F&W; BLDG; DEH; TRIBE

LINDBERG GEOLOGIC CONSULTING
Post Office Box 306
Cutten California 95534
(707) 442-6000

February 9, 2017

0201.00

Mr. Kevin Spurlock
Post Office Box 278
Hydesville, California 95547

Subject: Preliminary Engineering-Geologic (R-2) Soils Exploration Report
APN: 210-074-008, Hidden Valley Road, Butte Creek, Larabee Valley Area

Dear Mr. Spurlock:

In accordance with our agreement, we have prepared this Preliminary Engineering Geologic and Soils Engineering Report and provide it herein to assist with permitting your proposed and existing developments on the subject parcel. The letter report which follows below addresses the soils and soil conditions observed at the location of the existing storage shed. A building pad was created at this site by grading. Our investigation was limited to the existing storage shed location, the proposed processing shed and replacement greenhouse #3 location, and the vicinity of the two test pit locations noted; the Engineer also explored the areas nearby to find suitable leach field locations for a private disposal (septic) system and reserve area (reported separately by others). No other structures or developments on the parcel are addressed in this document.

Project

This report documents the results of a site-specific preliminary soils exploration conducted at the above-referenced project site by Lindberg Geologic Consulting (LGC). A copy of the engineer's preliminary plot plan from October 21, 2016, is appended to this report. The purpose of our field exploration was to conduct a limited-scope, observational soils engineering analysis at the location of an existing one-story, wood-framed storage shed of approximately 500 square feet, or 16 feet by 32 feet. We also explored the site of a proposed new processing shed and a replacement site for a green house. At present, the property is used for agricultural purposes. The project is in the Butte Creek watershed, southeast of the Larabee Buttes area of eastern Humboldt County (Figures 1, 2 and 3). Our exploration was conducted to confirm, for permitting purposes, that the storage shed was located and built such that it will not contribute to, or be impacted by hazardous geologic or adverse soils conditions. We also examined the proposed new processing building and replacement greenhouse site, to ensure that they may be developed without contributing to, or being impacted by hazardous geologic or adverse soils conditions.

Following our research and exploration, it is our opinion that, from an engineering-geologic perspective, the site of the existing storage shed appears to have been inadequately prepared prior to construction of the storage shed. It seems that the cut and fill grading for the building

site was not performed adequately for the development of the storage shed. A one story wood framed structure of typical lightweight construction could probably have been built at the site of the existing storage shed if the site had been appropriately prepared. At the site of the proposed new processing building and replacement greenhouse, soils appear adequate to support the anticipated loads from the proposed new structures, provided our recommendations, and the requirements of the 2016 California Building Code are adhered to.

We were not provided with any floor plans or foundation details for review as part of our explorations. Based on the information provided by our client, his engineer, and on our research and field observations, it is our opinion that differential settlement of non-engineered, uncompacted fill soils will continue, and will further damage the existing storage shed. Below that building, on the downslope side, the fill prism appeared to be over steepened and creeping down slope. Several old foundation pier blocks were observed on the slope below the building suggesting that significant settlement had occurred and been repaired previously.

Project Location

The developed portions of the subject property are located approximately two miles south of Larabee Valley (Figure 1); access is from State Highway 36 via Hidden Valley Road to Butte Creek Road. An annotated copy of the Humboldt County Assessor's parcel map is attached to our report as Figure 2. Assessor's Parcel 210-074-008 comprises 40 acres in area, and is located in the southeast ¼ of the southeast ¼ of Section 35, T. 1 N. and R. 4 E., Humboldt Baseline and Meridian. This parcel is mapped on, and Figure 1 is modified from the Larabee Valley, Calif., 7.5-Minute Topographic Quadrangle map.

Parcel 210-074-008 is located approximately two miles south-southwest from State Highway 36 at its intersection with Hidden Valley Road. This property is accessed by an existing private road (Butte Creek Road) off of Hidden Valley Road. The property is bordered on all sides by sparsely-developed forested lands. The property to the west is under federal ownership. According to the Humboldt County WebGIS, the latitude and longitude of the parcel centroid are 40.4151°, and -123.6869° respectively. The storage shed is located at approximately 40.4146°, and -123.6854°. Water is supplied from an existing well on the parcel. Power will supplied by on-site sources (solar and generator). A new on-site wastewater treatment (septic) system was designed by the Engineer, to be submitted as a separate report.

Subsurface Conditions

Soil Profile

Soil and groundwater conditions were characterized at the site on October 10, 2016, by excavation of two exploratory backhoe soil test pits in the vicinity of the developed area of the site (Figure 3). Depth to the static water table at the building site was greater than 7.5 feet. Logs of the soil profiles encountered in our test pits are attached as Figures 5 and 6. Our descriptions of the soil profiles were developed based on the field observations and are described in general

accordance with ASTM standards.
Based on our observation, the undisturbed native soil profile on this site consists of a thin layer of forest litter and rocky topsoil over weathered Franciscan mélange, which at the storage shed location, consists of weathered fractured sandstone overlying bedrock of hard fractured sandstone. Soils were observed to be brown to grayish brown, with angular graywacke sandstone, and were classified in the field as silty sand gravel (SM). When samples from 4 feet below the ground surface (bgs) were tested in a certified soils laboratory for Textural Analysis they were classified as Loamy Sand and Sandy Loam. Below the uppermost four feet, the profile rapidly became increasingly hard and rocky with depth.

Native soils were dry to moist and medium dense to very dense. In-place undisturbed native soils at 12 inches bgs, after the topsoil is stripped, are considered suitable target bearing soils for foundation construction at the storage shed location. Soils appear suitable to support the loads applied by typical wood framed utility structures supported on reinforced concrete foundations.

Summarizing, suitably dense, load bearing soils appeared to be present beginning at approximately 12 inches below the undisturbed native ground surface exclusive of the topsoil, where the storage shed is sited on this parcel. Based on our field observations, we classify the native soils in the area within the footprint of the storage shed structure as a Site Class D per ASCE 7-05 consisting of a stiff soil profile (1613.3.2, CBC, 2016). Presumptive load bearing values for the native soil materials are 2,000 pounds per square foot (psf) for vertical foundation pressure, 150 psf per foot below natural grade for lateral bearing pressure, and a lateral sliding resistance coefficient of friction) of 0.25, multiplied by the dead load, per 2016 CBC Section 1806.2.

Site geology, as mapped by McLaughlin and others (2000), consists of mélange rocks of the Central Belt of the Franciscan Complex (Figures 4, 4a). McLaughlin describes the (cm1) mélange unit underlying this parcel as consisting of "predominantly penetratively sheared, locally tuffaceous, scaly meta-argillite, and less abundant blocks of metasandstone. Exhibits rounded, poorly incised, lumpy and irregular topography." The subgrade soils, beginning approximately one foot below the existing native ground surface are expected to be suitable bearing material for the structural loads anticipated to be imposed by the processing building or storage shed. Structures founded on firm undisturbed materials below this depth should not be expected to be subject to detrimental differential settlement. Foundations should be engineered and designed of reinforced concrete to resist settlement.

Conclusions and Recommendations

Existing storage shed foundations failed previously and were subsequently repaired; our client could provide few details regarding the construction or repairs of the building. Old foundation pier blocks were observed several feet downslope of the existing foundations. Existing

foundations appeared to be experiencing continued detrimental settlement due, it is presumed, to continuing downslope creep of the sidecast fill along the east side of the structure. It is likely that the sidecast fill was placed on the sloping native ground surface with no benching and inadequate compaction. Additional settlement, but not catastrophic failure, may be anticipated.

In our opinion, because of the observed differential settlement and the high likelihood of an improperly constructed fill prism, the settlement is expected to continue and to have additional detrimental effects on the storage shed. Therefore, we recommend that the structure be removed, and the fill prism be pulled back up and replaced on the cut from which it came. Alternately, following removal of the fill, the storage shed may be rebuilt on the same footprint on a suitable foundation system, founded at least 12 inches into firm, undisturbed native mineral soils.

Foundations

Foundation Design

Foundation design recommendations presented here assume that the existing failing storage shed will be removed and replaced, and that the new processing shed and the replacement storage shed will be supported on a new, reinforced concrete foundation system embedded at least one foot into undisturbed native mineral soil, below all topsoils, fills and any other unsuitable materials. In our opinion, a one -story wood (or metal) framed processing or storage shed structure may be supported by a foundation system designed according to the 2016 CBC. A perimeter spread footing with interior footings appears suitable for the replacement storage shed structure. A perimeter spread footing with interior footings, or a slab on grade foundation system, are suitable for the processing shed.

Foundations of the type described above are considered suitable for this site's conditions, provided that they are constructed in accordance with our recommendations and specifications, and designed to meet the standards of the 2016 edition of the CBC, and the County of Humboldt.

Footings

- Foundation systems on this site should be reinforced and designed to limit potential structural damage due to differential settlement.
- If necessary to mitigate unsuitable soils, excavate and replace with suitable engineered fill, placed and compacted as recommended, or use controlled low strength material such as concrete sand slurry.
- Trenches to be backfilled with controlled low strength material should be at least 24 inches wide.
- Foundations should be embedded a minimum of 12 inches below the ground surface after it is stripped of any fill materials and all topsoil.

- Minimum width of footings should be 15 inches, and the minimum thickness should be 6 inches, per CBC Section 1809.
- Support any deck(s) on new reinforced concrete piers embedded at least three feet into firm undisturbed native soil below any and all fill or topsoil, approximately four feet or more below existing grade, at minimum.

Grading and Drainage

Finished grading at this site shall provide positive drainage away from all foundation elements. Roofs shall have gutters and downpipes. No water shall be allowed to pond anywhere on the site, nor to migrate beneath any structures.

- At minimum, a five percent gradient away from the foundation should be maintained for landscaped (i.e., soil or gravel) areas within 15-feet of permanent structures.
- A minimum gradient of two percent away from foundations may be maintained for all hardscaped (asphalt or concrete) areas within 15-feet of structures.
- Finished grading of the site should be designed and executed to avoid concentrating runoff, and promote drainage by sheet flow.
- All roof storm drainage should be controlled with the installation of gutters and downpipes connected to tightlines to convey roof storm runoff away from erodible areas, foundations, and fills, to suitable outlet points where no erosion, flooding or sediment mobilization or deposition will occur.
- Runoff from any hardscaped areas, such as sidewalks and parking areas, and other impermeable surfaces should also be controlled, and directed to suitable outlet points where no erosion, flooding or sediment mobilization or deposition will occur.

Groundwater

At the time of the field investigation, no groundwater or soil mottling indicative of high groundwater conditions was observable on-site. Estimated depth to groundwater was greater than 10 feet. Documented depth to groundwater was greater than 7.5 feet. Groundwater is interpreted to remain greater than 10 feet below existing grade throughout the year. Elevated groundwater is not anticipated to adversely affect the new processing shed or the replacement storage shed structure.

Settlement

Settlement typically occurs closely with the application of the structural component loads. Based upon the observed native soil profile and the lightly-loaded nature of the proposed replacement storage shed structure, detrimental total or differential settlement is preventable, provided that our recommendations are adhered to.

Slope Stability Conditions

During our explorations no active or dormant landslides were observable at the site of the

proposed residence. Published geologic mapping in the vicinity (Figure 4) does not show any active or dormant landslides in the immediate vicinity of the subject property. Small landslides and unstable ground are common in the region. Based on our field observations and research, the potential for slope stability hazards in the form of differential settlement of foundations placed on improperly constructed fill to adversely affect the existing storage shed during its economic life appears to be significant.

Surface Drainage Conditions

No evidence of surface erosion by overland flow, including rilling and gullying, was observed on the proposed building site during our explorations. Minor roadway erosion was noted, which should be addressed by the owner and his engineer by paving the driveway with gravel and providing drainage with culverts, water bars or rolling dips, as appropriate. In our opinion, the potential for erosion to adversely affect the project site is low, provided that a grading and erosion control plan is implemented prior to the advent of the next winter rainy season.

Surface Fault Rupture Hazards

The State of California recognizes no active faults in this part of Humboldt County. The project site is not located within an Alquist-Priolo Earthquake Fault Hazard Zone. Therefore, the potential for active surface fault rupture to adversely affect the project site is considered low.

Seismic Ground Motion Hazards

We recommend that the designers utilize the following site-specific spectral response spectrum as obtained from the United States Geological Survey and 2010 ASCE 7 (w/March 2013 errata). The USGS ground motion calculator uses spectral acceleration values (S_S and S_1) based on site-specific geographic coordinates, the seismic database maintained by the USGS, the site classification, site coefficients, and adjusted maximum considered earthquake values (F_a, F_v, S_{Ms} and S_{M1}).

Spectral Response Accelerations

Situs Information APN 210-074-008 Butte Creek, Larabee Valley	Latitude / Longitude	40.4151° / -123.6869°
	Risk/Occupancy Category	II
	Seismic Design Category	D
	Site Class	D
Spectral Acceleration	S_s (Site Class B)	1.500 g
	S_1 (Site Class B)	0.705 g
Site Coefficients	F_a / F_v	1.0 / 1.5
Response Accelerations	S_{MS}	1.500 g
	S_{M1}	1.057 g
	S_{DS}	1.000 g
	S_{D1}	0.705 g

Given the intended use, this proposed residence will be in Risk Category II (Table 1604.5, 2016 CBC). Due to the fact that the site-specific spectral acceleration S_1 is greater than 0.75, the project parcel is assigned to Seismic Design Category E (1613.3.5, 2016 CBC). Based on the site conditions and an assumption of the soils within 100-feet of the ground surface, we conservatively classify the site as Site Class D consisting of a "stiff soil profile" (Section 1613.3.2, 2016 CBC). The parameters in the table above are based on this classification. Assuming that current California Building Codes and our recommendations are adhered to during the design and construction process, the potential for seismic ground shaking to adversely affect a rebuilt processing structure at this location can be characterized as low.

Liquefaction Hazard

Liquefaction is the loss of soil strength, resulting in fluid mobility through the soil. Liquefaction typically occurs when uniformly-sized, loose, saturated sands or silts are subjected to repeated shaking in areas where the groundwater is less than 50-feet bgs. In addition to the necessary soil and groundwater conditions, the ground acceleration must be high enough, and the duration of the shaking must be sufficient, for liquefaction to occur. Given the dry, rocky site soil profile, and the distance to known active faults, this site is unlikely to experience liquefaction.

Summary

Based upon our field reconnaissance of the site of this existing storage shed, and the proposed processing shed (as well as the immediately-surrounding terrain), the site-specific soil profile observations from our subsurface explorations, published maps and reports, and other documentation, it is our opinion that no further soils mechanics analysis is required; therefore, no geotechnical engineer consultation appears warranted. Foundations for a new processing shed and a replacement storage shed can, in our opinion, be designed and constructed according to current building codes and other regulations such that they will not be subject to, nor contribute to, recognized existing geologic or soils hazards.

In-place silty sand with gravel soils, beginning 12 inches below the existing topsoil, or the undisturbed ground surface, appear suitably dense to bear the structural loads imposed by the anticipated replacement storage shed structure. We do not anticipate settlement to have any adverse effects on the proposed residence as long as our recommendations are adhered to.

Site-Specific Recommendations

In addition to our recommendations above, an engineered erosion control plan should be implemented prior to any grading that may occur prior to the onset of the next wet season. Footings for the replacement storage shed should be embedded at least one foot into firm, undisturbed native mineral soils in accordance with our recommendations, and those of the project engineer.

No further site-specific recommendations are provided with this report due to the fact that no other new developments were proposed. Any additional, future developments on this property should have a site-specific soils investigations and reporting. The information in this report should not be assumed to be applicable to any other locations on this parcel, nor to any other parcel(s).

Review of Grading, Foundation, and Drainage Plans

Recommendations provided in this report are based on the assumption that soil conditions encountered during any future earthwork will be essentially the same as those exposed during our explorations, and that the general nature of the grading, and use of the property will be as described above. LGC should provide inspection services to assure conformance with the recommendations in this report including:

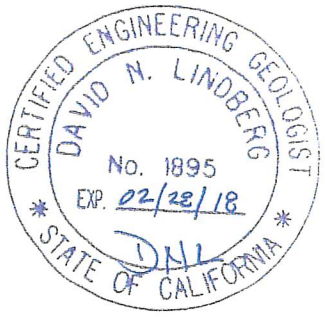
- Review and approval of grading and drainage plans, and foundation drawings prior to issuance for construction.
- Observation of completed foundation excavations prior to placement of any fill, concrete formwork, or reinforcing steel.

Contact our office if you have any questions or require additional information.

Sincerely,
Lindberg Geologic Consulting

David N. Lindberg

David N. Lindberg
CEG 1895, Exp. 2/28/18



DNL:sll

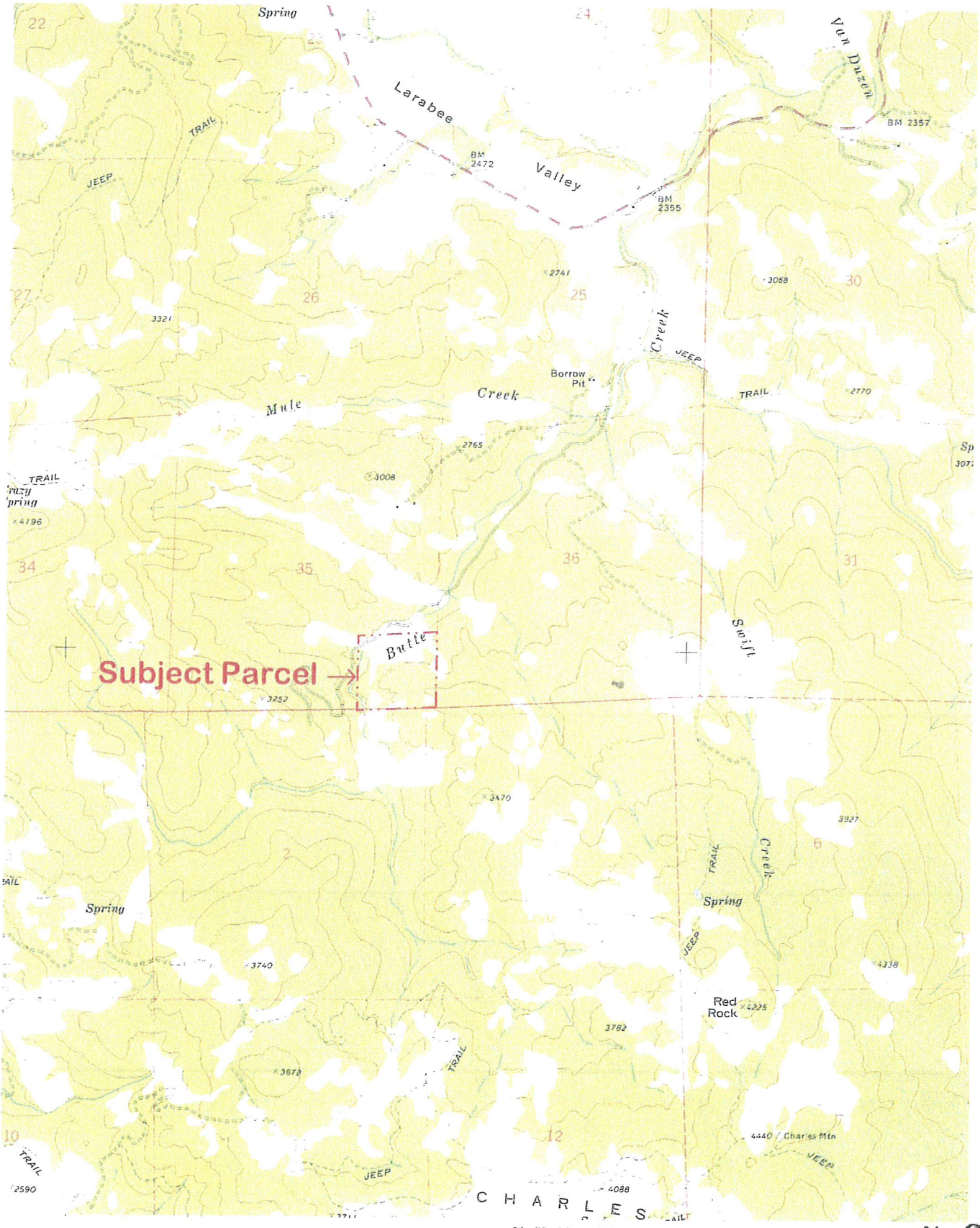
Figures:

Figure 1:	Location Map
Figure 2:	Assessor's Parcel Map 210-074-008
Figure 3:	Site Plan Image
Figure 4:	Geologic Map
Figure 4a:	Geologic Map Explanation
Figure 5:	Soil Profile Log, Test Pit 1 (TP-1)
Figure 6:	Soil Profile Log, Test Pit 2 (TP-2)

References:

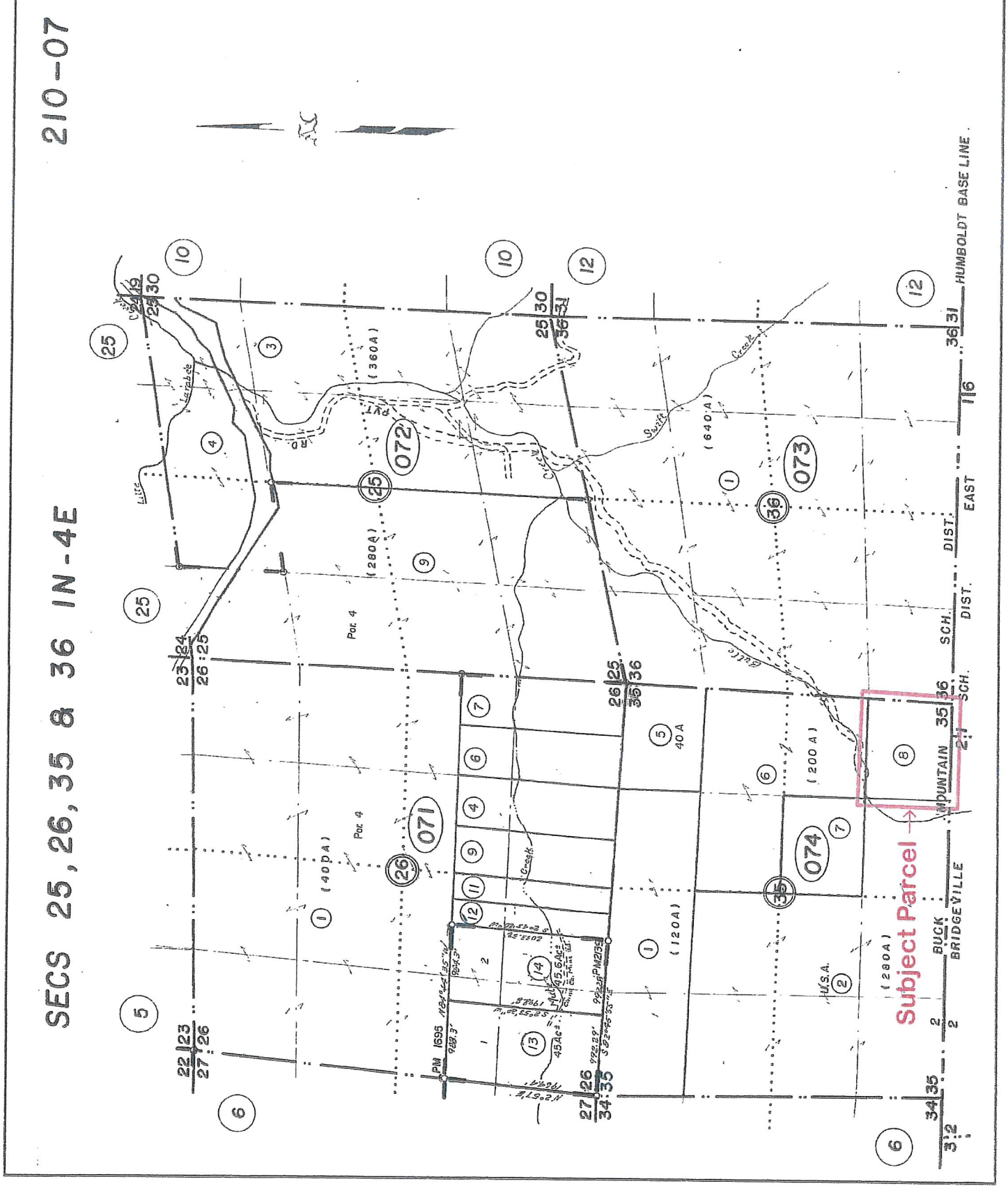
CBC (California Building Code), 2016 edition

Lindberg Geologic Consulting	Preliminary Engineering Geologic Soils Exploration Report	Figure 1
P. O. Box 306	Hidden Valley Road, Butte Creek, Larabee Valley, Humboldt County	February 9, 2017
Cutten, CA 95534	Assessor's Parcel 210-074-008, Mr. Kevin Spurlock, Client	Project 0201.00
(707) 442-6000	Topographic Location Map (All Locations Approximate)	1 inch ≅ ½ mile



Modified from: USGS Larabee Valley, Calif. 7.5' Quadrangle Map, 1977. N ≅

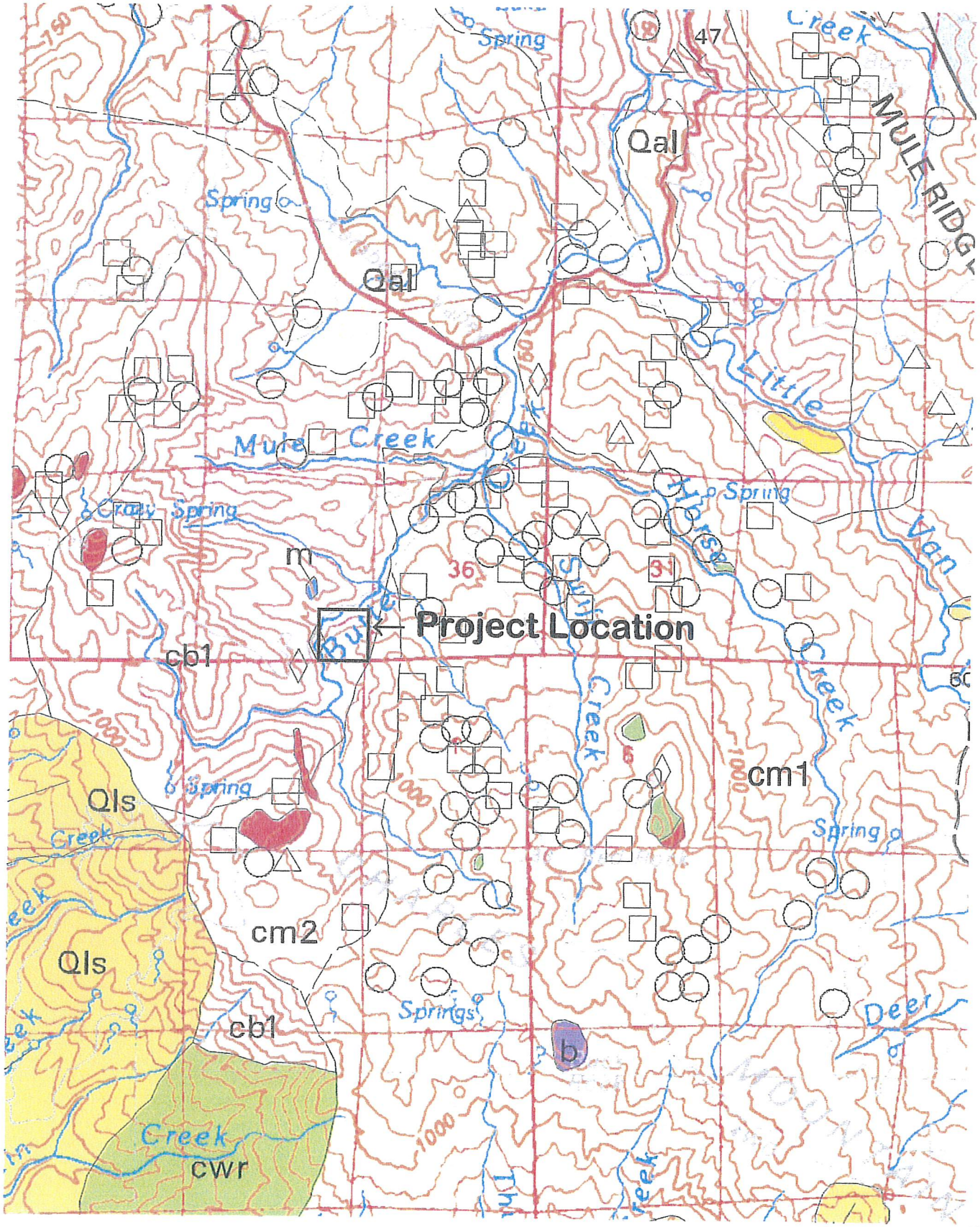
Lindberg Geologic Consulting	Preliminary Engineering Geologic Soils Exploration Report	Figure 2
P. O. Box 306	Hidden Valley Road, Butte Creek, Larabee Valley, Humboldt County	February 9, 2017
Cutten, CA 95534	Assessor's Parcel 210-074-008, Mr. Kevin Spurlock, Client	Project 0201.00
(707) 442-6000	Modified from Humboldt County Assessor's Parcel Map 210-07	Not to Scale



Lindberg Geologic Consulting	Preliminary Engineering Geologic Soils Exploration Report	Figure 3
P. O. Box 306	Hidden Valley Road, Butte Creek, Larabee Valley, Humboldt County	February 9, 2017
Cutten, CA 95534	Assessor's Parcel 210-074-008, Mr. Kevin Spurlock, Client	Project 0201.00
(707) 442-6000	Satellite Image; Test Pit Locations and Site Developments	1 inch ≅ 40 feet

Google Earth Imagery of May 26, 2016. N ≅

Lindberg Geologic Consulting	Preliminary Engineering Geologic Soils Exploration Report	Figure 4
P. O. Box 306	Hidden Valley Road, Butte Creek, Larabee Valley, Humboldt County	February 9, 2017
Cutten, CA 95534	Assessor's Parcel 210-074-008, Mr. Kevin Spurlock, Client	Project 0201.00
(707) 442-6000	Geologic Map of Project Vicinity	Not to Scale



Modified from: McLaughlin and others, 2000. N ≅

Lindberg Geologic Consulting	Preliminary Engineering Geologic Soils Exploration Report	Figure 4a
P. O. Box 306	Hidden Valley Road, Butte Creek, Larabee Valley, Humboldt County	February 9, 2017
Cutten, CA 95534	Assessor's Parcel 210-074-008, Mr. Kevin Spurlock, Client	Project 0201.00
(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)
- 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)
- bs — Undivided blueschist (Jurassic?)

King Range terrane (Miocene to Late Cretaceous)

- Krp — Igneous and sedimentary rocks of Point Delgada (Late Cretaceous)
- bs — 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)
- ch — Chert (Late Cretaceous to Early Jurassic)
- bs — Basaltic rocks (Cretaceous and Jurassic)
- bs — Undivided blueschist blocks (Jurassic?)
- gs — Greenstone
- ch — 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
- ch — Metachert
- ybh — Metagraywacke of Hammerhorn Ridge (Late Jurassic to Middle Jurassic)
- ch — Metachert
- gs — Greenstone
- sp — Serpentinite
- ybd — Devils Hole Ridge broken formation of Blake and Jayko (1983) (Early Cretaceous to Middle Jurassic)
- 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)

LABORATORY				FIELD						
Dry Density (pcf)	Moisture Content (%)	Cohesion; Friction Angle (psf; degrees)	Other Tests	Blows/foot*	Sample	Depth (feet)	Graphic Lithology	U.S.C.S. Designation	SOIL DESCRIPTION	
			72% Sand, 18% Silt, 10% Clay			1 2 3 4 5 6 7		SM	Silty sand with gravel, brown to light grayish brown, dense, dry to moist, friable, weathered sandstone, intensely fractured, topsoil stripped by grading, few roots, gravel increases in percentage and size with depth. At four feet depth, soil contained approximately 44% coarse angular sandstone fragments, by volume. No groundwater encountered. No soil mottling observed. Test pit backfilled by owner.	

* The blow counts have been converted to standard N-value blow counts

SURFACE ELEVATION: 2,800 Feet

TOTAL DEPTH: 7.0 Feet

GROUNDWATER DEPTH: >7.0 Feet

LOGGED BY: David N. Lindberg, CEG

BOREHOLE DIAMETER: 24 Inches

EQUIPMENT: Backhoe

HAMMER TYPE: None

LINDBERG GEOLOGIC CONSULTING

PROJECT NUMBER: 0201.00 DATE: Oct. 10, 2016

LOG OF TEST EXCAVATION / BORING

Test Pit-1 **Spurlock Soils**

Figure No. **5**

LABORATORY				FIELD						SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Cohesion; Friction Angle (psf; degrees)	Other Tests	Blows/foot*	Sample	Depth (feet)	Graphic Lithology	U.S.C.S. Designation		
			69% Sand, 20% Silt, 11% Clay			1 2 3 4 5 6 7		SM		Sand with silt and gravel, brown to grayish brown to yellowish brown, dense, dry to moist, friable, weathered sandstone, pervasively fractured, thin topsoil stripped by grading, few roots, angular sandy gravel increases in percentage and size with depth. At four feet depth, this soil contains approximately 25 percent coarse angular sandstone fragments, by volume. No groundwater encountered. No soil mottling observed. Test pit backfilled by owner.

* The blow counts have been converted to standard N-value blow counts

SURFACE ELEVATION: 2,800 Feet

TOTAL DEPTH: 7.5 Feet

GROUNDWATER DEPTH: >7.5 Feet

LOGGED BY: David N. Lindberg, CEG

BOREHOLE DIAMETER: 24 Inches

EQUIPMENT: Backhoe

HAMMER TYPE: None

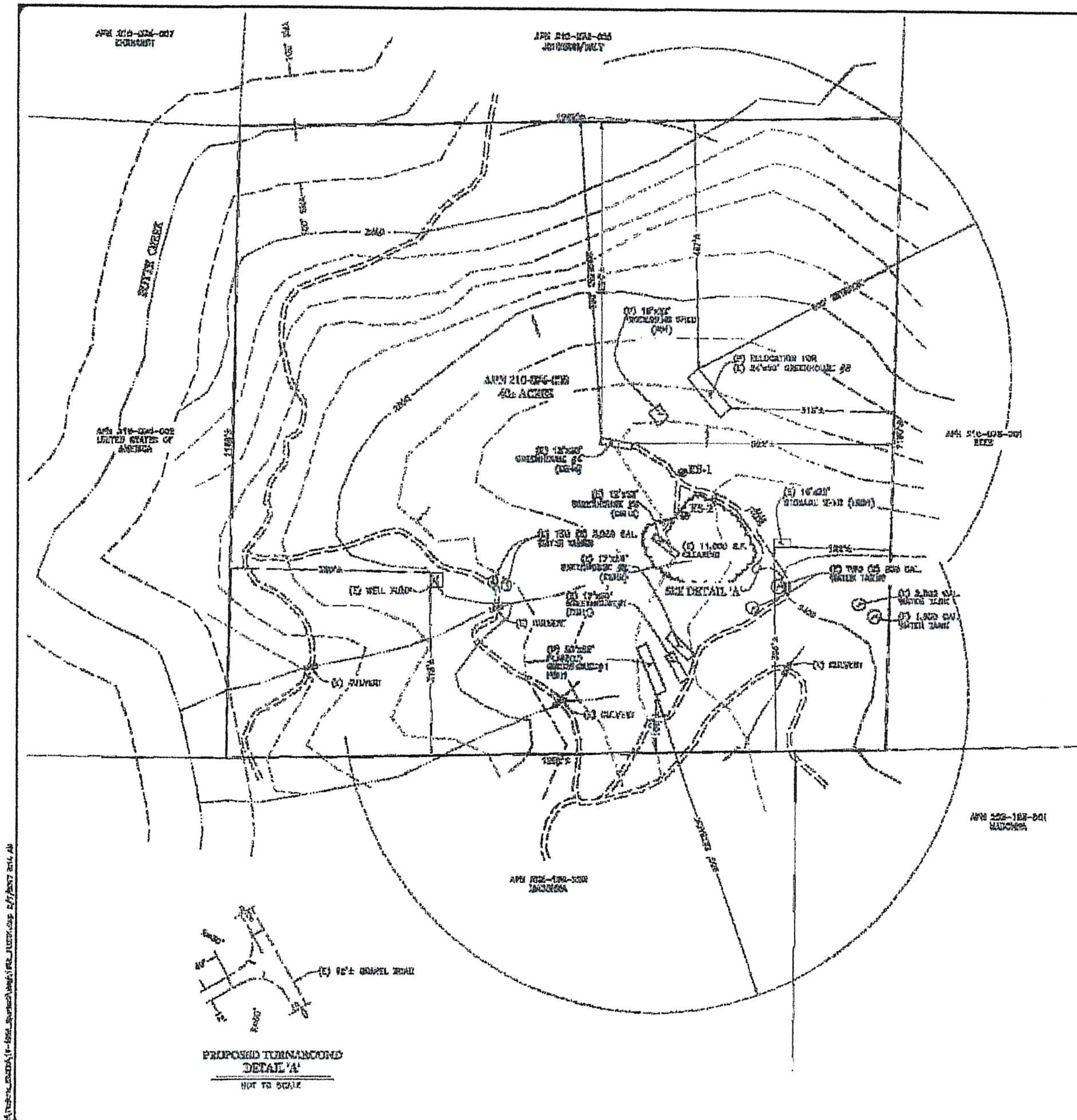
LINDBERG GEOLOGIC CONSULTING

PROJECT NUMBER: 0201.00 DATE: Oct. 10, 2016

LOG OF TEST EXCAVATION / BORING

Test Pit-2 **Spurlock Soils**

Figure No. **6**

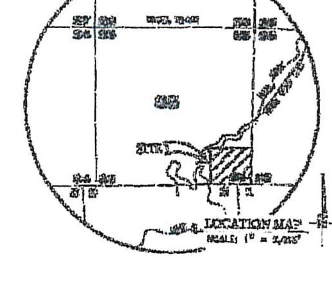


UTILITIES

WATER & SEWER	ON-SITE
GAS	ON-SITE (PROPANE)
ELECTRIC	SOLAR
TELEPHONE	CELLULAR SERVICE
T.V.	SATELLITE DISH

LEGEND

SYMBOL	INDICATES
	PARKING SPACE
	DIRECTION OF SURFACE WATER RUNOFF
(P)	PROPOSED
(E)	EXISTING
TYP.	TYPICAL
S.F.	SQUARE FEET
GAL.	GALLON
SMA	STREAMSIDE MANAGEMENT AREA
	CONTOUR AT 40 FOOT INTERVALS
	SEWAGE DISPOSAL TEST HOLE LOCATION
	EXISTING GRAVEL ROADS



NOTES

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. [illegible]
9. [illegible]
10. [illegible]
11. [illegible]
12. [illegible]
13. [illegible]
14. [illegible]
15. [illegible]
16. THIS PLAN IS NOT INTENDED TO BE USED FOR CONSTRUCTION PURPOSES.

PRELIMINARY

OWNER / APPLICANT
KEVIN SPURLOCK

APN 210-074-008

PLOT PLAN
KEVIN SPURLOCK

OMSBERG & PRESTON
Surveyors • Engineers • Planners
434 7th Street, Suite B
Eureka, CA 95501
(707) 443-8651
www.omsberg.com
kpreston@omsberg.com

October 20, 2016

16-1908

Adam Molofsky
Humboldt County Division of Environmental Health
100 H Street, Suite 100
Eureka, CA 95501

Re: **Sewage Disposal Report**
Kevin Spurlock (APN 210-074-008)

Dear Adam:

Sewage disposal testing has been completed on APN 210-074-008 for Kevin Spurlock.

Attached herewith is the engineered soils data demonstrating suitable leach-field and reserve areas for the existing 3-bedroom residence.

On September 10, 2016, an auger was brought to the site and two test holes were established. Results from the soils lab indicated a Zone 2 soil was found at both test holes numbered KS-1 and KS-2. Based on this result, an on-site sewage disposal system was designed at the KS-2 test site location consisting of 5 leach lines, each 72' long (using 36" wide infiltrators.) The reserve area will be at the KS-1 test site location and shall be 36'X72'.

The water source for this proposed residence is a spring.

Thank you, and please do not hesitate to contact me with any questions or comments you may have.

OMSBERG AND PRESTON

Stephen G. Nesvold, PE
RCE 25681

SEWAGE DISPOSAL SYSTEM CHECKLIST

JN: 16-1908

TYPE OF APPLICATION: After the fact building permit DATE: October 20 2016

NAME: Kevin Spurlock SANITARIAN: Ben Dolf

APN: 210-074-008 LOCATION: Dinsmore

WATER SUPPLY: PRIVATE X Well Spring

DISPOSAL FIELD LOCATION W.R.T.: Average Slope Primary: 15%

Perennial Stream >100 Ft. Buildings >10 Ft. Cut Banks >25 Ft.

Ephemeral Stream >50 Ft. Property Lines >50 Ft. Wells >100 Ft.

SOIL PROFILES:

Hole #	Date	Hole Depth	Observed G.W. Depth (Ft.)	Mottling Depth (Ft.)	Trench location Depth range	Soil below
KS-1	10/10/16	5'6"	None	None	2'	3'6"
KS-2	10/10/16	5'8"	None	None	2'	3'8"

SOIL ANALYSIS:

Hole #	Bulk Dens	Sample Depth	Zone	% Clay	% Silt	% Sand	USDA Texture
KS-1	No peds	4'	2	10.3	18.2	71.5	Loamy Sand
KS-2	No peds	4'	2	11.4	19.8	68.8	Sandy Loam

KS-2 is the test hole demonstrating a suitable leachfield.
KS-1 is the test hole demonstrating a suitable reserve area.

OMSBERG & COMPANY
SURVEYORS ENGINEERS
1864 MYRTLE AVENUE
EUREKA, CA 95501
(707) 443-8651

SHEET NO ______ OF ______ SHEETS
JOB NO 2-1290

SUBJECT Design of on-site sewage disposal system for the existing 3-bedroom residence for [illegible] Spurlock (APN 210-274-00[illegible])

MADE BY SGN DATE 12-20-16 CHECKED BY ______

3 Bedroom ∴ Design Effluent Volume = 450 gal/day

Use 36" wide infiltrative [illegible]

Zone 2 soils then Soil Application Rate =
0.425 Gallons/Day/Sq.Ft

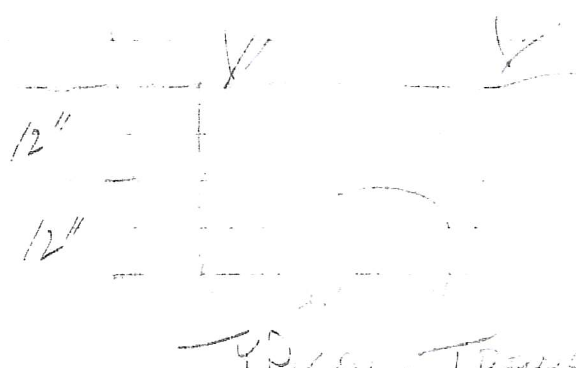
Try 5 Lines @ 72'/Line

5 Lines x 72'/Line x 3' x 0.425 = 459 gal/day
Since we need 450 gal/day

We're fine at the KS-2 test site location.

Reserve Area will be 72' x 36'
(at the KS-1 test site location

OMSBERG & PRESTON
SURVEYORS ENGINEERS
Cell 499-1175
(707) 443-8651
(707) 443-0422 FAX
4[illegible] 7th Street, Ste. B
Eureka, CA 95501
STEPHEN NESVOLD, P.E.
Civil Engineer
snesvold@omsberg.com



Typical Trench Detail

OMSBERG & PRESTON
SURVEYORS ENGINEERS

434 7th STREET, SUITE B
EUREKA, CA 95501
(707) 443-8651
FAX (707) 443-0422

SUBSURFACE PROFILE LOG

Client KEVIN SPURLOCK Project No. 16-1908 Logged By SGN
Location DUNES WORKS APN 210-074-008 Hole No. KS-1
Testing Date 10/10/2016 Excavation Rig HAND AUGER

Description & Remarks	Color	Moisture	Consistancy	Depth (ft.)	Samples
NO TOPSOIL SANDY CLAY LOAM with GRAVEL	GREYISH BROWN	MOIST	MED DENSE	1 2 3 4 5	X
AUGER REFUSAL - COBBLE	H.F			5 1/2" 6 7	
No Ground Water OR Mottling ENCOUNTERED				8 9	
IT had rained 6" in last 48 HRS				10 11 12	

OMSBERG & PRESTON
SURVEYORS ENGINEERS

434 7th STREET, SUITE B
EUREKA, CA 95501
(707) 443-8651
FAX (707) 443-0422

SUBSURFACE PROFILE LOG

Client KEVIN SPURLOCK Project No. 16-1908 Logged By SGN
Location DUNES WEST APN 210-074-008 Hole No. KS-2
Testing Date 10/10/2016 Excavation Rig HAND AUGER

Description & Remarks	Color	Moisture	Consistancy	Depth (ft.)	Samples
TOPSOIL	GREENISH	MOIST	MED	1	
SANDY clay	BROWN		DENSE	2	
Loam with GRAVEL				3	
				4	X
				5	
AUGER REFUSAL - HIT COBBLE				5'8" 6	
				7	
No Groundwater OR MOTTLING ENCOUNTERED				8	
				9	
It had rained 1 6" in last 48 HRS				10	
				11	
				12	

CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W.Wabash Eureka,CA 95501-2138 Tel:707/441-8855 FAX:707/441-8877 E-mail:shninfo@shn-engr.com

Reference: 016031

October 28, 2016

Stephen Nesvold
Omsberg & Preston
434 7th Street, Suite B
Eureka, CA 95501

SOIL PERCOLATION SUITABILITY / TEXTURAL ANALYSIS RESULTS

Job Name: Omsberg (Spurlock) **Sampled By:** SN
Date Sampled: 10/10/16 **Date Tested:** 10/28/16
Date Received: 10/11/16 **AP Number:** 210-074-008

Sample ID	Depth	% Sand	% Clay	% Silt	% Coarse Fragments by Volume	Zone	Bulk Density
KS 1	4'	71.5	10.3	18.2	44.3	2	*
	Material: Loamy Sand						
KS 2	4'	68.8	11.4	19.8	24.8	2	*
	Material: Sandy Loam						

* = no peds provided

Regional Water Quality Control Board Zone Descriptions:

Zone 1 - Soils in this zone are very high in sand content. They readily accept effluent, but because of their low silt and clay content they provide minimal filtration. These soils demand greater separation distances from groundwater.

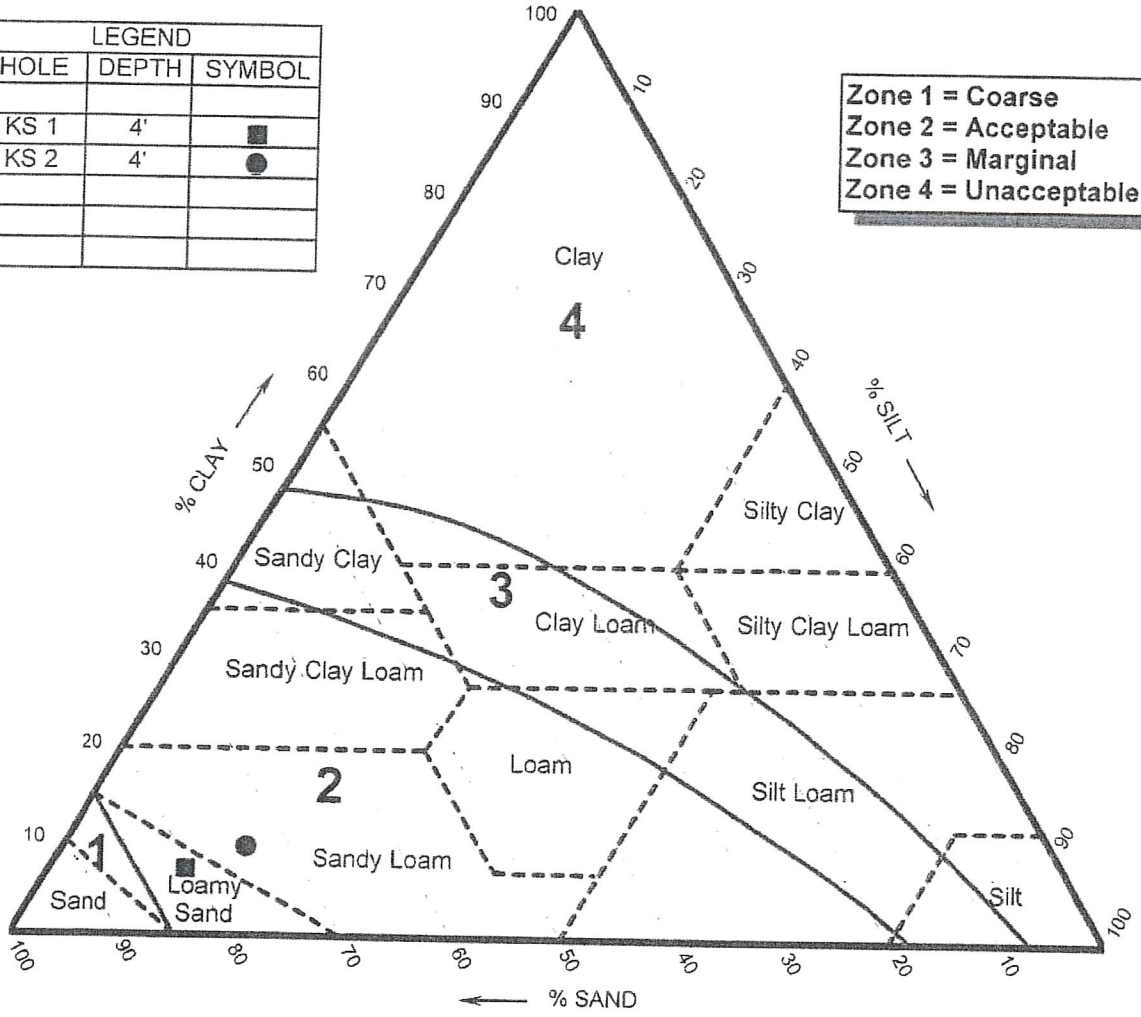
Zone 2 - Soils in this zone provide adequate percolation rates and filtration of effluent. They are suitable for use of a conventional system without further testing.

Zone 3 - Soils in this zone are expected to provide good filtration of effluent, but their ability to accept effluentat at a suitable rate is questionable. These soils require wet-weather percolation tests to verify their suitability for effluent disposal by conventional leachfield methods.

Zone 4 - Soils in this zone are unsuitable for a conventional leachfield because of their severe limitations for accepting effluent.

SOIL PERCOLATION SUITABILITY CHART

LEGEND		
HOLE	DEPTH	SYMBOL
KS 1	4'	■
KS 2	4'	●



NOTES

1. Soil texture is plotted on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjustment for coarse fragments has been made by moving the plotted point in the sand direction an additional 2% for each 10% (by volume) of fragments greater than 2mm in diameter.
3. Adjustment for compactness of soil has been made by moving the plotted point in the clay direction an additional 15% for soils having a bulk-density greater than 1.7 gm/cc, when analyzed.
4. For soils falling in sand, loamy sand, or sandy loam, classification adjustment for bulk density will generally not affect suitability and a bulk-density analysis was not necessary.

JOB NUMBER: 016031 **DATE:** 10/28/16

JOB NAME: Omsberg (Spurlock) **APN:** 210-074-008

SHN Consulting Engineers & Geologists, Inc.
812 W. Wabash
Eureka, CA 95501-2138
(707) 441-8855

F&W ; TRIBE

Water Resource Protection Plan

for APN 210-074-008

Humboldt County

Submitted to:

California Regional Water Quality Control Board - North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

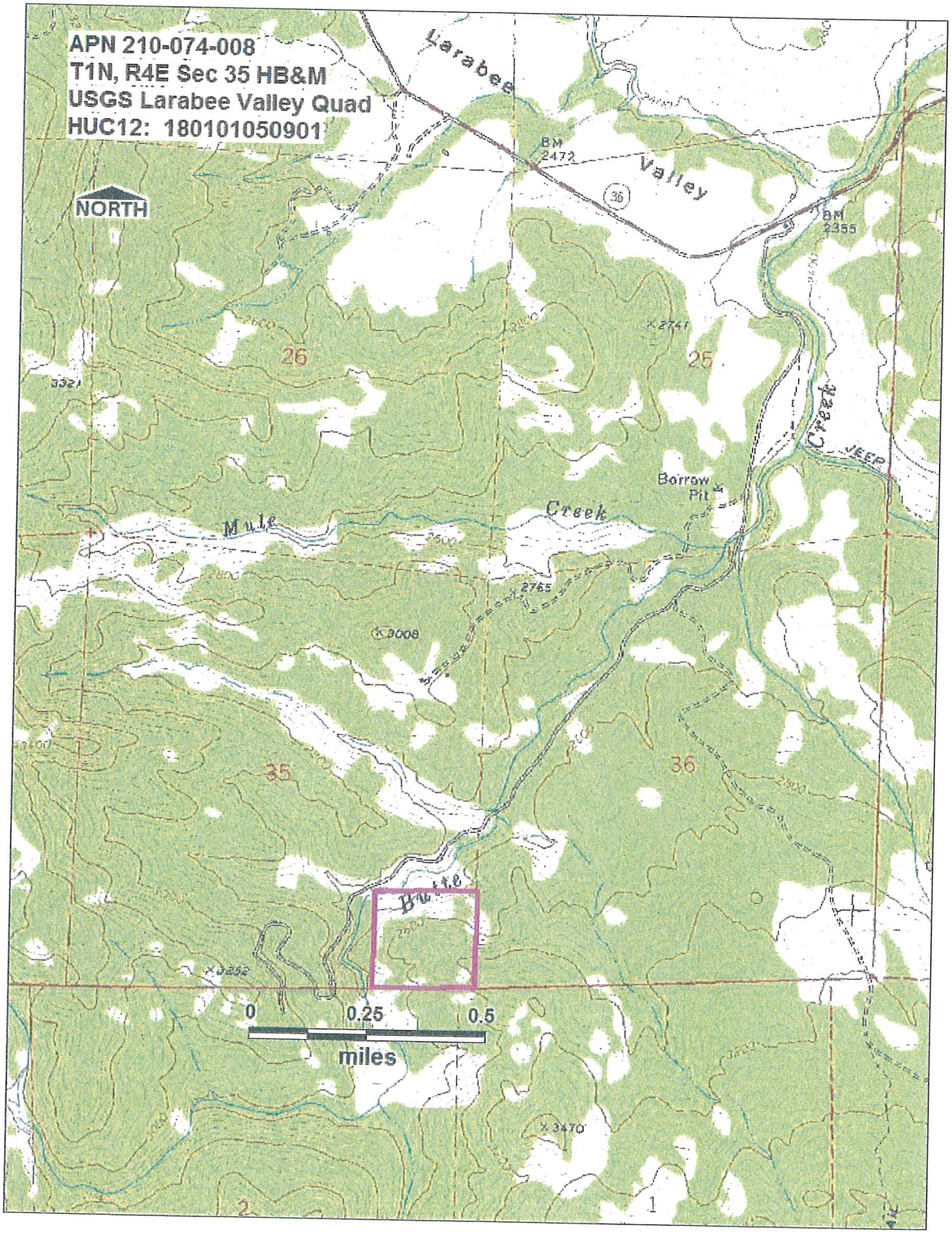
Prepared by:
Sandra Brown & Prairie Moore
Natural Resources Management Corporation
1434 3rd Street
Eureka, CA 95501

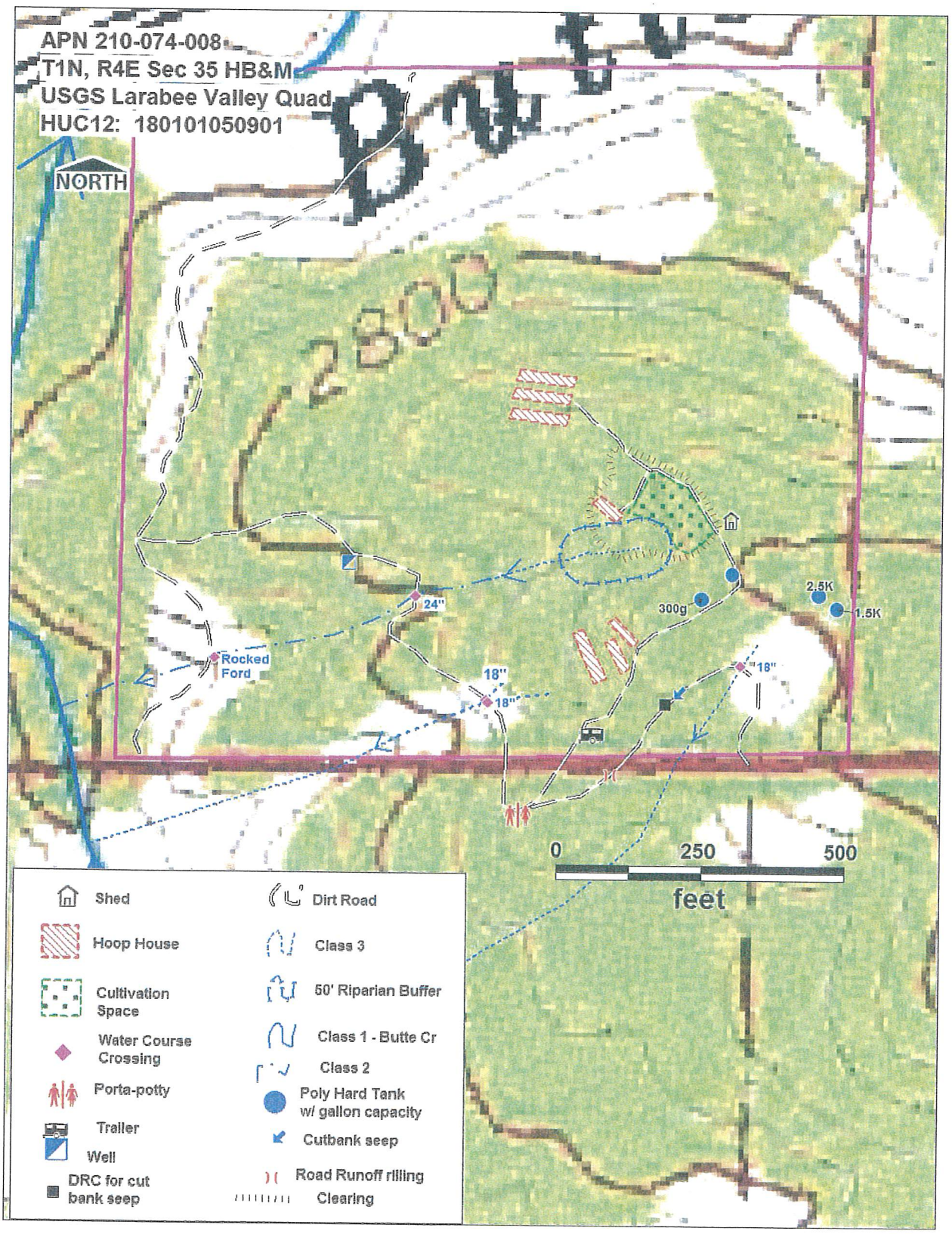
February 1, 2017

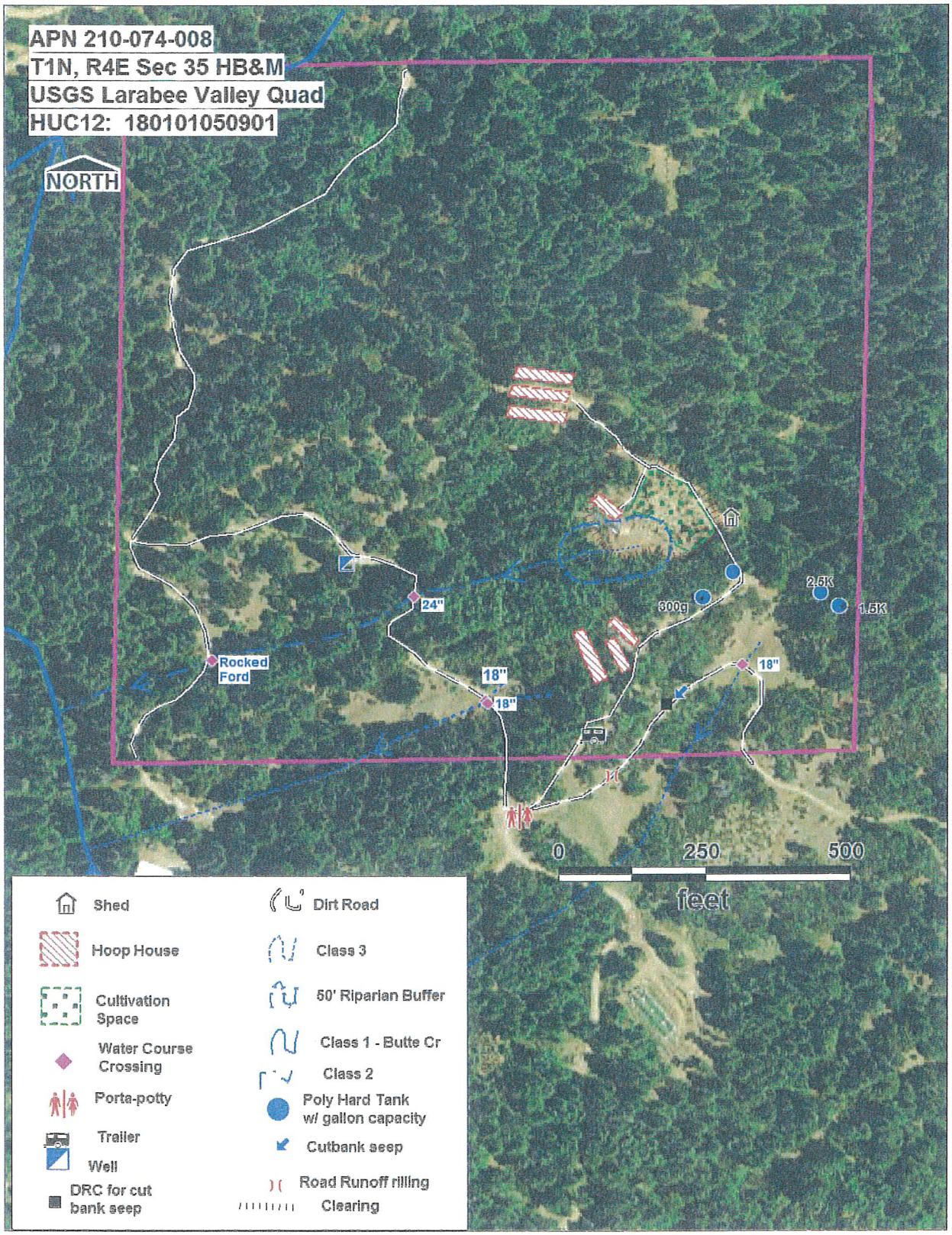
NRM
NATURAL RESOURCES MANAGEMENT
CORPORATION

2

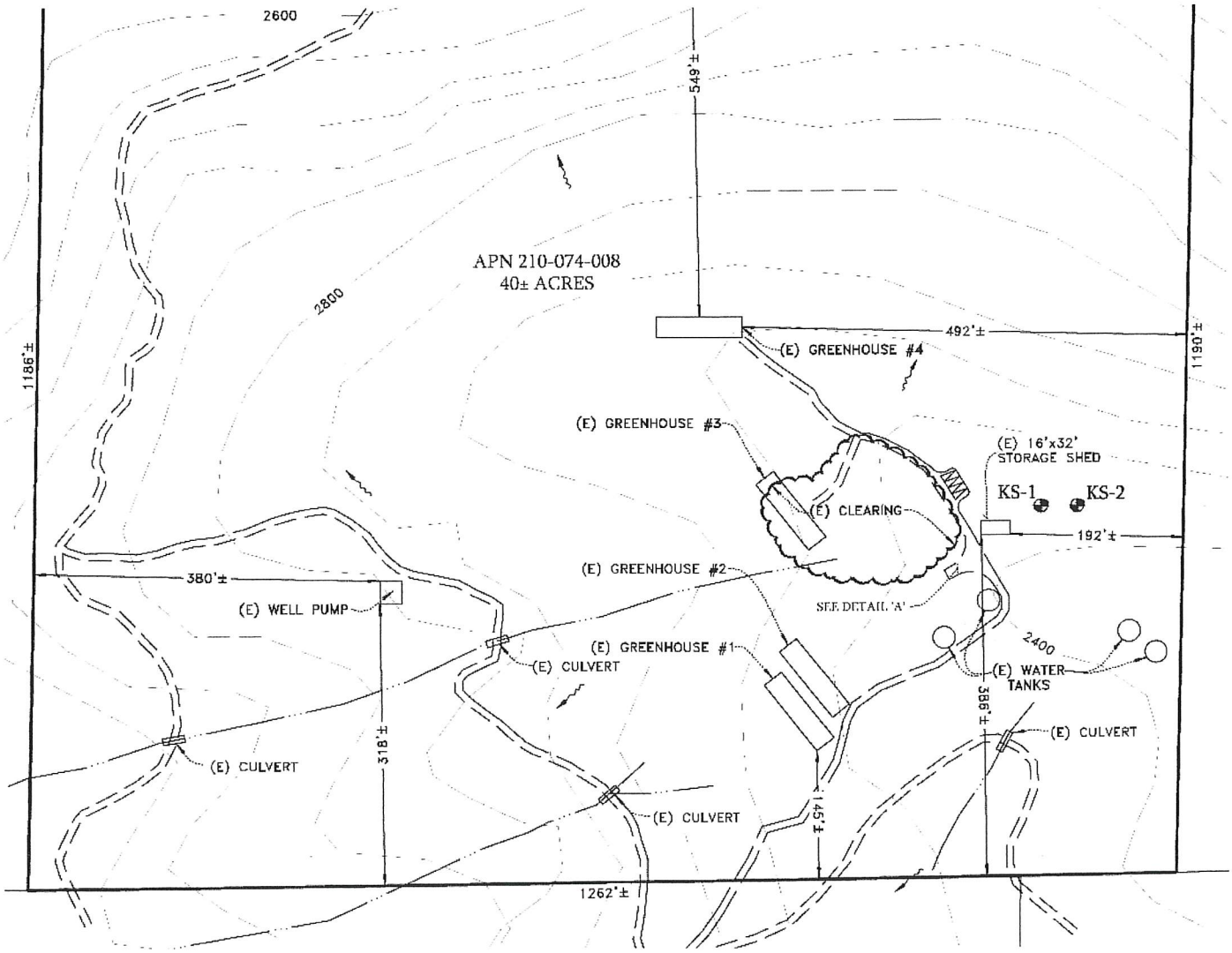
Figure 1- Site Maps for Property




APN 210-074-008
T1N, R4E Sec 35 HB&M
USGS Larabee Valley Quad
HUC12: 180101050901
NORTH
2800
24"
Rocked Ford
18"
18"
18"
300g
2.5K
1.5K
0
250
500
feet
Shed
Hoop House
Cultivation Space
Water Course Crossing
Porta-potty
Trailer
Well
DRC for cut bank seep
Dirt Road
Class 3
50' Riparian Buffer
Class 1 - Butte Cr
Class 2
Poly Hard Tank w/ gallon capacity
Cutbank seep
Road Runoff rilling
Clearing


APN 210-074-008
T1N, R4E Sec 35 HB&M
USGS Larabee Valley Quad
HUC12: 180101050901
NORTH
24"
Rocked Ford
18"
18"
18"
300g
2.5K
1.5K
0
250
500
feet
Shed
Hoop House
Cultivation Space
Water Course Crossing
Porta-potty
Trailer
Well
DRC for cut bank seep
Dirt Road
Class 3
50' Riparian Buffer
Class 1 - Butte Cr
Class 2
Poly Hard Tank w/ gallon capacity
Cutbank seep
Road Runoff rilling
Clearing

Portion of 210-074-008 Plot Plan by Omsberg & Preston, dated 10/21/16.



Water Resource Protection Plan

This document serves as the water resource protection plan for site APN 210-074-008 pursuant to Order No. R1-2015-0023. On August 13, 2015, the North Coast Regional Water Quality Control Board (Regional Water Board) adopted a General Waiver of Waste Discharge requirements and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects in the North Coast Region, Order No. R1-2015-0023. One of the requirements of the order is to prepare a Water Resource Protection Plan (WRPP) for all sites that are enrolled under Tier 2 of the order.

Site Assessment

This approximate 40 acre parcel has a Non-Industrial Timber Management Plan, under which the landowner had a less than 3-acre conversion completed on the parcel (Harvest document number 1-16EX-049 HUM) in 2016. The conversion opened space on all three flats. Most cultivation is taking place inside raised beds or pots in hoop houses, with additional outdoor plants in Smart Pots in the aforementioned clearing. Natural slopes are generally less than 35 percent, and the graded flats have slopes generally less than 5 percent.

The total cultivation area is approximately 19,700 square feet; and a well (determined as by CDFW groundwater from the well drilling report) provides the water for cultivation. The cultivation is done with all natural light and on a drip irrigation system. Soils are reused each year. Therefore there are no spoils piles located on the property. The property also has no open trash piles etc.

A shed on the property is used for storage of fertilizer as well as drying and processing. No pesticides or fungicides are used. A small Honda EU3000i portable generator is used to provide power to the shed. A generator shed with space for gas cans is adjacent to the storage shed.

A travel trailer provides living space. A porta potty (which is shared with the neighboring property) provides human waste facilities.

Current Conditions – Please refer to Figure 1 site maps

Watercourses

The parcel lies on a broad ridge-nose hillside above Butte Creek. There are three small unnamed draws that drain the hillside which are only intermittently or seasonally wet (figure 1).

The headwaters of one Class 3, located at clearing, captures approximately 10 feet of a hoop house and several smart pots in the 50 foot riparian buffer area. At this headwater location, it has very minimal bed and bank development and is surrounded by grass and herbaceous vegetation. And it was flagged out left undisturbed during the harvest. A full 50 foot buffer will be established.

Watercourse Crossings

Sediment issues with this property are associated with stream crossing on the original Ranch roads / logging roads that were put in by previous owners. There are five stream crossing on the property (see figure 1). Four of them have culverts. All culverts are appropriately sized and properly functioning. The most western crossing is a stable rocked ford for the lowest drainage that had a long 75 foot flat depositional inlet that is not appropriate for a culvert.

Roads

The primary access road to the parcel is stable and rocked. It is situated on a bench approximately 240 feet (three 80 contour lines) above Butte Creek. Departing from the primary access road, the secondary roads into the parcel were initially entered for forestry purposes and go up in elevation. The spur road that goes up to the ridgeline has one particularly steep reach, generally requiring four wheel drive, but any runoff from this road has minimal sediment delivery potential. There is a fair amount of natural rock in the road surface and additional surface rock has been applied. The small Class 3 drainages mentioned above have been slated for upgrades. Additional dips and road drainage features have also recently been incorporated into this road network.

Flats

There are three distinct areas on the property used for cultivation. The northern most flat was expanded at the end of 2016 during the 3 acre conversion process. It now has three 20ft by 96ft greenhouses on. The middle flat has one hoop house on it. During the initial site visit it was determined that this hoop that a portion of this hoop house was within the 50 ft buffer of the class III stream. It was reduced to 20 ft X 50 ft so it now is outside of the 50 foot buffer. There were also a number of scattered smart pots within the 50 foot buffer these were also removed. The southern most flat was expanded under the 3 acre conversion in the late spring of 2016. It now has three hoop houses on it one is 17ft by 60 ft and the other two are 20ft by 96 ft each. The graded flats where the hoop houses are situated, all have slopes of less than five percent. Natural slopes tend to be more along the lines of 15 to 30 percent. The fillslopes are stable and raw soil was mulched prior to the rainy season 2016-2017.

General Property Conditions

Overall, the broad hillside and near-ridge features of this parcel lend itself to being stable. The cultivation activities, for the most part, are consolidated, contained, and have limited erosion potential.

List of Chemicals Stored Onsite & Information about Use

All generators, pumps, fertilizers and petroleum products are stored in the shed during the offseason. Secondary containment is needed for all equipment and products that can spill or leak into the ground. No pesticides or fungicides are used.

Prior to planting powdered bone meal and guano are mixed into the soil. Plants are also top dressed with bone meal and guano throughout the growing season. Compost teas and molasses are watered on the plants periodically throughout the season.

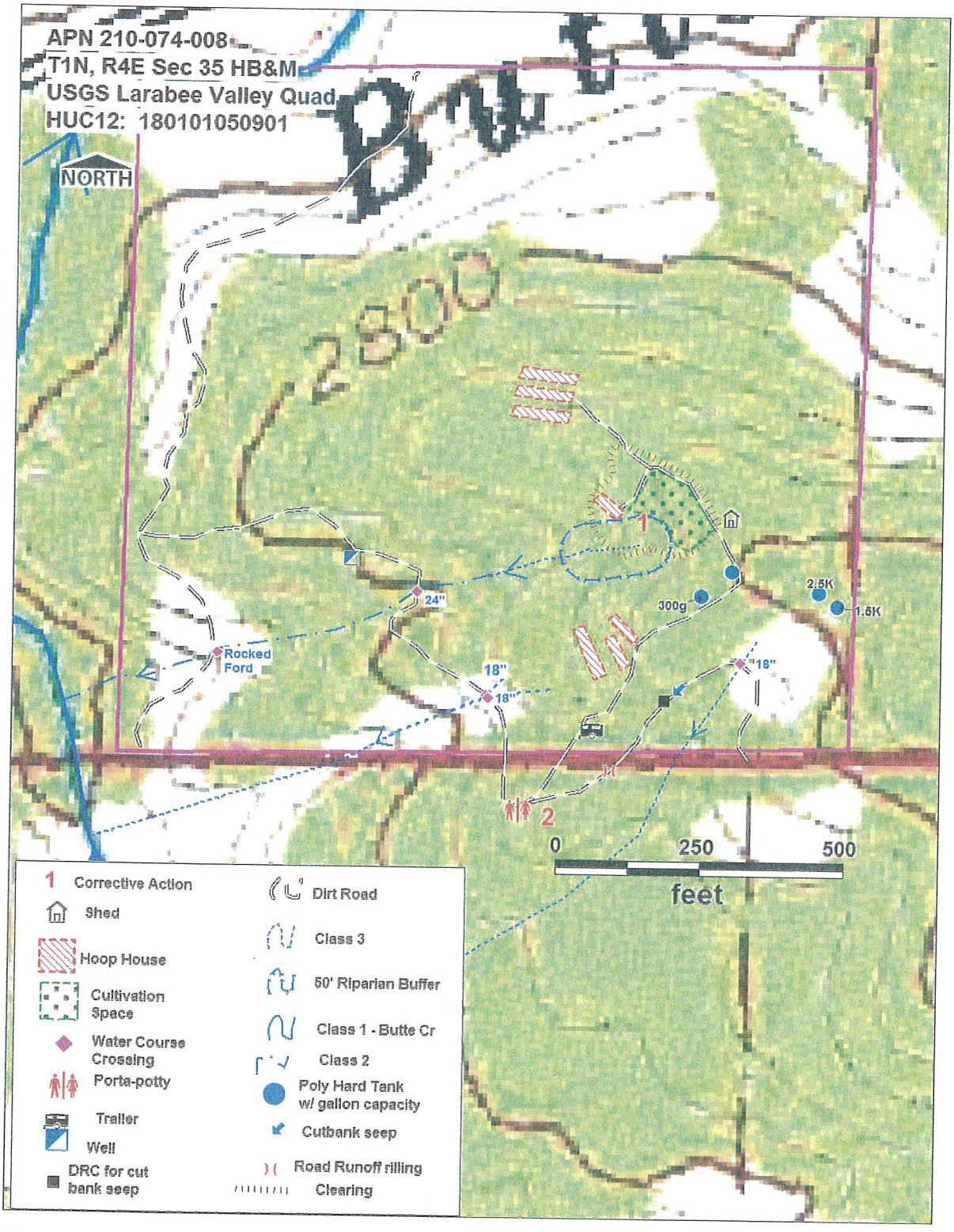
For future compliance, **a log of nutrient use** stating type of nutrient/amendments being added with stated NPK ratios (where available) will be provided to the client to track and monitor the amounts used and applied over the growing season. This monitoring log will be kept onsite for future reference and documentation of nutrient applications.

Water Use

Water is pumped from an on-property, non-jurisdictional groundwater well; and no surface water diversions would be active in the Class 3 channels during the summer non-diversion season, but there are no surface water diversions on the parcel. Plants are watered using drip irrigation; and a slow drip system greatly reduces any irrigation runoff issues.

For the 13,000 square feet cultivation area grown in 2016, the watering as reported in the Monitoring Reporting Program totals **61,450 gallons** from May to October. The monthly gallon totals (starting for May) are as follows: 9,150; 9,150; 12,000; 12,000; 10,000 and 9,150. We estimate that the total water use for the 19,700 sq ft would be around 93,000 gallons. A water meter will be installed to record the amount of water used for irrigation in the 2017 season.

Figure 2. Corrective actions map



Corrective Actions – Please refer to Figure 2 site map

Table 1. Features that need improvement. See Appendix B for Associated Standard Conditions (A.S.C.)

Unique Map Points	Map Point Descriptions	A.S.C	Temporary BMP	Permanent BMP	Priority for Action	Time Schedule for completion of Permanent BMP	Completion Date
1	Cultivation within 50 feet of a Class III	3.a	NA	Establish 50' buffer zone	2	5/15/16	Nov. 2016
2	Pota-potty	2.a b	Porta-potty	Permitted septic	3	12/31/17	

Priority time frames: 1 is high priority with treatment being planned to occur immediately; 2 is a high priority for treatment to occur prior to the start of the non-diversion period; 3 is a moderate priority for treatment to occur within a year, or prior to the winter of the second season of operations; 4 is a lower priority with treatment being planned within the shortest time possible, but no later than the expiration of this Order (five years).

Points 1 (identified in March 2016): The 10 feet of hoop house and smart pots were removed in the late spring of 2016. The area naturally revegetated.

Point 2 The pota-potty will be used until a permitted septic can be installed. The porta-potty will be pumped regularly, and records of the pumping will be kept and submitted to NRM. Additionally the unit will be staked down to prevent it from, blowing or falling over.

Additionally, a **water meter** will be installed to determine the quantity of water used over a season. A photo of the meter reading will be taken on the 1st of each month to document water use.

And **a log of nutrient use** stating type of nutrient/amendments being added with stated NPK ratios (where available) will be provided to the client to track and monitor the amounts used and applied over the growing season. This monitoring log will be kept onsite for documentation and referencing of nutrient applications.

Winter Site Preparation

Prior to winter rains at the end of the growing season the following steps will be taken to prepare the site for winter.

- Soil used in cultivation will be piled, covered, and surrounded with straw wattle.
- Any bare soil on the fill slopes on the landing will be covered with straw 2 to 3 inches thick and secured with a tackafier. Fill slopes could be seeded with or planted to establish vegetation. Once vegetation is established straw would no longer be necessary.
- Cannabis stems and root balls will be properly disposed of outside of the streams and riparian areas.
- All nutrients will be placed in a secure storage shed
- All trash and debris will be properly disposed of.
- Any vegetation of debris obstructing the inlet or outlet of all five culverts will be removed and disposed of where they cannot enter any streams and at least 200 feet from any streams.
- Steep sections of road up to the grow area will have water bars installed at regular intervals (approximately every 50 feet).

Monitoring element to ensure that BMPs are being implemented and to evaluate their effectiveness

Corrective Action Monitoring

Items 1-3 will be checked for competition by NRM prior May 15, 2017. These corrections will be photo documented. Upon competition if Item 4 the permit for the composting toilet or the septic will be submitted to NRM.

Annual Monitoring

Fall / Winter Monitoring

Monitoring for this site will follow the revised Appendix C from the Order No. 2015-0023. Annual monitoring will be done each year. At a minimum it will be done prior to October 15th, by December 15th, and immediately following a precipitation event with 3 inches of accumulation in 24hr period.
Each monitoring session the following items will be inspected:

1. Pumps, nutrients, fertilizers, and any petroleum products are stored in a dry, enclosed location.
2. Soil and any spoils are properly contained and covered to prevent nutrient leaching.
3. Culvert inlets and outlets
4. Water bars installed on steep sections of road

This monitoring may be done by the landowner/registrant. Photos will be taken at each monitoring point. These photos along with the notes taken during the monitoring will be kept on-site. The monitoring forms and photos will be submitted by the landowner/registrant to NRM or the RWQCB.

Growing Season Monitoring

During the growing season the landowner will monitor the following items at least monthly:

- Tanks, bladders, and water lines to ensure there are no leaks
- Cultivation area during or immediately after watering to ensure irrigation water is soaking into the surface (not running off)
- Cultivation area to ensure that all fertilizers are properly contained in the storage shed, that all trash and debris is properly contained and secured.

The landowner/registrant will keep a record of the dates this monitoring was completed, if any corrective action was necessary, and what actions were taken. A copy will also be kept on file at NRM.

During the growing season all fertilizer use and irrigation water use will be tracked. The type and amount of fertilizers uses as well and the monthly total of water used for irrigation will be reported to NRM by December 31st of each year.

Annual monitoring reports will be submitted annually by March 31st of each year to the Water Board. The report will include the reporting from in Appendix C.

Water Resource Protection Plan

Name of Legally Responsible Person (LRP)_____

Title for LRP (owner, lease, operator, etc.)_____

Signature:_____ Date:_____

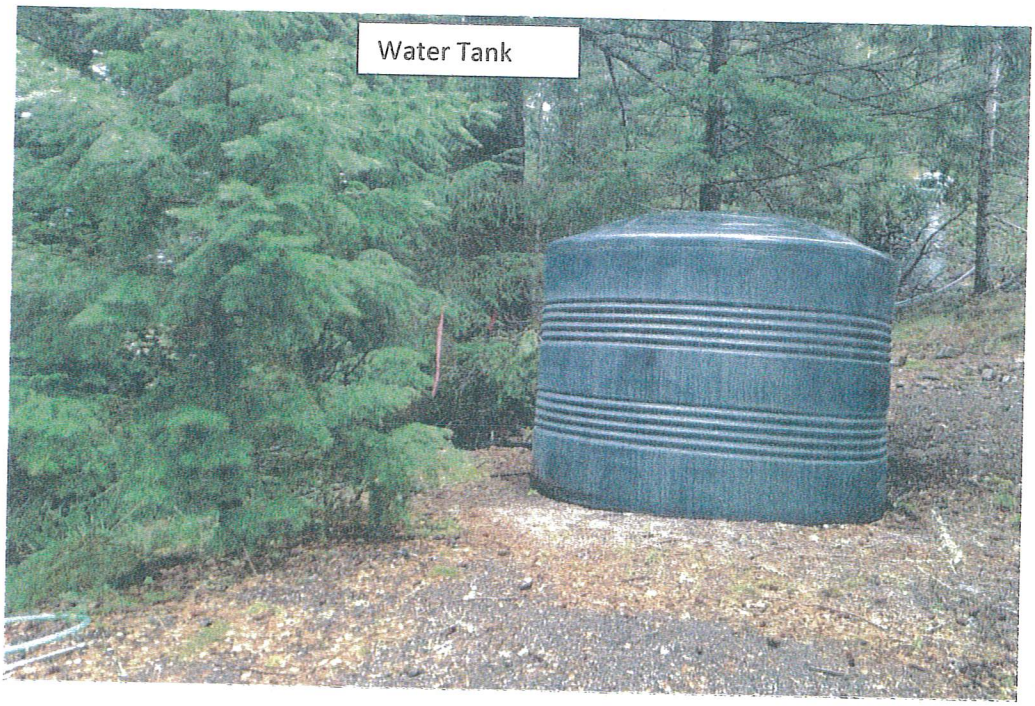
WRPP prepared by: **Natural Resources Management Corp. (NRM)**

Date:_____

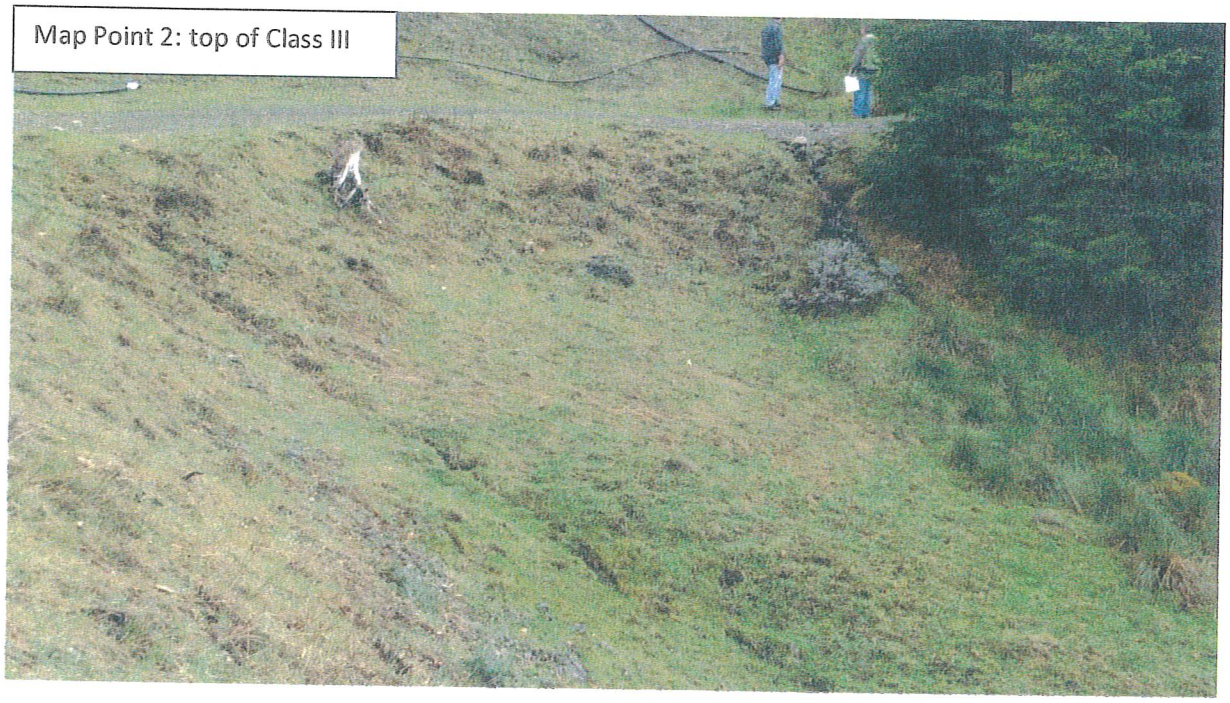
NRM Signature:_____

Appendix A. Photo Documentation on 3/31/2016; and October 2016

Map Point 1: Hoop House partially in Class III buffer zone (Class 3 not visible to the left side)



Map Point 2: top of Class III



Cutbank seep contributing road runoff

18” culvert

24” culvert

Rock Ford

Shed

Appendix B. Associated Standard Conditions

I. As described in the Order, dischargers will fall within one of three tiers.

Discharger shall be in the tier that covers the most impactful part of the operations (i.e., different sections of a property cannot be divided among the tiers). **All dischargers**, regardless of Tier are subject to the standard conditions in section **I.A,** MRP section I.D., and General Terms, Provisions and Prohibitions. **Tier 2 Dischargers** are also subject to section **I.B. (a Water Resources Protection Plan)**, and Tier 3 Dischargers are subject to sections I.A., I.B.(if cultivating cannabis), and I.C.

A. Standard Conditions, Applicable to All Dischargers

1. Site maintenance, erosion control and drainage features

a. Roads shall be maintained as appropriate (with adequate surfacing and drainage features) to avoid developing surface ruts, gullies, or surface erosion that results in sediment delivery to surface waters.

b. Roads, driveways, trails, and other defined corridors for foot or vehicle traffic of any kind shall have adequate ditch relief drains or rolling dips and/or other measures to prevent or minimize erosion along the flow paths and at their respective outlets.

c. Roads and other features shall be maintained so that surface runoff drains away from potentially unstable slopes or earthen fills. Where road runoff cannot be drained away from an unstable feature, an engineered structure or system shall be installed to ensure that surface flows will not cause slope failure.

d. Roads, clearings, fill prisms, and terraced areas (cleared/developed areas with the potential for sediment erosion and transport) shall be maintained so that they are hydrologically disconnected, as feasible, from surface waters, including wetlands, ephemeral, intermittent and perennial streams. Connected roads are road segments that deliver road surface runoff, via the ditch or road surface, to a stream crossing or to a connected drain that occurs within the high delivery potential portion of the active road network. A connected drain is defined as any cross-drain culvert, water bar, rolling dip, or ditch-out that appears to deliver runoff to a defined channel. A drain is considered connected if there is evidence of surface flow connection from the road to a defined channel or if the outlet has eroded a channel that extends from the road to a defined channel (http://www.forestsandfish.com/documents/Road_Mgmt_Survey.pdf).

e. Ditch relief drains, rolling dip outlets, and road pad or terrace surfaces shall be maintained to promote infiltration/dispersal of outflows and have no apparent erosion or evidence of soil transport to receiving waters.

f. Stockpiled construction materials are stored in a location and manner so as to prevent their transport to receiving waters.

2. Stream Crossing Maintenance

a. Culverts and stream crossings shall be sized to pass the expected 100- year peak streamflow.

b. Culverts and stream crossings shall be designed and maintained to address debris associated with the expected 100-year peak streamflow.

c. Culverts and stream crossings shall allow passage of all life stages of fish on fish-bearing or restorable streams, and allow passage of aquatic organisms on perennial or intermittent streams.

d. Stream crossings shall be maintained so as to prevent or minimize erosion from exposed surfaces adjacent to, and in the channel and on the banks.

e. Culverts shall align with the stream grade and natural stream channel at the inlet and outlet where feasible. At a minimum, the culvert shall be aligned at the inlet. If infeasible to align the culvert outlet with the stream grade or channel, outlet armoring or equivalently effective means may be applied.

f. Stream crossings shall be maintained so as to prevent stream diversion in the event that the culvert/crossing is plugged, and critical dips shall be employed with all crossing installations where feasible. If infeasible to install a critical dip, an alternative solution may be chosen.

3. Riparian and Wetland Protection and Management

a. For Tier 1 Dischargers, cultivation areas or associated facilities shall not be located within 200 feet of surface waters. While 200 foot buffers are preferred for Tier 2 sites, at minimum, cultivation areas and associated facilities shall not be located or occur within 100 feet of any Class I or II watercourse or within 50 feet of any Class III watercourse or wetlands. The Regional Water Board or its Executive Officer may apply additional or alternative conditions on enrollment, including site-specific riparian buffers and other BMPs beyond those identified in water resource protection plans to ensure water quality protection. Alternative site-specific riparian buffers that are equally protective of water quality may be necessary to accommodate existing permanent structures or other types of structures that cannot be relocated.

b. Buffers shall be maintained at natural slope with native vegetation.

c. Buffers shall be of sufficient width to filter wastes from runoff discharging from production lands and associated facilities to all wetlands, streams, drainage ditches, or other conveyances.

d. Riparian and wetland areas shall be protected in a manner that maintains their essential functions, including temperature and microclimate control, filtration of sediment and other pollutants, nutrient cycling, woody debris recruitment, groundwater recharge, streambank stabilization, and flood peak attenuation and flood water storage.

4. Spoils Management

a. Spoils shall not be stored or placed in or where they can enter any surface water. Spoils are waste earthen or organic materials generated through grading or excavation, or waste plant growth media or soil amendments. Spoils include but are not limited to soils, slash, bark, sawdust, potting soils, rock, and fertilizers.

b. Spoils shall be adequately contained or stabilized to prevent sediment delivery to surface waters.

c. Spoils generated through development or maintenance of roads, driveways, earthen fill pads, or other cleared or filled areas shall not be sidecast in any location where they can enter or be transported to surface waters.

5. Water Storage and Use

a. Size and scope of an operation shall be such that the amount of water used shall not adversely impact water quality and/or beneficial uses, including and in consideration with other water use by operations, instream flow requirements and/or needs in the watershed, defined at the scale of a HUC-12 watershed or at a smaller hydrologic watershed as determined necessary by the Regional Water Board Executive Officer.

b. Water conservation measures shall be implemented. Examples include use of rainwater catchment systems or watering plants with a drip irrigation system rather than with a hose or sprinkler system.

c. For Tier 2 Dischargers, if possible, develop off-stream storage facilities to minimize surface water diversion during low flow periods.

d. Water is applied using no more than agronomic rates. "Agronomic rates" is defined as the rates of fertilizer and irrigation water that a plant needs to enhance soil productivity and provide the crop or forage growth with needed nutrients for optimum health and growth, without having any excess water or nutrient percolate beyond the root zone.

e. Diversion and/or storage of water from a stream should be conducted pursuant to a valid water right and in compliance with reporting requirements under Water Code section 5101.

f. Water storage features, such as ponds, tanks, and other vessels shall be selected, sited, designed, and maintained so as to insure integrity and to prevent release into waters of the state in the event of a containment failure.

6. Irrigation Runoff

Implementing water conservation measures, irrigating at agronomic rates, applying fertilizers at agronomic rates and applying chemicals according to the label specifications, and maintaining stable soil and growth media should serve to minimize the amount of runoff and the concentration of chemicals in that water.

In the event that irrigation runoff occurs, measures shall be in place to treat/control/contain the runoff to minimize the pollutant loads in the discharge. Irrigation runoff shall be managed so that any entrained constituents, such as fertilizers, fine sediment and suspended organic particles, and other oxygen consuming materials are not discharged to nearby watercourses. Management practices include, but are not limited to, modifications to irrigation systems that reuse tailwater by constructing offstream retention basins, and active (pumping) and or passive (gravity) tailwater recapture/redistribution systems. Care shall be taken to ensure that irrigation tailwater is not discharged towards or impounded over unstable features or landslides.

7. **Fertilizers and Soil Amendments**

   a. Fertilizers, potting soils, compost, and other soils and soil amendments shall be stored in locations and in a manner in which they cannot enter or be transported into surface waters and such that nutrients or other pollutants cannot be leached into groundwater.

   b. Fertilizers and soil amendments shall be applied and used per packaging instructions and/or at proper agronomic rates (see footnote on previous page).

   c. Cultivation areas shall be maintained so as to prevent nutrients from leaving the site during the growing season and post-harvest.

8. **Pesticides/Herbicides**

   At the present time, there are no pesticides or herbicides registered specifically for use directly on cannabis and the use of pesticides on cannabis plants has not been reviewed for safety, human health effects, or environmental impacts. Under California law, the only pesticide products not illegal to use on cannabis are those that contain an active ingredient that is exempt from residue tolerance requirements and either registered and labeled for a broad enough use to include use on cannabis or exempt from registration requirements as a minimum risk pesticide under FIFRA section 25(b) and California Code of Regulations, title 3, section 6147. For the purpose of compliance with conditions of this Order, any uses of pesticide products shall be consistent with product labelling and any products on the site shall be placed, used, and stored in a manner that ensures that they will not enter or be released into surface or ground waters.

9. **Petroleum products and other chemicals**

   a. Petroleum products and other liquid chemicals, including but not limited to diesel, biodiesel, gasoline, and oils shall be stored so as to prevent their spillage, discharge, or seepage into receiving waters. Storage tanks and containers must be of suitable material and construction to be compatible with the substance(s) stored and conditions of storage such as pressure and temperature.

   b. Above ground storage tanks and containers shall be provided with a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation.

   c. Dischargers shall ensure that diked areas are sufficiently impervious to contain discharged chemicals.

   d. Discharger(s) shall implement spill prevention, control, and countermeasures (SPCC) and have appropriate cleanup materials available onsite.

   e. Underground storage tanks 110 gallons and larger shall be registered with the appropriate County Health Department and comply with State and local requirements for leak detection, spill overflow, corrosion protection, and insurance coverage.

10. Cultivation-related wastes

Cultivation-related wastes including, but not limited to, empty soil/soil amendment/ fertilizer/pesticide bags and containers, empty plant pots or containers, dead or harvested plant waste, and spent growth medium shall, for as long as they remain on the site, be stored at locations where they will not enter or be blown into surface waters, and in a manner that ensures that residues and pollutants within those materials do not migrate or leach into surface water or groundwaters. Plant waste may also be composted, subject to the same restrictions cited for cultivation-related waste storage.

11. Refuse and human waste

a. Disposal of domestic sewage shall meet applicable County health standards, local agency management plans and ordinances, and/or the Regional Water Board's Onsite Wastewater Treatment System (OWTS) policy, and shall not represent a threat to surface water or groundwater.

b. Refuse and garbage shall be stored in a location and manner that prevents its discharge to receiving waters and prevents any leachate or contact water from entering or percolating to receiving waters.

c. Garbage and refuse shall be disposed of at an appropriate waste disposal location.

12. Remediation/Cleanup/Restoration

Remediation/cleanup/restoration activities may include, but are not limited to, removal of fill from watercourses, stream restoration, riparian vegetation planting and maintenance, soil stabilization, erosion control, upgrading stream crossings, road outsloping and rolling dip installation where safe and suitable, installing ditch relief culverts and overside drains, removing berms, stabilizing unstable areas, reshaping cutbanks, and rocking native-surfaced roads. Restoration and cleanup conditions and provisions generally apply to Tier 3 sites, however owners/operators of Tier 1 or 2 sites may identify or propose water resource improvement or enhancement projects such as stream restoration or riparian planting with native vegetation and, for such projects, these conditions apply similarly.

APN: 21-074-008

Order No. R1-2015-0023
REPORTING FORM

A. **Site WDID:** 1B161087CHUM

B. **Subwatershed (HUC-12)[2]:** 180102060901

C. **Enrollment date:** March 31, 2016

D. **Reporting date:** _____

E. **Please check the box corresponding to the enrolled site's current tier (Tier 3 sites with cultivation must also check Tier 2).**

☐ Tier 1 ☒ Tier 2 ☐ Tier 3

Has the site's tier status changed since the last reporting period? Y☐/N☒
If YES, briefly explain: _____

F. **Check all fields that apply to the enrolled site:**

i. **Tier 1 sites:**
(see Order at page 6 for details on Tier 1 characteristics)
- ☐ Average slope of each individual cultivation area is no more than 35% slope.
- ☐ Total cultivation area is no more than 5,000 square feet.
- ☐ No cultivation areas or associated facilities are located within 200 feet of a surface water. (Surface waters include wetlands and Class I, II, and III watercourses.)
- ☐ No surface water diversion from May 15 through October 31.
- ☐ The site is in compliance with all Standard Conditions under Order R1-2015-0023, section I.A.

ii. **Tier 2 sites:**

a. A Water Resource Protection Plan has been developed and is being implemented? Y☐/N☒

If NO, expected date when plan will be ready and implementation will begin: December 31, 2016

If YES, have there been changes to the implementation schedule since the prior year of reporting? Y☐/N☐

[2] 12-digit HUC-12 subwatershed codes are available online at http://iaspub.epa.gov/apex/grts/f?p=110:95:::NO::APP_SHOW_HIDE:

OMSBERG & PRESTON
Surveyors · Engineers · Planners
434 7th Street, Suite B
Eureka, CA 95501
(707) 443-8651
www.omsberg.com
kpreston@omsberg.com

October 20, 2016

16-1908

Adam Molofsky
Humboldt County Division of Environmental Health
100 H Street, Suite 100
Eureka, CA 95501

Re: **Sewage Disposal Report**
Kevin Spurlock (APN 210-074-008)

Dear Adam:

Sewage disposal testing has been completed on APN 210-074-008 for Kevin Spurlock.

Attached herewith is the engineered soils data demonstrating suitable leach-field and reserve areas for the existing 3-bedroom residence.

On September 10, 2016, an auger was brought to the site and two test holes were established. Results from the soils lab indicated a Zone 2 soil was found at both test holes numbered KS-1 and KS-2. Based on this result, an on-site sewage disposal system was designed at the KS-2 test site location consisting of 5 leach lines, each 72' long (using 36" wide infiltrators.) The reserve area will be at the KS-1 test site location and shall be 36'X72'.

The water source for this proposed residence is a spring.

Thank you, and please do not hesitate to contact me with any questions or comments you may have.

OMSBERG AND PRESTON

Stephen G. Nesvold, PE
RCE 25681

SEWAGE DISPOSAL SYSTEM CHECKLIST

JN: 16-1908

TYPE OF APPLICATION: After the fact building permit DATE: October 20 2016

NAME: Kevin Spurlock SANITARIAN: Ben Dolf

APN: 210-074-008 LOCATION: Dinsmore

WATER SUPPLY: PRIVATE X Well Spring

DISPOSAL FIELD LOCATION W.R.T.: Average Slope Primary: 15%

Perennial Stream >100 Ft. Buildings >10 Ft. Cut Banks >25 Ft.

Ephemeral Stream >50 Ft. Property Lines >50 Ft. Wells >100 Ft.

SOIL PROFILES:

Hole #	Date	Hole Depth	Observed G.W. Depth (Ft.)	Mottling Depth (Ft.)	Trench location Depth range	Soil below
KS-1	10/10/16	5'6"	None	None	2'	3'6"
KS-2	10/10/16	5'8"	None	None	2'	3'8"

SOIL ANALYSIS:

Hole #	Bulk Dens	Sample Depth	Zone	% Clay	% Silt	% Sand	USDA Texture
KS-1	No peds	4'	2	10.3	18.2	71.5	Loamy Sand
KS-2	No peds	4'	2	11.4	19.8	68.8	Sandy Loam

KS-2 is the test hole demonstrating a suitable leachfield.
KS-1 is the test hole demonstrating a suitable reserve area.

OMSBERG & COMPANY
SURVEYORS *ENGINEERS*
1864 MYRTLE AVENUE
EUREKA, CA 95501
(707) 443-8651

SHEET NO ______ OF ______ SHEETS
JOB NO 5-[illegible]

SUBJECT DESIGN OF ON-SITE SEWAGE DISPOSAL SYSTEM to the Existing 3-bedroom RESIDENCE for [illegible] Spurlock (APN 210-074-[illegible])

MADE BY SGN DATE 10-20-16 CHECKED BY ______

3 Bedroom ∴ Design Effluent Volume = 450 gal/day

USE 36" WIDE INFILTRATIVE [illegible]

Zone 2 soils then Soil Application RATE = 0.425 GALLONS/DAY/SQ. FT

TRY 5 LINES @ 72'/LINE

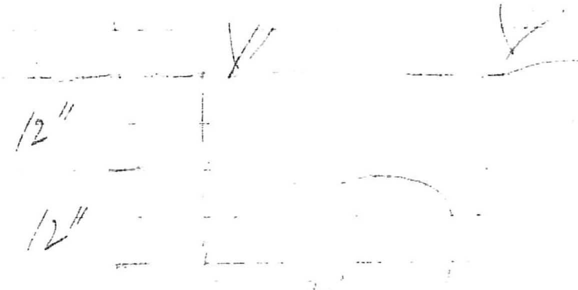
5 LINES × 72'/LINE × 3' × 0.425 = 459 gal/DAY

Since we need 450 gal/day

WE'RE FINE AT the KS-2 TEST SITE LOCATION

RESERVE AREA will be 72' × 36'
(AT the KS-1 TEST SITE LOCATION)

OMSBERG & PRESTON
SURVEYORS *ENGINEERS*
Call 499-1175
(707) 443-8651
(707) 443-0422 FAX
[illegible] 7th Street, Ste. B
Eureka, CA 95501
STEPHEN NESVOLD, P.E.
Civil Engineer
snesvold@omsberg.com



TYPICAL TRENCH DETAIL

OMSBERG & PRESTON
SURVEYORS ENGINEERS

434 7th STREET, SUITE B
EUREKA, CA 95501
(707) 443-8651
FAX (707) 443-0422

SUBSURFACE PROFILE LOG

Client KEVIN SPURLOCK Project No. 16-1908 Logged By SGN
Location DIKES WORK APN 210-074-008 Hole No. KS-1
Testing Date 10/10/2016 Excavation Rig HAND AUGER

Description & Remarks	Color	Moisture	Consistancy	Depth (ft.)	Samples
NO TOPSOIL SANDY CLAY LOAM WITH GRAVEL	GRAYISH BROWN	MOIST	MED DENSE	1 2 3 4 5	X
AUGER REFUSAL - HIT COBBLE				5'11" 6 7	
NO GROUND WATER OR MOTTLING ENCOUNTERED IT HAD RAINED 6" IN LAST 48 HRS				8 9 10 11 12	

DUNSBERG & DOLTON
SURVEYORS ENGINEERS

434 7th STREET, SUITE B
EUREKA, CA 95501
(707) 443-8651
FAX (707) 443-0422

SUBSURFACE PROFILE LOG

Client KEVIN SPURLOCK Project No. 16-1908 Logged By SGN
Location DUNES MORE APN 210-074-008 Hole No. KS-2
Testing Date 10/10/2016 Excavation Rig HAND AUGER

Description & Remarks	Color	Moisture	Consistancy	Depth (ft.)	Samples
TOPSOIL	GREENISH BROWN	MOIST	MED DENSE	1 2 3 4 5	X
SANDY clay COBBLE with GRAVEL				5'8" 6 7 8 9 10 11 12	
AUGER REFUSAL - HIT COBBLE					
NO Groundwater OR MOTTLING ENCOUNTERED					
IT had rained 1 6" in last 48 HRS					

CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W.Wabash Eureka,CA 95501-2138 Tel:707/441-8855 FAX:707/441-8877 E-mail:shninfo@shn-engr.com

Reference: 016031

October 28, 2016

Stephen Nesvold
Omsberg & Preston
434 7th Street, Suite B
Eureka, CA 95501

SOIL PERCOLATION SUITABILITY / TEXTURAL ANALYSIS RESULTS

Job Name: Omsberg (Spurlock) **Sampled By:** SN
Date Sampled: 10/10/16 **Date Tested:** 10/28/16
Date Received: 10/11/16 **AP Number:** 210-074-008

Sample ID	Depth	% Sand	% Clay	% Silt	% Coarse Fragments by Volume	Zone	Bulk Density
KS 1	4'	71.5	10.3	18.2	44.3	2	*
	Material: **Loamy Sand**						
KS 2	4'	68.8	11.4	19.8	24.8	2	*
	Material: **Sandy Loam**						

* = no peds provided

Regional Water Quality Control Board Zone Descriptions:

Zone 1 - Soils in this zone are very high in sand content. They readily accept effluent, but because of their low silt and clay content they provide minimal filtration. These soils demand greater separation distances from groundwater.

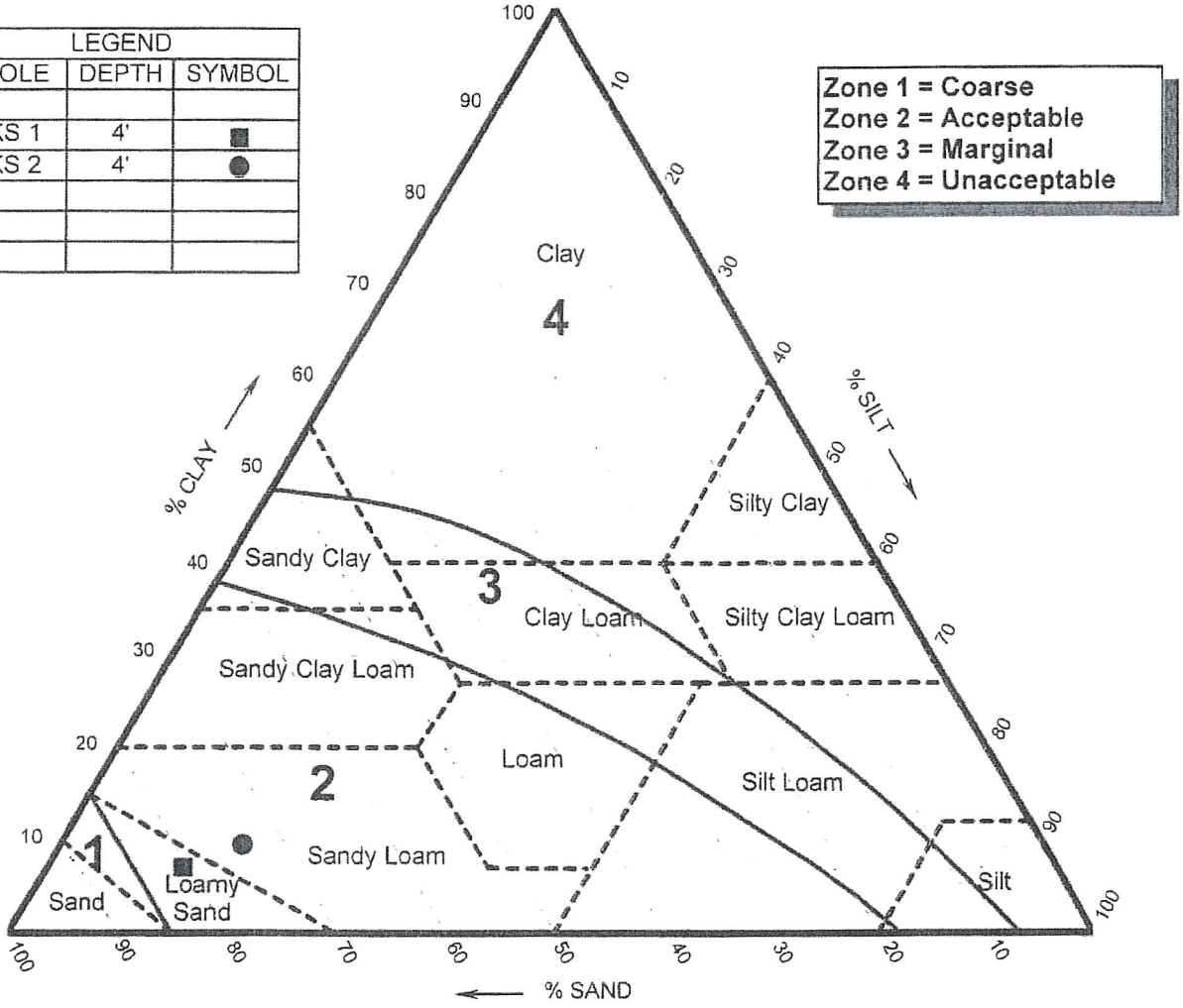
Zone 2 - Soils in this zone provide adequate percolation rates and filtration of effluent. They are suitable for use of a conventional system without further testing.

Zone 3 - Soils in this zone are expected to provide good filtration of effluent, but their ability to accept effluentat a suitable rate is questionable. These soils require wet-weather percolation tests to verify their suitability for effluent disposal by conventional leachfield methods.

Zone 4 - Soils in this zone are unsuitable for a conventional leachfield because of their severe limitations for accepting effluent.

SOIL PERCOLATION SUITABILITY CHART

LEGEND		
HOLE	DEPTH	SYMBOL
KS 1	4'	■
KS 2	4'	●



NOTES

1. Soil texture is plotted on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjustment for coarse fragments has been made by moving the plotted point in the sand direction an additional 2% for each 10% (by volume) of fragments greater than 2mm in diameter.
3. Adjustment for compactness of soil has been made by moving the plotted point in the clay direction an additional 15% for soils having a bulk-density greater than 1.7 gm/cc, when analyzed.
4. For soils falling in sand, loamy sand, or sandy loam, classification adjustment for bulk density will generally not affect suitability and a bulk-density analysis was not necessary.

JOB NUMBER: 016031 **DATE:** 10/28/16

JOB NAME: Omsberg (Spurlock) **APN:** 210-074-008

Consulting Engineers & Geologists, Inc.

812 W. Wabash
Eureka, CA 95501-2138
(707) 441-8855