

**DRAFT DELINEATION OF JURISDICTIONAL WATERS  
OF THE UNITED STATES**

**Bella Vista Subdivision Project**

Mendocino County, California

June 2021



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## DRAFT DELINEATION OF JURISDICTIONAL WATERS OF THE UNITED STATES,

### Bella Vista Subdivision Project Location:

Mendocino, California

Rancho Yokaya Land Grant

### Introduction and Project Location

Gallaway Enterprises conducted a delineation of waters of the United States (WOTUS) and aquatic resources for the Bella Vista Subdivision project (Project) site consisting of approximately 36.8-acres of land located immediately south of the city limits of Ukiah in Mendocino County, California. The Project site is located on the west side of South State Street and Hwy 101 and south of Gobalet Lane (**Figure 1 and 2**). The Project site is located within the United States Geological Survey (USGS) Rancho Yokaya Land Grant quadrangle, within Section 32, Township 15N, Range 12W.

To access the site from Hwy 101 N, take exit 546 for State Street. Yield right onto South State Street heading north towards Ukiah. Continue on South State Street for approximately 1,000 feet and the Project site will be on the left side of the road.

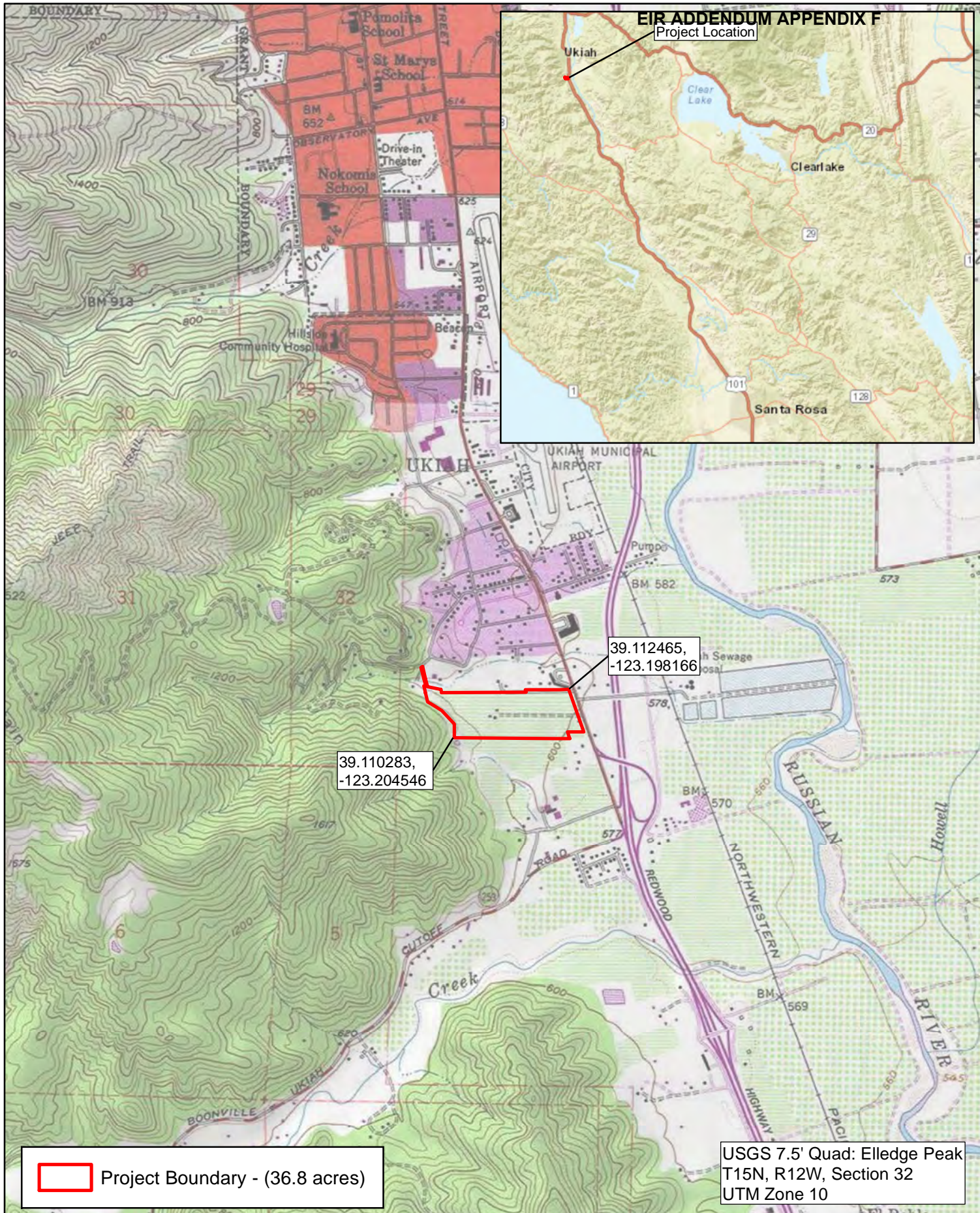
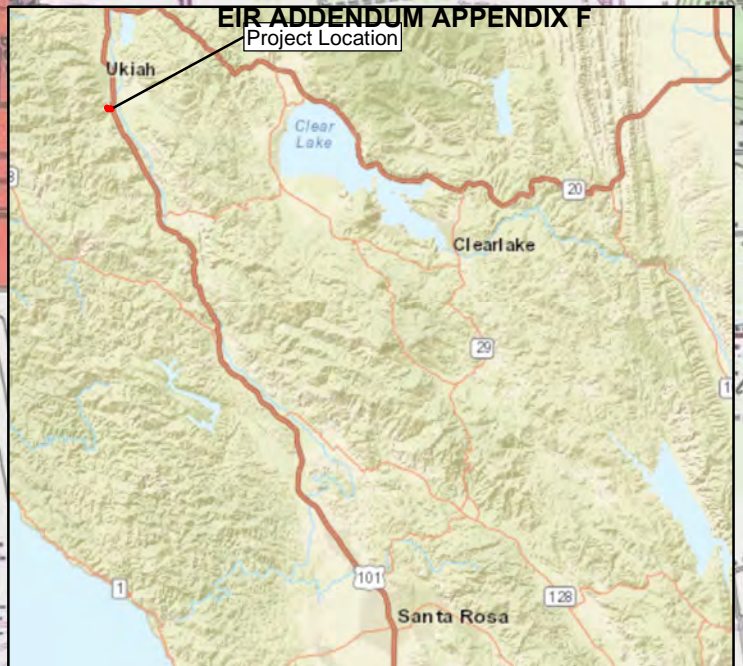
A survey of WOTUS was conducted on May 3, 2021, by senior botanist Elena Gregg. Data regarding the location and extent of wetlands and other waters of the United States were collected using a Trimble Geo Explorer 6000 Series GPS Receiver. The survey involved an examination of botanical resources, soils, hydrological features, and determination of wetland characteristics based on the *United States Army Corps of Engineers Wetlands Delineation Manual* (1987) (1987 Delineation Manual); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (2008) (Arid West Manual); the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (2008); the *State of California 2016 Wetland Plant List and 2019 National Wetland Plant List updated information*; and the *Clean Water Act Final Rule, Federal Register Volume 85, No-77* (Final Rule), April 21, 2020. Gallaway Enterprises have prepared this report in compliance with the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (January 2016).

### Environmental Setting and Site Conditions

The Project site is composed largely of a mix of annual grassland and vineyards with small areas of urban habitat and mixed montane hardwood conifer vegetation. A number of barren dirt/gravel access roads occur throughout the site. One small intermittent drainage, Cleland Mountain Creek, flows roughly west to east through the northernmost part of the Project site. Gobalet Lane, residential homes and a small vineyard occur adjacent to the Project site to the north, a large established vineyard to the south, South State Street and an industrial area to the east, and open montane hardwood conifer woodland associated with Cleland Mountain to the west.


The average annual precipitation is 37.26 inches and the average annual temperature is 58.6° F (WRCC 2021) in the region where the Project is located. The elevation of the Project site ranges from 600 to 695 feet above sea level. The Project site is relatively flat in the eastern portion of the site and becomes steeper with rolling terrain in the western portion of the site. Slopes on site range from 2 to 50 percent. Soils within the site were well draining loams and gravelly loams with a deep restrictive layer typically found more than 80 inches in depth.

Project Location

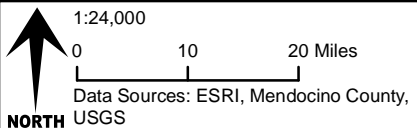


39.112465, -123.198166

39.110283, -123.204546

 Project Boundary - (36.8 acres)

USGS 7.5' Quad: Elledge Peak  
T15N, R12W, Section 32  
UTM Zone 10



Bella Vista Subdivision  
Regional Location Map

Figure 1

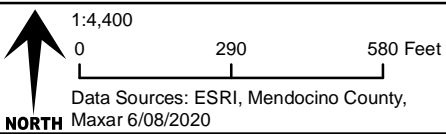


39.112465,  
-123.198166

39.110283,  
-123.204546

S State St

 Project Boundary - (36.8 acres)



Bella Vista Subdivision  
Project Location Map

Figure 2

## Survey Methodology

The entire Project site was traversed on foot by Gallaway Enterprises staff on May 3, 2021 to identify any potentially jurisdictional features. The survey, mapping efforts, and report production were performed according to the current valid legal definitions of WOTUS that went into effect starting June 22, 2020. The boundaries of non-tidal, non-wetland waters, when present, were delineated at the ordinary high water mark (OHWM) as defined in 33 Code of Federal Regulations (CFR) 328.3. The OHWM represents the limit of United States Army Corps of Engineers (Corps) jurisdiction over non-tidal waters (e.g., streams and ponds) in the absence of adjacent wetlands (33 CFR 328.04) (Curtis, et. al. 2011). Historic aerial photographs available on Google Earth were analyzed prior to conducting the field visit. Areas identified as having potential wetland or unusual signatures on historical aerial photos were assessed in the field to determine the current conditions.

Field data was entered onto data sheets using the most current format (**Appendix A**). The 1987 Delineation Manual and the Arid West Manual were used to identify the presence of wetlands, when present, and record and define the wetland perimeters according to their topographic and hydrologic orientation. Test pit sampling was performed and/or photographs were taken in areas displaying potential wetland signatures on aerial photographs and problem areas. At each sampling point data collected involved physical sampling of soils and vegetation, and investigation regarding hydrological connectivity. Only areas exhibiting the necessary wetland parameters according to the 1987 Delineation Manual and Arid West Manual on the date surveyed were mapped as wetlands. Photographs were taken to show test pit locations, features and/or areas identified as having unusual aerial signatures. The locations of the photo points are depicted in **Figure 3** and the associated photographs are provided at the end of the report.

Many of the terms used throughout this report have specific meanings relating to the federal wetland delineation process. Term definitions are based on the Corps 1987 Delineation Manual; the Arid West Manual; *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*, (Lichvar and McColley 2008) and the Final Rule. The terms defined below have specific meaning relating to the delineation of WOTUS as prescribed by §404 of the Clean Water Act (CWA) and described in 33 CFR Part 328 and 40 CFR Parts 110, 112, and 116, and 122.

### Determination of Hydrophytic Vegetation

The presence of hydrophytic vegetation was determined using the methods outlined in the 1987 Delineation Manual and the Arid West Manual. Areas were considered to have positive indicators of hydrophytic vegetation if they pass the dominance test, meaning more than 50 percent of the dominant species are obligate wetland, facultative wetland and facultative plants. Plant species were identified to the lowest taxonomy possible. Plant indicator status was determined by reviewing the State of California 2016 Wetland Plant List for the Arid West Region and the National Wetland Plant List 2019 updated information. In situations where dominance can be misleading due to seasonality, the prevalence index will be used to determine hydrophytic status of the community surrounding sample sites.

#### ***Plant indicator status categories:***

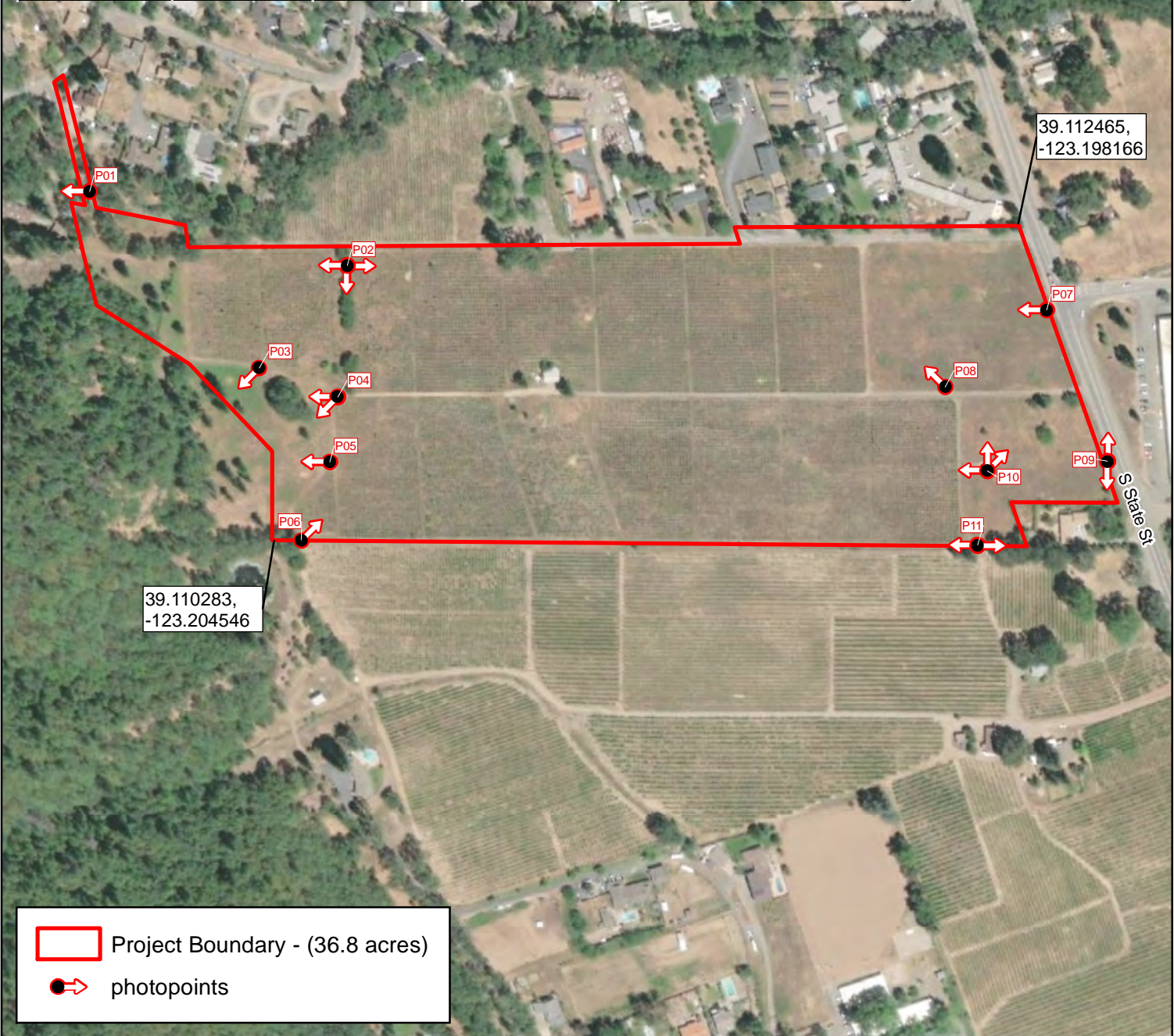
*Obligate wetland plants (OBL)* – plants that occur almost always (estimated probability 99%) in wetlands under normal conditions, but which may also occur rarely (estimated probability 1%) in non-wetlands.

*Facultative wetland plants (FACW)* - plants that usually occur (estimated probability 67% to 99%) in wetlands under normal conditions, but also occur (estimated probability 1% to 33%) in non-wetlands.

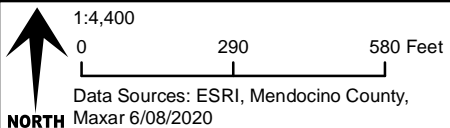
*Facultative plants (FAC)* – Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands.

**Ground Photographs Table**

label	Direction	Latitude	Longitude	Comment
P01	W	39.11259927	-123.2061748	intermittent drainage
P02	E + S + W	39.11212711	-123.2039491	upland overview
P03	SW	39.11143009	-123.2046945	upland hillside
P04	W + SW	39.1112425	-123.2040152	toe of slope
P05	W	39.11080542	-123.2040761	eroded/slide
P06	NE	39.11028211	-123.204313	overview
P07	W	39.11188901	-123.1979218	upland with signature
P08	NW	39.11136321	-123.1987893	TP01
P09	N + S	39.11088329	-123.1973779	upland ditch
P10	NE + W + N	39.11080615	-123.1984151	upland / upland depression
P11	W + E	39.11030819	-123.1984876	upland ditch



Project Boundary - (36.8 acres)  
➔ photopoints



Bella Vista Subdivision  
 Ground Photographs Map  
 Figure 3

*Facultative upland plants* (FACU) – Plants that occur sometimes (estimated probability 1% to 33%) in wetlands, but occur more often (estimated probability 67% to 99%) in non-wetlands.

*Obligate upland plants* (UPL) – Plants that occur rarely (estimated probability 1%) in wetlands, but occur almost always (estimated probability 99%) in non-wetlands under natural conditions.

### Determination of Hydric Soils

Soil survey information was reviewed for the current site condition. Field samples were evaluated by using the Munsell soil color chart (2009 Edition), hand texturing, and assessing soil features (e.g. oxidized root channels, evidence of hardpan, Mn and Fe concretions). Information regarding local soil and series descriptions is provided in **Appendix B**. The current Natural Resources Conservation Service (NRCS) *Field Indicators of Hydric Soils in the United States, Version 8.2* (NRCS 2018) was used in conjunction with the Arid West Manual to determine the presence of hydric soil indicators.

### Determination of Wetland Hydrology

Wetland hydrology was determined to be present if a site supported one or more of the following characteristics:

- Landscape position and surface topography (e.g. position of the site relative to an up-slope water source, location within a distinct wetland drainage pattern, and concave surface topography),
- Inundation or saturation for a long duration either inferred based on field indicators or observed during repeated site visits, and
- Residual evidence of ponding or flooding resulting in field indicators such as scour marks, sediment deposits, algal matting, surface soil cracks and drift lines.

The presence of water or saturated soil for approximately 12% or 14 consecutive days during the growing season typically creates anaerobic conditions in the soil, and these conditions affect the types of plants that can grow and the types of soils that develop (Wetland Training Institute 1995).

Historic aerial photographs were analyzed to look for primary and secondary wetland hydrology indicators of inundation or saturation. The historic aerial imagery reviewed was the public, readily available imagery provided on Google Earth (1998-2018). If aerial signatures demonstrated the presence of surface water on 5 or more of the historic aerial photographs viewed, inundation and a primary indicator of wetland hydrology was determined to be present. Saturation, a secondary indicator of wetland hydrology, was determined to be present if saturation, “darker patches within the field,” were observed on 5 or more of the 9 historic aerial photographs viewed.

### Determination of Ordinary High Water Mark

Gallaway Enterprises utilized methods consistent with the Arid West Manual and *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*, (Lichvar and McColley 2008) to determine the OHWM. The lateral extents of non-tidal water bodies (e.g. intermittent and ephemeral streams) were based on the OHWM, which is “the line on the shore established by the fluctuations of water” (Corps 2005). The OHWM was determined based on multiple observed physical characteristics of the area, which can include scour, multiple observed flow events (from current and historical aerial photos), shelving, and changes in the character of soil, presence of mature vegetation, deposition, and topography. Due to the wide extent of some floodplains, adjacent riparian scrub areas characterized by hydric soils, hydrophytic vegetation, and

hydrology may be included within the OHWM of a non-tidal water body (Curtis, et. al. 2011). Inclusion of minor special aquatic areas is an acceptable practice as outlined in the Arid West Manual.

#### **OHWM Transects:**

Representative OHWM widths measured in the field in feet as required by the Corps *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program (2016)* and presented as an average for the entire drainage. These transect measurements are used to ensure that the other waters of the United States identified within the area surveyed are mapped and calculated at the appropriate average width for each channel segment based on the Corps definition of OHWM as defined in the Arid West OHWM Field Guide and the Ordinary High Water Mark Identification RGL 05-05 (2005) (RGL 05-05). At the transect line Gallaway Enterprises used multiple observed physical indicators in determining the OHWM. The lateral extents of the transect lines identify the location of the OHWM where benches, drift, exposed root hairs, changes in substrate/particle size, and, if appropriate, changes in vegetation were observed.

#### **Jurisdictional Boundary Determination and Acreage Calculation**

The wetland-upland boundary was determined based on the presence or inference of positive indicators of all mandatory criteria. Soil samples were taken, as needed, within wetland and upland areas. The site was traversed on foot to identify wetland features and boundaries. The spatial data obtained during the preparation of this wetland delineation was collected using a Trimble Geo Explorer 6000 Series GPS Receiver. No readings were taken with fewer than 5 satellites. Point data locations were recorded for at least 25 seconds at a rate of 1 position per second. Area and line data were recorded at a rate of 1 position per second while walking at a slow pace. All GPS data were differentially corrected for maximum accuracy. In some cases, when visual errors and degrees of precision are identified due to environmental factors negatively influencing the precision of the GPS instrument (i.e. dense tree cover, steep topography, and other factors affecting satellite connection) mapping procedures utilized available topographic and aerial imagery datasets in order to improve accuracy in feature alignment and location.

#### **Determination of Wetland Boundaries in Difficult Wetland Situations**

In California, the winter of 2020/2021 was considered a below average rainfall year (NOAA 2021). As such, the guidelines provided in the Arid West Manual for making wetland determinations in atypical, difficult wetland situations was used. To aid in the determination, spatial patterns, analysis of aerial photographs, topography, and landscape position were used in conjunction with vegetation data to determine the wetland boundary. Areas where wetland vegetation or wetland hydrology was lacking but where the landscape position was likely to concentrate water were closely inspected. Gallaway Enterprises mapped these areas as wetlands if hydric soil indicators were detected and at least one other hydric indicator was present (i.e. wetland hydrology or hydrophytic vegetation).

#### **Non-wetland Boundary Determination**

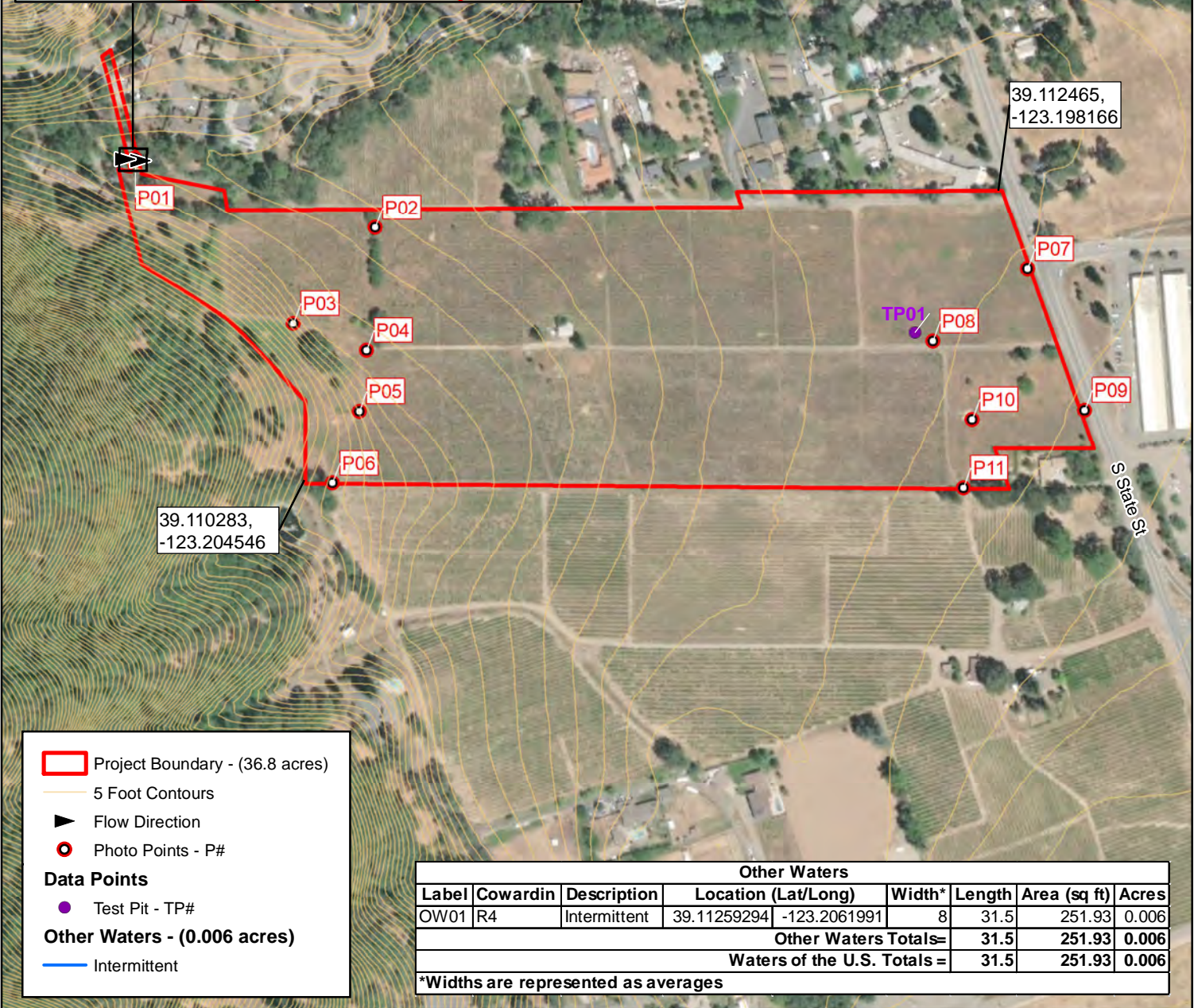
Areas were determined to be non-wetlands if they did not meet the necessary wetland test parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4). One test pit (TP01) was taken at a minute depression in the annual grassland portion of the Project site (**Figure 4**). This test pit location lacked the necessary wetland parameters to be considered a wetland and was, thus, determined to be upland/non-wetland (**Appendix A**). Further, the southeast block of vineyard within the Project site was observed to be dominated by an understory of snow white meadowfoam (*Limnanthes douglasii ssp. nivea*) (OBL). However, this area lacked suitable ponding landscape position, was being actively irrigated and lacked wetland hydrology indicators so the area was considered upland.

**EIR ADDENDUM APPENDIX F**

Coordinate System: NAD1983 California State Plane II (Feet)  
 Projection: Lambert Conformal Conic  
 Datum: North American 1983  
 Vertical Datum: NAVD 88

Made in accordance with the Updated Map & Drawing Standards  
 for the South Pacific Division Regulatory Program

The features represented on this graphic are  
 considered preliminary until written verification by the USACE



**Legend**

- Project Boundary - (36.8 acres)
- 5 Foot Contours
- Flow Direction
- Photo Points - P#
- Data Points**
- Test Pit - TP#
- Other Waters - (0.006 acres)**
- Intermittent

Other Waters								
Label	Cowardin	Description	Location (Lat/Long)		Width*	Length	Area (sq ft)	Acres
OW01	R4	Intermittent	39.11259294	-123.2061991	8	31.5	251.93	0.006
<b>Other Waters Totals =</b>						<b>31.5</b>	<b>251.93</b>	<b>0.006</b>
<b>Waters of the U.S. Totals =</b>						<b>31.5</b>	<b>251.93</b>	<b>0.006</b>

\*Widths are represented as averages

1:4,800  
 0 320 640 Feet  
 1 inch = 400 feet  
 Data Sources: ESRI, Mendocino County, Maxar 6/08/2020  
 NORTH

Bella Vista Subdivision  
 Delineation of Waters of the U.S.

**gallaway**  
 ENTERPRISES  
 GIS: #21-035 Map Date: 06/02/2021

## Results

A complete Draft Delineation of WOTUS map, utilizing a 1" to 400' scale, is included as **Figure 4**. **Table 1** details the area calculations for the pre-jurisdictional features within the Project site.

**Table 1. Waters of the United States Acreage Table for the Bella Vista Subdivision Project.**

Waters of the United States						
Label	Cowardin	Description	Avg Width	Length	Area (sq ft)	Acres
OW01	R4	Intermittent	8	31.5	251.93	0.006
<b>Other Waters Totals=</b>				<b>31.5</b>	<b>251.93</b>	<b>0.006</b>
<b>Waters of the U.S. Totals =</b>				<b>31.5</b>	<b>251.93</b>	<b>0.006</b>

### Waters of the United States: Tributaries

There is one feature that functions as a Tributary (Tributary) to a TNW per the Final Rule within the Project site. Tributaries are intermittent or perennial water bodies in a typical year, including lakes, stream channels, and other similar surface water features that exhibit an OHWM, but lack positive indicators for one or more of the three wetland parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4).

The one drainage identified within the Project is an intermittent drainage that demonstrated an OHWM and is locally referred to as Cleland Mountain Creek (OW01, **Figure 4**). No water was observed flowing within the intermittent drainage during the May field visit, but the streambed substrate was saturated (see picture associated with photo point P01, **Figure 3**).

### Waters of the United States: Adjacent Wetlands

No potentially adjacent wetlands were found to occur within the Project site.

Photo points were taken throughout the Project site to depict the current site conditions (**Figure 3**).

### Soils

Gallaway Enterprises' field observations of soil characteristics included soil color, texture, structure, and the visual assessment of soil features (e.g. the presence, or absence of redoximorphic features and the depth of restrictive layers such as hardpans). Gallaway Enterprises' soil texture evaluations rendered silty and gravelly loams. Iron concentrations and depletions were found primarily in pore spaces and as soft masses in the soil matrix at varying depths within the surface horizons. Field observations of soil characteristics at the test pit site are included in the data sheet form presented in **Appendix A**.

The geographic region in which the Project site is found is often characterized as having a deep naturally occurring restrictive layer. Within the Project site, the restrictive layer is typically found at a depth of more than 80 inches. The depth of the hand dug soil pits were dug deep enough to determine or rule out the presence/absence of hydric soil indicators.

Gallaway Enterprises queried the National Cooperative Soil Survey database to further evaluate the soil conditions. A copy of the soil survey map and a description of mapped soil units for the Project site are included as **Appendix B**. Two soil map units occur within the Project site. These map units are listed below in **Table 2**. Based on Gallaway Enterprises' review of the soil map units identified within the Project site, no hydric components occur. A copy of the soil survey map and a description of mapped soil units for the Project site are included as **Appendix B**.

**Table 2. Soil Map Units, NRCS hydric soil designation, and approximate totals for Bella Vista Subdivision Project.**

Map Unit Symbol	Map Unit Name	% Hydric Component	Hydric Component Landform	% Map Unit in Project Site
155	Kekawaka-Casabonne-Wohly complex, 30 to 50 percent slopes	N/A	N/A	13.8%
178	Pinole gravelly loam, 2 to 8 percent slopes	N/A	N/A	86.2%

### Vegetation

The central portion of the Project site was dominated by vineyard (*Vitis* sp.) (FACU) with scattered English walnuts (*Juglans regia*) (UPL) along the periphery of the blocks of vineyard and an understory of weedy annual vegetation. Only the southeast block of vineyard was observed to have a dense understory dominated by snow white meadowfoam. The annual grassland habitat present was dominated primarily by rattlesnake grass (*Briza maxima*) (UPL), wild oats (*Avena barbata*) (UPL), foothill filaree (*Erodium brachycarpum*) (NL), Mediterranean barley (*Hordeum marinum ssp. gussoneanum*) (FAC), soft chess (*Bromus hordeaceus*) (FACU), winter vetch (*Vicia villosa*) (NL), field bindweed (*Convolvulus arvensis*) (NL), and smooth cat's ear (*Hypochaeris glabra*) (NL). The montane hardwood conifer habitat was dominated by a tree canopy of oracle oak (*Quercus x morehus*) (NL), Garry oak (*Quercus garryana* var. *garryana*) (UPL), douglas-fir (*Pseudotsuga menziesii* var. *menziesii*) (FACU), bay laurel (*Umbellularia californica*) (FAC) and pacific madrone (*Arbutus menziesii*) (NL) with a shrub layer dominated by Himalayan blackberry (*Rubus armeniacus*) (FAC) and poison oak (*Toxicodendron diversilobum*) (FACU). The bed of the intermittent drainage was largely void of vegetation but within the active floodplain the vegetation was composed of perennial ryegrass (*Festuca perennis*) (FAC), curly dock (*Rumex crispus*) (FAC), watercress (*Nasturtium officinale*) (OBL), and seep monkeyflower (*Erythranthe guttata*) (OBL) with a few sporadic willows (*Salix* sp.) (FACW).

### Hydrology

Hydrology within the Project site is influenced primarily by irrigation practices of the vineyard, precipitation and localized runoff. No wetlands were observed within the Project site. One small intermittent Tributary, as defined by the Final Rule, occurs within the northernmost portion of the Project site (OW01). This Tributary, Cleland Mountain Creek, is a direct tributary of the Russian River, a TNW.

Site Photos Taken on May 3, 2021



P01 – OW01 looking west



P02 – Upland overview looking east



P03 – upland with dark aerial signature looking southwest



P02 – Upland overview looking west



P04 – Upland at the toe of the hillslope looking west



P02 – Upland overview looking south



P04 – Upland at the toe of the hillslope looking southwest



P07 – Upland grassland overview looking west



P05 – Erosion/hill slump looking west



P08 – TP01 looking northwest



P06 – Site overview looking slightly northeast



P09 – upland roadside swale looking north



P09 – Upland roadside swale looking south



P10 – Upland overview looking northeast



P10 – Upland overview looking west



P11 – Upland agricultural ditch looking west



P10 – Upland depression looking north



P11 – End of upland ditch looking east

## Glossary

**Abutting:** When referring to wetlands that are adjacent to a tributary, abutting defines those wetlands that are not separated from the tributary by an upland feature, such as a berm or dike.

**Adjacent:** Adjacent wetlands are defined in Corps and EPA regulations as wetlands that abut, or touch at least at one point or side, a tributary or other jurisdictional feature. Wetlands separated from other waters of the U.S. by man-made/artificial dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands' so long as the artificial structure allows for a direct hydrologic surface connection. The entirety of wetlands are considered adjacent if the wetland has a road or similar artificial structure dividing it as long as the road/structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

The regulations define "adjacent wetlands" as wetlands that meet at least one of following criteria:

- (1) There is an unbroken surface hydrologic connection between the wetland and jurisdictional waters;
- (2) The wetland is inundated by flooding from a jurisdictional sea, tributary or lake/pond;
- (3) The wetlands are physically separated from jurisdictional sea, tributary or lake/pond only by a natural berm, bank, dune, or similar natural feature; or
- (4) The wetlands are physically separated from jurisdictional sea, tributary or lake/pond only by an artificial dike, barrier or similar artificial structure and the artificial structure allows for a direct connection between the wetland and jurisdictional water in a typical year.

The agencies will also continue to assert jurisdiction over wetlands "adjacent" to traditional navigable waters as defined in the agencies' regulations. The Rapanos decision does not affect the scope of jurisdiction over wetlands that are adjacent to traditional navigable waters. The agencies will assert jurisdiction over those adjacent wetlands that have a continuous surface connection with a relatively permanent, non-navigable tributary, without the legal obligation to make a significant nexus finding.

**Atypical situation (significantly disturbed):** In an atypical (significantly disturbed) situation, recent human activities or natural events have created conditions where positive indicators for hydrophytic vegetation, hydric soil, or wetland hydrology are not present or observable.

**Channel.** "An open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water" (Langbein and Iseri 1960:5).

**Channel bank.** The sloping land bordering a channel. The bank has steeper slope than the bottom of the channel and is usually steeper than the land surrounding the channel.

**Cobbles.** Rock fragments 7.6 cm (3 inches) to 25.4 cm (10 inches) in diameter.

**Debris flow.** A moving mass of rock fragments, soil, and mud where more than 50% of the particles are larger than sand-sized.

**Ditch.** A constructed or excavated channel used to convey water.

**Drift.** Organic debris oriented to flow direction(s) (larger than small twigs).

**Ephemeral stream.** An ephemeral stream has flowing water only in direct response to precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

**Facultative wetland (FACW).** Wetland indicator category; species usually occurs in wetlands (estimated probability 67–99%) but occasionally found in non-wetlands.

**Flat.** A level landform composed of unconsolidated sediments usually mud or sand. Flats may be irregularly shaped or elongate and continuous with the shore, whereas bars are generally elongate, parallel to the shore, and separated from the shore by water.

**Gravel.** A mixture composed primarily of rock fragments 2mm (0 .08 inch) to 7.6 cm (3 inches) in diameter. Usually contains much sand.

**Growing season** The frost-free period of the year (see U.S. Department of Interior, National Atlas 1970:110-111 for generalized regional delineation).

**Herbaceous.** With the characteristics of an herb; a plant with no persistent woody stem above ground.

**Hydric soil.** Soil is hydric that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic (oxygen-depleted) conditions in its upper part (i.e., within the shallow rooting zone of herbaceous plants).

**Hydrophyte, hydrophytic.** Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

**Intermittent stream.** An intermittent stream has flowing water during certain times of the year and more than in direct response from precipitation, when elevated groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water.

**Jurisdictional Waters.** Features that meet the definition of waters of the United States provided below and that fall under Corps regulations pursuant to Section 404 of the CWA are considered jurisdictional features. These include territorial seas; tributaries; lakes and ponds and impoundments of jurisdictional waters; and adjacent wetlands.

**Litter.** Organic debris oriented to flow direction(s) (small twigs and leaves).

**Man-induced wetlands.** A man-induced wetland is an area that has developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities.

**Normal circumstances.** This term refers to the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed.

**Obligate hydrophytes.** Species that are found only in wetlands e.g., cattail (*Typha latifolia*) as opposed to ubiquitous species that grow either in wetland or on upland e.g., red maple (*Acer rubrum*).

**Obligate wetland (OBL).** Wetland indicator category; species occurs almost always (estimated probability 99%) under natural conditions in wetlands.

**Palustrine** the Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 parts per thousand. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2 m (6.6 feet) at low water; and (4) salinity due to ocean-derived salts is less than 0.5 parts per thousand.

**Perennial stream.** A perennial stream has flowing water year-round during atypical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

**Ponded.** Ponding is a condition in which free water covers the soil surface (e.g., in a closed depression) and is removed only by percolation, evaporation, or transpiration.

**Problem area.** Problem areas are those where one or more wetland parameters may be lacking because of normal seasonal or annual variations in environmental conditions that result from causes other than human activities or catastrophic natural events.

**Scour.** Soil and debris movement.

**Sheetflow.** Overland flow occurring in a continuous sheet; a relatively high-frequency, low-magnitude event.

**Shrub.** A woody plant which at maturity is usually less than 6 meters (20 feet) tall and generally exhibits several erect, spreading, or prostrate stems and has a bushy appearance; e.g., speckled alder (*Alnus rugosa*) or buttonbush (*Cephalanthus occidentalis*).

**Succession.** Changes in the composition or structure of an ecological community.

**Traditional Navigable Waters (TNWs).** “[a]ll waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.” These waters are referred to in this guidance as traditional navigable waters. The traditional navigable waters include all of the “navigable waters of the United States,” as defined in 33 C.F.R. Part 329 and by numerous decisions of the federal courts, plus all other waters that are navigable-in-fact (for example, the Great Salt Lake, UT, and Lake Minnetonka, MN). Thus, the traditional navigable waters include, but are not limited to, the “navigable waters of the United States” within the meaning of Section 10 of the Rivers and Harbors Act of 1899 (also known as “Section 10 waters”).

**Tree.** A woody plant which at maturity is usually 6 m (20 feet) or more in height and generally has a single trunk, unbranched for 1 m or more above the ground, and a more or less definite crown; e.g., red maple (*Acer rubrum*), northern white cedar (*Thuja occidentalis*).

**Tributary.** Tributaries are defined by regulation as a “river, stream or similar naturally occurring surface water channel that contributes surface water flow to a [jurisdictional water] in a typical year either directly or through one or more [jurisdictional water]. A tributary must be perennial or intermittent in a typical year.” Tributaries include natural perennial or intermittent drainages that have been realigned or relocated.

**Typical Year.** Defined by the EPA and Corps as meaning when precipitation and other climactic variables are within the normal periodic range for the geographic area based on a rolling thirty-year period.

**Water table.** The upper surface of a zone of saturation. No water table exists where that surface is formed by an impermeable body.

**Waters of the United States (WOTUS).** This is the encompassing term for areas under federal jurisdiction pursuant to Section 404 of the CWA. Waters of the United States are divided into “adjacent wetlands” and “tributaries”.

**Watershed (drainage basin).** An area of land that drains to a single outlet and is separated from other watersheds by a divide.

**Wetland.** Wetlands are defined as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3 [b], 40 CFR

230.3). To be considered under potential federal jurisdiction, a wetland must support positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology.

**Woody plant.** A seed plant (gymnosperm or angiosperm) that develops persistent, hard, fibrous tissues, basically xylem; e.g., trees and shrubs.

**Xeric.** Relating or adapted to an extremely dry habitat

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**Appendix A: Wetland Delineation Data Sheets**

**EIR ADDENDUM APPENDIX F  
WETLAND DETERMINATION DATA FORM - Arid West Region**

Project/Site: Bella Vista Subdivision City/County: Ukiah, Mendocino County Sampling Date: 5-3-2021  
 Applicant/Owner: Guillon, Inc. State: CA Sampling Point: TP01  
 Investigator(s): E. Gregg Section, Township, Range: Section 32, Township 15N, Range 12W  
 Landform (hillslope, terrace, etc.): Valley flat Local relief (concave, convex, none): none Slope (%): 0.5  
 Subregion (LRR): C - Mediterranean California Lat: 39.111424 Long: -123.198952 Datum: NAD 83  
 Soil Map Unit Name: Pinole gravelly loam, 2 to 8 percent slopes NWI classification: N/A

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

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

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks: <u>Low rainfall year. Area was relatively flat to minutely concave.</u>	

**VEGETATION**

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
3. _____				
4. _____				
Total Cover: _____ %				
Sapling/Shrub Stratum				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
Total Cover: _____ %				
Herb Stratum				
1. <u>Hordeum marinum ssp. gussoneanum</u>	50	Yes	FAC	
2. <u>Convolvulus arvensis</u>	20	Yes	Not Listed	
3. <u>Festuca myuros</u>	10	No	FACU	
4. <u>Avena barbata</u>	10	No	UPL	
5. <u>Plantago lanceolata</u>	5	No	FAC	
6. <u>Mentha pulegium</u>	5	No	OBL	
7. _____				
8. _____				
Total Cover: <u>100%</u>				
Woody Vine Stratum				
1. _____				
2. _____				
Total Cover: _____ %				
% Bare Ground in Herb Stratum <u>0 %</u>	%		% Cover of Biotic Crust <u>0 %</u>	%

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

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species 5 x 1 = 5  
 FACW species \_\_\_\_\_ x 2 = 0  
 FAC species 55 x 3 = 165  
 FACU species 10 x 4 = 40  
 UPL species 30 x 5 = 150  
 Column Totals: 100 (A) 360 (B)  
 Prevalence Index = B/A = 3.60

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present.

**Hydrophytic Vegetation Present?** Yes  No

Remarks:

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 4/3	99	2.5YR 4/6	1	C	PL	silty loam	
2-9	10YR 5/3	95	5YR 4/6	10	C	PL	gravelly loam	

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

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

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

Indicators for Problematic Hydric Soils: <sup>3</sup>

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

<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present unless distributed or problematic

Restrictive Layer (if present):

Type: none  
 Depth (inches): N/A

Hydric Soil Present? Yes  No

Remarks: Area was very minutely concave, therefore, it could be considered to be a closed depression and meet the criteria for indicator F8.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): \_\_\_\_\_

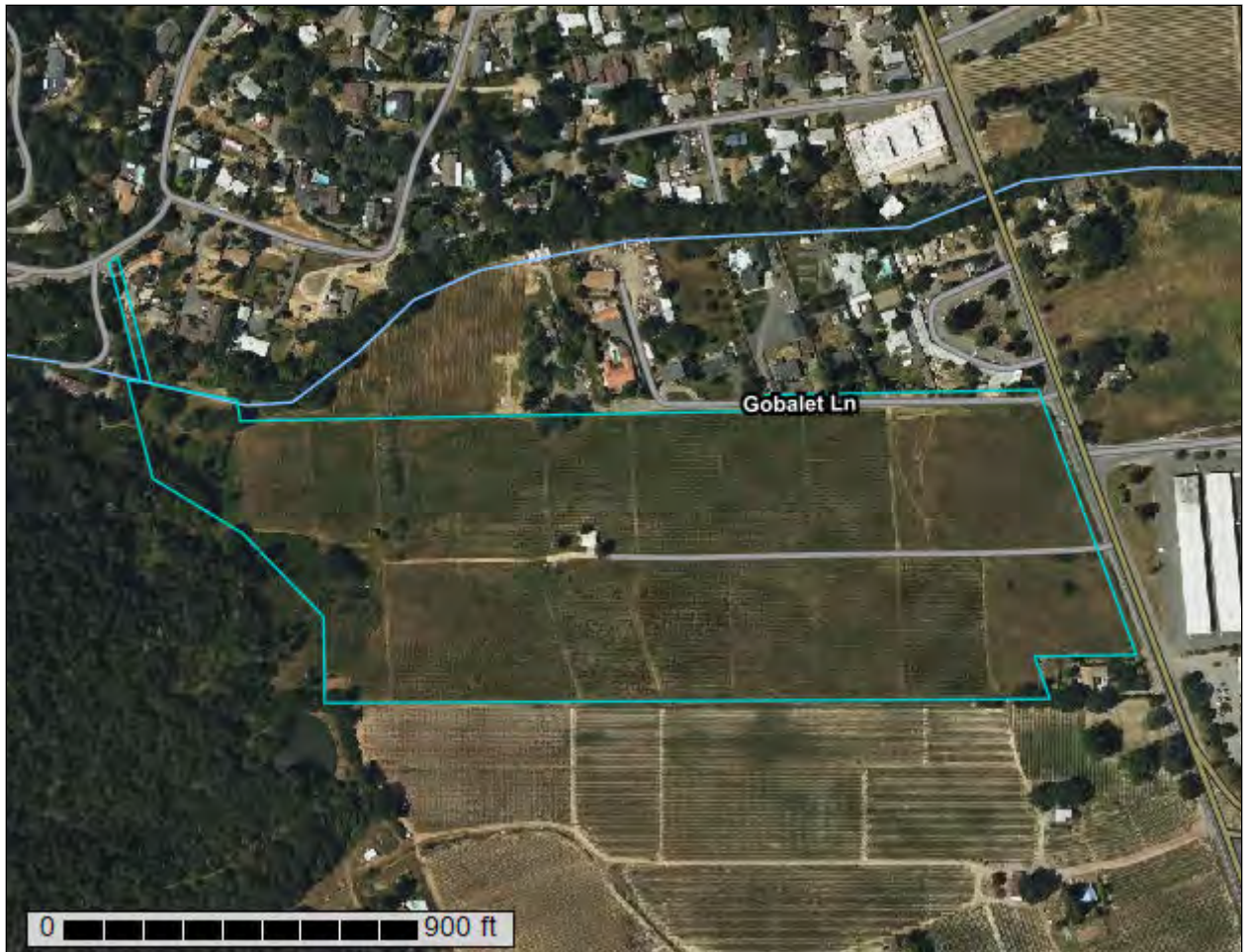
Wetland Hydrology Present? Yes  No

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

Remarks: No wetland hydrology indicators observed.

**Appendix B: NRCS Soils Map and Soil Series Description**

# Custom Soil Resource Report for Mendocino County, Eastern Part and Southwestern Part of Trinity County, California



# Preface

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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](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

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

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

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

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## How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

## Soil Map

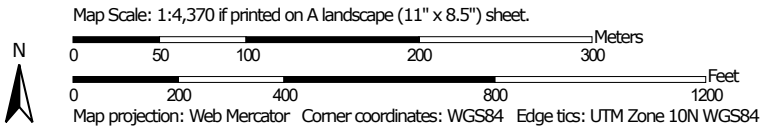
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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce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

Custom Soil Resource Report  
Soil Map




Soil Map may not be valid at this scale.



### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Mendocino County, Eastern Part and Southwestern Part of Trinity County, California  
 Survey Area Data: Version 15, Jun 1, 2020

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

Date(s) aerial images were photographed: May 5, 2019—Jun 3, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

**MAP LEGEND**

**MAP INFORMATION**

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
155	Kekawaka-Casabonne-Wohly complex, 30 to 50 percent slopes	5.1	13.8%
178	Pinole gravelly loam, 2 to 8 percent slopes	31.7	86.2%
<b>Totals for Area of Interest</b>		<b>36.8</b>	<b>100.0%</b>

## 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

## Custom Soil Resource Report

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.

## Mendocino County, Eastern Part and Southwestern Part of Trinity County, California

### 155—Kekawaka-Casabonne-Wohly complex, 30 to 50 percent slopes

#### Map Unit Setting

*National map unit symbol:* hgr8  
*Elevation:* 500 to 4,800 feet  
*Mean annual precipitation:* 35 to 80 inches  
*Mean annual air temperature:* 54 to 57 degrees F  
*Frost-free period:* 150 to 290 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Kekawaka and similar soils:* 35 percent  
*Casabonne and similar soils:* 20 percent  
*Wohly and similar soils:* 20 percent  
*Minor components:* 25 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Kekawaka

##### Setting

*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountainflank, side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Residuum weathered from sandstone and siltstone

##### Typical profile

*H1 - 0 to 4 inches:* loam  
*H2 - 4 to 35 inches:* clay loam  
*H3 - 35 to 61 inches:* clay

##### Properties and qualities

*Slope:* 30 to 50 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water capacity:* High (about 9.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6e  
*Hydrologic Soil Group:* C  
*Hydric soil rating:* No

**Description of Casabonne****Setting**

*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountainflank, side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Convex  
*Parent material:* Residuum weathered from sandstone and shale

**Typical profile**

*A1 - 0 to 7 inches:* gravelly loam  
*A2 - 7 to 15 inches:* loam  
*Bt1 - 15 to 24 inches:* clay loam  
*Bt2 - 24 to 43 inches:* clay loam  
*Bt3 - 43 to 53 inches:* gravelly clay loam  
*CB - 53 to 58 inches:* gravelly clay loam  
*Ct - 58 to 71 inches:* gravel

**Properties and qualities**

*Slope:* 30 to 50 percent  
*Depth to restrictive feature:* 58 to 62 inches to strongly contrasting textural stratification  
*Drainage class:* Well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water capacity:* High (about 9.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6e  
*Hydrologic Soil Group:* C  
*Hydric soil rating:* No

**Description of Wohly****Setting**

*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountainflank, side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Residuum weathered from sandstone and shale

**Typical profile**

*A1 - 0 to 5 inches:* loam  
*A2 - 5 to 11 inches:* loam  
*Bt1 - 11 to 17 inches:* gravelly clay loam  
*Bt2 - 17 to 24 inches:* gravelly clay loam  
*Ct - 24 to 71 inches:* gravel

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**Properties and qualities***Slope: 30 to 50 percent**Depth to restrictive feature: 24 to 28 inches to paralithic bedrock**Drainage class: Well drained**Runoff class: High**Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high  
(0.20 to 2.00 in/hr)**Depth to water table: More than 80 inches**Frequency of flooding: None**Frequency of ponding: None**Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)**Available water capacity: Low (about 3.7 inches)***Interpretive groups***Land capability classification (irrigated): None specified**Land capability classification (nonirrigated): 6e**Hydrologic Soil Group: C**Hydric soil rating: No***Minor Components****Cummiskey***Percent of map unit: 5 percent**Hydric soil rating: No***Woodin***Percent of map unit: 4 percent**Hydric soil rating: No***Rock outcrop***Percent of map unit: 4 percent**Hydric soil rating: No***Sanhedrin***Percent of map unit: 4 percent**Hydric soil rating: No***Pardaloe***Percent of map unit: 4 percent**Hydric soil rating: No***Unnamed***Percent of map unit: 4 percent**Hydric soil rating: No***178—Pinole gravelly loam, 2 to 8 percent slopes****Map Unit Setting***National map unit symbol: hgs0*

## Custom Soil Resource Report

*Elevation:* 500 to 1,500 feet  
*Mean annual precipitation:* 37 inches  
*Mean annual air temperature:* 57 degrees F  
*Frost-free period:* 200 to 250 days  
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

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

**Description of Pinole****Setting**

*Landform:* Terraces  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from sedimentary rock

**Typical profile**

*H1 - 0 to 10 inches:* gravelly loam  
*H2 - 10 to 37 inches:* gravelly clay loam, clay loam  
*H2 - 10 to 37 inches:* sandy clay loam, gravelly sandy clay loam  
*H3 - 37 to 61 inches:*  
*H3 - 37 to 61 inches:*

**Properties and qualities**

*Slope:* 2 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*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 capacity:* Very high (about 15.8 inches)

**Interpretive groups**

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

**Minor Components****Yokayo**

*Percent of map unit:* 5 percent  
*Landform:* Terraces  
*Hydric soil rating:* No

**Unnamed**

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

**Pinnobie**

*Percent of map unit: 5 percent*

*Landform: Terraces*

*Hydric soil rating: No*

# Soil Information for All Uses

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## Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

## Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

## Hydric Soil List - All Components

This table lists the map unit components and their hydric status in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the

## Custom Soil Resource Report

upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
  - A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
  - B. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
  - A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
  - B. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
  - A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or

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B. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:

- Federal Register. July 13, 1994. Changes in hydric soils of the United States.  
 Federal Register. Doc. 2012-4733 Filed 2-28-12. February, 28, 2012. Hydric soils of the United States.  
 Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.  
 Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.  
 Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.  
 Vasilas, L.M., G.W. Hurt, and C.V. Noble, editors. Version 7.0, 2010. Field indicators of hydric soils in the United States.

### Report—Hydric Soil List - All Components

Hydric Soil List - All Components—CA687-Mendocino County, Eastern Part and Southwestern Part of Trinity County, California					
Map symbol and map unit name	Component/Local Phase	Comp. pct.	Landform	Hydric status	Hydric criteria met (code)
155: Kekawaka-Casabonne-Wohly complex, 30 to 50 percent slopes	Kekawaka	35	Hills,mountains	No	—
	Casabonne	20	Hills,mountains	No	—
	Wohly	20	Mountains,hills	No	—
	Cumiskey	5	—	No	—
	Woodin	4	—	No	—
	Rock outcrop	4	—	No	—
	Sanhedrin	4	—	No	—
	Pardaloe	4	—	No	—
	Unnamed	4	—	No	—
178: Pinole gravelly loam, 2 to 8 percent slopes	Pinole	85	Terraces	No	—
	Yokayo	5	Terraces	No	—
	Unnamed	5	—	No	—
	Pinnobie	5	Terraces	No	—

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- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
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- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_054262](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262)
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053577](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577)
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053580](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580)
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- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2\\_053374](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374)
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242)

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_052290.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf)