LINDBERG GEOLOGIC CONSULTING
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Post Office Box 306
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May 18, 2022 Project No: 0457.00

Ms. April Armstrong
Post Office Box 2140
McKinleyville, California 95519

Subject: Hydrologic Isolation of Existing Well from Surface Waters, 30000 State Highway 299, Berry Summit Area, APN: 316-086-017, WCR e0151530, 11/12-0415

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. Creeks in the vicinity of this well drain to Redwood Creek (Figure 1). A California-Certified Engineering Geologist visited this site on April 11, 2022, to observe the subject well and local site conditions. Based on our professional experience, our observations, and research, 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 wetlands and or surface waters in the vicinity. We understand that water from this well will be utilized to irrigate cannabis. We are not aware of the volume of water to be extracted or what the pumping schedule might be but expect that the applicant can supply that information.

This well was drilled by Fisch Drilling Inc. of Hydesville, California, in May, 2015, under county permit #14/15-0562. Fisch Well Drilling is a licensed well-drilling contractor (C-57 #683865). Fisch Well Drilling submitted the well completion report (DWR 188) on May 8, 2012 (attached). Fisch Well Drilling estimated the yield of this well at 5 gallons per minute on May 1, 2012. Based on a four-hour air lift pump test, the total drawdown was reported to be 210 feet. The well location is shown approximately on Figures 1 and 3.

Borehole diameter was reported by the driller as 10-inches. Total drilled depth is 220 feet. A bentonite sanitary surface seal was installed from grade to 20 feet below the ground surface (bgs). From the surface to the total depth, the well was constructed of 5-inch diameter, CL200 Schedule 80 PVC pipe. From 20 feet bgs to the total completed total depth of 220 feet bgs, the annulus was backfilled with 3/8-inch pea gravel. The well is cased and sealed through any potential shallow subsurface aquifers and is screened (0.032” milled slots) from 20 to 220 feet. Depth to first water was reported to be 100 feet below grade. Depth to static water in the completed and developed well was also reported as 100 feet bgs when the driller conducted the pump test on May 1, 2012.

By our estimation, this parcel 316-086-017 (Figure 2) encompasses approximately 43 acres. Based on our on-site GPS measurements, the subject well is located approximately at latitude 40.90988° north, and longitude 123.78982° west (±9'), in Section 13, T6N, R3E, HB&M (Figures 1 and 2).

Based on the Humboldt County WebGIS mapping, this well is more than 1,400 feet from the nearest mapped surface waters, an ephemeral tributary of Redwood Creek (Figure 1). Based on interpolation from the 1973 USGS Lord-Ellis Summit topographic quadrangle map (Figure 1), and the Humboldt County WebGIS, well elevation is approximately 2,200 feet above sea level. At the nearest point to this well, the elevation of the ephemeral tributary of Redwood Creek is approximately 2,000 feet. The elevation of the bottom of the well is approximately 1,990 feet which is only slightly lower than the elevation of the ephemeral tributary of Redwood Creek, at its nearest point, on the Humboldt County WebGIS map.

No springs are mapped on Section 13. In the adjacent, surrounding sections, there is only one spring mapped on the USGS Lord-Ellis Summit topographic quadrangle map, and that spring is in the southwest corner of Section 19 (Figure 1). From the well, the nearest mapped spring appears to be at least two miles south-southeast south, at an elevation approximately of approximately 2,780 feet, or 580 feet higher than the subject well. We observed no other springs mapped in Section 13, nor in any of the sections contiguous to Section 13.

On the geologic map (Figure 4) by Falls and Hardin (2005), the subject property is mapped as underlain by the "Incoherent unit of Coyote Creek (KJfc), (Cretaceous-Jurassic), Eastern Belt Franciscan Complex: The Coyote Creek unit consists dominantly of a fine-grained sandstone and shale assemblage that has been pervasively sheared into a mélange by tectonic processes. The Coyote Creek unit is further characterized by the presence of greenstone, chert and minor conglomerate. Greenstone blocks are found as "floaters" in pervasively sheared mudstone matrix. Soils developing on the bedrock are typically clay rich and highly susceptible to erosion and sliding. Areas dominated by mélange generally form rounded hilltops with gentle slopes and poorly developed side hill drainages. Sharp-crested ridges with moderately steep slopes and well-defined drainage systems tend to develop where the upper edges of earthflow complexes meet. Intact tectonic blocks (usually sandstone) within the Coyote Creek Unit stand out from the surrounding landscape as steep-sided, rocky knobs that tend to be elongated in a northwest-southeast direction parallel to the structural grain. Active earthflows are the main modes of mass wasting in the mélange matrix of the Coyote Creek unit. Mélange matrix typically underlies the expansive grassland and lightly wooded areas present in the southeastern portion of the watershed. Well-developed gully networks are also common within the more active portions of these earthflow complexes.

Several large topographic amphitheaters along the west side of highway 299 appear to have formed in the Coyote Creek unit over time from the long-term episodic action of numerous earthflows. These amphitheaters do not appear to be active throughout their entirety, but rather contain areas of localized activity at any given time. Careful field reconnaissance is necessary to evaluate the relative stability of specific areas within the amphitheaters.

Such ”earthflow amphitheaters” appear to represent surfaces that have been created over time through the actions of thousands of small earthflows occurring throughout the amphitheater. This is analogous to the process that forms alluvial fans at the base of hillsides. Alluvial fans develop when watercourses exit hill-fronts and migrate back and forth across valley floors, depositing sediment as they go. The eventual result is a broad cone of sediment with its apex at the base of the hill-front. “Earthflow amphitheaters” form over time by material being removed from the system by earthflow activity, resulting in a broad, bowl-like slope.”

Materials on the geologic log of the driller’s well completion report (attached) include one foot of “Top Soil” over 62 feet of “Weathered Siltstone Brown”. From the depth of 63 to 186 feet, the driller logged “Very Fractured Sandstone Gray”. The fractured gray sandstone was in turn underlain by 34 feet (186’ – 220’) of “Shale Soft Drk Gray”. The depth to first water was 100 feet.

We interpret the “Top Soil” section of this profile from 0 to one foot, and the “Weathered Siltstone Brown” to likely be aquitard materials of low permeability and transmissivity. Materials below 63 feet, are fractured sandstone and below that, shale, We interpret the fractured sandstone (63’ – 186’) to be highly permeable, and the water-bearing aquifer material in this well. Fractured sandstone can be expected to have high transmissivity and permeability.

Below the topsoil, the earth materials encountered in the boring are likely the incoherent unit of Coyote Creek (KJfc) as mapped by Falls and Hardin (2005). The fractured sandstone materials in the KJfc may be expected to have a high hydraulic conductivity and likely constitutes a significant aquifer for the subject property. We interpret the underlying sequence of materials described by the driller (siltstone, sandstone, and shale), as lithologies within the Central Belt of the Franciscan Complex per McLaughlin et al., (2000). The sandstone is, in our interpretation, the water bearing unit in this well.

A geologic cross section of the area after McLaughlin et al., (2000) shows the structural and stratigraphic relationships between the local geologic units (Figure 5). The central belt mélange unit cm1 is shown bounded by fault planes. On-site, no dip of the rock units could be observed in the mélange because it was mantled with soil and hillslope colluvium, and heavily vegetated. We interpret the faults to be hydrologic boundaries of low permeability (due to grinding and shearing along the fault planes) which effectively separate portions of the central belt Franciscan units (incoherent unit of Coyote Creek (KJfc), per Falls and Hardin, 2005) from surrounding units, and limit groundwater flow between these fault-bound units.

In our professional opinion, based on our experience, observations, and review of pertinent and available information, this well has a low potential of having any direct connection to surface waters. First water was encountered at 100 feet. This well is sealed through the upper 20 feet of any potential unconfined, near-surface aquifers with which it might communicate hydraulically through the borehole because the bentonite-sealed surface casing isolates the topsoil, and much of the weathered siltstone brown material from the deeper fractured sandstone aquifer. When

considered with the stratigraphy and the geologic structure, the distances (horizontally and vertically) from the nearest surface waters, depth of the producing zone of this well (~100 to 186 feet, in fractured sandstone), as well as its position relative to the nearest adjacent watercourses, it is our conclusion that the depth of the surface seal is sufficient to preclude the potential for hydraulic connectivity with surface waters, of which there are none closer than 1,400 feet. Thus, the water source from which this well draws appears to be a confined subsurface fractured bedrock aquifer not hydrologically connected to any surface waters. This well appears, in our professional opinion, to be hydraulically isolated from all nearby wells, surface waters, springs or wetlands.

In our professional opinion, it appears that the aquifer tapped by the subject well is recharged by water infiltrating from source areas proximal and distal to the well site. Areas surrounding, and east of this well are the likely source for recharging the local aquifers. As noted, the "Water Level and Yield of Completed Well" section of the Well Completion Report estimated the yield of this well at 5 gallons per minute (gpm) on May 1, 2012, with 210 feet of drawdown, after Fisch Drilling's four-hour air-lift pump test. At a rate of 5 gpm, this well could potentially produce 7,200 gallons per day. As noted on the well completion report, this capacity may not be representative of this well's long-term yield.

In our opinion the subject well does not appear to be hydrologically connected to, or capable of influencing surface water flows in the nearest tributary, the nearest ephemeral tributary of the Redwood Creek, nor does this well appear to have any potential to be hydrologically connected to the nearest mapped spring or any ephemeral wetlands. Given the horizontal distances involved, the elevation difference between the apparent water-producing zone in the subject well, and the surface waters of the nearest watercourse, the potential for hydrologic connectivity between surface waters and groundwater in this deep bedrock aquifer appears to be low. Further, given the apparently limiting condition of 63 feet of low-transmissivity materials above the permeable fractured sandstone unit, the water-producing zone is considered hydrologically isolated from, and not demonstrably connected to any other aquifer(s) in the surrounding incoherent unit of Coyote Creek (KJfc) materials (cm1 central belt Franciscan deposits).

On the Lord-Ellis Summit USGS topographic quadrangle map, as mentioned, the nearest mapped spring is shown approximately two miles to the south-southeast at an elevation approximately 580 feet higher than the subject well, and no closer than 1,400 feet (Figure 1) in Section 32. This spring is the nearest mapped spring to the subject well and is at an elevation higher than the wellhead at 3,160 feet. There do not appear to be any other mapped natural springs or wetlands within a mile of this subject well.

We researched the California Department of Water Resources (DWR) database to determine if there are other wells within 1,000 feet of the subject well on our client's property. There are no other wells within 1,000 feet of the well on subject parcel 316-086-017. In Section 13 (T6N, R3E), we found three other wells in the Department of Water Resources (DWR) database; well

completion reports are attached. On APN 316-086-020 there is an irrigation well (WCR2016-006472) which was drilled in September 2016. Well WCR2016-006472 is more than 3,600 feet east-southeast of the subject well and is 220 feet deep. The other wells in Section 13 are also more than 1,000 feet from the subject well. On parcel 316-086-019, more than 1,800 feet to the southeast, there are two irrigation wells, a 200-foot deep well (WRC2020-015011) which was drilled in October 2020. Also, on parcel 316-086-019, well WCR 2018-008884, drilled in September 2014, is 100 feet deep. Both wells on APN 316-086-019 are more than 1,800 feet from the subject well on APN 316-086-017.

The USDA Natural Resources Conservation Service's, online Web Soil Survey, shows the subject well to be located within the Yorknorth-Witherell soil complex (#662, Figure 6), which is characterized as moderately well drained. The Web Soil Survey Unit description of the Yorknorth-Witherell soil complex is attached to this report. Mean annual precipitation in the area is listed by the USDA-NRCS as 49 to 90 inches per year. Capacity of the most limiting layer to transmit water (Ksat) is described as moderately low to moderately high (0.06 to 0.20 in/hr). Assuming ten percent of 49 inches of precipitation is absorbed by the soils and does not flow across the ground surface to local watercourses as runoff, then approximately 17.6 acre-feet, or 5.7 million gallons of water per year may be expected to recharge the local aquifer below this 43-acre subject property.

On the 28th of March, 2022, our governor issued an executive order (N-7-22) relating to the ongoing drought which California is presently experiencing. In his executive order, the governor outlined several measures the state will undertake to avoid and ameliorate the negative impacts of the current drought. Among these measures, it was ordered that counties, cities, and other public agencies are 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*". Your well on parcel 316-086-017 is not within a basin subject to this Act, and there has been no Groundwater Sustainability Agency established with authority over the area where your permitted well is located.

Further, Order N-7-22 states that counties, cities, and other public agencies are prohibited from issuing permits for new groundwater wells (or alteration of existing wells) "*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, and that cited in the preceding paragraph, are not applicable to "*wells that provide less than two acre-feet* (651,702 gallons) *per year of groundwater for individual domestic users, or that will exclusively provide groundwater to public water supply systems*."

Based on our professional experience, observations, and research, it is our opinion the well on parcel 316-086-017 has a minimal likelihood of being hydrologically connected to nearby surface waters or wells in any manner that might affect adjacent springs, wetlands, wells, and or surface waters in the vicinity. In our opinion, your well is not likely to interfere with the production and functioning of existing nearby wells and is not likely to cause subsidence that would adversely impact or damage nearby infrastructure.

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

Sincerely,

David N. Lindberg, CEG
Lindberg Geologic Consulting

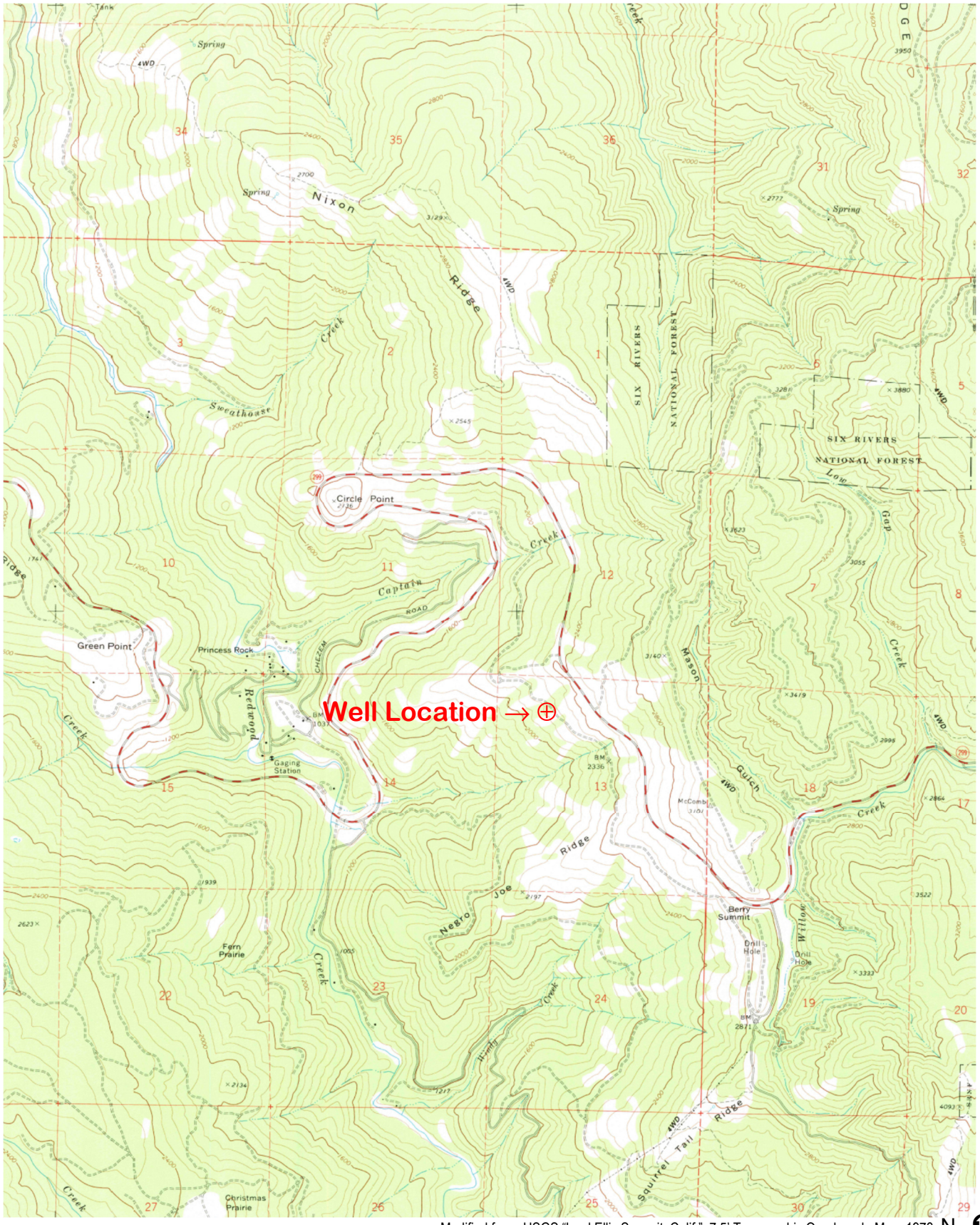
DNL:sll

Attachments:
Figure 1: Topographic Well Location Map
Figure 2: Humboldt County Assessor's Parcel Map
Figure 3: Satellite Image of Well Site Location
Figure 4: Geologic Map
Figure 4a: Geologic Map Explanation
Figure 5: Representative Geologic Cross Section
Figure 5a: Geologic Cross Section Explanation
Figure 6: USDA NRCS Soil Map

State of California Well Completion Reports:
Subject Well: WCR: #e0151530
Well on APN 316-086-020: WCR2016-006472
Well on APN 316-186-019: WCR2020-015011
Well on APN 316-186-019: WCR2018-008884

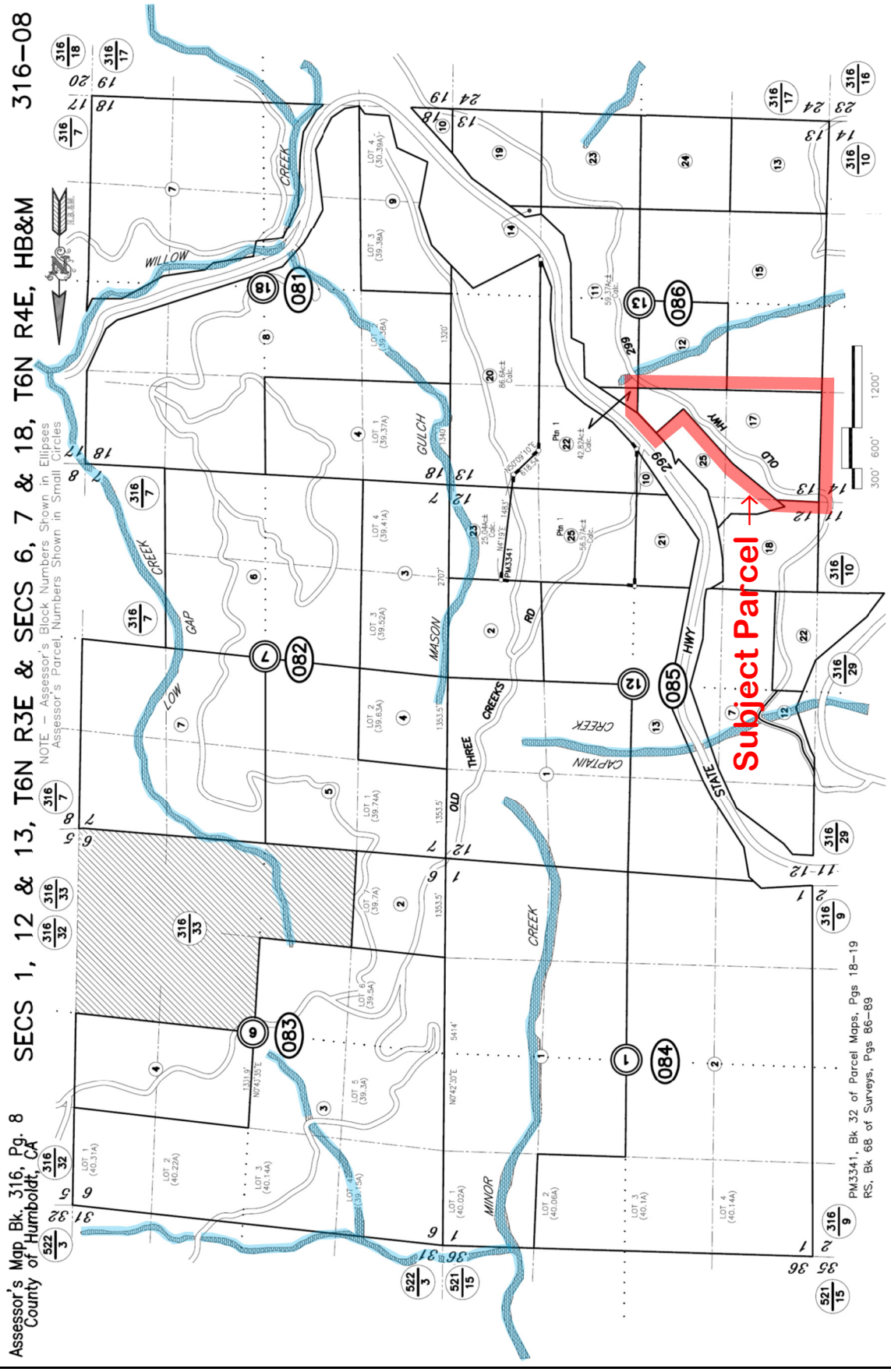
Web Soil Survey, USDA-NRCS Unit Description:
Yorknorth-Witherell complex, 30 to 50 percent slopes.

Lindberg Geologic Consulting	Engineering-Geologic Hydrogeologic Well Isolation Report	Figure 1
Post Office Box 306	30000 State Highway 299, Blue Lake, Humboldt County	May 18, 2022
Cutten, CA 95534	APN: 316-086-017, Ms. April Armstrong, Client	Project 0457.00
(707) 442-6000	Topographic Well Location Map (locations approximate)	1" ≈ 3400'

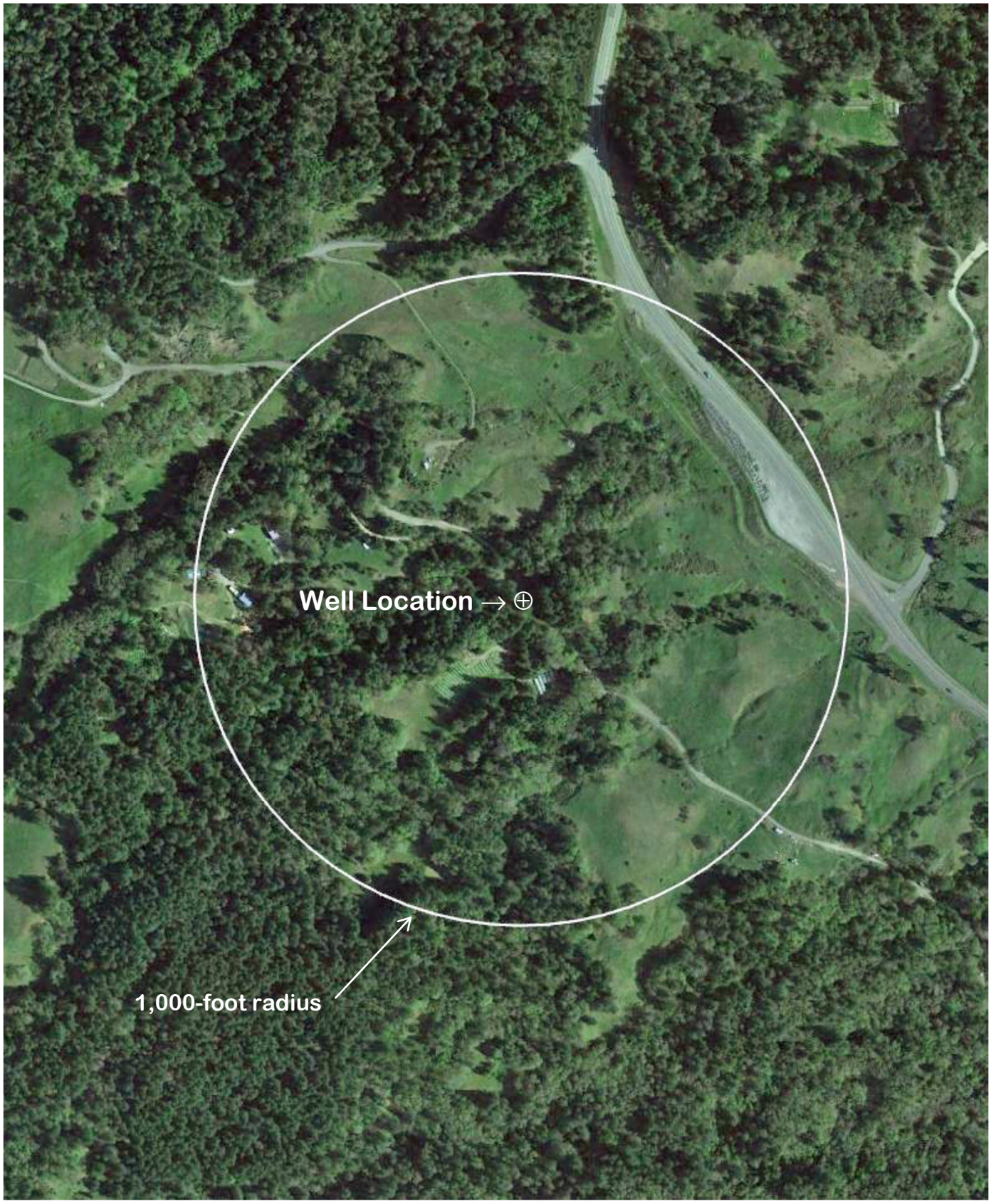


Modified from: USGS "Lord Ellis Summit, Calif.", 7.5' Topographic Quadrangle Map, 1973. N ≈

Lindberg Geologic Consulting	Engineering-Geologic Hydrogeologic Well Isolation Report	Figure 2
Post Office Box 306	30000 State Highway 299, Blue Lake, Humboldt County	May 18, 2022
Cutten, CA 95534	APN: 316-086-017, Ms. April Armstrong, Client	Project 0457.00
(707) 442-6000	Humboldt County Assessor's Parcel Map (locations approximate)	Scale as Noted

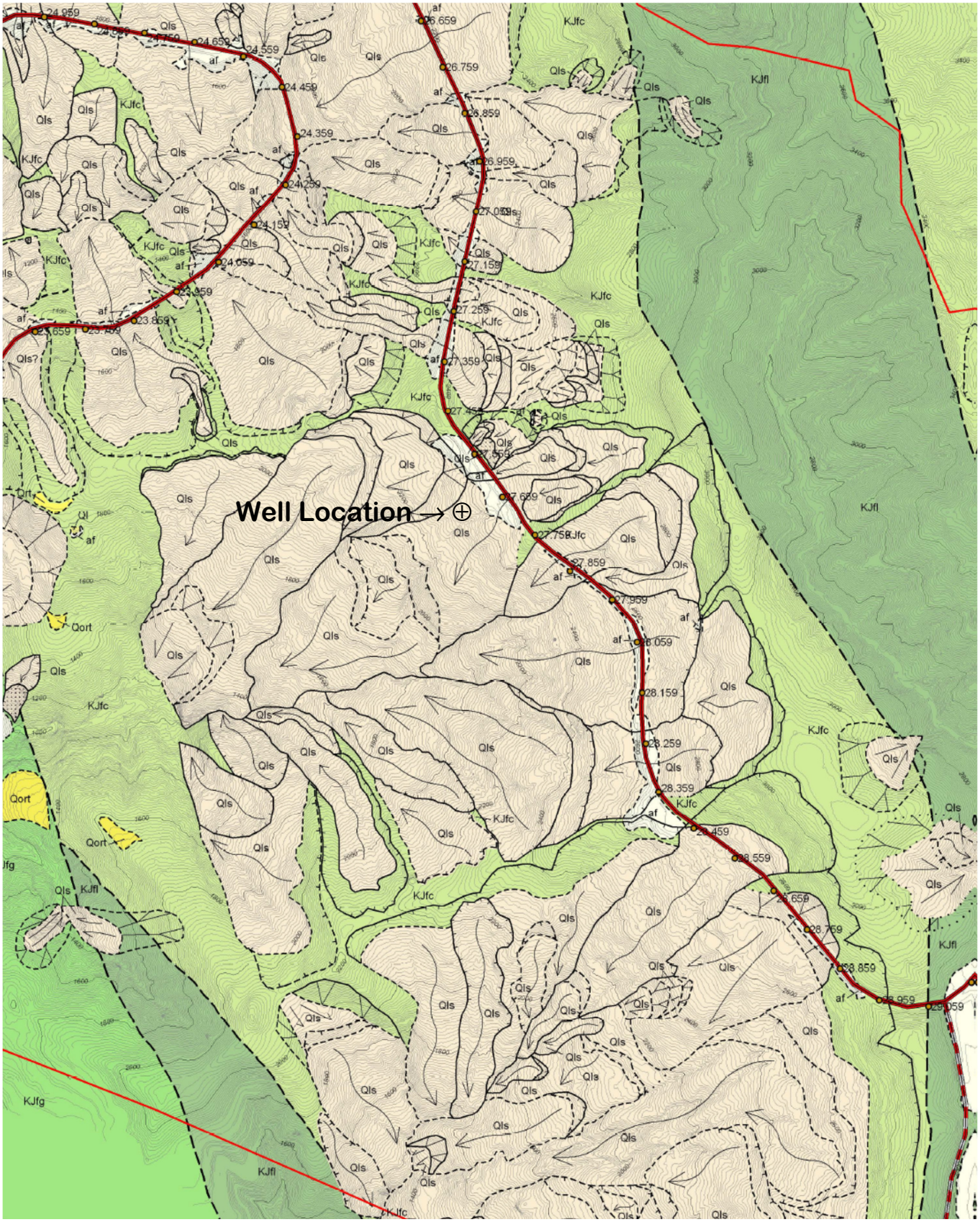


Lindberg Geologic Consulting	Engineering-Geologic Hydrogeologic Well Isolation Report	Figure 3
Post Office Box 306	30000 State Highway 299, Blue Lake, Humboldt County	May 18, 2022
Cutten, CA 95534	APN: 316-086-017, Ms. April Armstrong, Client	Project 0457.00
(707) 442-6000	Satellite Image of Well Site Location (locations approximate)	1" ≈ 210'



Modified from: Google Earth Imagery of April 21, 2019, N ≈

Lindberg Geologic Consulting	Engineering-Geologic Hydrogeologic Well Isolation Report	Figure 4
Post Office Box 306	30000 State Highway 299, Blue Lake, Humboldt County	May 18, 2022
Cutten, CA 95534	APN: 316-086-017, Ms. April Armstrong, Client	Project 0457.00
(707) 442-6000	Geologic Map (locations approximate)	1" ≈ 1,400'



GEOLOGIC MAP OF THE HIGHWAY 299 CORRIDOR HUMBOLDT COUNTY, CALIFORNIA. BLUE LAKE TO WILLOW CREEK. (James N. Falls, CEG and Burt Hardin, CEG, 2005) N ≈

Lindberg Geologic Consulting	Engineering-Geologic Hydrogeologic Well Isolation Report	Figure 4a
Post Office Box 306	30000 State Highway 299, Blue Lake, Humboldt County	May 18, 2022
Cutten, CA 95534	APN: 316-086-017, Ms. April Armstrong, Client	Project 0457.00
(707) 442-6000	Geologic Map Explanation (Modified from: Falls and Hardin 2005)	No Scale

af	Artificial fill (Holocene) - Heterogeneous mixture of artificially deposited material deposited ranging from well compacted gravel, sand, silt and clay to poorly compacted sediment high in organic content.
Qf	Alluvial fan (Holocene) - Characteristic fan-cone shapes at the mouths of eroding stream canyons.
Qal	Alluvium (Holocene and Late Pleistocene?) - Undifferentiated alluvial deposits of unconsolidated sand, gravel, silt, and lesser clay.
Ql	Lacustrine deposits (Holocene) - Undifferentiated and unconsolidated lake deposits of clay, silt and fine sand.
Qoa1	River terrace deposits (Holocene) - Dominantly sand and gravel with lesser silt and clay deposited during higher stream stands over flat-lying to gently inclined platforms.
Qoa2	Undifferentiated continental and marine deposits (Holocene-Pleistocene) - Undifferentiated older river terrace deposits. Weakly consolidated, moderately to poorly sorted, gravel, sand, silty sand, silt and clay deposited in a fluvial environment and subsequently uplifted.
QTfa	Falor Formation (Pliocene-Pleistocene) - Pebbly conglomerate, sandstone and siltstone that contains abundant animal and plant remains locally. Unit was deposited in a fluvial and shallow marine environment. Contact between it and underlying units is an erosional unconformity.
KJfsc	Sandstone and mélange unit of Snow Camp Mountain (Cretaceous-Jurassic) Central Belt Franciscan Complex - This unit underlies the bulk of the NF Mad River watershed and consists of bodies of dense, intact sandstone intermixed with a pervasively sheared shale-rich mélange containing smaller blocks of metagraywacke, metachert, volcanic breccia, metabasalt, metatuff, metavolcanic rocks, greenstone and glaucophane-lawsonite blueschist. Based on aerial photograph interpretation and mapping, this material appears to be similar mechanically to the incoherent unit of Coyote Creek, but appears to be more resistant to active mass-wasting. ss = sandstone, gs = greenstone, u = undifferentiated bedrock.
KJfg	Transitional rocks of the Grogan fault zone (Cretaceous-Jurassic) Eastern Belt Franciscan Complex - Phyllitic sandstone and mudstone with minor greenstone, metaconglomerate and exotic blocks of blueschist. Metaconglomerates exhibit alignment, deformation and shattering of clasts. Grogan fault zone rocks are described as intermediate in texture and degree of metamorphism between the Redwood Creek schist and the sandstone and mudstone units (Harden and others,1982). These rocks crop out along the trace of the Grogan fault and underlie much of the inner gorge of Redwood Creek.
KJfl	Coherent unit of Lacks Creek (Cretaceous-Jurassic) Eastern Belt Franciscan Complex - This unit consists of a relatively resistant assemblage of sandstone and mudstone. Intact sections of interbedded sandstone and mudstone show rhythmic bedding and sedimentary structures characteristic of turbidites. Sandstones are composed of lithic greywacke and quartzofeldspathic greywacke (Cashman et al., 1995). Massive sandstone beds are up to 10 m thick and are typically 0.1 - 3 m thick where interbedded with mudstone.
KJfc	Incoherent unit of Coyote Creek (Cretaceous-Jurassic) Eastern Belt Franciscan Complex - This unit consists dominantly of a fine-grained sandstone and shale assemblage that has been pervasively sheared into a mélange by tectonic processes. The unit underlies the Redwood Creek basin east of the Grogan fault. The Coyote Creek unit is further characterized by the presence of greenstone, chert and minor conglomerate. Greenstone blocks are found as "floaters" in pervasively sheared mudstone matrix. Soils developing on the bedrock are typically clay rich and highly susceptible to erosion and sliding.
KJfr	Redwood Creek schist (Cretaceous-Jurassic) Eastern Belt Franciscan Complex - This unit is mostly light green to dark gray fine-grained foliated and crenulated (numerous small folds) quartz-mica schist and underlies the western half of the watershed from Lord Ellis Summit to O'Kane. The unit is distinctive because of its strongly developed platy (metamorphic) textures and high quartz/mica content. The Redwood Creek schist and South Fork Mountain Schist seen in the Willow Creek section appear nearly identical at hand-sample scale. Several other types of rocks occur within the Redwood Creek schist, including meta-sandstone, greenstone (altered basalt) and tuff. Large variations in texture, composition and degree of deformation are reportedly seen within this unit (Cashman and others, 1995). Outcrops occasionally contain minor amounts of epidote, actinolite, lawsonite and graphite.
KJfs	South Fork Mountain Schist (Cretaceous-Jurassic) Eastern Belt Franciscan Complex - The dominant rock is dark gray to green quartz-albite-muscovite-chlorite schist and has similar mineralogical characteristics to the Redwood Creek schist. Includes foliated greenstone and quartz-gneissic rocks. The surface expression is geomorphically variable. It has a well-developed foliation (platy texture), is fine-grained and typically has quartz veins oriented parallel to the foliation based on our field examination of hand specimens and outcrop exposures.
Jg	Galice Formation (Jurassic) - Very fine- to coarse-grained gray phyllitic metagraywacke. Finer portions altered to slate and phyllitic slate. Level of metamorphism generally increases westward through the unit. Numerous exposures streams show graded bedding typical of turbidite sequences. Intruded by scattered metamorphic-felsite dikes and sills. Areas underlain by slates and phyllitic slate are especially subject to slope failure.

ROCK SLIDE: Slope movement with bedrock as its primary source material. This class of failure includes rotational and translational landslides; relatively cohesive slide masses with failure planes that are deep-seated in comparison to those debris slides of similar areal extent. The slide plane is curved in a rotational slide. Movement along a planer joint or bedding surface may be referred to as translational. Complex versions with combinations of rotational heads and translational movement or earthflows downslope are common. Landslide boundary indicates confidence; solid line- definite, dashed line - probable, dotted line - questionable. indicates a scarp, arrows show direction of movement. Qls denotes deposit when present.

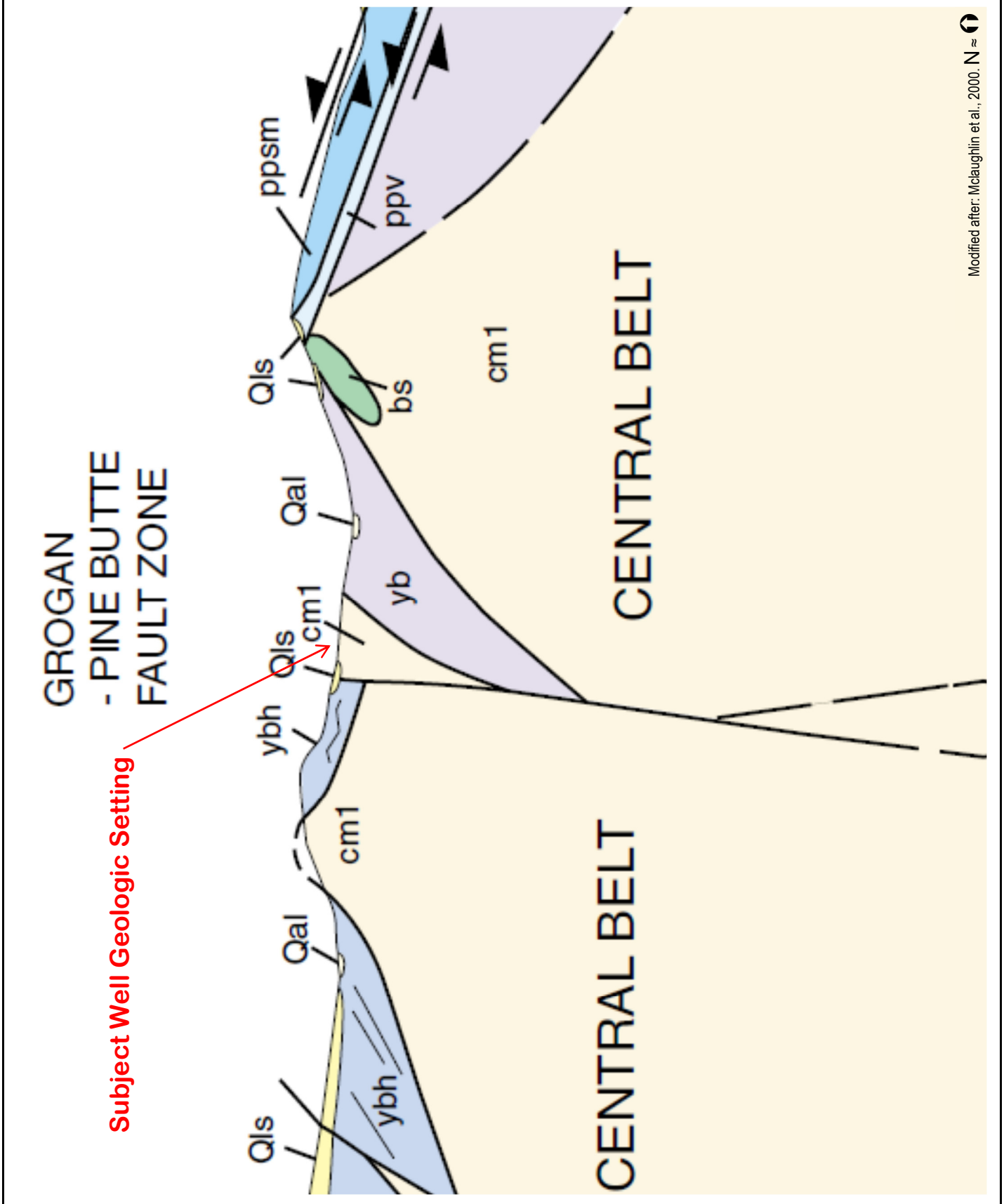
EARTHFLOW: Slow to rapid movement of mostly fine-grained soil with some rocky debris in a semi-viscous, highly plastic state. After initial failure, the mass may flow or creep seasonally in response to changes in groundwater level. These types of slope failures often include complexes of nested rotational slides and deeply incised gullies. Landslide boundary indicates confidence; solid line- definite, dashed line - probable, dotted line - questionable. indicates scarp, arrows show direction of movement. Qls denotes deposit when present.

Lithologic contact: Solid where location is certain, dashed where approximately located or inferred, dotted where concealed, and queried where continuation or existence is uncertain

Fault: Solid where location is certain, dashed where approximately located or inferred, dotted where concealed, and queried where continuation or existence is uncertain

Thrust fault: Barbs on upper plate. Solid where location is certain, dashed where approximately located or inferred, dotted where concealed, and queried where continuation or existence is uncertain

Lindberg Geologic Consulting	Engineering-Geologic Hydrogeologic Well Isolation Report	Figure 5
Post Office Box 306	30000 State Highway 299, Blue Lake, Humboldt County	May 18, 2022
Cutten, CA 95534	APN: 316-086-017, Ms. April Armstrong, Client	Project 0457.00
(707) 442-6000	Representative Geologic Cross Section with Well Location	Not to Scale



Lindberg Geologic Consulting	Engineering-Geologic Hydrogeologic Well Isolation Report	Figure 5a
P. O. Box 306	30000 State Highway 299, Blue Lake, Humboldt County	May 18, 2022
Cutten, CA 95534	APN: 316-086-017, Ms. April Armstrong, Client	Project 0457.00
(707) 442-6000	Geologic Cross Section 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 (10/20)
- Vertical
- Horizontal
- Overturned (10/20)
- Approximate (20)
- Joint (10)
- Strike and dip of cleavage (10)

Shear foliation:

- Inclined (10)
- Vertical

Folds:

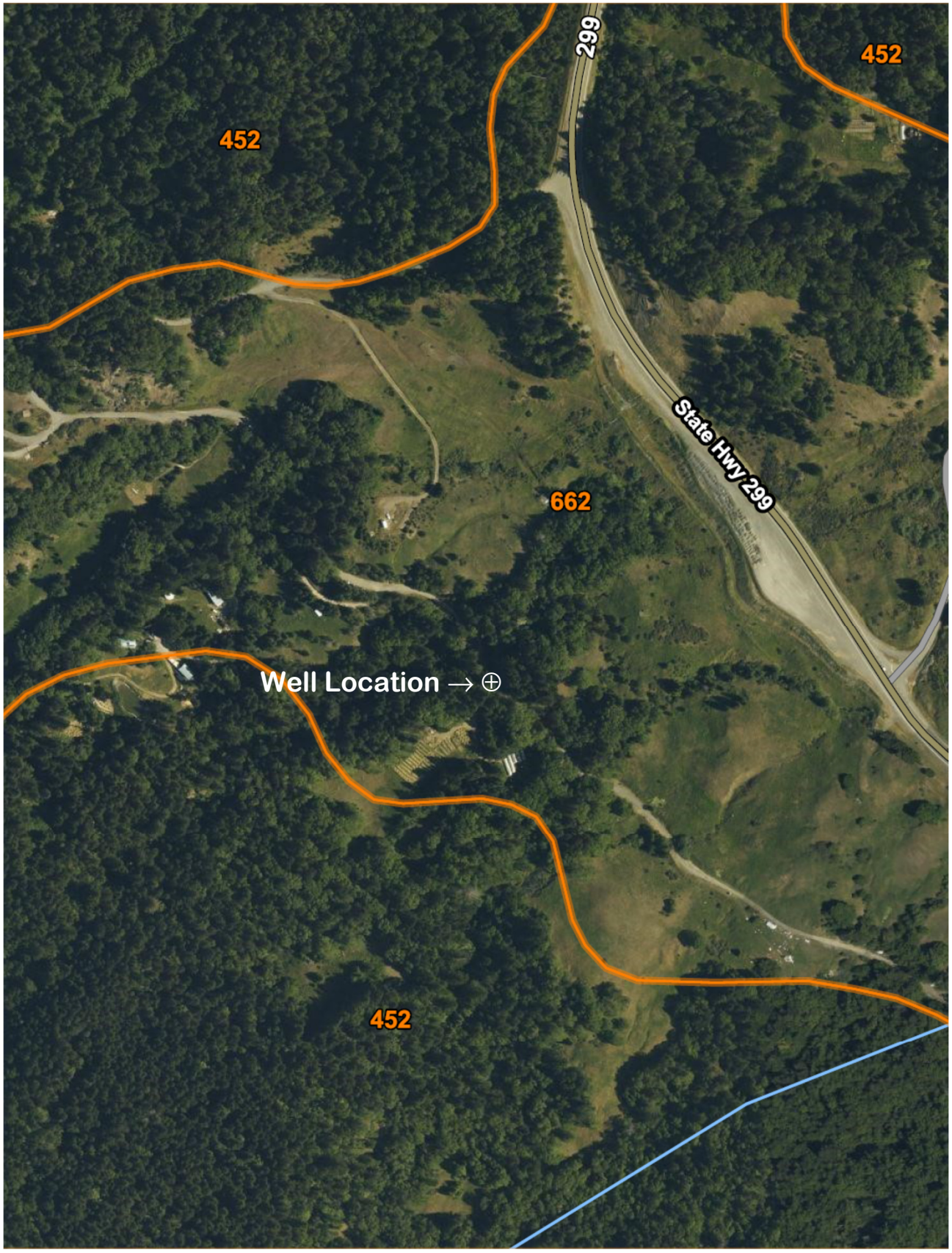
- Synclinal or synformal axis
- Anticlinal or antiformal axis
- Overturned syncline
- Landslide (Qls)

Melange Blocks:

- Serpentinite
- Chert
- Blueschist
- Greenstone
- Fossil locality and number (10)

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 Hydrogeologic Well Isolation Report	Figure 6
Post Office Box 306	30000 State Highway 299, Blue Lake, Humboldt County	May 18, 2022
Cutten, CA 95534	APN: 316-086-017, Mr. April Armstrong, Client	Project 0457.00
(707) 442-6000	USDA NRCS Soil Map (locations approximate)	1" ≈ 400'



Modified from: USDA NRCS Web Soil Survey, May 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 MAY 10 2012

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0151530

Page 1 of 1

Owner's Well Number 1

Date Work Began 05/01/2012 Date Work Ended 5/4/2012

Local Permit Agency Humboldt County E.H.D.

Permit Number 11/12-0415 Permit Date 4/5/12

DWR Use Only – Do Not Fill In

State Well Number/Site Number: 01N | 03E | 13

Latitude N / Longitude W

APN/TRS/Other

Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Direct Push Drilling Fluid Air

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	1	Top Soil
1	63	Weathered Siltstone Brown
63	186	Very Fractured Sandstone Gray
186	220	Shale Soft Drk Gray

Total Depth of Boring 220 Feet

Total Depth of Completed Well 210 Feet

Well Location

Address 30000 Hwy 299

City Blue Lake County Humboldt

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

Datum ___ Decimal Lat. ___ Decimal Long. ___

APN Book 316 Page 086 Parcel 017

Township 01N Range 03E Section 13

Location Sketch

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

North / West / East / South

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 100 (Feet below surface)

Depth to Static Water Level 100 (Feet) Date Measured 05/01/2012

Estimated Yield * 5 (GPM) Test Type Air Lift

Test Length 4.0 (Hours) Total Drawdown 210 (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)
0	90	10	Blank	PVC Sch. 80	CL200	5		
90	210	10	Screen	PVC Sch. 80	CL200	5	Milled Slots	0.032

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	20	Bentonite	Sanitary Seal
20	210	Filter Pack	3/8" Pea Gravel

Attachments

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

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 FISCH DRILLING (Person, Firm or Corporation)

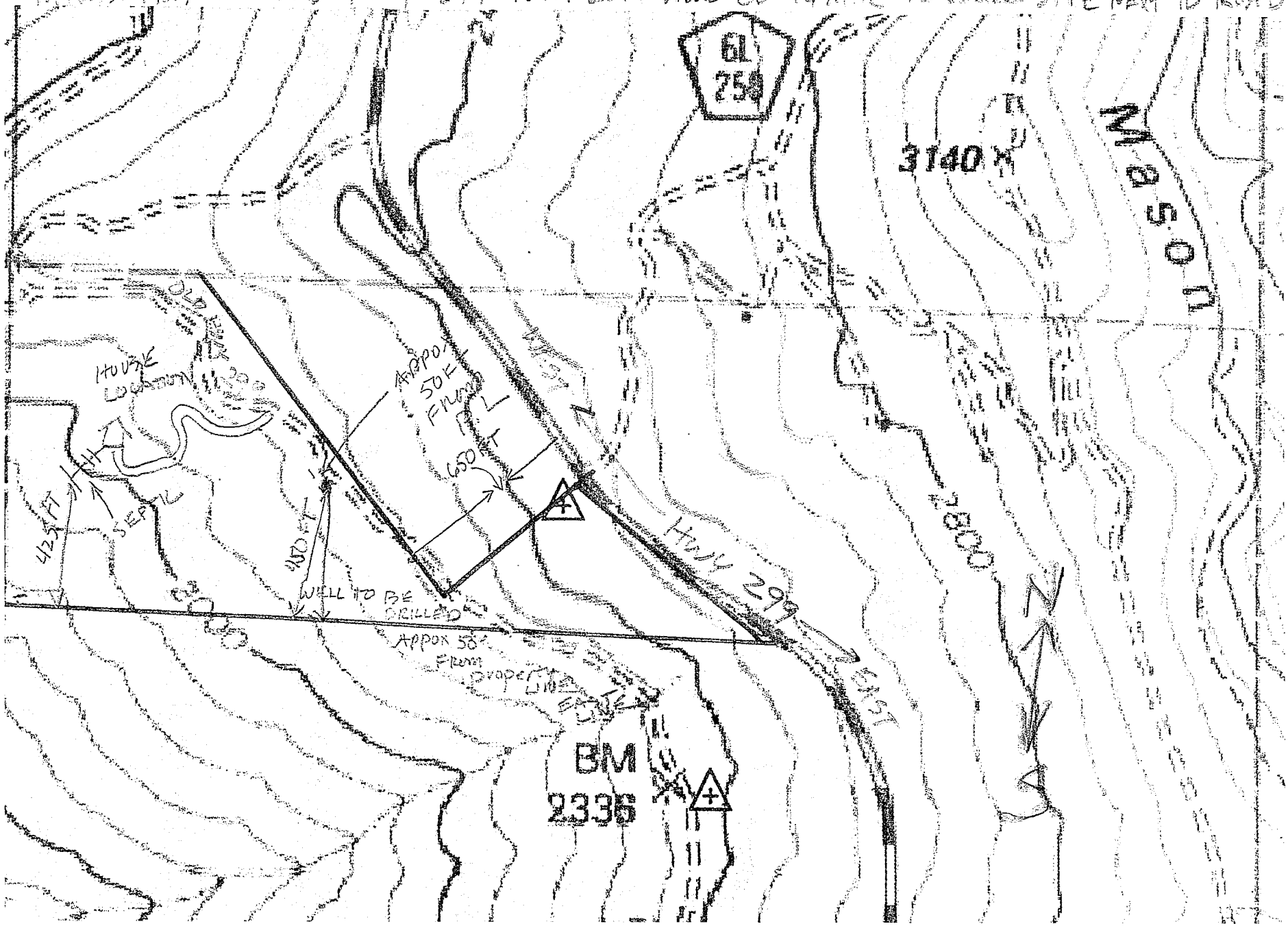
3150 JOHNSON ROAD (Address) HYDESVILLE (City) CA (State) 95547 (Zip)

Signed [signature] (C-57 Licensed Water Well Contractor) 05/08/2012 (Date Signed) 683865 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

DRIVING DIRECTIONS: GO EAST ON HWY 299 APPROX 28 miles from HWY 101 APN # TURN RIGHT AT ROAD WITH YELLOW GATE. PROCEED DOWN ROAD to the 316-08-017
INTERSECTION OF OLD HWY 299 TURN LEFT AND GO 1/4 mile to WELL SITE NEXT TO ROAD
20010 HWY 299



State of California

Well Completion Report

Form DWR 188 Complete 9/13/2016

WCR2016-006472

Owner's Well Number 1 | Date Work Began 09/02/2016 | Date Work Ended 09/13/2016

Local Permit Agency Humboldt County Department of Health & Human Services - Land Use Program

Secondary Permit Agency | Permit Number 15/16-0591 | Permit Date 04/06/2016

Well Owner (must remain confidential pursuant to Water Code 13752)

Name XXXXXXXXXXXXXXXXXXX

Mailing Address XXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXX

City XXXXXXXXXXXXXXXXXXX State XX Zip XXXXX

Planned Use and Activity

Activity New Well

Planned Use Water Supply Domestic

Well Location

Address 355 Old Three Creeks RD

City Blue Lake Zip 95525 County Humboldt

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

Dec. Lat. 40.9074900 Dec. Long. -123.7771200

Vertical Datum Horizontal Datum WGS84

Location Accuracy Location Determination Method

APN 316-086-20

Township 06 N

Range 03 E

Section 13

Baseline Meridian Humboldt

Ground Surface Elevation

Elevation Accuracy

Elevation Determination Method

Borehole Information

Orientation Vertical Specify

Drilling Method Direct Rotary Drilling Fluid Air

Total Depth of Boring 220 Feet

Total Depth of Completed Well 210 Feet

Water Level and Yield of Completed Well

Depth to first water 65 (Feet below surface)

Depth to Static Water Level 58 (Feet) Date Measured 09/07/2016

Estimated Yield* 10 (GPM) Test Type Air Lift

Test Length 4.0 (Hours) Total Drawdown 162 (feet)

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

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	4	Top Soil
4	23	Silt
23	47	Brown Sandstone
47	54	Soft Shale
54	163	Hard Shale/Sandstone Mix
163	220	Shale

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	50	Blank	PVC	OD: 5.563 in. | SDR: 21 | Thickness: 0.265 in.	0.265	5.563			
1	50	210	Screen	PVC	OD: 5.563 in. | SDR: 21 | Thickness: 0.265 in.	0.265	5.563	Milled Slots	0.032	
1	210	220	No Casing Installed	Other	N/A					

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Bentonite	Other Bentonite		Sanitary Seal
20	220	Filter Pack	Other Gravel Pack	3/8 in	Pea Gravel

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	220	10

Certification Statement

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

Name: FISCH DRILLING (Person, Firm or Corporation)

3150 JOHNSON ROAD (Address) | HYDESVILLE (City) | CA (State) | 95547 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 09/13/2016 (Date Signed) | 683865 (C-57 License Number)

Attachments

Seal.jpg - Photo

Site Map.pdf - Location Map

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

State of California

Well Completion Report

Form DWR 188 Complete 12/20/2020

WCR2020-015011

Owner's Well Number | Date Work Began: 10/20/2020 | Date Work Ended: 10/21/2020

Local Permit Agency: Humboldt County Department of Health & Human Services - Land Use Program

Secondary Permit Agency | Permit Number: 20/21-0309 | Permit Date: 09/24/2020

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: XXXXXXXXXXXXXXXXXXX

Mailing Address: XXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXX

City: XXXXXXXXXXXXXXXXXXX State: XX Zip: XXXXX

Planned Use and Activity

Activity: New Well

Planned Use: Water Supply Irrigation - Agriculture

Well Location

Address: 1 Old Highway 299

City: Willow Creek Zip: 95573 County: Humboldt

Latitude: 40 Deg. 53 Min. 51.2016 Sec. N

Longitude: -123 Deg. 46 Min. 41.053 Sec. W

Dec. Lat.: 40.897556 Dec. Long.: -123.7780703

Vertical Datum | Horizontal Datum: WGS84

Location Accuracy | Location Determination Method

APN: 316-086-019

Township: 06 N

Range: 03 E

Section: 13

Baseline Meridian: Humboldt

Ground Surface Elevation

Elevation Accuracy

Elevation Determination Method

Borehole Information

Orientation: Vertical Specify

Drilling Method: Direct Rotary Drilling Fluid: Air

Total Depth of Boring: 200 Feet

Total Depth of Completed Well: 200 Feet

Water Level and Yield of Completed Well

Depth to first water: 31 (Feet below surface)

Depth to Static Water Level: 91 (Feet) Date Measured: 10/22/2020

Estimated Yield*: 15 (GPM) Test Type: Pump

Test Length: 4 (Hours) Total Drawdown: (feet)

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

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	10	Brown Clay
10	35	Bedrock
35	55	Hard Bedrock
55	80	Bedrock w/ Quartz
80	200	Bedrock

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	140	Blank	PVC	OD: 5.563 in. | SDR: 17 | Thickness: 0.327 in.	0.327	5.563			
1	140	180	Screen	PVC	OD: 5.563 in. | SDR: 17 | Thickness: 0.327 in.	0.327	5.563	Milled Slots	0.032	
1	180	200	Blank	PVC	OD: 5.563 in. | SDR: 17 | Thickness: 0.327 in.	0.327	5.563			

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Bentonite	Other Bentonite	3/8	Hole Plug
20	200	Filter Pack	Other Gravel Pack	3/8	Pea Gravel

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	200	10

Certification Statement

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

Name: RICH WELL DRILLING & PUMP SERVICE INC (Person, Firm or Corporation)

1251 RAILROAD DRIVE (Address) | MC (City) | CA (State) | 95519 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 10/22/2020 (Date Signed) | 902702 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

State of California

Well Completion Report

Form DWR 188 Complete 11/19/2018

WCR2018-008884

Owner's Well Number 1 | Date Work Began 09/19/2014 | Date Work Ended 09/23/2014

Local Permit Agency Humboldt County Department of Health & Human Services - Land Use Program

Secondary Permit Agency | Permit Number 18/19-0246 | Permit Date 09/20/2018

Well Owner (must remain confidential pursuant to Water Code 13752)

Name XXXXXXXXXXXXXXXXXXX

Mailing Address XXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXX

City XXXXXXXXXXXXXXXXXXX State XX Zip XXXXX

Planned Use and Activity

Activity New Well

Planned Use Water Supply Irrigation - Agriculture

Well Location

Address 1 Old HWY 299 RD

City Willow Creek Zip 95573 County Humboldt

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

Dec. Lat. Dec. Long.

Vertical Datum Horizontal Datum WGS84

Location Accuracy Location Determination Method

APN 316-086-019

Township 06 N

Range 03 E

Section 13

Baseline Meridian Humboldt

Ground Surface Elevation

Elevation Accuracy

Elevation Determination Method

Borehole Information

Orientation Vertical Specify

Drilling Method Direct Rotary Drilling Fluid Air

Total Depth of Boring 100 Feet

Total Depth of Completed Well 100 Feet

Water Level and Yield of Completed Well

Depth to first water 60 (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield* 4 (GPM) Test Type Air Lift

Test Length 4 (Hours) Total Drawdown (feet)

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

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	20	yellow clay
20	25	Yellow Silty Clay
25	30	Silty Yellow Clay and Birds Eye gravel
30	50	Hard Blue Clay
50	75	Hard Broken Rock Blue
75	100	Hard Blue Shale

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	65	Blank	PVC	OD: 4.950 in. | SDR: 17 | Thickness: 0.291 in.	0.291	4.95			
1	65	75	Screen	PVC	OD: 4.950 in. | SDR: 17 | Thickness: 0.291 in.	0.291	4.95	Milled Slots	0.032	
1	75	100	Blank	PVC	OD: 4.950 in. | SDR: 17 | Thickness: 0.291 in.	0.291	4.95			W/ Bottom Cap

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Bentonite	Non Hydrated Bentonite		3/8 Hole Plug
20	100	Filter Pack	Other Gravel Pack	3/8 Pea Gravel	

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	100	9

Certification Statement

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

Name: RICH WELL DRILLING & PUMP SERVICE INC
Person, Firm or Corporation

1251 RAILROAD DRIVE (Address) | MC (City) | CA (State) | 95519 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 10/07/2018 (Date Signed) | 902702 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

Humboldt and Del Norte Area, California

662—Yorknorth-Witherell complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: v6lg
Elevation: 200 to 3,280 feet
Mean annual precipitation: 49 to 90 inches
Mean annual air temperature: 54 to 59 degrees F
Frost-free period: 240 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Yorknorth and similar soils: 70 percent
Witherell and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yorknorth

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Colluvium derived from sandstone and/or earthflow deposits derived from schist

Typical profile

A1 - 0 to 4 inches: silt loam
A2 - 4 to 15 inches: silt loam
Bt1 - 15 to 28 inches: silty clay loam
Bt2 - 28 to 52 inches: clay
C1 - 52 to 63 inches: clay
C2 - 63 to 71 inches: gravelly clay loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 20 to 39 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: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R005XZ005CA - Thermic Hills
Hydric soil rating: No

Description of Witherell

Setting

Landform: Mountains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Center third of mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Residuum weathered from sandstone

Typical profile

A - 0 to 2 inches: loam
Bt1 - 2 to 10 inches: gravelly loam
Bt2 - 10 to 12 inches: gravelly loam
C - 12 to 79 inches: gravel

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 10 to 14 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 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: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R005XZ005CA - Thermic Hills
Hydric soil rating: No

Minor Components

Briceland

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Concave
Across-slope shape: Linear

Hydric soil rating: No

Dryfield

Percent of map unit: 5 percent
Landform: Mountain slopes, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Center third of mountainflank, head slope
Down-slope shape: Concave, convex, linear
Across-slope shape: Linear, concave, convex
Hydric soil rating: No

Tankridge

Percent of map unit: 5 percent
Landform: Mountain slopes, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Center third of mountainflank
Down-slope shape: Linear, convex
Across-slope shape: Concave, linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: Humboldt and Del Norte Area, California
Survey Area Data: Version 15, Sep 6, 2021