erosive outlet away from all foundations.



Typical 2019 California Building Code Drainage Requirements

The above referenced elements pertaining to drainage of the proposed structures is provided as general acknowledgement of the California Building Code requirements, restated and graphically illustrated for ease of understanding. Surface drainage design is the purview of the Project

Architect/Civil Engineer. Review of drainage design and implementation adjacent to the building envelopes is recommended as performance of these improvements is crucial to the performance of the foundation and construction of rigid improvements.

Drainage

In order to maintain the engineering strength characteristics of the soil presented for use in this geotechnical engineering study, maintenance of the building pads will need to be performed. This maintenance generally includes, but is not limited to, proper drainage and control of surface and subsurface water which could affect structural support and fill integrity. A difficulty exists in determining which areas are prone to the negative impacts resulting from high moisture conditions due to the diverse nature of potential sources of water; some of which are outlined in the paragraph below. We suggest that measures be installed to minimize exposure to the adverse effects of moisture, but this will not guarantee that excessive moisture conditions will not affect the structure.

Some of the diverse sources of moisture could include water from landscape irrigation, annual rainfall, offsite construction activities, runoff from impermeable surfaces, collected and channeled water, and water perched in the subsurface soils on the bedrock horizon or present in fractures in the weathered bedrock. Some of these sources can be controlled through drainage features installed either by the owner or contractor. Others may not become evident until they, or the effects of the presence of excessive moisture, are visually observed on the property.

Some measures that can be employed to minimize the buildup of moisture include, but are not limited to proper backfill materials and compaction of utility trenches within the footprint of the proposed residential structures; grout plugs at foundation penetrations; collection and channeling

of drained water from impermeable surfaces (i.e. roofs, concrete or asphalt paved areas); installation of subdrain/cut-off drain provisions; utilization of low flow irrigation systems; education to the proposed homeowners of proper design and maintenance of landscaping and drainage facilities that they or their landscaper installs.

Crawlspace: The configuration of a crawl space has an elevated risk of moisture intrusion and collection. If this configuration is used for the residence provisions for surface drainage should be provided at the base of the crawlspace and if sufficient fall to the sides of the residence cannot be achieved, the basement wall drainage recommendations in this report should be implemented. The construction of a building pad subdrain up slope of the crawlspace could reduce the risk of moisture penetration; however, moisture could still be found on the crawlspace surface without efforts to provide a complete cutoff. Ventilation for the crawlspace should meet minimum code requirements as well as be uniformly spaced around the perimeter of the structure to the extent possible.

Building Pad Subdrain: It has been our experience that sites constructed within this area generally have an increased potential for moisture related issues related to water perched on the bedrock horizon and/or present in the fractures of the bedrock as well as moisture transmission through utility trenches. To mitigate for the potential of these issues, subdrains can be constructed in addition to the drainage provisions provided in the 2019 CBC. Typical subdrain construction would include a 3 feet deep trench (or depth required to intercept the bottom of utility trenches) constructed as detailed on Figure C-4. The water collected in the subdrain pipe would be directed to an appropriate non-erosive outlet. We recommend that a representative from our firm be present during the subdrain installation procedures to document that the drain is installed in accordance with the observed field conditions, as well as to provide additional consultation as the conditions dictate.

As noted in the previous discussions, the moisture conditions may not manifest until after the site is developed. As such, any recommendations for the subdrain orientation and location to mitigate the moisture conditions can be provided on an as requested basis as the conditions arise.

Post Construction: All drainage related issues may not become known until after construction and landscaping are complete. Therefore, some mitigation measures may be necessary following site development. Landscape watering is typically the largest source of water infiltration into the subgrade. Given the soil conditions on site, excessive or even normal landscape watering may contribute to groundwater levels rising, which could contribute to moisture related problems and/or cause distress to foundations and slabs, pavements, and underground utilities, as well as creating a nuisance where seepage occurs. In order to mitigate these conditions, additional subdrainage measures may be necessary. On foothill developments constructed with cut/fill pads on shallow bedrock conditions, seepage may not be apparent until post construction. In order to mitigate these conditions additional subdrainage measures may be necessary.

6.0 DESIGN REVIEW AND CONSTRUCTION MONITORING

The design plans and specifications should be reviewed and accepted by Youngdahl Consulting Group, Inc. prior to contract bidding. A review should be performed to determine whether the recommendations contained within this report are still applicable and/or are properly reflected and incorporated into the project plans and specifications.

Construction Monitoring

Construction monitoring is a continuation of the findings and recommendations provided in this report. It is essential that our representative be involved with all grading activities in order for us

to provide supplemental recommendations as field conditions dictate. Youngdahl Consulting Group, Inc. should be notified at least two working days before site clearing or grading operations commence, and should observe the stripping of deleterious material, overexcavation of existing fills or loose/soft soils and provide consultation to the Grading Contractor in the field.

Low Impact Development Standards

Low Impact Development or LID standards have become a consideration for many projects in the region. LID standards are intended to address and mitigate urban storm water quality concerns. These methods include the use of Source Controls, Run-off Reduction and Treatment Controls. For the purpose of this report use of Run-off Reduction measures and some Treatment Controls may impact geotechnical recommendations for the project.

Youngdahl Consulting Group, Inc. did not perform any percolation or infiltration testing for the site as part of the Geotechnical Investigation. A review of soil survey and the data collected from test pits indicate that soils within the project are Hydrologic Soil Group C (slow rate of water transmission). Based on this condition, use of infiltration type LID methods (infiltration trenches, dry wells, infiltration basins, permeable pavements, etc.) should not be considered without addressing applicable geotechnical considerations/implications. As such, use of any LID measure that would require infiltration of discharge water to surfaces adjacent to structures/pavement or include infiltration type measures should be reviewed by Youngdahl Consulting Group, Inc. during the design process.

Post Construction Monitoring

As described in Post Construction section of this report, all drainage related issues may not become known until after construction and landscaping are complete. Youngdahl Consulting Group, Inc. can provide consultation services upon request that relate to proper design and installation of drainage features during and following site development.

7.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. This report has been prepared for the exclusive use of Helwig Properties, LLC. and their consultants for specific application to the Sunshine Ranch project. Youngdahl Consulting Group, Inc. has endeavored to comply with generally accepted geotechnical engineering practice common to the local area. Youngdahl Consulting Group, Inc. makes no other warranty, expressed or implied.

2. As of the present date, the findings of this report are valid for the property studied. With the passage of time, changes in the conditions of a property can occur whether they be due to natural processes or to the works of man on this or adjacent properties. Legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may cause this report to be invalid, wholly or partially. Therefore, this report should not be relied upon after a period of three years without our review nor should it be used or is it applicable for any properties other than those studied.

3. Section [A] 107.3.4 of the 2019 California Building Code states that, in regard to the design professional in responsible charge, the building official shall be notified in writing by the owner if the registered design professional in responsible charge is changed or is unable to continue to perform the duties.

   WARNING: Do not apply any of this report's conclusions or recommendations if the nature, design, or location of the facilities is changed. If changes are contemplated, Youngdahl Consulting Group, Inc. must review them to assess their impact on this report's applicability.

Also note that Youngdahl Consulting Group, Inc. is not responsible for any claims, damages, or liability associated with any other party's interpretation of this report's subsurface data or reuse of this report's subsurface data or engineering analyses without the express written authorization of Youngdahl Consulting Group, Inc.

4. The analyses and recommendations contained in this report are based on limited windows into the subsurface conditions and data obtained from subsurface exploration. The methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Samples cannot be relied on to accurately reflect the strata variations that usually exist between sampling locations. Should any variations or undesirable conditions be encountered during the development of the site, Youngdahl Consulting Group, Inc. will provide supplemental recommendations as dictated by the field conditions.

5. The recommendations included in this report have been based in part on assumptions about strata variations that may be tested only during earthwork. Accordingly, these recommendations should not be applied in the field unless Youngdahl Consulting Group, Inc. is retained to perform construction observation and thereby provide a complete professional geotechnical engineering service through the observational method. Youngdahl Consulting Group, Inc. cannot assume responsibility or liability for the adequacy of its recommendations when they are used in the field without Youngdahl Consulting Group, Inc. being retained to observe construction. Unforeseen subsurface conditions containing soft native soils, loose or previously placed non-engineered fills should be a consideration while preparing for the grading of the property. It should be noted that it is the responsibility of the owner or his/her representative to notify Youngdahl Consulting Group, Inc., in writing, a minimum of 48 hours before any excavations commence at the site.

6. Our experience has shown that vapor transmission through concrete is controlled through proper concrete mix design. As such, proper control of moisture vapor transmission should be considered in the design of the slab as provided by the project architect, structural or civil engineer. It should be noted that placement of the recommended plastic membrane, proper mix design, and proper slab underlayment and detailing per ASTM E1643 and E1745 will not provide a waterproof condition. If a waterproof condition is desired, we recommend that a waterproofing expert be consulted for slab design.

7. Following site development, additional water sources (i.e. landscape watering, downspouts) are generally present. The presence of low permeability materials can prohibit rapid dispersion of surface and subsurface water drainage. Utility trenches typically provide a conduit for water distribution. Provisions may be necessary to mitigate adverse effects of perched water conditions. Mitigation measures may include the construction of cut-off systems and/or plug and drain systems. Close coordination between the design professionals regarding drainage and subdrainage conditions may be warranted.

   Seepage may be observed emanating from the cut slopes following their excavation during the following rainy season or following development of the areas above the cut. Generally, this seepage is not enough flow to be a stability issue to the cut slope, but may be an issue for the owner of the lot at the base of the cut from a surface drainage and standing water (damp spot) standpoint. This amount of water is generally collected easily with landscaping drainage, surface drainage at the toe of the slope, or subsurface toe drains. Recommendations may be provided at the time of observed seepage; however, we recommend that the developer of the property disclose this possibility to future owners.

Table 6: Checklist of Recommended Services

	Item Description	Recommended	Not Anticipated
1	Provide foundation design parameters	Included	
2	Review grading plans and specifications	✓	
3	Review foundation plans and specifications	✓	
4	Observe and provide recommendations regarding demolition		✓
5	Observe and provide recommendations regarding site stripping	✓	
6	Observe and provide recommendations on moisture conditioning removal, and/or recompaction of unsuitable existing soils	✓	
7	Observe and provide recommendations on the installation of subdrain facilities	✓	
8	Observe and provide testing services on fill areas and/or imported fill materials	✓	
9	Review as-graded plans and provide additional foundation recommendations, if necessary	✓	
10	Observe and provide compaction tests on storm drains, water lines and utility trenches		✓
11	Observe foundation excavations and provide supplemental recommendations, if necessary, prior to placing concrete	✓	
12	Observe and provide moisture conditioning recommendations for foundation areas and slab-on-grade areas prior to placing concrete		✓
13	Provide design parameters for retaining walls	Included	
14	Provide finish grading and drainage recommendations	Included	
15	Provide geologic observations and recommendations for keyway excavations and cut slopes during grading	✓	
16	Excavate and recompact all test pits within structural areas	✓	

APPENDIX A

Field Study

Vicinity Map
Site Plan
Logs of Exploratory Test Pits
Soil Classification Chart and Log Exploration

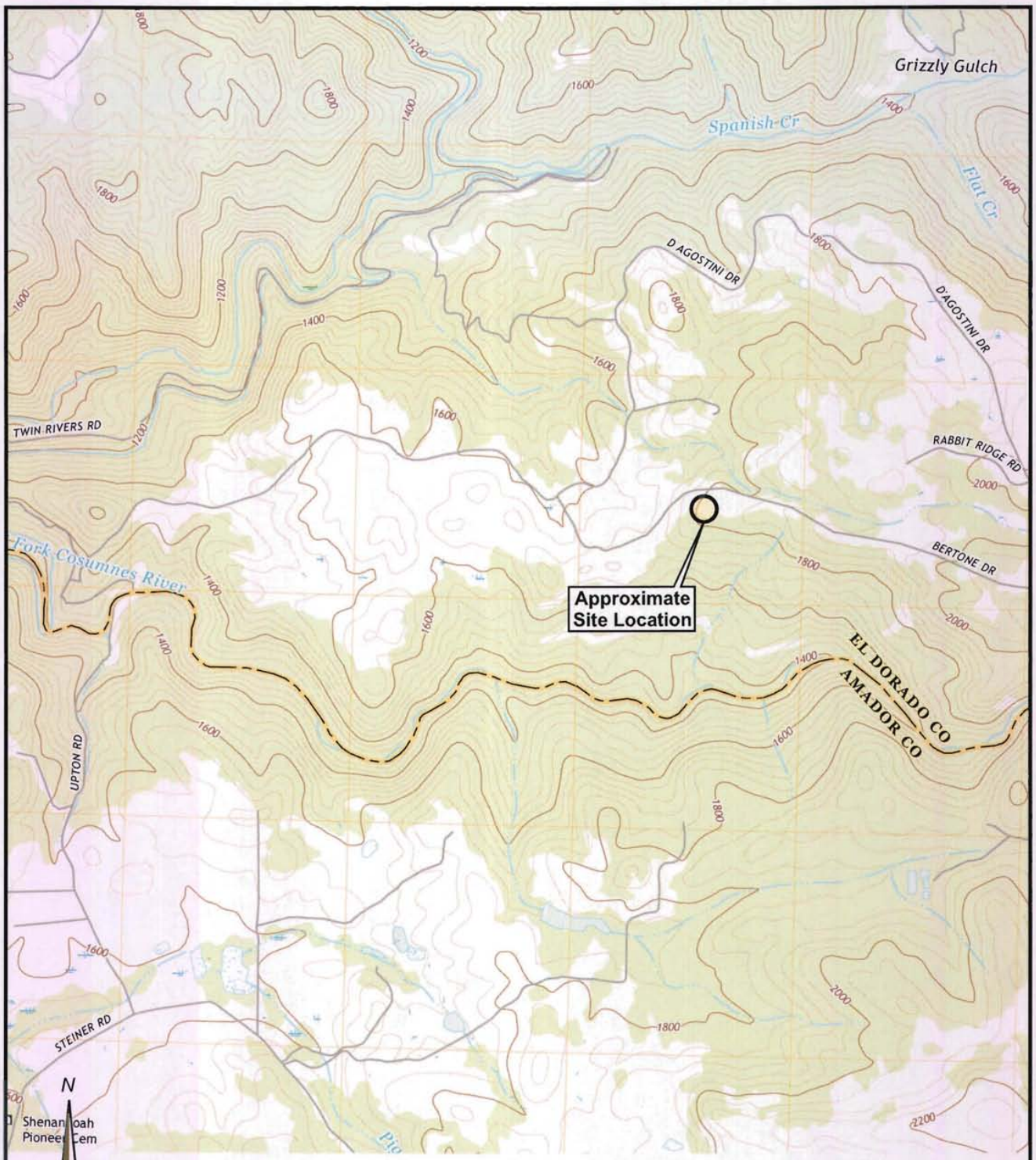
Introduction

The contents of this appendix shall be integrated with the geotechnical engineering study of which it is a part. They shall not be used in whole or in part as a sole source for information or recommendations regarding the subject site.

Our field study included a site reconnaissance by a Youngdahl Consulting Group, Inc. representative followed by a subsurface exploration program conducted on 17 December 2019, which included the excavation of 3 test pits under his direction at the approximate locations shown on Figure A-2, this Appendix. Excavation of the test pits was accomplished with a John Deere 410L rubber tire-mounted backhoe equipped with an 18-inch-wide bucket. The bulk and bag samples collected from the test pits were returned to our laboratory for further examination and testing.

The Exploratory Test Pit Logs describe the vertical sequence of soils and materials encountered in each test pit, based primarily on our field classifications and supported by our subsequent laboratory examination and testing. Where a soil contact was observed to be gradual, our logs indicate the average contact depth. Our logs also graphically indicate the sample type, sample number, and approximate depth of each soil sample obtained from the test pits.

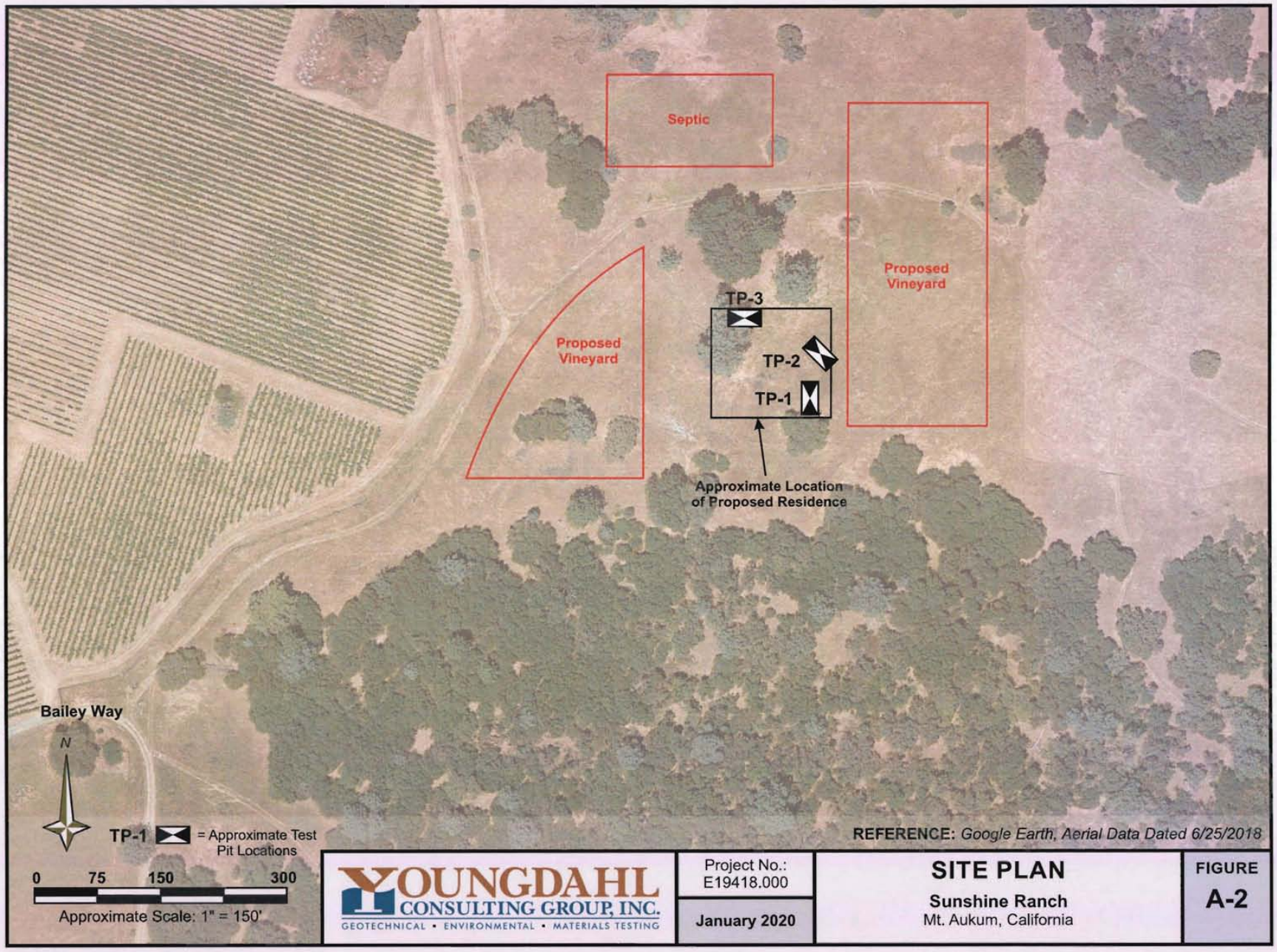
The soils encountered were logged during excavation and provide the basis for the "Logs of Test Pits", Figures A-3 through A-5, this Appendix. These logs show a graphic representation of the soil profile, the location, and depths at which samples were collected.



BASE MAP REFERENCE: *U.S.G.S. 7.5 Minute Topographic Series, Fiddletown Quadrangle, Dated 2018*

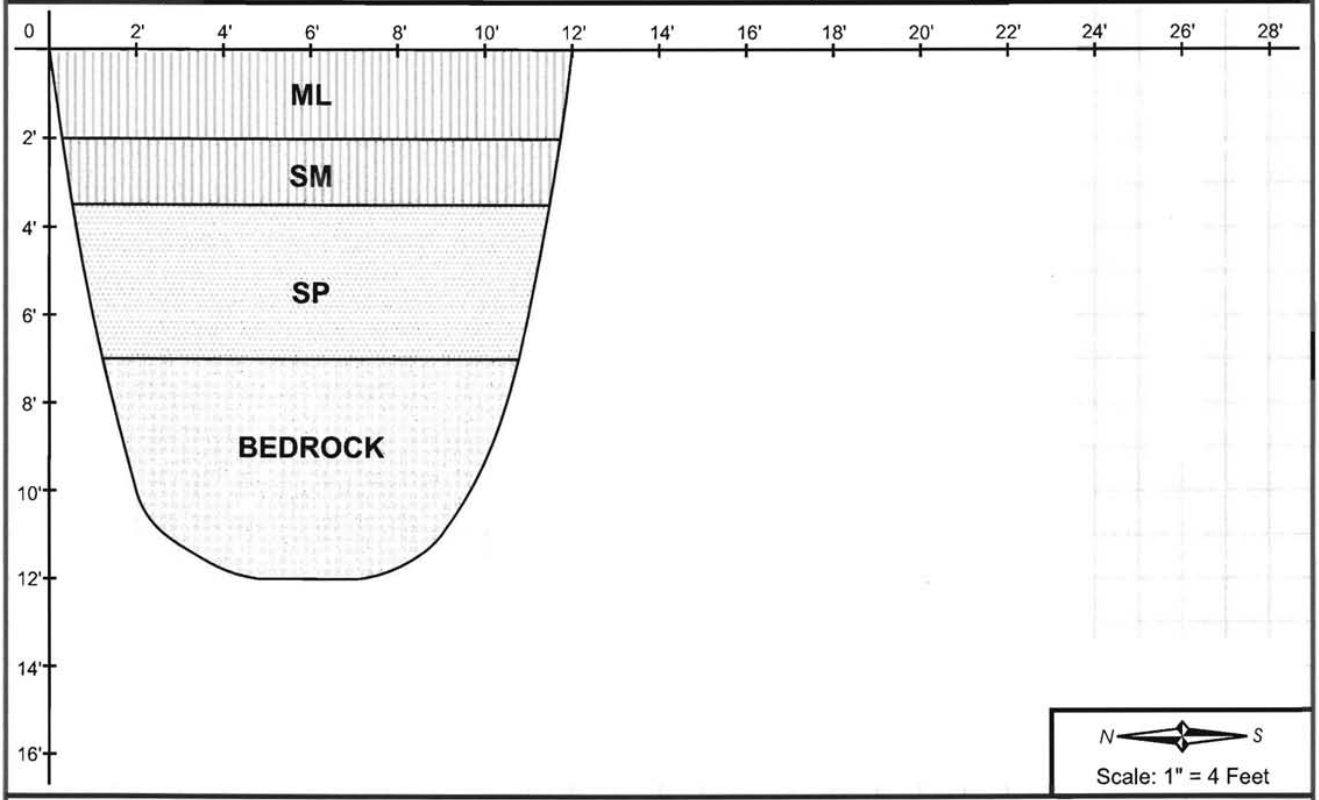
YOUNGDAHL CONSULTING GROUP, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING	Project No.: E19418.000 **January 2020**	**VICINITY MAP** **Sunshine Ranch** Mt. Aukum, California	**FIGURE** **A-1**

P20-0001 SUNSHINE RANCH PARCEL MAP
ATTACHMENT 4 - GEOTECHNICAL ENGINEERING STUDY



Logged By: **MRG**	Date: **17 December 2019**	Lat / Lon: **N 38.56089° / W 120.76692°**		Pit No. **TP-1**
Equipment: **John Deere 410L with 18" Bucket**		Pit Orientation: **N - S**	Elevation: ~	

Depth (Feet)	Geotechnical Description & Unified Soil Classification	Sample	Tests & Comments
@ 0' - 2'	Brown sandy **SILT (ML)** with trace clay, soft, wet	**TP-1** @ 2-3'	*PP @ 1' = 1.25 tsf* *PP @ 3' = 3.5 tsf* *PP @ 4' = 4.5+ tsf*
@ 2' - 3.5'	Red brown silty **SAND (SM)**, medium dense, moist	**TP-1** @ 2'	
@ 3.5' - 7'	Yellow brown **SAND (SP)** with silt, medium dense, slightly moist	**TP-1** @ 3.5'	
@ 7' - 9'	Yellow brown **BEDROCK (DG)**, completelyweathered, slightly moist		
@ 9' - 12'	*Grades highly weathered*		
	Test pit terminated at 12' No free groundwater encountered No caving noted		

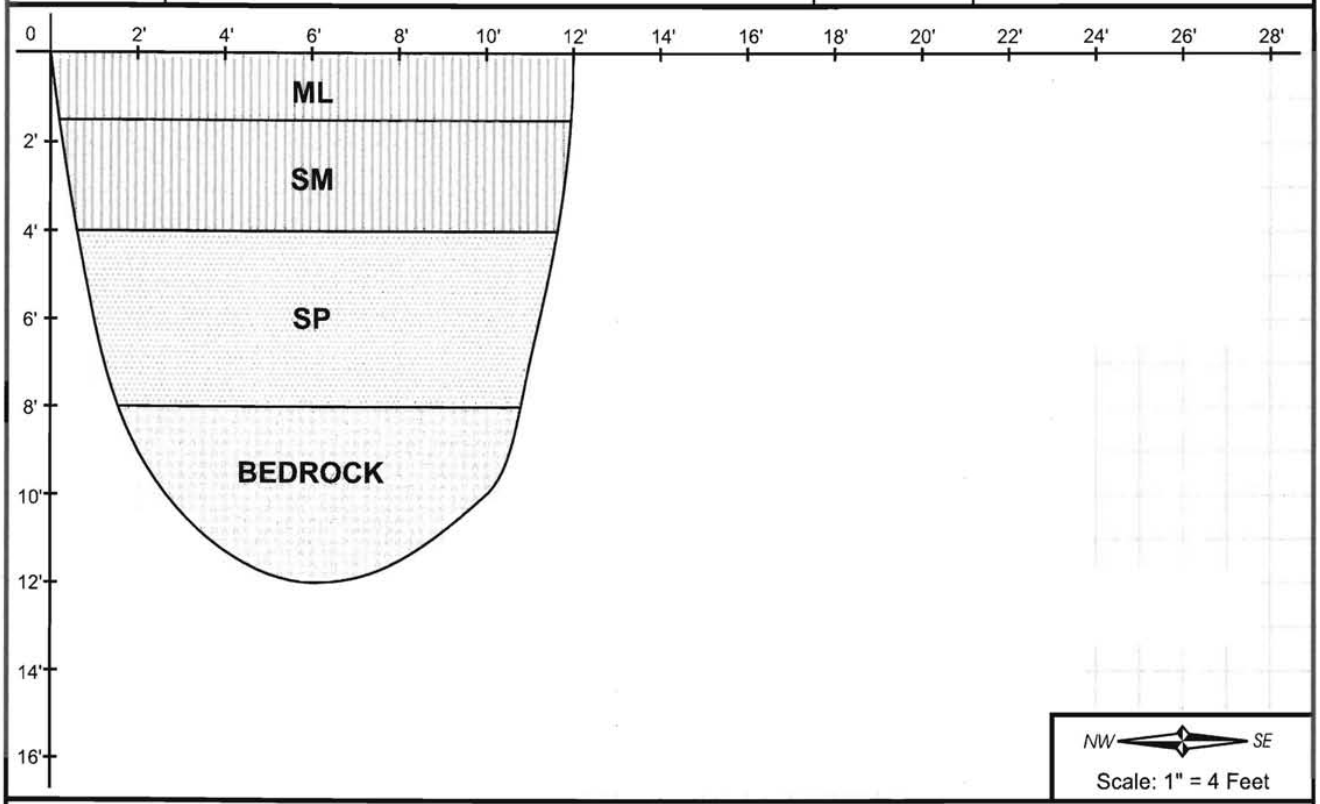


Note: The test pit log indicates subsurface conditions only at the specific location and time noted. Subsurface conditions, including groundwater levels, at other locations of the subject site may differ significantly from conditions which, in the opinion of Youngdahl Consulting Group, Inc., exist at the sampling locations, Note, too, that the passage of time may affect conditions at the sampling locations.

YOUNGDAHL CONSULTING GROUP, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING	Project No.: E19418.000 **January 2020**	**EXPLORATORY TEST PIT LOG** **Sunshine Ranch** Mt. Aukum, California	**FIGURE A-3**

Logged By: **MRG**	Date: **17 December 2019**	Lat / Lon: **N 38.56109° / W 120.76690°**	Pit No. **TP-2**
Equipment: **John Deere 410L with 18" Bucket**		Pit Orientation: **NW - SE**	Elevation: ~

Depth (Feet)	Geotechnical Description & Unified Soil Classification	Sample	Tests & Comments
@ 0' - 1.5'	Brown sandy **SILT (ML)**, soft, moist		
@ 1.5' - 4'	Red brown silty **SAND (SM)**, medium dense, moistYellow		
@ 4' - 8'	brown **SAND (SP)** with silt, dense, slightly moist	**TP-2** @ 7'	
@ 8' - 10'	Yellow brown **BEDROCK (DG)**, completely weathered,		
@ 10' - 12'	slightly moist *Grades highly weathered*		
	Test pit terminated at 12' No free groundwater encountered No caving noted		



Note: The test pit log indicates subsurface conditions only at the specific location and time noted. Subsurface conditions, including groundwater levels, at other locations of the subject site may differ significantly from conditions which, in the opinion of Youngdahl Consulting Group, Inc., exist at the sampling locations, Note, too, that the passage of time may affect conditions at the sampling locations.

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Project No.: E19418.000

January 2020

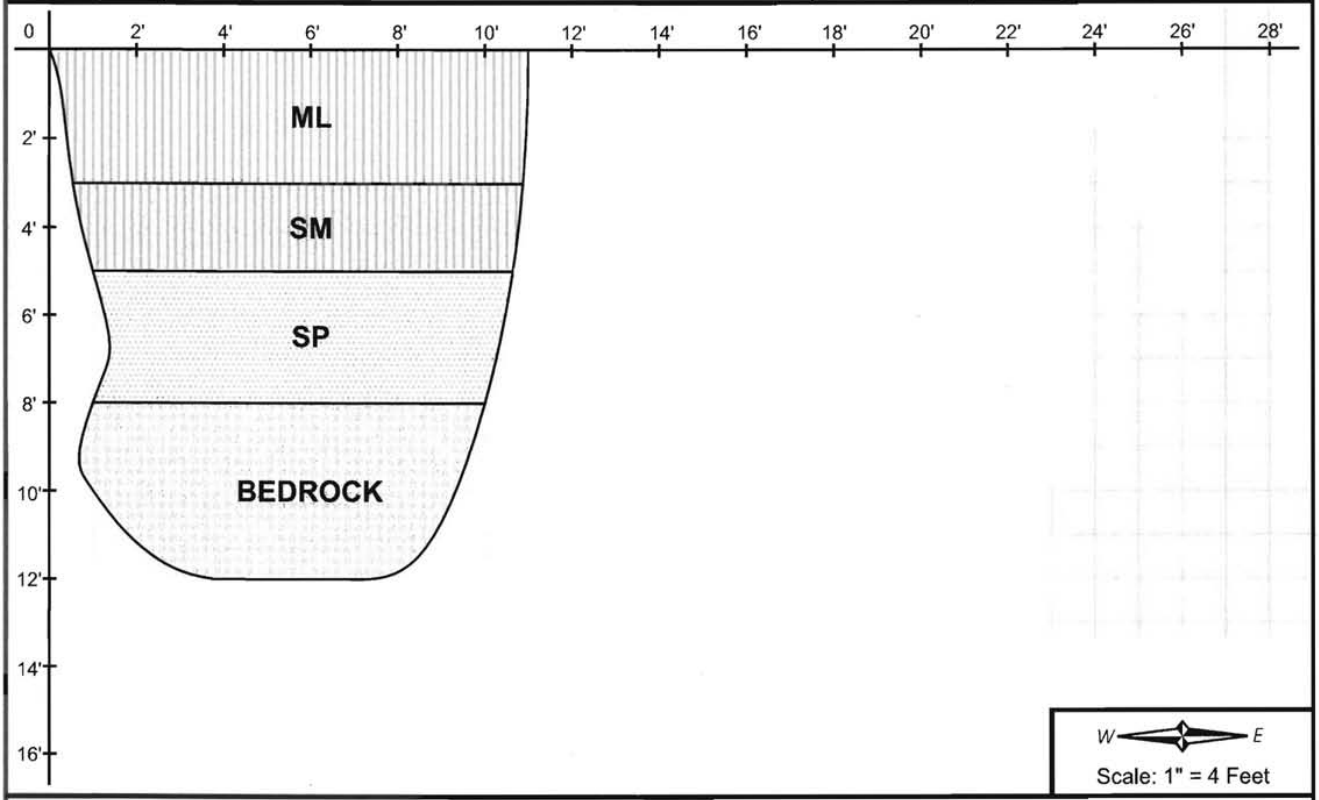
EXPLORATORY TEST PIT LOG

Sunshine Ranch
Mt. Aukum, California

FIGURE A-4

Logged By: **MRG**	Date: **17 December 2019**	Lat / Lon: **N 38.56117° / W 120.76722°**		Pit No. **TP-3**
Equipment: **John Deere 410L with 18" Bucket**		Pit Orientation: **W - E**	Elevation: ~	

Depth (Feet)	Geotechnical Description & Unified Soil Classification	Sample	Tests & Comments
@ 0' - 1.5'	Brown sandy **SILT (ML)** with trace clay, soft, moist		*PP @ 1' = 0.5 tsf* *PP @ 3' = 3.5 tsf* *PP @ 5' = 4.5+ tsf*
@ 1.5' - 4'	Red brown silty **SAND (SM)**, medium dense, moist		
@ 4' - 8'	Yellow brown **SAND (SP)** with silt, dense, slightly moist		
@ 7' - 8'	*Grades without silt*		
@ 8' - 10'	Yellow brown **BEDROCK (DG)**, completely weathered, slightly moist		
@ 10' - 12'	*Grades highly weathered*		
	Test pit terminated at 12' No free groundwater encountered No caving noted		



Note: The test pit log indicates subsurface conditions only at the specific location and time noted. Subsurface conditions, including groundwater levels, at other locations of the subject site may differ significantly from conditions which, in the opinion of Youngdahl Consulting Group, Inc., exist at the sampling locations, Note, too, that the passage of time may affect conditions at the sampling locations.

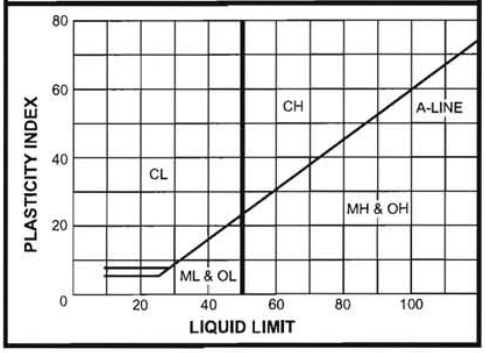
YOUNGDAHL CONSULTING GROUP, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING	Project No.: E19418.000 **January 2020**	**EXPLORATORY TEST PIT LOG** **Sunshine Ranch** Mt. Aukum, California	**FIGURE A-5**

UNIFIED SOIL CLASSIFICATION SYSTEMS

MAJOR DIVISION			SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS Over 50% > #200 sieve	GRAVELS Over 50% > #4 sieve	Clean GRAVELS With Little Or No Fines	GW	Well graded **GRAVELS, GRAVEL-SAND** mixtures
			GP	Poorly graded **GRAVELS, GRAVEL-SAND** mixtures
		GRAVELS With Over 12% Fines	GM	Silty **GRAVELS**, poorly graded **GRAVEL-SAND-SILT** mixtures
			GC	Clayey **GRAVELS**, poorly graded **GRAVEL-SAND-CLAY** mixtures
	SANDS Over 50% < #4 sieve	Clean SANDS With Little Or No Fines	SW	Well graded **SANDS**, gravelly **SANDS**
			SP	Poorly graded **SANDS**, gravelly **SANDS**
		SANDS With Over 12% Fines	SM	Silty **SANDS**, poorly graded **SAND-SILT** mixtures
			SC	Clayey **SANDS**, poorly graded **SAND-CLAY** mixtures
FINE GRAINED SOILS Over 50% < #200 sieve	SILTS & CLAYS Liquid Limit < 50		ML	Inorganic **SILTS**, silty or clayey fine **SANDS**, or clayey **SILTS** with plasticity
			CL	Inorganic **CLAYS** of low to medium plasticity, gravelly, sandy, or silty **CLAYS**, lean **CLAYS**
			OL	Organic **CLAYS** and organic silty **CLAYS** of low plasticity
	SILTS & CLAYS Liquid Limit > 50		MH	Inorganic **SILTS**, micaceous or diamacious fine sandy or silty soils, elastic **SILTS**
			CH	Inorganic **CLAYS** of high plasticity, fat **CLAYS**
			OH	Organic **CLAYS** of medium to high plasticity, organic **SILTS**
HIGHLY ORGANIC CLAYS			PT	PEAT & other highly organic soils

PLASTICITY CHART

USED FOR CLASSIFICATION OF FINE GRAINED SOILS



SAMPLE DRIVING RECORD

BLOWS PER FOOT	DESCRIPTION
25	25 Blows drove sampler 12 inches, after initial 6 inches of seating
50/7"	50 Blows drove sampler 7 inches, after initial 6 inches of seating
50/3"	50 Blows drove sampler 3 inches during or after initial 6 inches of seating

Note: To avoid damage to sampling tools, driving is limited to 50 blows per 6 inches during or after seating interval.

SOIL GRAIN SIZE

U.S. STANDARD SIEVE	6"	3"	¾"	4	10	40	200		
	BOULDER	COBBLE	GRAVEL		SAND			SILT	CLAY
			COARSE	FINE	COARSE	MEDIUM	FINE		
SOIL GRAIN SIZE IN MILLIMETERS	150	75	19	4.75	2.0	.425	0.075	0.002	

KEY TO PIT & BORING SYMBOLS

- Standard Penetration test
- 2.5" O.D. Standard California Sampler
- 3" O.D. Modified California Sampler
- Shelby Tube Sampler
- 2.5" Hand Driven Liner
- Bulk Sample
- Water Level At Time Of Drilling
- Water Level After Time Of Drilling
- P — Perched Water

KEY TO PIT & BORING SYMBOLS

	Joint
	Foliation
	Water Seepage
NFWE	No Free Water Encountered
FWE	Free Water Encountered
REF	Sampling Refusal
DD	Dry Density (pcf)
MC	Moisture Content (%)
LL	Liquid Limit
PI	Plasticity Index
PP	Pocket Penetrometer
UCC	Unconfined Compression (ASTM D2166)
TVS	Pocket Torvane Shear
EI	Expansion Index (ASTM D4829)
Su	Undrained Shear Strength

YOUNGDAHL CONSULTING GROUP, INC.
GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Project No.: E19418.000

January 2020

SOIL CLASSIFICATION CHART AND LOG EXPLANATION
Sunshine Ranch
Mt. Aukum, California

FIGURE A-6

APPENDIX B

Laboratory Testing

Direct Shear Test
Modified Proctor Test
Expansion Index Test

Introduction

Our laboratory testing program for this evaluation included numerous visual classifications, direct shear, modified proctor and expansion index tests. The following paragraphs describe our procedures associated with each type of test. Graphical results of certain laboratory tests are enclosed in this appendix. The contents of this appendix shall be integrated with the geotechnical engineering study of which it is a part. They shall not be used in whole or in part as a sole source for information or recommendations regarding the subject site.

Laboratory Testing Procedures

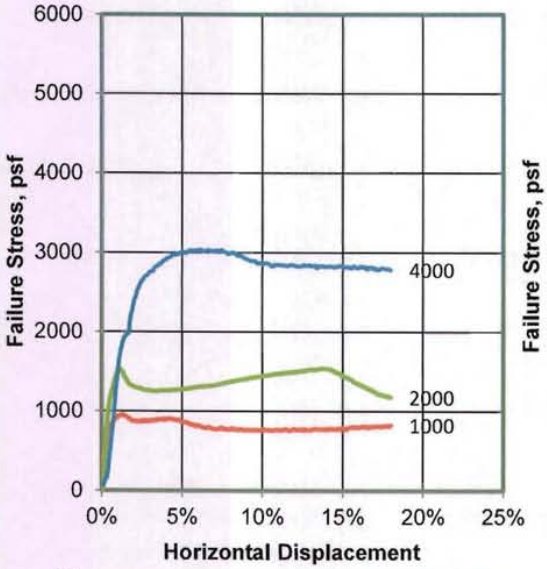
Visual Classification: Visual soil classifications were conducted on all samples in the field and on selected samples in our laboratory. All soils were classified in general accordance with the Unified Soil Classification System, which includes color, relative moisture content, primary soil type (based on grain size), and any accessory soil types. The resulting soil classifications are presented on the exploration logs in Appendix A.

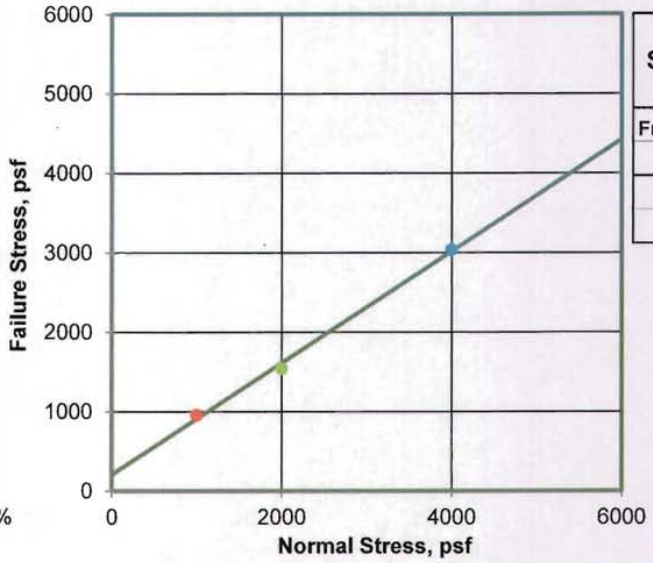
Soil Strength Determination: The strength parameters of the foundation soils were based on direct shear tests (ASTM D3080) performed on a representative remolded sample of the near-surface soils. The results of these tests are presented on Figure B-1, this Appendix.

Maximum Dry Density Determination: A modified proctor test (ASTM D1557) was conducted to provide the optimum moisture and maximum dry density on the near surface material. The results of this test are presented on Figure B-2, this Appendix.

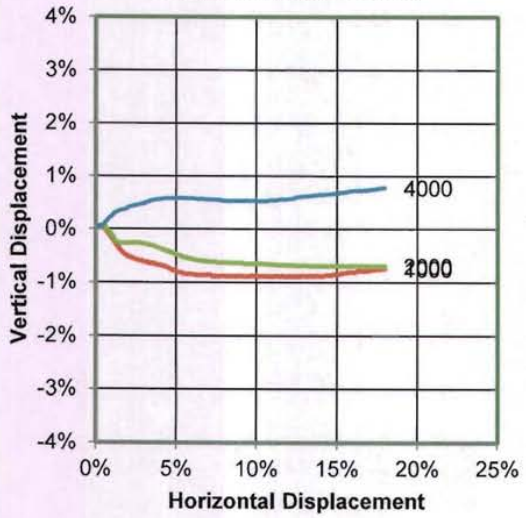
Expansion Index Determination: An expansion index test (ASTM D4829) was conducted to determine the potential for the near surface soils to undergo volume changes with changes in moisture. The results of these tests are presented on Figure B-3, this Appendix.

Direct Shear Test of Soils Under Consolidated Drained Conditions, ASTM D3080





Direct Shearbox Results
Friction Angle
35.1°
Cohesion
206 psf



Test No.		1	2	3
Initial	Wet Density, pcf	126.5	126.5	126.5
	Dry Density, pcf	114.6	114.6	114.6
	Moisture Content, %	10.4	10.4	10.4
	Diameter, in	2.50	2.50	2.50
	Height, in	1.00	1.00	1.00
Pre Shear	Wet Density, pcf	137.7	140.6	134.9
	Dry Density, pcf	116.0	116.4	114.6
	Moisture Content, %*	18.7	20.8	17.7
	Diameter, in	2.50	2.50	2.50
	Height, in	0.99	0.98	1.00
Normal Stress, psf		1000	2000	4000
Failure Stress, psf		955	1540	3039
Failure Strain, %		1.30	13.75	6.06
Rate, in/min			0.002	

*Based on post shear moisture content

Sample Type: Remolded to 90% RC

Material Description: **Red Brown Silty SAND**

Source:

Notes:

Sample No./Depth:	TP-1 @ 2-3'	USCS Class.	Liquid Limit	Plasticity Index	% Greater than No. 4	% Less than No. 200
Date Sampled:	12/17/2019				0	
Date Test Started:	12/23/2019					

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Project: **Sunshine Ranch GES**

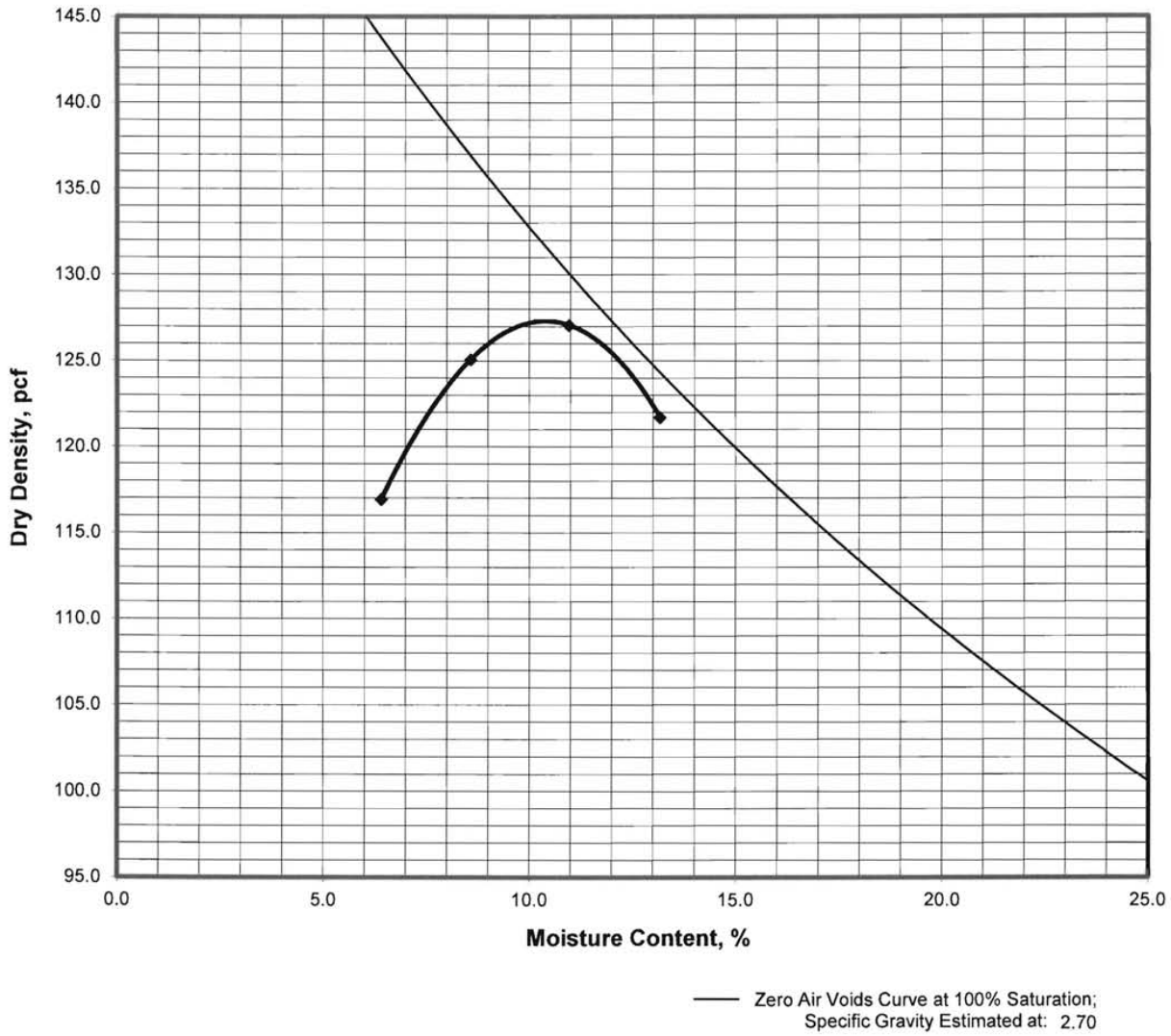
Project No.: **E19418.000**

Figure: B-1

Reviewed By: DN

Date: 12/31/2019

Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 lf-lbf/ft3), ASTM D1557, Method A



Maximum Dry Density, pcf:	**127.3**	Optimum Moisture Content, %:	**10.4**
Material Description:	**Red Brown Silty SAND**		
Source:			
Notes:			

Sample No./Depth:	TP-1 @ 2-3'	USCS Class.	Liquid Limit	Plasticity Index	% Greater than No. 4 :	% Less than No. 200
Date Sampled:	12/17/2019					
Date Test Started:	12/19/2019				0	

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Project:	**Sunshine Ranch GES**		
Project No.:	**E19418.000**		Figure
Reviewed By:	DN	Date: 12/20/2019	B-2

Expansion Index of Soils, ASTM D4829

Test Results

Expansion Index	26
Dry Density, as molded, pcf	103.5
Moisture Content, as molded, %	11.4
Final Moisture Content, %	23.8
Initial Saturation, as molded, %	49.0

Classification of Potentially Expansive Soil

Expansion Index, EI	Potential Expansion
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
Above 130	Very High

Material Description: **Brown Sandy SILT with trace Clay**

Source:

Notes:

Sample No./Depth:	TP-1 @ 2'			USCS Class.	Liquid Limit	Plasticity Index	% Greater than No. 4	% Less than No. 200
Date Sampled:	12/17/2019	Date Test Started:	12/19/2019				0	

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Project: **Sunshine Ranch GES**

Project No.: **E19418.000**

Figure B-3

Reviewed By: DN Date: 1/2/2020

APPENDIX C

Details

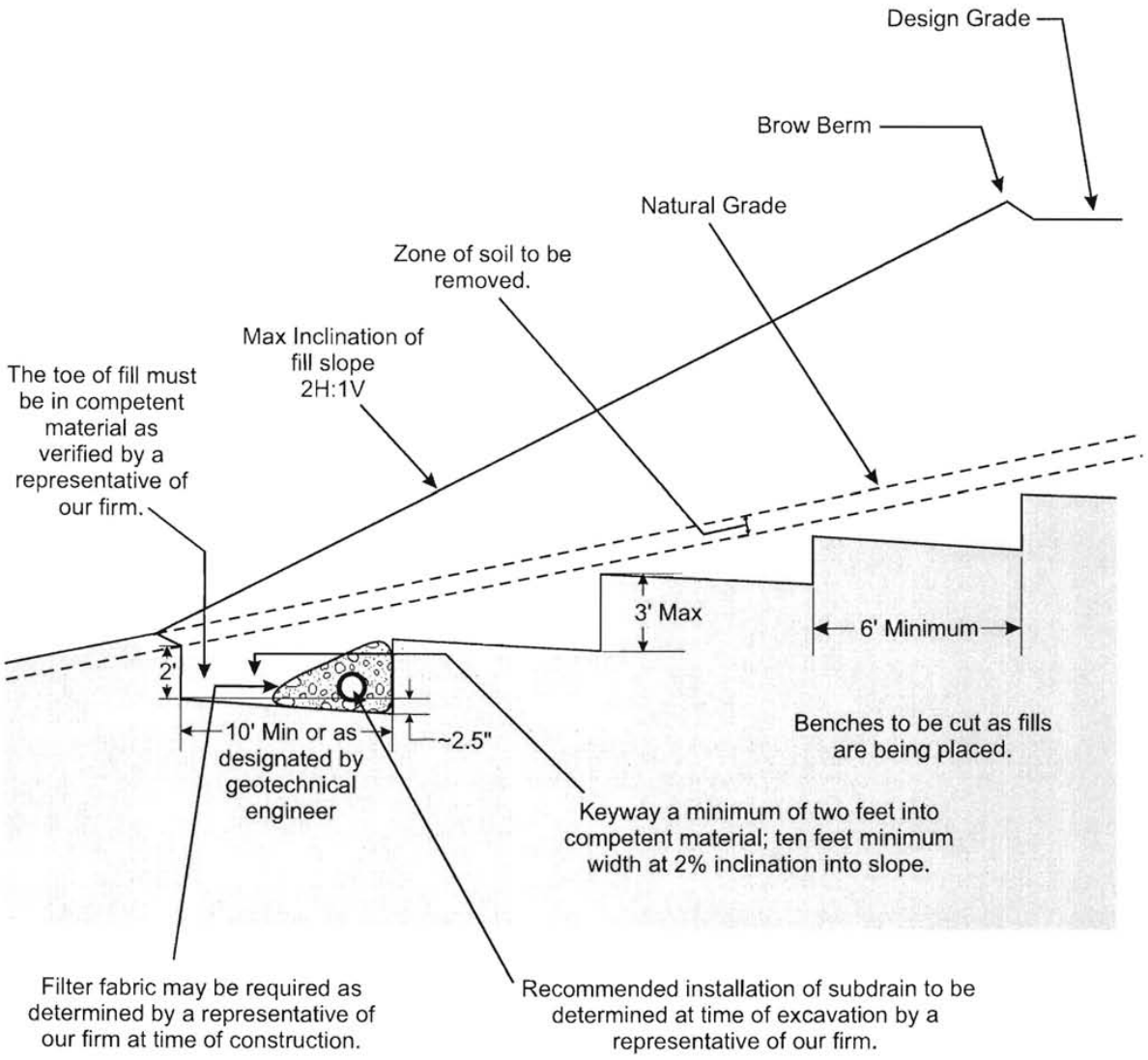
Keyway and Bench with Drain
Site Wall Drainage
Basement Wall Drainage
Subdrain

PLACEMENT OF FILL ON NATURAL SLOPE

(Typical)

All keyways should be observed and approved prior to placement of fill.

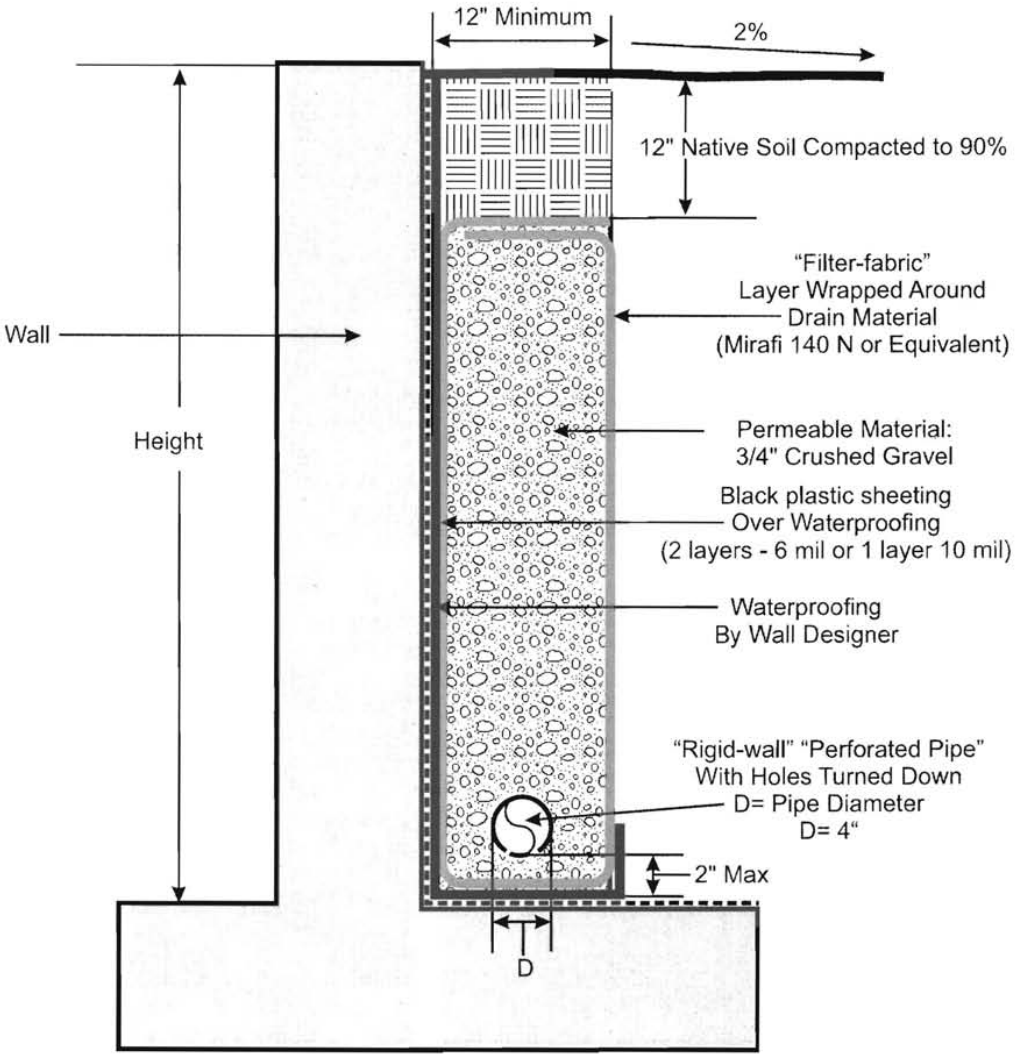
A keyway is required by CBC for fills on natural slopes of 5H:1V or steeper.



YOUNGDAHL CONSULTING GROUP, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING	Project No.: E19418.000 January 2020	**KEYWAY & BENCH WITH DRAIN** **Sunshine Ranch GES** Mt. Aukum, California	**FIGURE** **C-1**

Retaining Wall With "Perforated Pipe Sub-Drain"

(Typical Cross Section)

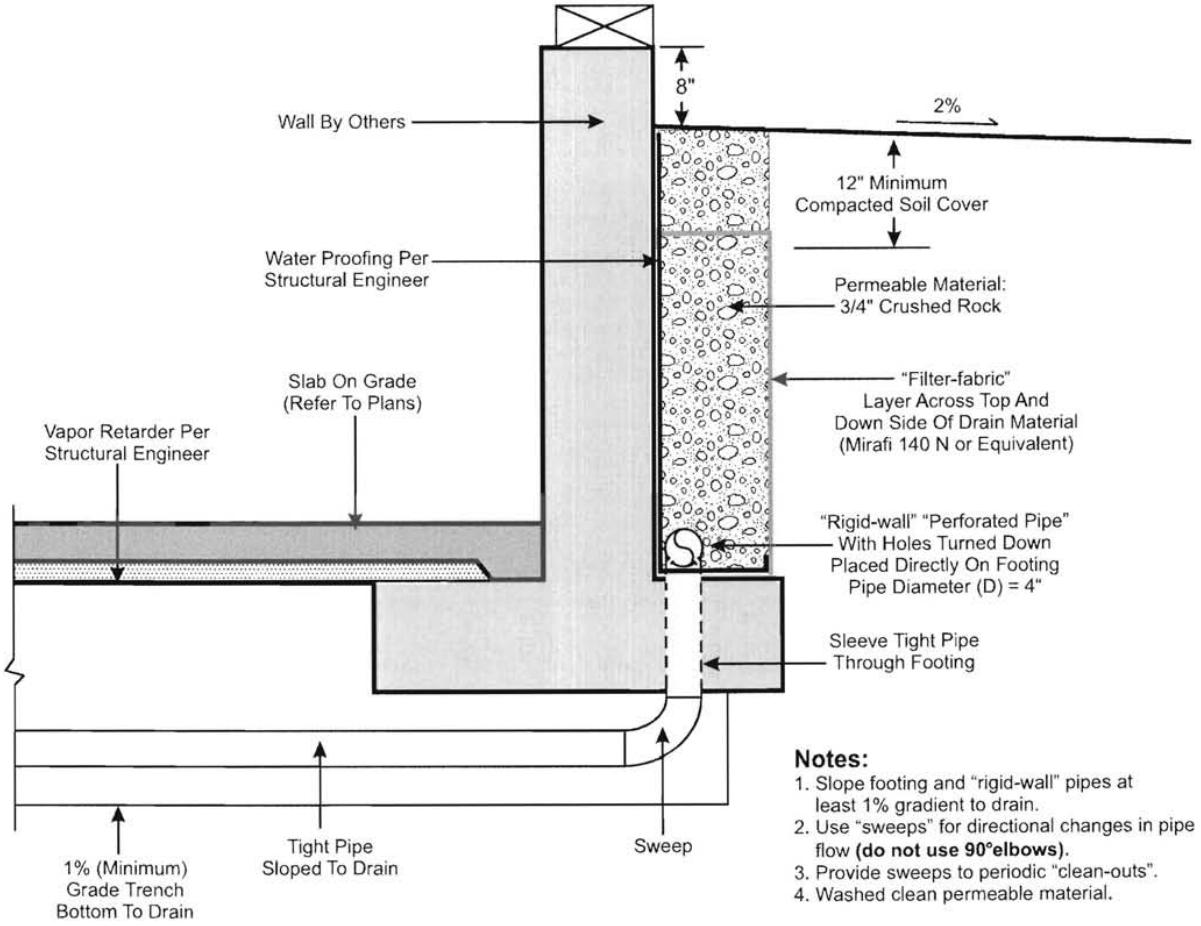


Notes:
1. Slope footing and "rigid-wall" pipes along flow line parallel to wall at least 1% gradient to drain to an appropriate outfall area away from residence.
2. Use "sweeps" for directional changes in pipe flow **(do not use 90°elbows)**.
3. Provide periodic "clean-outs".
4. Washed clean permeable material.

Not To Scale

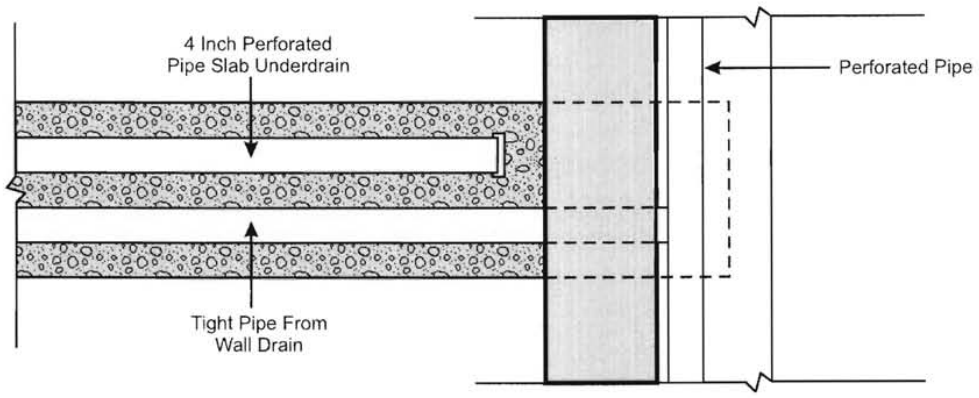
YOUNGDAHL CONSULTING GROUP, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING	Project No.: E19418.000 January 2020	**RETAINING WALL DRAIN DETAIL** **Sunshine Ranch GES** Mt. Aukum, California	FIGURE **C-2**

Profile View
(Typical)

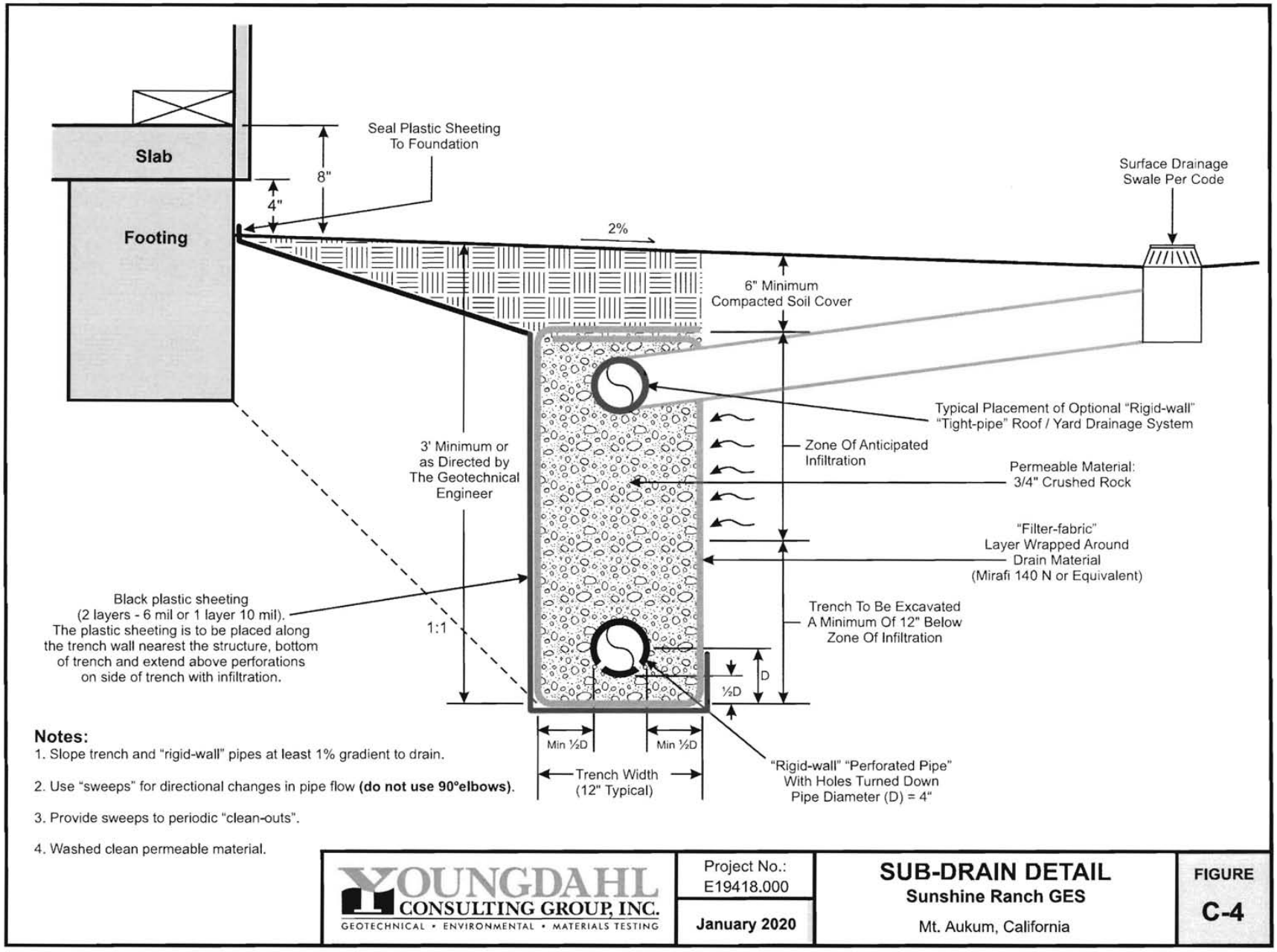


Notes:
1. Slope footing and "rigid-wall" pipes at least 1% gradient to drain.
2. Use "sweeps" for directional changes in pipe flow **(do not use 90°elbows)**.
3. Provide sweeps to periodic "clean-outs".
4. Washed clean permeable material.

Plan View
(Typical)



YOUNGDAHL CONSULTING GROUP, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING	Project No.: E19418.000 January 2020	**BASEMENT STEMWALL DRAIN** **Sunshine Ranch GES** Mt. Aukum, California	FIGURE **C-3**



Notes:

1. Slope trench and "rigid-wall" pipes at least 1% gradient to drain.
2. Use "sweeps" for directional changes in pipe flow **(do not use 90°elbows)**.
3. Provide sweeps to periodic "clean-outs".
4. Washed clean permeable material.

YOUNGDAHL CONSULTING GROUP, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING	Project No.: E19418.000 January 2020	**SUB-DRAIN DETAIL** **Sunshine Ranch GES** Mt. Aukum, California	**FIGURE** **C-4**

Bianca Dinkler <bianca.dinkler@edcgov.us>

Project for Review & Comment - P20-0001 - SUNSHINE RANCH

Dave Spiegelberg <dave.spiegelberg@edcgov.us> Fri, Jun 19, 2020 at 3:53 PM
To: Bianca Dinkler <bianca.dinkler@edcgov.us>

Bianca -

DOT takes no exceptions to this parcel split, and offers no further comments or conditions.

Dave W. Spiegelberg, P.E.
Senior Civil Engineer

County of El Dorado
Community Development
Department of Transportation, Development Section
2850 Fairlane Court
Placerville, CA 95667
530-621-6077 / 530-957-3521 (cell) / 530-295-2655 (fax)
dave.spiegelberg@edcgov.us

---------- Forwarded message ---------
From: **Planning Department** <planning@edcgov.us>
Date: Tue, Apr 7, 2020 at 8:31 AM
Subject: Project for Review & Comment - P20-0001 - SUNSHINE RANCH
To:
[Quoted text hidden]

Initial Consultation Letter_P20-0001.pdf
223K

P20-0001 SUNSHINE RANCH PARCEL MAP
ATTACHMENT 5 - COMMENTS, DEPARTMENT OF TRANSPORTATION

COMMUNITY DEVELOPMENT AGENCY

ENVIRONMENTAL MANAGEMENT DIVISION

http://www.edcgov.us/EMD/

PLACERVILLE OFFICE:
2850 Fairlane Court
Placerville, CA 95667
(530) 621-5300
(530) 626-7130 Fax

LAKE TAHOE OFFICE:
924 B Emerald Bay Road
South Lake Tahoe, CA 96150
(530) 573-3450
(530) 542-3364 Fax

INTEROFFICE MEMORANDUM

TO: **BIANCA DINKLER**, Development Technician
EDC Development Services Division

FROM: Environmental Management

SUBJECT: P 20-0001 SUNSHINE RANCH PARCEL SPLIT

DATE: 5/7/2020

CC:

Environmental Management Division staff has reviewed the subject application. The following reflects our concerns and requirements:

Environmental Health (Bryan Vyverberg x5924):

Soil depth and soil percolation data on file for an existing septic system demonstrates that the parcels will meet El Dorado County Local Agency Management Plan requirements for land divisions. Each proposed parcel is required to have its own percolation testing completed as part of a septic system design. Parcels that have not had soil percolation testing completed for proposed sewage dispersal areas will be required to complete and submit soil percolation rates for the parcel itself as part of any onsite wastewater treatment system design.

Well information on file indicates that an adequate water supply is available for the proposed parcels.

Hazardous Materials (Mark Moss x6665):

No comments or concerns

Solid Waste Division (Timothy Engle x6587)

No comments or concerns

Tribal Cultural Resource Avoidance Mitigation Measure

Avoidance and preservation in place is the preferred manner of mitigating impacts to tribal cultural resources and will be accomplished by several means, including:

- Planning construction to avoid tribal cultural resources, archaeological sites and/ or other resources; incorporating sites within parks, green-space or other open space; covering archaeological sites; deeding a site to a permanent conservation easement; or other preservation and protection methods agreeable to consulting parties and regulatory authorities with jurisdiction over the activity. Recommendations for avoidance of cultural resources will be reviewed by the CEQA lead agency representative, interested Native American Tribes and the appropriate agencies, in light of factors such as costs, logistics, feasibility, design, technology and social, cultural and environmental considerations, and the extent to which avoidance is consistent with project objectives. Avoidance and design alternatives may include realignment within the project area to avoid cultural resources, modification of the design to eliminate or reduce impacts to cultural resources or modification or realignment to avoid highly significant features within a cultural resource. Native American Representatives from interested Native American Tribes will be allowed to review and comment on these analyses and shall have the opportunity to meet with the CEQA lead agency representative and its representatives who have technical expertise to identify and recommend feasible avoidance and design alternatives, so that appropriate and feasible avoidance and design alternatives can be identified.

- If the resource can be avoided, the construction contractor(s), with paid Native American monitors from culturally affiliated Native American Tribes present, will install protective fencing outside the site boundary, including a buffer area, before construction restarts. The construction contractor(s) will maintain the protective fencing throughout construction to avoid the site during all remaining phases of construction. The area will be demarcated as an “Environmentally Sensitive Area”. Native American representatives from interested Native American Tribes and the CEQA lead agency representative will also consult to develop measures for long term management of the resource and routine operation and maintenance within culturally sensitive areas that retain resource integrity, including tribal cultural integrity, and including archaeological material, Traditional Cultural Properties and cultural landscapes, in accordance with state and federal guidance including National Register Bulletin 30 (*Guidelines for Evaluating* and *Documenting Rural Historic Landscapes*), Bulletin 36 (*Guidelines for Evaluating and Registering Archaeological Properties*), and Bulletin 38 (*Guidelines for Evaluating and Documenting Traditional Cultural Properties*); National Park Service Preservation Brief 36 (*Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes*) and using the Advisory Council on Historic Preservation (ACHP) *Native American Traditional Cultural Landscapes Action Plan* for further guidance. Use of temporary and

Tribal Cultural Resource Avoidance Mitigation Measure

permanent forms of protective fencing will be determined in consultation with Native American rrepresentatives from interested Native American Tribes.

Native American Monitoring Mitigation Measure

To minimize the potential for destruction of or damage to existing or previously undiscovered burials, archaeological and tribal cultural resources and to identify any such resources at the earliest possible time during project-related earthmoving activities, THE PROJECT PROPONENT and its construction contractor(s) will implement the following measures:

- Paid Native American monitors from culturally affiliated Native American Tribes will be invited to monitor the vegetation grubbing, stripping, grading or other ground-disturbing activities in the project area to determine the presence or absence of any cultural resources. Native American representatives from cultural affiliated Native American Tribes act as a representative of their Tribal government and shall be consulted before any cultural studies or ground-disturbing activities begin.

- Native American representatives and Native American monitors have the authority to identify sites or objects of significance to Native Americans and to request that work be stopped, diverted or slowed if such sites or objects are identified within the direct impact area. Only a Native American representative can recommend appropriate treatment of such sites or objects.

- If buried cultural resources, such as chipped or ground stone, historic debris, building foundations, or bone, are discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a archaeologist who meets the Secretary of the Interior's qualification standards can assess the significance of the find and, if necessary, develop appropriate treatment measures in consultation with the Caltrans, the SHPO, and other appropriate agencies. Appropriate treatment measures may include development of avoidance or protection methods, archaeological excavations to recover important information about the resource, research, or other actions determined during consultation.

- In accordance with the California Health and Safety Code, if human remains are uncovered during ground disturbing activities, the construction contractor or the County, or both, shall immediately halt potentially damaging excavation in the area of the burial and notify the County coroner and a qualified professional archaeologist to determine the nature of the remains. The coroner shall examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands, in accordance with Section 7050(b) of the Health and Safety Code. If the coroner determines that the remains are those of a Native American, he or she shall contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). After the coroner's findings are presented, the County, the archaeologist, and the NAHC-designated Most Likely Descendant (MLD) shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed.

Inadvertent Discoveries Mitigation Measures

Develop a standard operating procedure, points of contact, timeline and schedule for the project so all possible damages can be avoided or alternatives and cumulative impacts properly accessed.

If potential tribal cultural resources, archaeological resources, other cultural resources, articulated, or disarticulated human remains are discovered by Native American Representatives or Monitors from interested Native American Tribes, qualified cultural resources specialists or other Project personnel during construction activities, work will cease in the immediate vicinity of the find (based on the apparent distribution of cultural resources), whether or not a Native American Monitor from an interested Native American Tribe is present. A qualified cultural resources specialist and Native American Representatives and Monitors from culturally affiliated Native American Tribes will assess the significance of the find and make recommendations for further evaluation and treatment as necessary. These recommendations will be documented in the project record. For any recommendations made by interested Native American Tribes which are not implemented, a justification for why the recommendation was not followed will be provided in the project record.

If adverse impacts to tribal cultural resources, unique archeology, or other cultural resources occurs, then consultation with Wilton Rancheria regarding mitigation contained in the Public Resources Code sections 21084.3(a) and (b) and CEQA Guidelines section 15370 should occur, in order to coordinate for compensation for the impact by replacing or providing substitute resources or environments.

Tribal Cultural Resource – Awareness Training - Mitigation Measure

A consultant and construction worker tribal cultural resources awareness brochure and training program for all personnel involved in project implementation will be developed in coordination with interested Native American Tribes. The brochure will be distributed and the training will be conducted in coordination with qualified cultural resources specialists and Native American Representatives and Monitors from culturally affiliated Native American Tribes before any stages of project implementation and construction activities begin on the project site. The program will include relevant information regarding sensitive tribal cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating State laws and regulations. The worker cultural resources awareness program will also describe appropriate avoidance and minimization measures for resources that have the potential to be located on the project site and will outline what to do and whom to contact if any potential archaeological resources or artifacts are encountered. The program will also underscore the requirement for confidentiality and culturally-appropriate treatment of any find of significance to Native Americans and behaviors, consistent with Native American Tribal values.