



June 30, 2021

Don Wennerholm P.O. Box 357 Carlotta, CA 95528

RE:

Proposed OWTS

Residential Development 139 Sunny Slope Lane Carlotta, CA 95528 APN: 206-211-014



JN: WNM2101

ONSITE WASTEWATER TREATMENT SYSTEM (OWTS) DESIGN

1. Project Description

This proposed OWTS design will support a proposed 3-bedroom residence.

Estimated sewage flow for the proposed residence is 450 gallons per day. This sewage flow estimate is based on 150 gallons per day per bedroom up to three bedrooms. A detailed sewage disposal quantity calculation is shown in section 8 of this report. The daily sewage flow quantity is based on the current California Regional Water Quality Control Board (CRWQCB) standards. Note: this parcel will be subdivided and require a letter from the property owner of the remaining southern parcel to allow encroachment of the proposed OWTS to come less than 50 feet of the new common property line, while still maintaining a minimum 25 foot setback from the sloped bank.

2. Project Location

From Eureka proceed south on HWY 101. Take exit 685 for CA-36 E; continue for approximately 6.5 miles. Take a left turn at Sunny Slope Lane. The property is on right side, approximately 1,000 feet down the road.

3. Site Map

See attached septic system site plan.

4. Site Description

The area of this parcel where the proposed primary and reserve septic fields will be located is southwest of the proposed home site. The ground surface in the vicinity of the proposed septic fields, at test hole 1 (TH-1) and TH-2 slopes down toward the southeast at slopes of 1% - 2%. A bank slopes 50% - 60% southwest of the proposed septic fields. The remainder of the lot also generally slopes down toward the South/Southeast at slopes up to 2%. This area currently consists of mostly grasses used for cattle grazing.

Eureka: (707) 444-1420

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Residential OWTS
WNM2101
June 30, 2021

5. Written Summary of Site Evaluation and Work Completed

Investigations and Testing

On March 11, 2021, two test holes, TH-1 and TH-2, were excavated to approximately 4 feet with a back hoe, and a hand auger was used to dig to a depth of approximately 8 feet; soil boring logs and monitoring well installation were performed. See attachments for soil data and well diagrams.

Groundwater Conditions

On March 11, 17, 23, 2021, groundwater monitoring was performed at TH-1 and TH-2. No groundwater was encountered down to the well installation limits throughout the 3-week monitoring period. TH-1 was set to 88" below grade, and TH-2 to 100" below grade.

Percolation Testing

On April 1, 2019, Percolation testing was performed. PH-1 showed a 60 minute per inch (mpi) rate at 24" depth. PH-2 showed 60 mpi at 24" depth.

This testing was performed under the direction of Terry O'Reilly, P.E. RCE# 49506, qualified as described in section X.6 water quality control plan for the north coast region (basin plan).

6. Accurate Soil Profile Description, Percolation Test Data Groundwater Data.

See attached data.

7. Explanation of Appropriate Sewage Disposal System Design.

This property is located within the variance prohibition area as described in the Humboldt County OWTS Regulations and Technical Manual due to increased local hydrogeologic vulnerabilities. A low pressure graveled trench on-site waste treatment system will be used to protect local water quality.

8. Complete Sewage Disposal Design Calculations.

This design is based on current (November 7, 201) design manual for sewage disposal regulations, Humboldt County Department of Environmental Health (HCDEH)

Sewage Disposal Daily Waste Flow Calculation

System Design - Primary Field

- 1. Design Flow Rate = 3 bedrooms x 150 gal/bedroom/day = 450 gpd
- 2. Effective adsorption area:

Maximum Loading Rate = 0.277 gpd/ft² (Humboldt Co. OWTS RTM, Table 3)

Depth of gravel below pipe = 18"

Width of trench = 18"

Absorption Area: $(1.5' \times 2 \text{ walls}) \times 1.5' = 4.5 \text{ ft}^2/\text{LF}$

- 3. Length of distribution line: $450 \text{ gpd} / (0.277 \text{gpd/ft}^2 \times 4.5 \text{ ft}^2/\text{LF}) = 361 \text{ LF}$
- 4. Minimum trench spacing: $2 \times (1.5' + 1') = 5'$

Use (8) 18" Depth x 18" Width Trench, Each 47' Long @ 5' O.C.

Approximate field area = 1551 ft²

9. Reserve Field Design

Same as primary field

10. Pressure Distribution Network Design

Dosing and Distribution System

- 1) Total # of Holes = Use 5' hole spacing, (8) 47' long leach lines.
 - a. Holes per Line = 47'/5' = 10 Holes
 - b. Total # of Holes = 10 Holes x 8 Lines = 80 Holes
- 2) Flow Rate per Hole

For 5/32" diameter hole with 3' pressure head (assumed), flow rate = 0.5 gpm (Table 2)

3) Total Dosing Rate

Flow rate per line = 0.5 gpm x 10 holes = 5 gpm per line

Total flow rate = 5 gpm x 8 lines = 40 gpm

Pump Selection

- 4) Pipe Friction = $(30'/100') \times 0.65' = 0.195'$ for 3" Pipe Diameter for Manifold (Table 3)
- 5) Friction Head = $1.2 \times 0.195' = 0.23'$
- 6) Elevation Head = 6'
- 7) Total Head = 0.23' + 6' + 3' = 9.23'
- 8) Pump Size: Per attached pump curve, min pump size 1/3 H.P. (Goulds WE0311)

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Dose Volume

Supply Line = 30 ft of 3 inch pipe

V supply = (30'/100') x 42 gal = 12.6 gal (Table 4)

Lateral Lines = 368 ft of 1-1/4 inch pipe

 $V | ateral = (368'/100') \times 9gal = 33.1 gal$

V dosing = 12.6 gal + 5 (33.1 gal) = 178.2 gal => Use 180 g/dose

Minimum Dose: 450 gpd / 4 = 113 g

Maximum Dose: 450 gpd / 2 = 225 g

<u>Dose Chamber</u> - Use a 750 gal dose chamber and 1500 gal septic tank.

Depending on location of new residence, siphon and/ or anti- back flow device may be required

11. Detailed Schematic Drawings and Specifications for all Sewage Disposal System Components

See attached septic system site plan

12. Written Installation Instructions for Sewage Disposal System Proposed

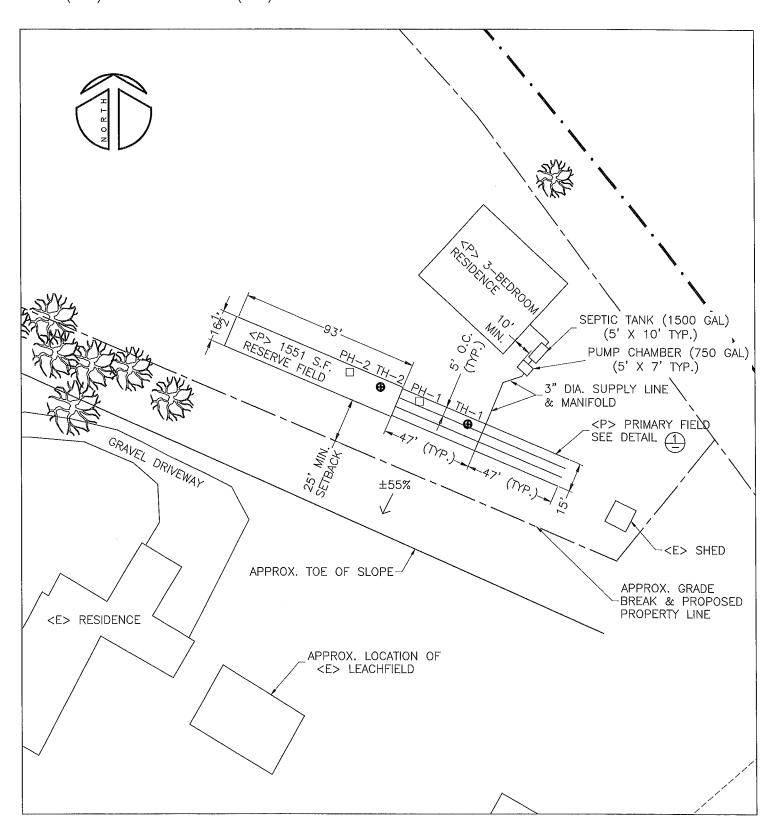
See detailed requirements from HCDEH

NO. 49506

www.whitchurchengineering.com Fortuna: (707) 725-6926 Eureka: (707) 444-1420

WHITCHURCH ENGINEERING, INC.

Building Design Civil & Structural Éngineering 610 9th Street Fortuna, Ca. 95540 (707) 725-6926 Fax. (707) 725-2959 6/30/21 JN: WNM2101 APN: 206-211-014 Page 5 of 17

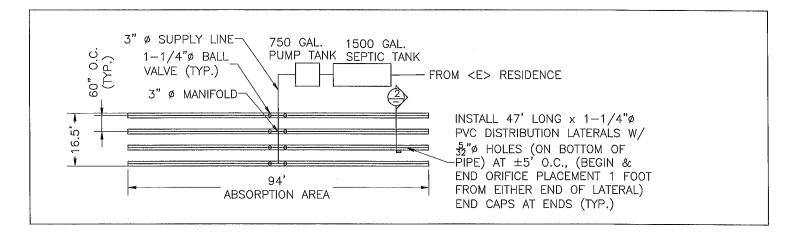


OWTS SITE PLAN

SCALE: 1"=50"

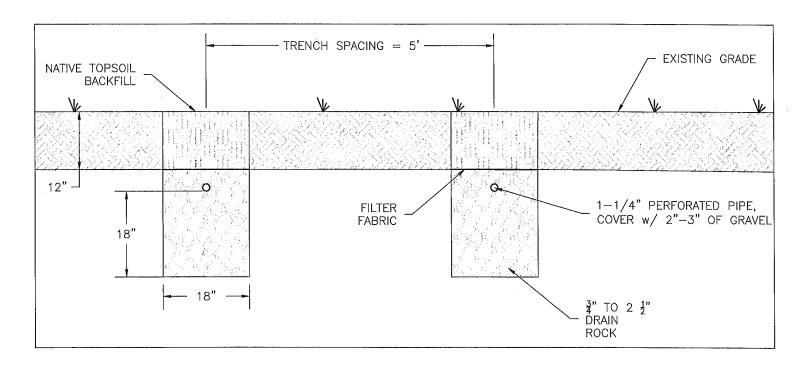
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Building Design Civil & Structural Engineering 610 9th Street Fortuna, Ca. 95540 (707) 725-6926 Fax. (707) 725-2959 6/30/21 JN: WNM2101 APN: 206-211-014 Page 6 of 17



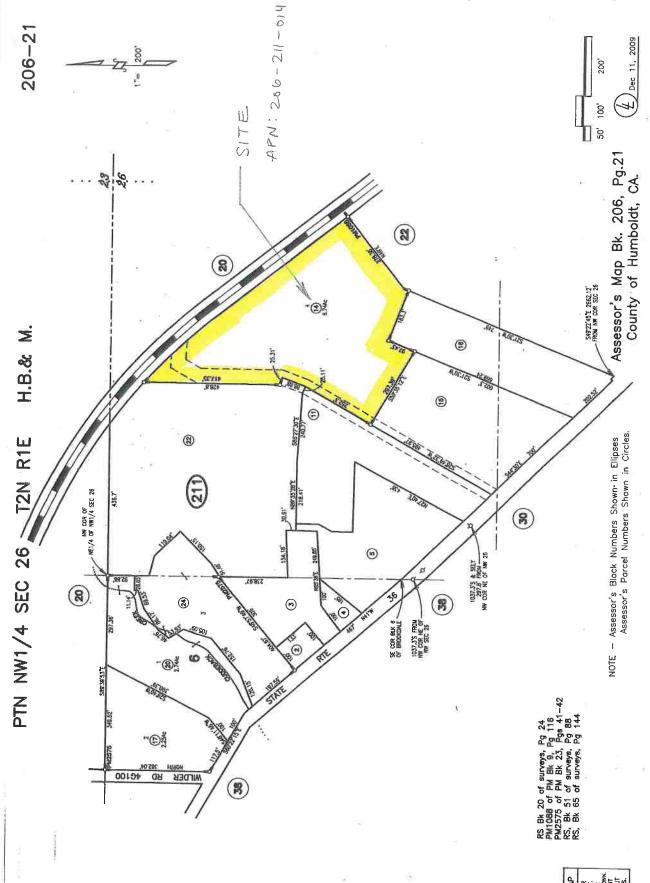
1 PRIMARY FIELD DETAIL

SCALE: 1"=30'



TYP. DISPERSAL LATERAL TRENCH SECTION

SCALE: 1"=20'



ASSESSOR'S PARCEL MAP

1. THIS JUP WAS PREPARED FOR

2. NO LUBLITH IS ASSUMED FOR

3. ASSESSOR PROCES. WIT.

3. ASSESSOR'S PARCELS WAY NOT

COMPLY WITH LOOK LOT-SPLIT

OR BUILDING SITE DREDIMANCES.

Whitchurch Engineering, Inc. SHEET 1 OF 610 9th Street **EXPLORATION** Fortuna, CA 95540 **TEST LOG** (707) 725-1553 APN: 206-211-014 PROJECT NAME: Wennerholm Septic JOB NO: WNM2101 HOLE #: HOLE TYPE: LOGGED BY: SAMPLE DATE: **RAO** 1 **BACKHOE & HAND AUGER** 3/11/2021 LAB DATA SOIL DESCRIPTION MOISTURE CONTENT (%) RELATIVE COMPACTION UNCONFINED COMPRESSIVE STRENGTH (TONS/SF) SOIL, COLOR, MOISTURE, CONSISTENCY, REMARKS, DRY DENSITY (PCF) PLASTICITY INDEX WATER LEVEL(S) AND DATE(S) LIQUID LIMIT (UNIFIED SOILS CLASSIFICATION SYSTEM) SOIL TYPE SAMPLE SILTY CLAY, DARK BROWN, DENSE/BRITTLE, MOIST --1--Χ SILTY CLAY, BROWN W/ SPARSE RED/ORANGE MOTTLING. DENSE/BRITTLE, MOIST - -2 - ---3--Χ SILTY CLAY, DARK BROWN W/ SLIGHT RED/ORANGE MOTTLING DENSE, MOIST (MOISTURE INCREASES W/ DEPTH) --5----6----7--RIVER RUN COARSE SAND, W/ SILT & CLAY TRACES & ROCK UP TO 3" DIA. DENSE, GROUNDWATER ENCOUNTERED **BOTTOM OF HOLE AT 88"** --8--- - 9 - --- 10 ----11--

Whitchurch Engineering, Inc. SHEET 2 OF 610 9th Street **EXPLORATION** Fortuna, CA 95540 **TEST LOG** (707) 725-1553 APN: 206-211-014 PROJECT NAME: Wennerholm Septic JOB NO: WNM2101 HOLE #: HOLE TYPE: LOGGED BY: SAMPLE DATE: **BACKHOE & HAND AUGER** 3/11/2021 2 **RAO** LAB DATA **SOIL DESCRIPTION** RELATIVE COMPACTION UNCONFINED COMPRESSIVE STRENGTH (TONS/SF) MOISTURE CONTENT (%) SOIL, COLOR, MOISTURE, CONSISTENCY, REMARKS, DRY DENSITY (PCF) **DEPTH (FEET)** PLASTICITY INDEX WATER LEVEL(S) AND DATE(S) LIQUID LIMIT SOIL TYPE (UNIFIED SOILS CLASSIFICATION SYSTEM) SAMPLE SILTY CLAY W/ ROOTS, DARK BROWN, DENSE/BRITTLE, MOIST --1--14" Х - -2 - -(CLAY CONTENT INCREASES W/ DEPTH) Х SILTY CLAY, TAN BROWN (SPARSE ORANGE MOTTLING BEGINS AT 27") DENSE, MOIST --5--SANDY SILTY CLAY, TAN BROWN W/ ORANGE MOTTLING DAMP, DENSE --6--SILTY CLAY W/ SAND, TAN BROWN, DAMP, MEDIUM DENSITY SANDY SILTY CLAY, TAN BROWN W/ ORANGE MOTTLING DAMP, DENSE --8--100" COARSE SAND W/ SILT & CLAY TRACES & ROCK UP TO 3", DENSE, DAMP **BOTTOM OF HOLE AT 100"** NO GROUNDWATER ENCOUNTERED - - 9 - -- - 10 - ---11--

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Division of Environmental Health

100 H Street - Suite 100 - Eureka, CA 95501 Phone: 707-445-6215 - Toll Free: 800-963-9241

Fax: 707-441-5699

envhealth@co.humboldt.ca.us

OBSERVATION WELL LOG

	Job Number WNM 2101
Project SUNNYSLOPE LANE SEPTIC	
AP# 206-211-014	
Test Hole #	
Elevation of Rim	
Depth of Well ਫਿਨ"	

Date	Time	Depth to Water Surface	Total Rainfall (to date)	Rainfall Past 24 hours*	Comments
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3-17-21	5 pm	88"	21.57"	T	NO DATA.
3-23-21	11 Pm	. 88"	22.15"	0	
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- * Data from Weather Bureau (707) 443-7062 (Eureka measurements)
- ** Please attach site plan showing locations of observation wells



Division of Environmental Health (6.13

100 H Street - Suite 100 - Eureka, CA 95501 Phone: 707-445-6215 - Toll Free: 800-963-9241

Fax: 707-441-5699

envhealth@co.humboldt.ca.us

OBSERVATION WELL LOG

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Project SUNNY SLOPE LANE	SEPTIC		
AP# 206-211-014			ı
Test Hole # 2	CONTROL		
Elevation of Rim			
Depth of Well /oo"			

Date	Time	Depth to Water Surface	Total Rainfall (to date)	Rainfall Past 24 hours*	Comments
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3-17-21	5 Pm	100"	21.57"	T	NO DATA
3-23-21	11 PM	1000"	22.15	0	on no He
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- * Data from Weather Bureau (707) 443-7062 (Eureka measurements)
- ** Please attach site plan showing locations of observation wells

Building Design
Civil & Structural Engineering

610 9th STREET FORTUNA, CALIFORNIA 95540 (707) 725-6926 FAX (707) 725-2959

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SOILS PERCOLATION TEST DATA

Test Hole No.

Presoak

N/A -WET WEATHER

Saturation 10:18 14m - 11:18 14m

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Stabilized Rate 60 min/inch

Building Design Civil & Structural Engineering 610 9th STREET

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SOILS PERCOLATION TEST DATA

Test Hole No. 2

Presoak

N/A -WET WEATHER

Saturation

10:27 Am - 11:27 Am

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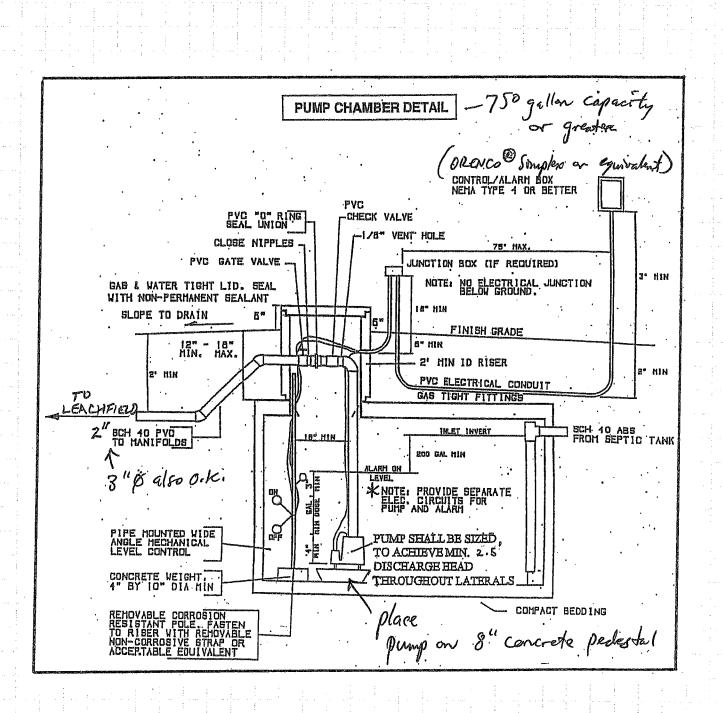
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Stabilized Rate 60 min/inch

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610 9th STREET FORTUNA, CA 95540 (707) 725-6926 716 HARRIS STREET EUREKA, CA 95501 (707) 444-1420

JOB SUNN	Y SLOPE	CARLOTTA	SEPTIC.
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610 9th STREET FORTUNA, CA 95540 **(707) 725-6926** 716 HARRIS STREET EUREKA, CA 95501 (707) 444-1420

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APPENDIX E - OWTS SETBACK REQUIREMENTS

Minimum Setback Distance Requirements

Tanks and dispersal fields must be located to meet the minimum setback distances shown below. See page reverse for required OWTS horizontal setbacks to public water wells and surface water intakes.

Minimum Horizontal Distance (ft.)	Public Water Well	Private Water Well	Surface Intake Public Water	Perennial Stream, Wetland & Other Waters*	Ephemeral Stream or Drainage Swale*
Septic Tank	100	100		50	25
Pump Tank	100	100		50	25
Dispersal System	150	100	200-400 (see table below)	100	50

Minimum Horizontal Distance (ft.)	Property Lines Public Water	Property Lines (Private Water)	Buildings or Structures	Cut Banks Unstable Land Steep Slopes>30%	Large Trees
Septic Tank	5	25	5	25	10
Pump Tank	5	25	5	25	10
Dispersal System	10	50	10	25	10

^{*} Setback distances from surface waters is determined based on the US Army Corps of Engineers' definition of Ordinary High Water Mark, 33 CFR 328.3(e).

Whitchurch Engineering, Inc. 610 9th Street Fortuna, CA 95540

EXPLORATION TEST LOG

SHEET 1 OF 2

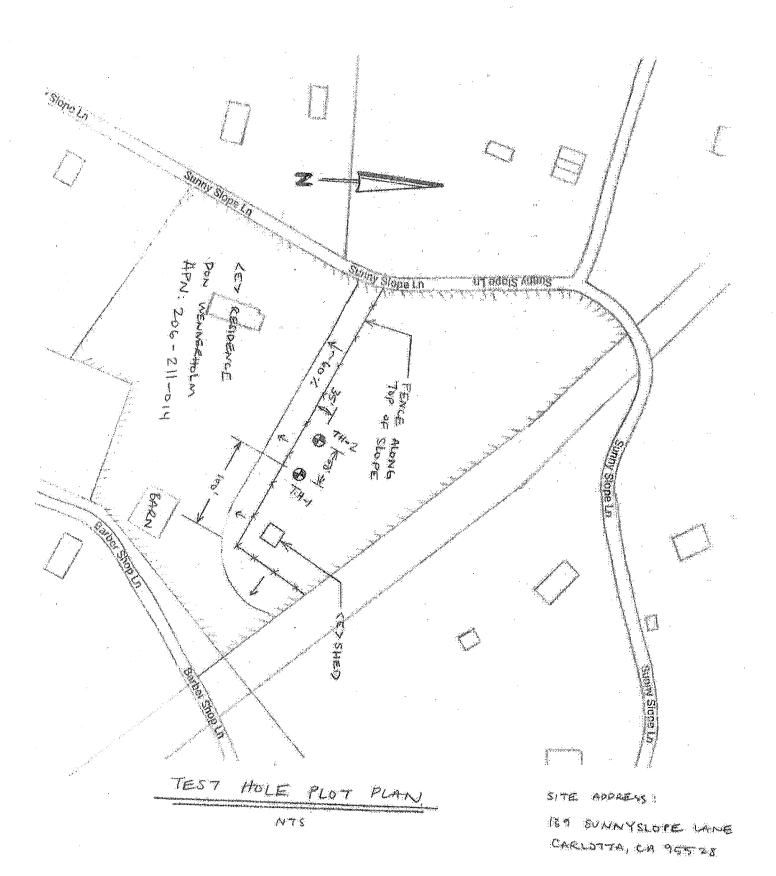
(707) 725-1553 APN: 206-211-014 PROJECT NAME: JOB NO: Wennerholm Septic WNM2101 HOLE #: HOLE TYPE: LOGGED BY: SAMPLE DATE: 1 **BACKHOE & HAND AUGER** RAO 3/11/2021 LAB DATA SOIL DESCRIPTION MOISTURE CONTENT (%) RELATIVE COMPACTION UNCONFINED COMPRESSIVE STRENGTH (TONS/SF) SOIL, COLOR, MOISTURE, CONSISTENCY, REMARKS, DEPTH (FEET) DENSITY (PCF) PLASTICITY INDEX WATER LEVEL(S) AND DATE(S) IQUIDLIMIT (UNIFIED SOILS CLASSIFICATION SYSTEM) SILTY CLAY, DARK BROWN, DENSE/BRITTLE, MOIST Χ SILTY CLAY, BROWN W/ SPARSE RED/ORANGE MOTTLING. 22" DENSE/BRITTLE, MOIST --2 ----3--Χ SILTY CLAY, DARK BROWN W/ SLIGHT RED/ORANGE MOTTLING DENSE, MOIST (MOISTURE INCREASES W/ DEPTH) --5----6----7--RIVER RUN COARSE SAND, W/ SILT & CLAY TRACES & ROCK UP TO 3" DIA. DENSE, GROUNDWATER ENCOUNTERED **BOTTOM OF HOLE AT 88"** RECEIVED --8--JUL 1 3 2021 Humboldt County --9--Planning Division -- 10 -----11--

Whitchurch Engineering, Inc. 610 9th Street Fortuna, CA 95540

EXPLORATION TEST LOG

SHEET 2 OF 2

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(707) 725-1553					725	5-1553		- ingramman	APN: 206-211-014		
PROJECT NAME: Wennerholm Septi						We	nnerl	holm Septi	Č	IOB NO:	WNM2101
HOLE #: HOLE TYPE:					LOGGED BY:		SAMPLE DATE:				
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MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (TONS/SF)	LIQUID LIMIT	PLASTICITY INDEX	RELATIVE COMPACTION	SAMPLE	SOIL TYPE	DEPTH (FEET)	SOIL, COLOR, MOISTURE, CONSISTENCY, REMARKS WATER LEVEL(S) AND DATE(S) (UNIFIED SOILS CLASSIFICATION SYSTEM)		
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