LINDBERG GEOLOGIC CONSULTING
David N. Lindberg, CEG
Post Office Box 306
Cutten California 95534
(707) 442-6000

December 6, 2022 Project No: 0493.00

Mr. John Zartarian
Post Office Box 233
Weott, California 95571

Subject: Hydrologic Isolation of Existing Well from Surface Waters, 407 Sunny Lane Weott, APN: 095-201-005, WCR2017-002379 (Legacy #e0347153)

To Whom It May Concern:

As requested, Lindberg Geologic Consulting has assessed an existing permitted well on the above-referenced parcel to estimate its potential for hydrologic connectivity with any adjacent wetlands and or surface waters, and if pumping this well could affect surface waters in nearby water courses. Tributaries in the vicinity of this well drain to the South Fork Eel River (Figure 1).

A California-Certified Engineering Geologist visited this site on November 4, 2022, to observe the subject well and local site conditions. Based on our research, observations, and our professional experience, it is our opinion the subject well has a low likelihood of being hydrologically connected to nearby surface waters in any manner that could affect adjacent springs, wetlands and or surface waters in the vicinity.

We define the "vicinity" as the area within a 1,000-foot radius of the subject well, an area of approximately 72 acres. We understand that the applicant hopes to use water from this well for cannabis irrigation. At the time of our visit this well was not in use. We are not aware of the volume of water to be extracted or what the pumping schedule might be but expect that that information is provided elsewhere in the application.

Based on the Humboldt County WebGIS and the Assessor's Parcel Map (Figure 2), parcel 095-201-005 (Figure 2) encompasses approximately 35 acres. Our GPS coordinates located the subject well at latitude 40.32921° north, and longitude 123.92135° west (±9'). This well is in Section 35, T1S, R2E, HB&M, and is 160 feet deep with the wellhead at an elevation of approximately 642 feet (Figure 1 and 2). Elevation of the static water level is therefore 552 feet, and the bottom of the well is 482 feet above sea level.

The Humboldt County WebGIS shows the nearest stream, an ephemeral tributary of South Fork Eel River, more than 1,500 feet south of the well**.** The next closest water course is the South Fork of the Eel River to the west more than 1,540 feet (Figure 1). As stated, based on interpolation from the USGS "Weott, Calif." (1969), topographic quadrangle map (Figure 1), and the Humboldt County WebGIS, the well site elevation is 642 feet. The elevation of the closest ephemeral watercourse to the south is approximately 300 feet, and the elevation of the South Fork Eel River to the west is 110 feet. The bottom elevation of the subject well is 482 feet, making the elevation

of the nearest unnamed watercourse to the south 182 feet lower than the total depth of the well. The South Fork Eel River to the west is 372 feet lower than the total depth of the subject well.

The subject well location is shown approximately on the attached figures. This well was drilled by 3D Drilling, of Rock Springs, Wyoming, in June of 2017, under County well permit #16/17-1/27. 3D Drilling is a licensed well-drilling contractor (C-57 #10015033). They submitted their well completion report (DWR 188) after June 27, 2017 (attached). The driller estimated a yield of 4 gpm in June 2017, based on a 4-hour air lift pump test. Total drawdown during the pump test (if any) was not noted on the driller's report.

Well -002379 is 160 feet deep. The borehole diameter is apparently 6-inches from grade to 160-feet. From grade to 20-feet the driller reported installation of a 6-5/8-inch diameter blank (unslotted) Low Carbon Steel casing. A bentonite chip seal was reportedly installed from the surface to 130 feet. This makes the effective bottom of the well likely 130 feet below the ground surface (bgs). The well is apparently cased and sealed through any potential shallow subsurface aquifers. Depth to first water was reported at 60 feet below the surface. Depth to static water in the completed developed well was reported to be 90 feet bgs when the driller conducted the pump test on June 26, 2017, so the aquifer at 130 feet appears to be under some hydrostatic pressure.

From well-002379, the nearest spring is mapped in Section 1 (Figure 1), approximately 6,380 feet to the east-southeast, elevation 1,120-feet, near the head waters of Robinson Creek on Mail Ridge per the WebGIS. We found one additional spring in the 8 contiguous Sections. That spring is in the southern part of Section 11, more than 10,500 feet from the subject well at an elevation of 850 feet. Both springs are more than one mile from, and higher in elevation than the subject well.

This parcel is located within California's Coast Range Geomorphic Province, in the Coastal Belt of the Franciscan Complex (McLaughlin et at., 2000), a seismically active region in which large earthquakes are expected to occur during the economic life span (70 years) of any developments on the subject property. Geologic mapping by McLaughlin shows that the site is underlain by Yager Terrane of the Coastal Belt of the Franciscan Complex, as shown in Figure 4.

The topsoil is thin and rocky and is composed of loam, six inches thick, and underlain by 7 inches of silt loam. Gravelly silty clay loam, and gravelly clay loam soils underlain the silt loam to a depth of approximately 6 feet. Soils, based on our observations, are interpreted to be uniformly distributed across the well site on the subject parcel. In the areas explored, the soil profile appeared to consist of approximately 12-inches of topsoil. Beneath this thin topsoil, soils are gravelly loam to a depth of approximately 6-feet where they are underlain by lithologies associated with the Yager Terrane.

Materials reported on the geologic log of the driller's well completion report (attached) include 15 feet of "Brown Rock" above 10-feet of "Brown Silt" (15-feet to 25 feet). Beneath the brown silt lies 5-feet of "Brown Clay" (25 to 30-feet). Below the brown clay, the driller logged 5-feet (30 to 35-feet) of "Grey Shell". In the next 5-feet section (35- to 40-feet), the driller logged "Brown

Shel/rock" followed by 5-feet (40- 45-feet) of Clay/Brown Rock. Below the clay/brown rock is another 5 feet of "Grey Shell" (45- to 50-feet). Grey shell is underlain by 5-feet (50- to 55-feet) of Brown/Shell/Rock. In the next 5-feet (55- to 60-feet) the driller logged Brown/Shell/Rock again. In the next 40-feet (60- to 120-feet) "Grey Shell" was logged, followed by 15-feet (120- to 135-feet) of "White Rock". In the final 25-feet (135- to 160-feet) the driller logged "Grey/Black Shell).

We interpret the upper 135 feet of the profile in this well to be an aquitard, materials of lesser permeability and transmissivity. White rock and grey black shale are inferred to be more porous and permeable. The white rock, and the grey black shale below 135 feet appear to be the water-bearing aquifer materials tapped by this well. Fractured shale and white rock apparently have a higher transmissivity and permeability than would be typical of an unfractured shale interbedded with fine sandstone. At the location of the subject well, the elevation of the water-bearing aquifer unit is thus approximately 552 feet, based on the driller's report.

Below the surface soils, the earth materials encountered in the boring are Yager Terrane rocks of the Coastal Belt Franciscan Complex, as mapped by McLaughlin et al., (2000). Sheared, fractured, and folded metasedimentary rock materials can have variable hydraulic conductivity but can still constitute significant aquifers. We interpret the sequence of shale and clay described by the driller below 15 feet, as lithologies within the Yager Terrane (y1) of the Franciscan Complex. The white rock and grey black shale section of the bore, from 135 to 160 feet, apparently has a favorable hydraulic conductivity, making it, in our interpretation, the water bearing unit in this well.

A generalized geologic cross section of the area, modified from McLaughlin et al., (2000), shows the structural and stratigraphic relationships between the regional geologic units (Figure 5). In Section 27 to the northwest, the Yager Terrane is shown dipping northeast at 58°. On-site, no dip of the rock units could be observed because they are mantled with soil and colluvium and obscured by vegetation. We interpret the faults in the subsurface to be hydrologic boundaries of reduced permeability (due to grinding and shearing along the fault planes), effectively separating units of the Franciscan Complex from each other hydrologically and limiting groundwater flow between these fault-bound units.

Based on observations, review of pertinent and available information, and our experience, it is our professional opinion that this well has a low potential of having any direct or significant connection to proximal surface waters. First water was reportedly encountered at 60 feet, later dropping to 90 feet bgs. This well is sealed through the upper 130 feet of any potential unconfined, near-surface aquifers with which it might communicate hydraulically through the borehole. The bentonite-sealed surface casing isolates the well bore from surface and shallow subsurface water infiltration into the deeper water-bearing aquifers.

When considered with the stratigraphy and the underlying geologic structure, plus the distances (horizontal and vertically) from the nearest surface waters, and the depth of the producing zone of this well (>130 feet), as well as its position relative to the nearest adjacent ephemeral watercourses and surface waters in the vicinity, we conclude that the depth of the surface seal, combined with

the 130 feet of bentonite chips, are sufficient to preclude the potential for hydraulic connectivity with perennial surface waters, of which there are none closer than 1,540 feet in South Fork Eel River. The water source of this well draws appears to be a confined subsurface aquifer not connected to surface waters or unconfined, near-surface aquifer(s). This well appears likely to be hydraulically isolated from nearby wells, surface waters, springs, and wetlands.

The driller estimated the yield of this well to be 4 gallons per minute (gpm) on June 26, 2017. Total drawdown was not reported after 3D Drilling's four-hour air-lift pump test. At 4 gpm, this well would produce 5,760 gallons per day (potentially). As stated in the well completion report, this capacity (4 gpm) may not be representative of this well's long-term yield. Additional drawdown and recovery testing would be necessary to estimate a sustainable long-term yield of the site well, and that is beyond the scope of this report.

This subject well does not appear to be hydrologically connected to, or capable of influencing surface water flows in the South Fork Eel River. Nor does this well appear to be hydrologically connected to any local springs or ephemeral wetlands. Given the horizontal distances involved, and the elevation differences between the water-producing zone in the subject well (~552' – 482'), and the surface waters of the nearest watercourse (S.F.Eel ~120'), the potential for significant hydrologic connectivity between surface waters and groundwater in the deeper bedrock aquifers appears low. Further, given the apparently limiting condition of 130 feet of sealed borehole above the water-bearing unit, the aquifer is likely isolated from, and not significantly hydraulically connected to any other aquifer(s).

As mentioned, on the Weott USGS topographic quadrangle map, more than 6,380 feet southeast of the subject well at an elevation of approximately 1,120 feet, there is a spring mapped near the center of Section 1. The next nearest spring is in Section 11, over two miles south, across the South Fork Eel River at an elevation of approximately 350 feet. Between the subject well and the second closest spring, the South Fork Eel River flows at an elevation of approximately 120 feet. We found no other springs mapped in the eight contiguous sections surrounding the subject well in Section 35 on the Weott topographic quadrangle map.

We researched the California Department of Water Resources (DWR) database to determine if there were any wells within 1,000 feet of the subject well. Based on the information available at the present time there are no wells that meet that criterion.

There are multiple wells situated thousands of feet to the north and south of well-002379. As groundwater flow mimics topography and responds to the force of gravity in the shallow subsurface, in general it will move down slope in a direction subparallel to topography. At this well site, the ground surface slopes southwest toward the river, and the unconfined groundwater surface does approximately the same, flowing to the southwest, toward the axis of the South Fork. At the time of our visit, there was a pump installed in the subject well, but it was not in use.

In our professional opinion, it appears that the aquifer tapped by the subject well is recharged by water infiltrating through the soil from upslope source areas both proximal and distal to the well site. We speculate that most recharge occurs from the "flat" top of Mail Ridge, approximately 1,540 feet to the northeast, where elevations range from approximately 1,000 to 1,200 feet. Ephemeral streams around the well contribute recharge when they flow during runoff generating storm events.

The Natural Resources Conservation Service's (NRCS), online Web Soil Survey, shows the subject well within soils of the Redwoodhouse-Yagercreek-Mailridge complex, on slopes of 30 to 50 percent, (#513, Figure 7), which the NRCS describes as well-drained. The site is also classified as "Not prime Farmland".

The Web Soil Survey unit description is attached to this report. Mean annual precipitation for this site is listed by the NRCS in their unit description as 40 to 85 inches per year. Capacity of the most limiting soil layer to transmit water (Ksat) is described as moderately high (0.20 to 0.60 in/hr) with a depth to the water table of greater than 80 inches.

If, during the wet season, just ten percent of the "low end" 40 inches of precipitation is absorbed by the soils, recharging groundwater, then approximately 11.7 acre-feet, or 3.8 million gallons of water per year (MGPY), may be expected to recharge the local aquifer below this 35-acre subject property. Given that same 40-inches of precipitation, and the same 10 percent partitioned to groundwater recharge, then recharge can be estimated within the 1,000-foot vicinity-radius of the subject well. Recharge within the 72 acres enclosed by a circle having a 1,000-foot radius, would be 24 acre-feet, more than 7.8 MGPY. Our estimates are conservative; United States Geological Survey (USGS) researchers estimate that in northwest California, approximately 33 percent of precipitation goes to recharge. (Flint, et al., 2013). Modelling the 72-acre circle surrounding this well with 33 percent of precipitation to recharge results in 26 MGPY.

On March 28, 2022, Governor Newsom issued an executive order (N-7-22) relating to the ongoing drought in California. In the executive order measures the state will undertake to avoid and ameliorate the negative impacts of the current drought are outlined. Among these measures, counties, cities, and other public agencies have been prohibited from approving permits for new groundwater wells (or alteration of existing wells) in basins "*subject to the Sustainable Groundwater Management Act and classified as medium- or high-priority without first obtaining written verification from a Groundwater Sustainability Agency managing the basin or area of the basin where the well is proposed*". The subject well is not within a basin subject to the Act. There is not yet a Groundwater Sustainability Agency established with authority over this permitted well.

Order N-7-22 further states that counties, cities, and other public agencies are prohibited from issuing permits for well construction or alteration "*without first determining that extraction of groundwater from the proposed well is (1) not likely to interfere with the production and functioning of existing nearby wells, and (2) not likely to cause subsidence that would adversely impact or damage nearby infrastructure*". Note that this Order is not applicable to "*wells that*

provide less than two acre-feet per year (650,000+ gallons) *of groundwater for individual domestic users, or that will exclusively provide groundwater to public water supply systems*."

Therefore, based on our observations, research, and professional experience, it is our professional opinion that well WCR2017-002379 (Legacy #e0347153), on APN 095-201-005, at 407 Sunny Lane, Weott, has a low likelihood of being hydrologically connected to nearby surface waters or wells in any manner that might significantly impact or affect adjacent wetlands, wells, and or surface waters in the vicinity.

Please contact us if you have questions or concerns regarding our findings and conclusions.

Sincerely,

David N. Lindberg, CEG
Lindberg Geologic Consulting

DNL:sll

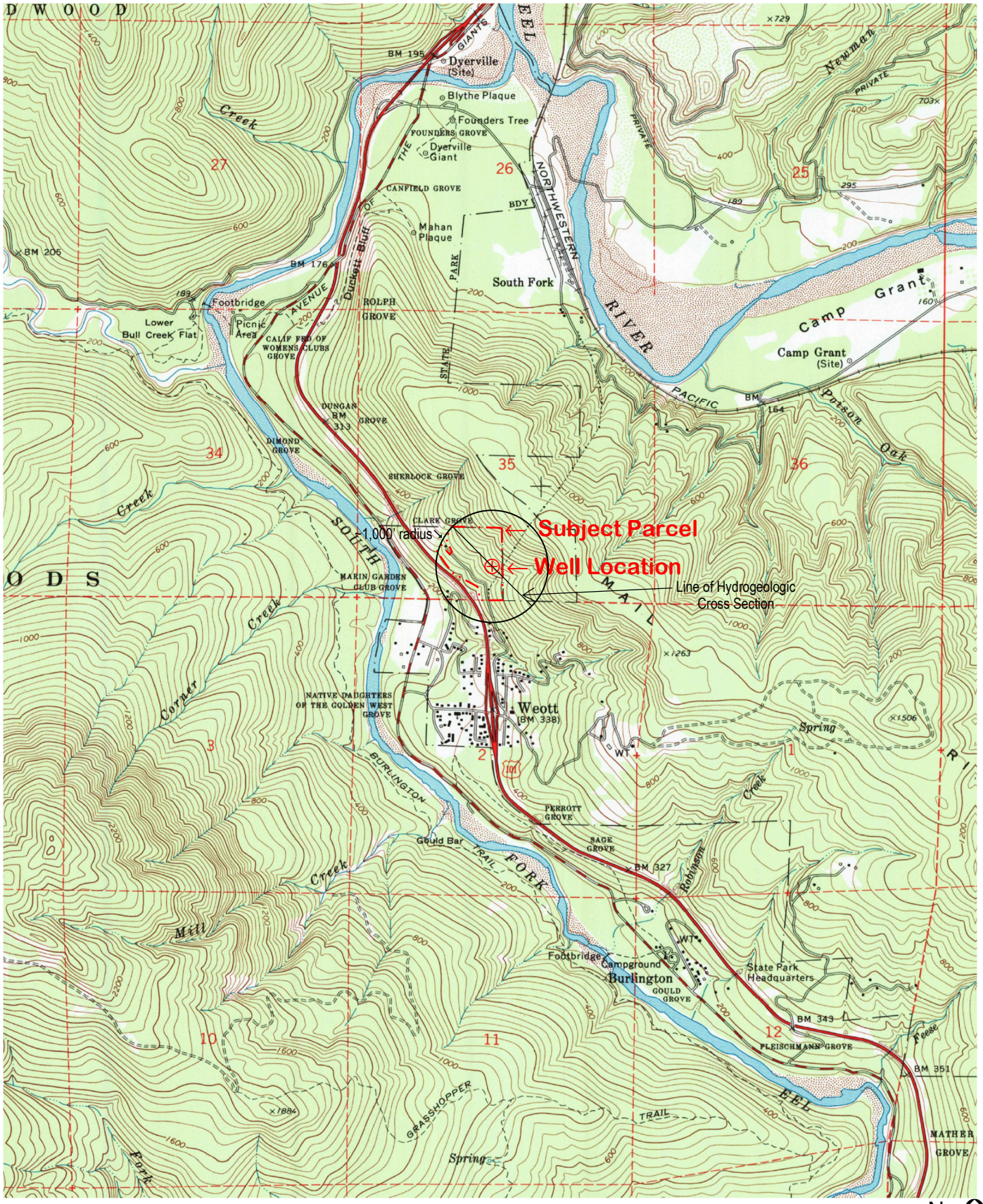
Attachments:
Figure 1: Topographic Well Location Map
Figure 2: Humboldt County Assessor's Parcel Map
Figure 3: Satellite Image of Well location
Figure 4: Geologic Map
Figure 4a: Geologic Map Explanation
Figure 5: Generalized Geologic Cross Section
Figure 6: Hydrogeologic Cross Section
Figure 7: USDA-NRCS Soils Map

State of California Well Completion Report:
WCR2017-002379, APN: 095-201-005 (Subject Well)

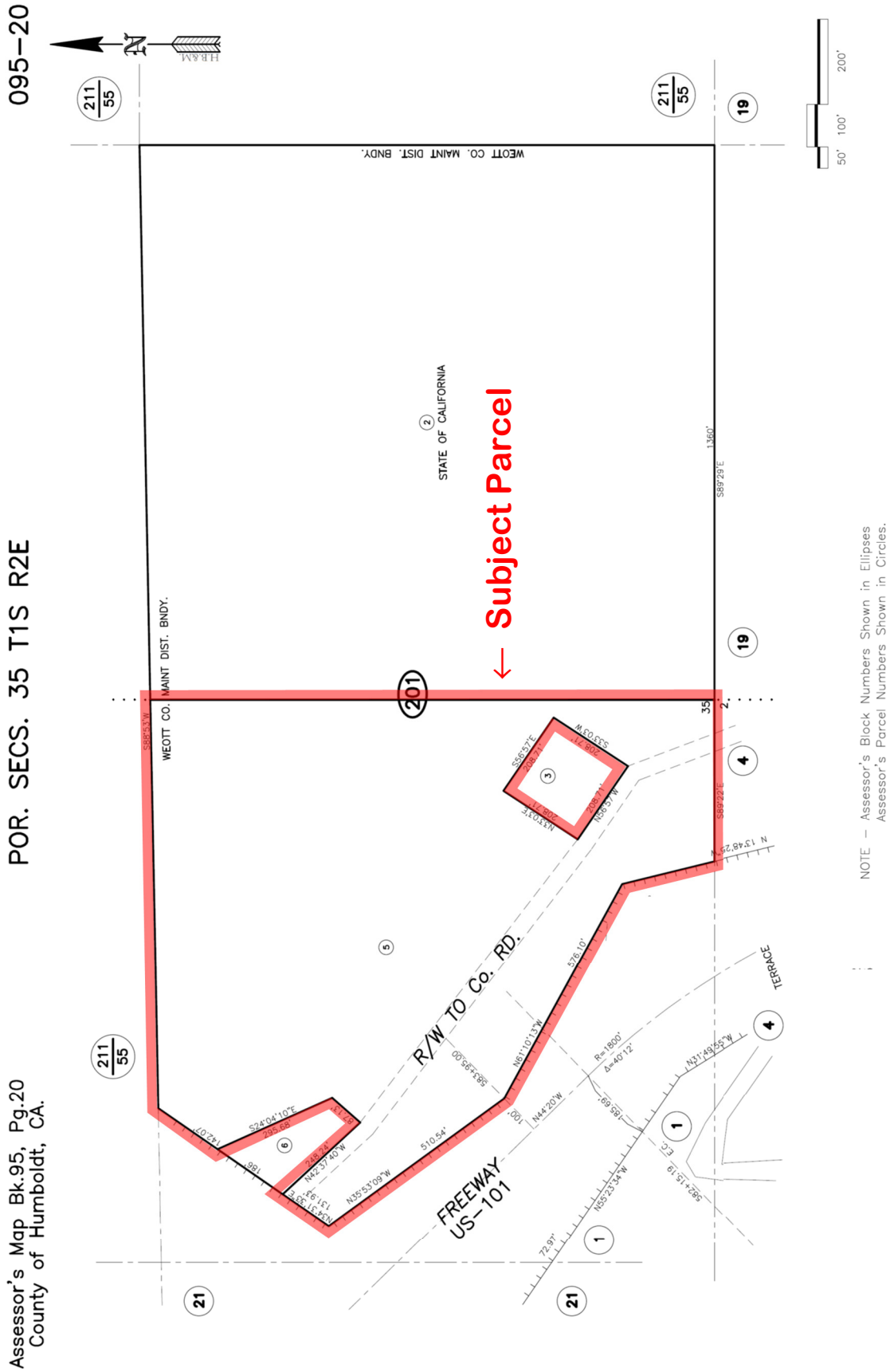
Web Soil Survey, NRCS Map Unit Description:
Redwoodhouse-Yagercreek-Mailridge complex, #513, 30 to 50 percent slopes.

Reference:
Flint et al.: Fine-scale hydrologic modeling for regional landscape applications: the California Basin Characterization Model development and performance. Ecological Process, 2013, 2:25. (doi:10.1186/2192-1709-2-25)

Lindberg Geologic Consulting	Engineering-Geologic Well Connectivity Assessment Report	Figure 1
Post Office Box 306	407 North Sunny Lane, Weott, California, APN 095-201-005	December 6, 2022
Cutten, CA 95534	Well WCR2017-002379, Mr. John Zartarian, Client	Project 0493.00
(707) 442-6000	Topographic Well Location Map (locations approximate)	1" ≈ 2,400'



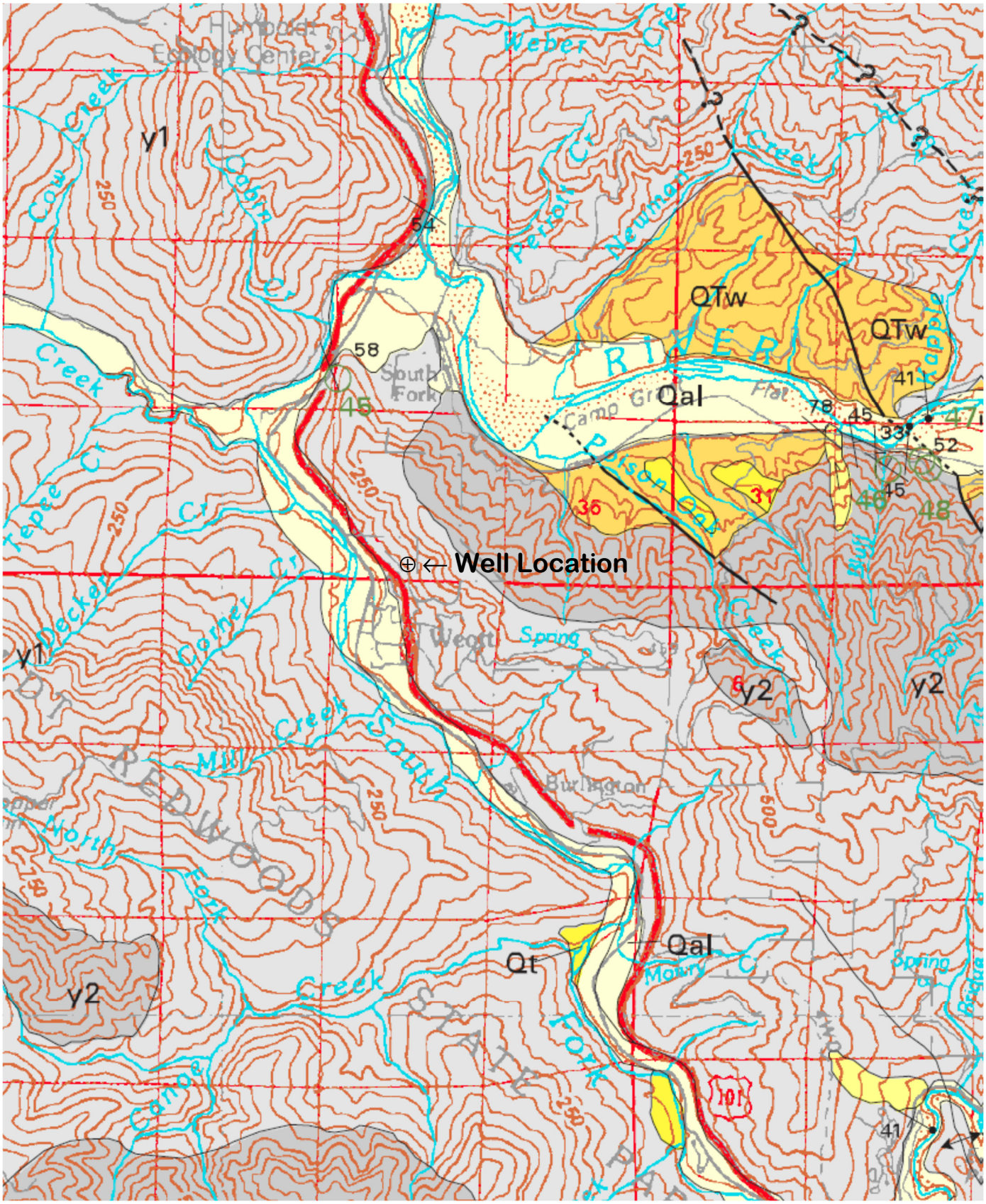
Lindberg Geologic Consulting	Engineering-Geologic Well Connectivity Assessment Report	Figure 2
Post Office Box 306	407 North Sunny Lane, Weott, California, APN 095-201-005	December 6, 2022
Cutten, CA 95534	Well WCR2017-002379, Mr. John Zartarian, Client	Project 0493.00
(707) 442-6000	Humboldt County Assessor's Parcel Map (locations approximate)	Scale as Shown



Lindberg Geologic Consulting	Engineering-Geologic Well Connectivity Assessment Report	Figure 3
Post Office Box 306	407 North Sunny Lane, Weott, California, APN 095-201-005	December 6, 2022
Cutten, CA 95534	Well WCR2017-002379, Mr. John Zartarian, Client	Project 0493.00
(707) 442-6000	Satellite Image of Well Location (locations approximate)	1" ≈ 600'

Modified from: Google Earth Imagery of April 30, 2019. N ≈

Lindberg Geologic Consulting	Engineering-Geologic Well Connectivity Assessment Report	Figure 4
Post Office Box 306	407 North Sunny Lane, Weott, California, APN 095-201-005	December 6, 2022
Cutten, CA 95534	Well WCR2017-002379, Mr. John Zartarian, Client	Project 0493.00
(707) 442-6000	Geologic Map (locations approximate)	1" ≈ 4,200'



Modified from: McLaughlin, et al., (2000) N ≅

Lindberg Geologic Consulting	Engineering-Geologic R-2 Soils Report	Figure 4a
P. O. Box 306	407 North Sunny Lane, Weott, California, APN 095-201-005	December 6, 2022
Cutten, CA 95534	Well WCR2017-002379, Mr. John Zartarian, Client	Project 0493.00
(707) 442-6000	Geologic Map Explanation	No Scale

DESCRIPTION OF MAP UNITS

QUATERNARY AND TERTIARY OVERLAP DEPOSITS

- Qal — Alluvial deposits (Holocene and late Pleistocene?)
- Qm — Undeformed marine shoreline and aolian deposits (Holocene and late Pleistocene)
- Qt — Undifferentiated nonmarine terrace deposits (Holocene and Pleistocene)
- Qls — Landslide deposits (Holocene and Pleistocene)
- QTog — Older alluvium (Pleistocene and [or] Pliocene)
- QTw — Marine and nonmarine overlap deposits (late Pleistocene to middle Miocene)
- Ti — Volcanic rocks of Fickle Hill (Oligocene)

COAST RANGES PROVINCE

FRANCISCAN COMPLEX

-- Coastal Belt --

Coastal terrane(Pliocene to Late Cretaceous)

Sedimentary, igneous, and metamorphic rocks of the Coastal terrane (Pliocene to Late Cretaceous):

- co1 — Melange
- co2 — Melange
- co3 — Broken sandstone and argillite
- co4 — Intact sandstone and argillite
- cob — Basaltic Rocks (Late Cretaceous)
- cols — Limestone (Late Cretaceous)
- m — Undivided blueschist (Jurassic?)

King Range terrane (Miocene to Late Cretaceous)

- Krp — Igneous and sedimentary rocks of Point Delgada (Late Cretaceous)
- m — Undivided blueschist blocks (Jurassic?)

Sandstone and argillite of King Peak (middle Miocene to Paleocene[?]):

- krk1 — Melange and (or) folded argillite
- krk2 — Highly folded broken formation
- krk3 — Highly folded, largely unbroken rocks
- krl — Limestone
- krc — Chert
- krb — Basalt

False Cape terrane (Miocene? to Oligocene?)

- fc — Sedimentary rocks of the False Cape terrane (Miocene? to Oligocene?)

Yager terrane (Eocene to Paleocene?)

Sedimentary rocks of the Yager terrane (Eocene to Paleocene?):

- y1 — Sheared and highly folded mudstone
- y2 — Highly folded broken mudstone, sandstone, and conglomeratic sandstone
- y3 — Highly folded, little-broken sandstone, conglomerate, and mudstone
- Ycgl — Conglomerate

-- Central belt --

Melange of the Central belt (early Tertiary to Late Cretaceous):

Unnamed Metasandstone and meta-argillite (Late Cretaceous to Late Jurassic):

- cm1 — Melange
- cm2 — Melange
- cb1 — Broken formation
- cb2 — Broken formation
- cwr — White Rock metasandstone of Jayko and others (1989) (Paleogene and [or] Late Cretaceous)
- chr — Haman Ridge graywacke of Jayko and others (1989) (Cretaceous?)
- cfs — Fort Seward metasandstone (age unknown)
- cls — Limestone (Late to Early Cretaceous)
- cc — Chert (Late Cretaceous to Early Jurassic)
- bs — Basaltic rocks (Cretaceous and Jurassic)
- m — Undivided blueschist blocks (Jurassic?)
- gs — Greenstone
- c — Metachert
- yb — Metasandstone of Yolla Bolly terrane, undivided
- b — Melange block, lithology unknown

-- Eastern Belt --

Pickett Peak terrane (Early Cretaceous or older)

Metasedimentary and metavolcanic rocks of the Pickett Peak terrane (Early Cretaceous or older):

- ppsm — South Fork Mountain Schist
- mb — Chinquapin Metabasalt Member (Irwin and others, 1974)
- ppv — Valentine Springs Formation
- mv — Metabasalt and minor metachert

Yolla Bolly terrane (Early Cretaceous to Middle Jurassic?)

Metasedimentary and metaigneous rocks of the Yolla Bolly terrane (Early Cretaceous to Middle Jurassic?):

- ybt — Taliaferro Metamorphic Complex of Suppe and Armstrong (1972) (Early Cretaceous to Middle Jurassic?)
- ybc — Chicago Rock melange of Blake and Jayko (1983) (Early Cretaceous to Middle Jurassic)
- gs — Greenstone
- c — Metachert
- ybh — Metagraywacke of Hammerhorn Ridge (Late Jurassic to Middle Jurassic)
- c — Metachert
- gs — Greenstone
- sp — Serpentinite
- ybd — Devils Hole Ridge broken formation of Blake and Jayko (1983) (Early Cretaceous to Middle Jurassic)
- c — Radiolarian chert
- ybi — Little Indian Valley argillite of McLaughlin and Ohlin (1984) (Early Cretaceous to Late Jurassic)

Yolla Bolly terrane

- yb — Rocks of the Yolla Bolly terrane, undivided

GREAT VALLEY SEQUENCE AND COAST RANGE OPHIOLITE

Elder Creek(?) terrane

- ecms — Mudstone (Early Cretaceous)

Coast Range ophiolite (Middle and Late Jurassic):

- ecg — Layered gabbro
- ecsp — Serpentinite melange

Del Puerto(?) terrane

Rocks of the Del Puerto(?) terrane:

- dpms — Mudstone (Late Jurassic)

Coast Range ophiolite (Middle and Late Jurassic):

- dpt — Tuffaceous chert (Late Jurassic)
- dpb — Basaltic flows and keratophyric tuff (Jurassic?)
- dpd — Diabase (Jurassic?)
- dpsp — Serpentinite melange (Jurassic?)
- sp — Undivided Serpentinized peridotite (Jurassic?)

KLAMATH MOUNTAINS PROVINCE

Undivided Great Valley Sequence:

- Ks — Sedimentary rocks (Lower Cretaceous)

GREAT VALLEY SEQUENCE OVERLAP ASSEMBLAGE

Hayfork terrane

Eastern Hayfork subterrane:

- eh — Melange and broken formation (early? Middle Jurassic)
- ehls — Limestone
- ehsp — Serpentinite

Western Hayfork subterrane:

- whu — Hayfork Bally Meta-andesite of Irwin (1985), undivided (Middle Jurassic)
- whwg — Wildwood (Chanchelulla Peak of Wright and Fahan, 1988) pluton (Middle Jurassic)
- whwp — Clinopyroxenite
- whji — Diorite and gabbro plutons (Middle? Jurassic)

Rattlesnake Creek terrane

- rcm — Melange (Jurassic and older)
- rcls — Limestone
- rcc — Radiolarian chert
- rcis — Volcanic Rocks (Jurassic or Triassic)
- rcic — Intrusive complex (Early Jurassic or Late Triassic)
- rcp — Plutonic rocks (Early Jurassic or Late Triassic)
- rcum — Ultramafic rocks (age uncertain)
- rcpd — Blocky peridotite

Western Klamath terrane

Smith River subterrane:

- srs — Galice? formation (Late Jurassic)
- srv — Pyroclastic andesite
- srgb — Glen Creek gabbro-ultramafic complex of Irwin and others (1974)
- srpd — Serpentinized peridotite

MAP SYMBOLS

- Contact
- Fault
- Thrust fault
- Trace of the San Andreas fault associated with 1906 earthquake rupture

Strike and dip of bedding:

- Inclined
- Vertical
- Horizontal
- Overturned
- Approximate
- Joint
- Strike and dip of cleavage

Shear foliation:

- Inclined
- Vertical

Folds:

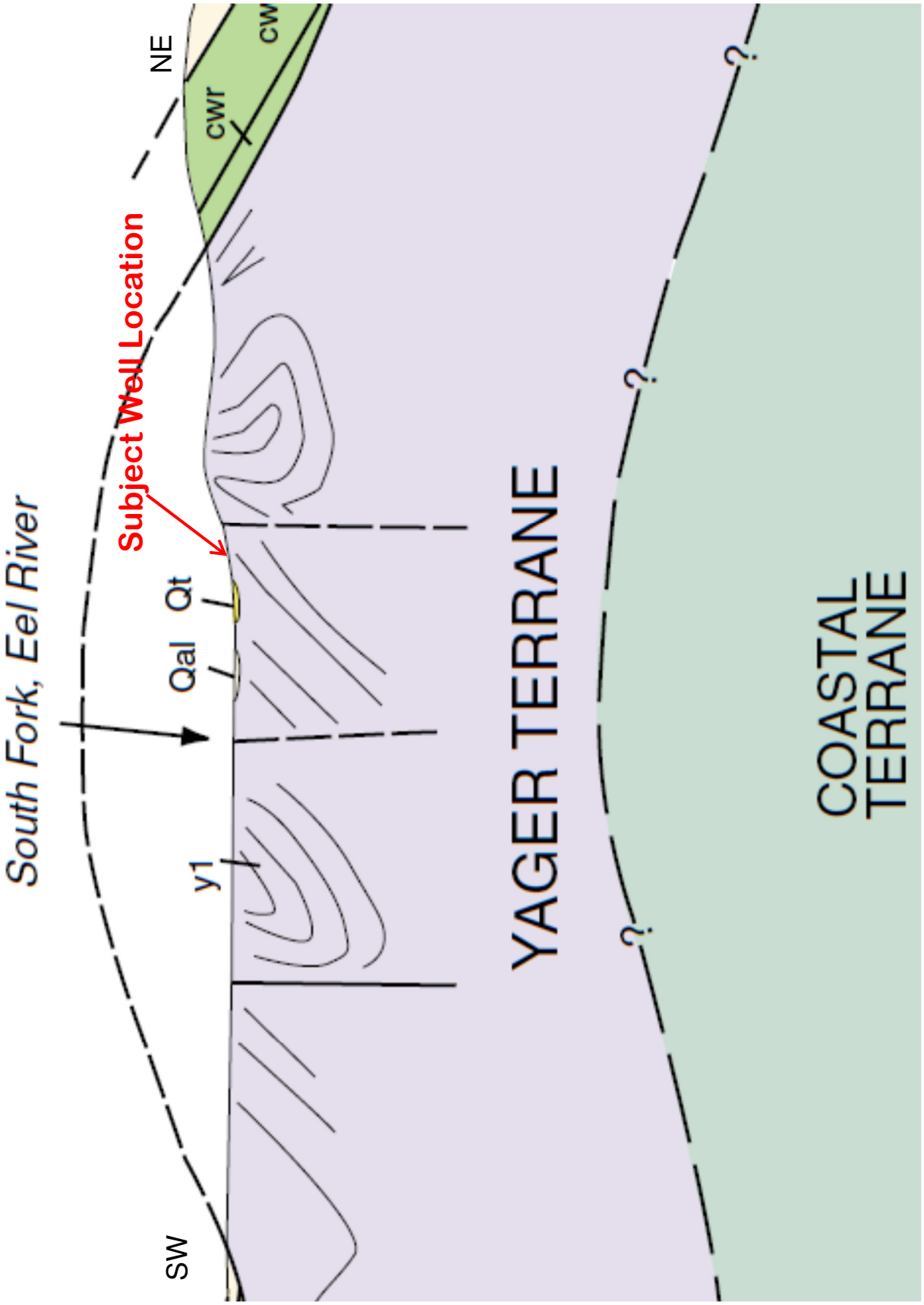
- Synclinal or synformal axis
- Anticlinal or antiformal axis
- Overturned syncline
- Landslide (Qls)

Melange Blocks:

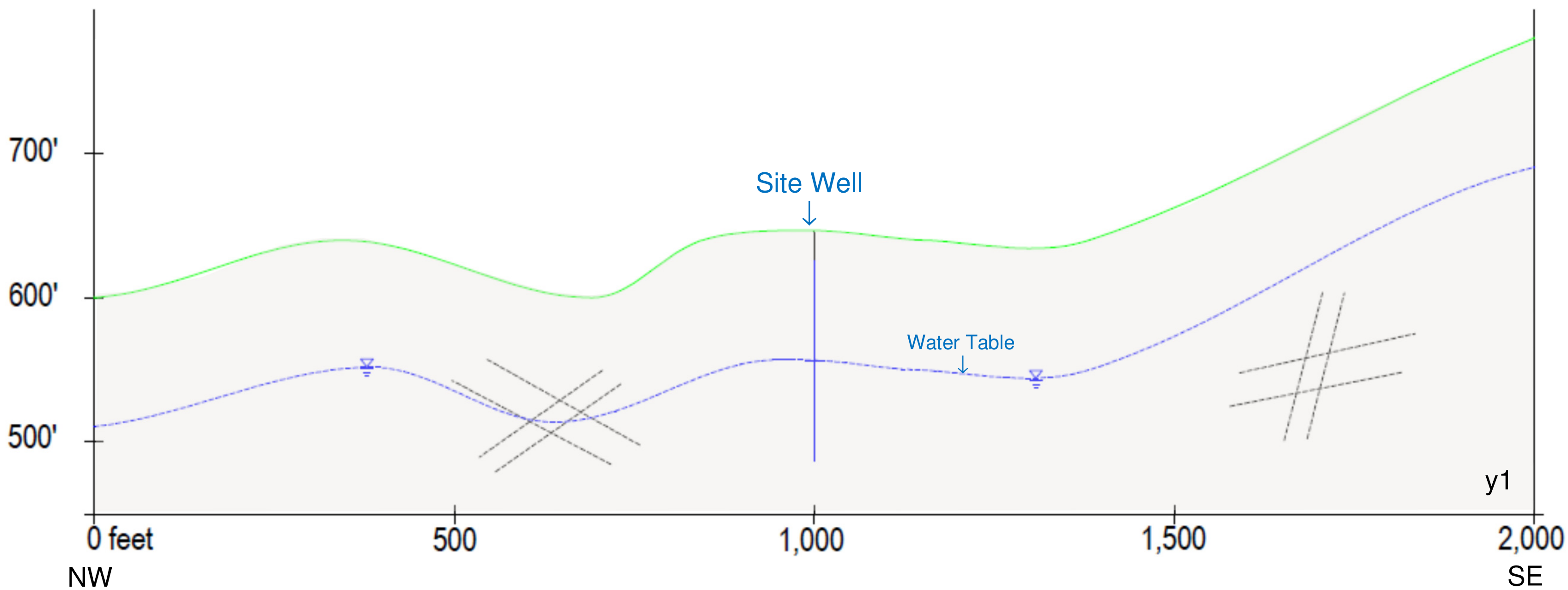
- Serpentinite
- Chert
- Blueschist
- Greenstone
- Fossil locality and number

GEOLOGY OF THE CAPE MENDOCINO, EUREKA, GARBERVILLE, AND SOUTHWESTERN PART OF THE HAYFORK 30 X 60 MINUTE QUADRANGLES AND ADJACENT OFFSHORE AREA, NORTHERN CALIFORNIA (McLaughlin et al., 2000)

Lindberg Geologic Consulting	Engineering-Geologic Well Connectivity Assessment Report	Figure 5
Post Office Box 306	407 North Sunny Lane, Weott, California, APN 095-201-005	December 6, 2022
Cutten, CA 95534	Well WCR2017-002379, Mr. John Zartarian, Client	Project 0493.00
(707) 442-6000	Generalized Geologic Cross Section (locations approximate)	Not To Scale



Lindberg Geologic Consulting	Engineering-Geologic Well Connectivity Assessment Report	Figure 6
Post Office Box 306	407 North Sunny Lane, Weott, California, APN 095-201-005	December 6, 2022
Cutten, CA 95534	Well WCR2017-002379, Mr. John Zartarian, Client	Project 0493.00
(707) 442-6000	Hydrogeologic Cross Section (locations approximate)	V.E. = 2X



In this vertically exaggerated (~2x) cross section, the view is looking to the northeast toward Mail Ridge. Groundwater flow in this cross section is southwesterly, toward from the viewer, or out of the page. Groundwater is presumed to flow from recharge areas in the higher ground to the northeast. This well is sited on a valley wall slope above South Fork Eel River. Subgrade is composed of interbedded sandstone and argillite of the Yager Terrane (y1). Bedrock subgrade was mapped by McLaughlin, et al., (2000). The Yager Terrane is a component of the Coastal Belt Franciscan Complex. Groundwater is envisioned to flow through fractured metasandstone in the Yager Terrane. Fractures in the interbedded metasandstone and argillite, plus sandstone's inherent porosity, are interpreted to be the primary permeability, providing preferential flow paths for the local groundwater. The driller noted that first water occurred 60 feet below the surface. Static water occurred 90 feet below the surface. This well is apparently cased, and sealed with bentonite to 130 below the surface, with open borehole from 130 feet to 160 feet where this well draws groundwater.

Lindberg Geologic Consulting	Engineering-Geologic Well Connectivity Assessment Report	Figure 7
Post Office Box 306	407 North Sunny Lane, Weott, California, APN 095-201-005	December 6, 2022
Cutten, CA 95534	Well WCR2017-002379, Mr. John Zartarian, Client	Project 0493.00
(707) 442-6000	USDA – NRCS Soil Map (locations approximate)	Scale Not Determined

Modified from: USGS-NRCS Web Soil Survey, December 6, 2022 N ≈

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR JUL 03 2017

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. xxxxxxx e0347153

Page 1 of 1

Owner's Well Number

Date Work Began 06/17/17 Date Work Ended 06/27/17

Local Permit Agency Humboldt County Division of Environmental Health

Permit Number 16/17-1/27 Permit Date 05/15/17

DWR Use Only – Do Not Fill In

State Well Number/Site Number: 01S/02E-35

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ○ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0	15	BROWN ROCK
15	25	BROWN SILT
25	30	BROWN CLAY
30	35	GREY SHELL
35	40	BROWN SHEL/ROCK
40	45	CLAY/BROWN ROCK
45	50	GREY SHELL
50	55	BROWN SHELL/ROCK
55	60	BROWN SHELL/ROCK
60	120	GREY SHELL
120	135	WHITE ROCK
135	160	GREY/BLACK SHELL

Total Depth of Boring 160 Feet

Total Depth of Completed Well 160 Feet

Well Owner

Well Location

Address 407 N. SUNNY LANE

City WEOTT County Humboldt

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

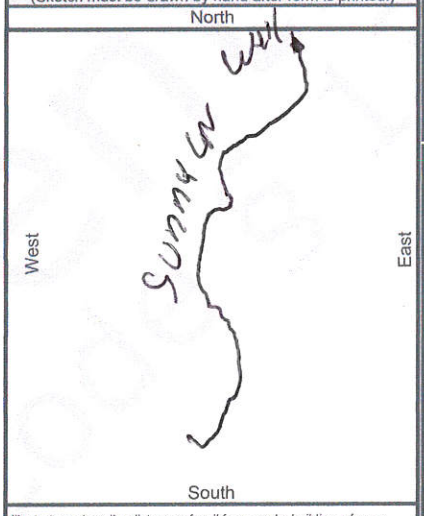
Datum Dec. Lat. Dec. Long.

APN Book 095 Page 201 Parcel 005

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

- ◉ New Well
- ○ Modification/Repair
  - ○ Deepen
  - ○ Other
- ○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

- ○ Water Supply
  - ☐ Domestic ☐ Public
  - ☐ Irrigation ☐ Industrial
- ○ Cathodic Protection
- ○ Dewatering
- ○ Heat Exchange
- ○ Injection
- ○ Monitoring
- ○ Remediation
- ○ Sparging
- ○ Test Well
- ○ Vapor Extraction
- ○ Other

Water Level and Yield of Completed Well

Depth to first water 60' (Feet below surface)

Depth to Static Water Level 90' (Feet) Date Measured 06/26/17

Estimated Yield * 4 (GPM) Test Type Air Lift

Test Length 4.0 (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
	20	6"		Low Carbon Steel	1/4"	6 5/8"		

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
	130	Bentonite	Bentonite Chips

Attachments

- ☐ Geologic Log
- ☐ Well Construction Diagram
- ☐ Geophysical Log(s)
- ☐ Soil/Water Chemical Analyses
- ☐ Other

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name 3D Drilling (Person, Firm or Corporation)

P.O. Box 1285 (Address) Rock Springs (City) WY (State) 82902 (Zip)

Signed (C-57 Licensed Water Well Contractor) Date Signed

10015033 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Humboldt County, South Part, California

513—Redwoodhouse-Yagercreek-Mailridge complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: vykb
Elevation: 200 to 3,770 feet
Mean annual precipitation: 40 to 85 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Redwoodhouse and similar soils: 50 percent
Yagercreek and similar soils: 30 percent
Mailridge and similar soils: 15 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Redwoodhouse

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium and residuum derived from interbedded sandstone and mudstone

Typical profile

A - 0 to 6 inches: loam
ABt - 6 to 13 inches: silt loam
Bt1 - 13 to 24 inches: gravelly silty clay loam
Bt2 - 24 to 37 inches: gravelly silty clay loam
Bt3 - 37 to 47 inches: gravelly silty clay loam
Bt4 - 47 to 71 inches: gravelly clay loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 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 supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F004BI104CA - Fog-influenced, upper elevation mountain slopes
Hydric soil rating: No

Description of Yagercreek

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium and residuum derived from interbedded sandstone and mudstone

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 9 inches: gravelly loam
Bt1 - 9 to 21 inches: very gravelly clay loam
Bt2 - 21 to 35 inches: extremely gravelly clay loam
Bt3 - 35 to 71 inches: extremely cobbly sandy clay loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
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 supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F004BI104CA - Fog-influenced, upper elevation mountain slopes
Hydric soil rating: No

Description of Mailridge

Setting

Landform: Mountain slopes

Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium and residuum derived from interbedded sandstone and mudstone

Typical profile

A - 0 to 7 inches: gravelly loam
Bt1 - 7 to 14 inches: gravelly clay loam
Bt2 - 14 to 47 inches: very gravelly clay loam
C - 47 to 61 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
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 supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F004BI104CA - Fog-influenced, upper elevation mountain slopes
Hydric soil rating: No

Minor Components

Mountbaldy

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Center third of mountainflank
Down-slope shape: Convex
Across-slope shape: Convex

Hydric soil rating: No

Data Source Information

Soil Survey Area: Humboldt County, South Part, California
Survey Area Data: Version 12, Sep 2, 2022