



Oregon

Tina Kotek, Governor

Department of Environmental Quality

Eastern Region Bend Office

475 NE Bellevue Dr., Suite 110

Bend, OR 97701

(541) 388-6146

FAX (541) 388-8283

TTY 711

July 31, 2024

Elsinore Shop LLC
1539 Santiago Drive
Newport Beach, CA 92660

Re: WQ: Variance Approval: 248-23-000458-VAR: 17104 Elsinore Road; T.20S; R.10E; Sec. 12AD; Tax Lot 6300; Lot 36, Block 18 Deschutes River Recreation Homesites Inc (Blks 18-25), 0.56 Acres; Deschutes County.

Dear Elsinore Shop LLC,

This correspondence verifies that a variance hearing provided for under Oregon Administrative Rules 340-071-0430, was held on the site at 9:00 am on May 29, 2024, for the subject property referenced above on Elsinore Road in Deschutes County. The purpose of the hearing was to provide a forum for the presentation of supportive facts to show that strict compliance with certain rules regulating onsite sewage disposal are inappropriate, or that special physical conditions at the site render strict compliance unreasonable, burdensome or impractical. The proposal and associated supporting information you provided with the application was presented during the recorded hearing.

Variance Decision:

Based on review and evaluation of the variance record and observations made during the variance hearing, I am pleased to inform you that the variance from the rules cited above is hereby granted. In my opinion, it would be unreasonable to prohibit this method of wastewater treatment by strictly following the administrative rules at this specific location at this time. It is my judgement that the proposed system is not likely to present a public health hazard risk or have any significant adverse impacts to groundwater or surface water quality if properly operated and maintained.

Justification for this decision:

- The proposed Orenco® AdvanTex AX20N-Mode 3B system is currently approved as a system meeting DEQ's Treatment Standard 2; OAR 340-071-0100(168) "Treatment Standard 2".
- On average, the AX20N-Mode 3B system is one of the best available technologies for Total Nitrogen treatment that has been approved for use in Oregon and is expected to treat residential wastewater to 20 mg/L Total Nitrogen, which is about two thirds of a reduction from that of a standard system and about half from a sand filter system in this climate.
- Treatment Standard 2, for the reduction of fecal coliform, will be met or exceeded with pre-treated effluent from the AX20N-Mode 3B unit (proposed w/o UV disinfection) and the RidNOx™ unit that will discharge into a 250 square foot bottomless sand filter with an additional 12-inches of sand filter media (embedded 6-inches below ground surface) placed below the filter to meet or exceed the minimum 24-inch separation requirement to

groundwater below. Note: The bottomless sand filter is assumed to meet Treatment Standard 2 criteria independently of the ATT, which is why UV disinfection is not included in the proposal.

- Overall Treatment: Treatment first occurs within the AX20N-Mode 3B system (w/o UV) for reductions in TSS, BOD₅ and Total Nitrogen (TN). The RidNOx™ unit is expected to further reduce TN (and Nitrate) as the effluent passes through and makes contact with the soluble carbon being released from the wood chip material. Final discharge will occur through the elevated bottomless sand filter, which may provide some additional reduction/treatment of BOD₅, TSS, Fecal Coliform and TN. It is expected that the final effluent being discharged shall meet or exceed that of the similar Nitrex unit, that was tested during the La Pine National Demonstration Project, which averaged a 96% reduction of TN. The final effluent Nitrate concentration is expected to be well under the EPA drinking water standard of 10 mg/L as well as local action levels set at 7 mg/L.
- The proposed system, with innovative technology, shall be required to be maintained by a certified maintenance provider for the life of the system. Additionally, the system shall be monitored and sampled at regular intervals to ensure that the system is performing as expected. The sampling, monitoring, and maintenance of the system shall be reported to Deschutes County on an annual basis.

Standards found in Oregon Administrative Rules Chapter 340, Division 071 & 073 have been developed to protect public health and the environment in Oregon. The variance officer's duty is to determine if in their professional judgement, the system proposed for this variance consideration is adequate to safeguard the public's health and the environment if variance from the standards noted above are granted. In my opinion, your proposal adequately addresses the limitations present at the site.

Other Considerations:

The effluent from the ATT and RidNOx™ system, discharging through a bottomless sand filter, will have a significant reduction in BOD, TSS, TN, and Fecal Coliform. In this proposal, treated ATT to RidNOx™ effluent will be discharged into a 250 square foot bottomless sand filter with an additional 10- inches of sand filter media embedded 6 - inches into the native soil that will be used to exceed the 24-inch separation from the shallowest water table depth standard by providing a total separation of 27- inches. The additional media will mitigate the lack of vertical separation from the bottom of the sand filter to the highest level of groundwater on site. The RidNOx™ unit is expected to provide a significant reduction of Total Nitrogen (and Nitrate) before the treated effluent enters the bottomless sand filter with a basal area intersecting the native soil and ultimately the groundwater below.

This variance approval is being granted on the condition that requirements contained in the enclosed schedules are met. Schedules A and B (attached) include requirements and specifications for the design and location of the system approved through this variance. Failure to meet these conditions may cause the variance approval to become null & void.

Site History & Variance Proposal:

Deschutes County conducted a site evaluation with 3 test pits within the subject property on September 6, 2023, where a denial was issued for the use of an onsite wastewater system on September 7, 2023. The primary reason for denial was due to the predicted depth to the seasonally

high permanent water table being less than 24- inches below the ground surface. Observed conditions associated with saturation that are used to determine water table levels and site suitability were observed between 18- inches and 19-inches below ground surface (bgs), respectively.

The proposal to overcome the site limitations is by installing an Orenco® AdvanTex AX20N-Mode 3B Alternative Treatment Technology System followed by a RidNOx™ solid-phase carbon flow-through filter before discharging to a 250 sq. ft. elevated Bottomless Sand Filter system constructed on a 12-inch bed of sand filter media embedded 6 inches into the native soil. It is expected that the highest level of groundwater within the lowest point of the sand filter areas will come to 21- inches bgs. The proposal overcomes this limitation by providing additional sand filter media with 3- inches of extra vertical separation and providing a total 27-inch separation to the shallowest predicted groundwater depth. The rest of the sand filter will be “conventional” from there up, consisting of 6 inches of underdrain media, 24- inches of sand filter media, 6- inches of drain media (with the distribution laterals), filter fabric, and 6 t- 9 inches deep of final backfill on top. The sand filter will be contained within a supporting berm with a slope no steeper than 3:1.

You are seeking a variance from the following Oregon Administrative Rules (OAR):

340-071-0135(1) – which addresses DEQ approval of new or innovative technologies, materials, or designs for onsite systems. **This rule is being varied from due to deviating from the approved design for the AX20N in Mode 3B by not requiring UV disinfection. Treatment Standard 2 will still be met or exceeded without the UV disinfection by discharging the treated effluent through a bottomless sand filter.**

340-071-071-0150(4)(a)(B) - which requires all criteria for approving a specific type or types of systems, as described in this division are satisfied.

340-071-0290(4)(d) which states: Bottomless Sand Filter. Sites may use a conventional bottomless sand filter if the site meets the criteria in this section and section (3) of this rule. (d) The water table is at least 24- inches below the ground surface throughout the year, and a minimum 24-inch separation is maintained between a water table and the bottom of the sand filter.

Should future ATT technologies for treatment of Total Nitrogen be approved for use in Oregon before issuance of a construction-installation permit for this site, Deschutes County may allow installation of equal or better technology instead of the type noted in this approval.

Conclusion:

The decision to grant your variance request is a Final Order of DEQ. Any person who is adversely affected or aggrieved by this Order is entitled to a contested case hearing before the Environmental Quality Commission. A request for a hearing must be received by DEQ within twenty days from the date of certified mailing of this Order. The request must specifically describe how the Order fails to meet the requirements of Oregon Revised Statutes 454.657 and 454.660, and include the technical basis that supports the petition. The appeal must be directed to the Environmental Quality Commission, in care of Lindsay Trapp, EQC Assistant, Department of Environmental Quality, 700 NE Multnomah St., Suite 600, Portland, OR 97232-4100.

Deschutes County onsite staff is hereby authorized to issue a construction-installation permit, subject to all the conditions, upon their receipt of a complete permit application. The application must include a favorable land use compatibility statement issued by Deschutes County, a set of detailed plans and specifications for the onsite wastewater treatment system, a current maintenance service agreement and the appropriate application fee.

Please feel free to contact me if you have any questions concerning this decision. I can be reached by telephone at (541) 776-6130, or by email at david.hurley@deq.oregon.gov.

Sincerely,



David Hurley, REHS
Variance Officer – Onsite Wastewater Program

Encl: Schedule A- Special Conditions
Schedule B- Approved Plans
Approved Drawings / Schematics

cc: Todd Cleveland, REHS; Deschutes County Onsite Wastewater Division, 117 NW Lafayette Ave, Bend OR 97703
Brian T. Rabe, CPSS, WWS; Principal Soil Scientist, of Elkhorn Consulting LLC, 14833 Goodrich Creek Lane, Baker City, OR 97814
Jonathon David Peterson, 4221 Pioneer Rd, Medford OR 97501
Daron and Tammy Paramenter, 2155 Ironwood St, Eugene OR 97401
Bend Development Group LLC, PO Box 2145 Bend, OR 97709
Adam C. Schmidt, PO Box 2741 Hillsboro, OR 97123
Glen Scott Reese Revocable Trust Et Al, 33723 Van Duyn Rd, Eugene, OR 97408
Third Tracks Investments LLC, PO Box 2710, Bend, OR 97707
Thomas A. Gettman, 10660 SW Citation Dr., Beaverton, OR 97008

Schedule A – Elsinore Shop LLC
Variance Report - Special Conditions
T 20S, R 10E, Sec: 12AD, TL 6300

Special Conditions and requirements for the Orenco® AX20N-Mode 3B Alternative Treatment Technology unit with a RidNOx™ system followed by an elevated 250 square foot Bottomless Sand Filter at 17104 Elsinore Road; T.20S; R.10E; Sec. 12AD; Tax Lot 6300; Lot 36, Block 18 Deschutes River Recreation Homesites Inc (Blks 18-25), 0.56 Acres; Deschutes County.

1. A person or business licensed by the Department of Environmental Quality in accordance with Oregon Revised Statutes, Chapter 454.695, must perform all work construction of this onsite wastewater treatment system.
2. Before starting with the actual construction of this system, the system installer shall submit, through a written statement to the Deschutes County Community Development Department, Onsite Wastewater Division (hereafter referred to as “County”) that acknowledges that they have thoroughly reviewed the conditions of this variance approval with technical staff in that office, and they understand and will comply with all conditions associated with this variance approval.
3. This system incorporates the use of Sand Filter Media and Underdrain media, as defined in Oregon Administrative Rules (OAR) 340-071-0100(124) and OAR 340-071-0100(170). Prior to delivery to the site, a current sieve analysis, using testing requirements required in rule for the respective material, must be submitted for review and approval to the County. Special handling of the respective media is to occur, during transport, site storage, and construction of the sand filter.
4. This onsite wastewater treatment system shall serve a single-family residence with up to four bedrooms. The projected daily sewage flow must not exceed 450 gallons per day, and the average daily flow must not exceed 225 gallons per day. Where practical, low water-use plumbing fixtures and appliances should be used within the dwelling in conjunction with water conservation practices. **Use of a garbage disposal is not recommended.**
5. All construction of this system shall only occur under optimum soil moisture conditions. The soils must be nearly dry and not frozen. Typically, the ideal construction period begins at the end of spring run-off season and ends prior to the onset of winter weather.
6. The setback to all wells from the initial or replacement bottomless sand filters is to be at least 100 feet.
7. The County shall inspect the installation of this system at those stages of construction they identify as appropriate to ensure proper construction.

8. Except as specifically authorized, all requirements of the Oregon Administrative Rules (Chapter 340, Rules 071-0100 through 071-0650) must be met.
9. The permittee shall comply with all local planning, zoning and building ordinances.
10. A Certificate of Satisfactory Completion shall be issued for the completed installation only if all conditions of this variance approval are met.
11. Should the onsite wastewater treatment and disposal system, authorized through this variance fail, County staff may exercise professional discretion in effecting a repair, based upon an analysis of the possible causes of failure. An area next to the initial sand filter is to be designated for future repair or replacement and must be reserved for this use. The replacement system considered in this variance procedure is the installation of another sand filter.

APPROVED

By DEQ Onsite Variance Officer 07/31/24

David Hurley

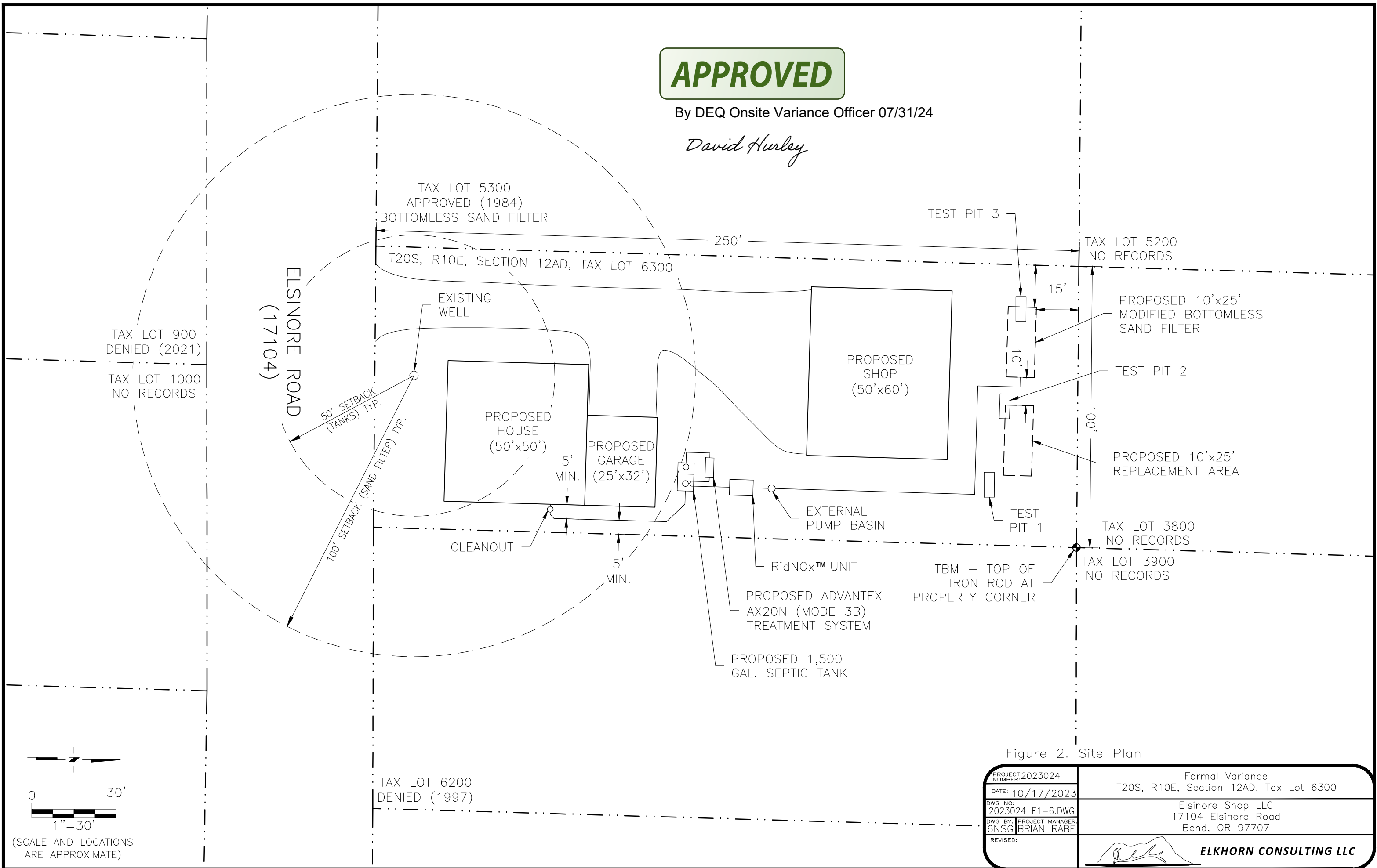
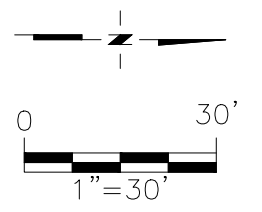


Figure 2. Site Plan



(SCALE AND LOCATIONS ARE APPROXIMATE)

PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG NO: 2023024 F1-6.DWG	
DWG BY: PROJECT MANAGER: 6NSG BRIAN RABE	
REVISED:	



ELKHORN CONSULTING LLC

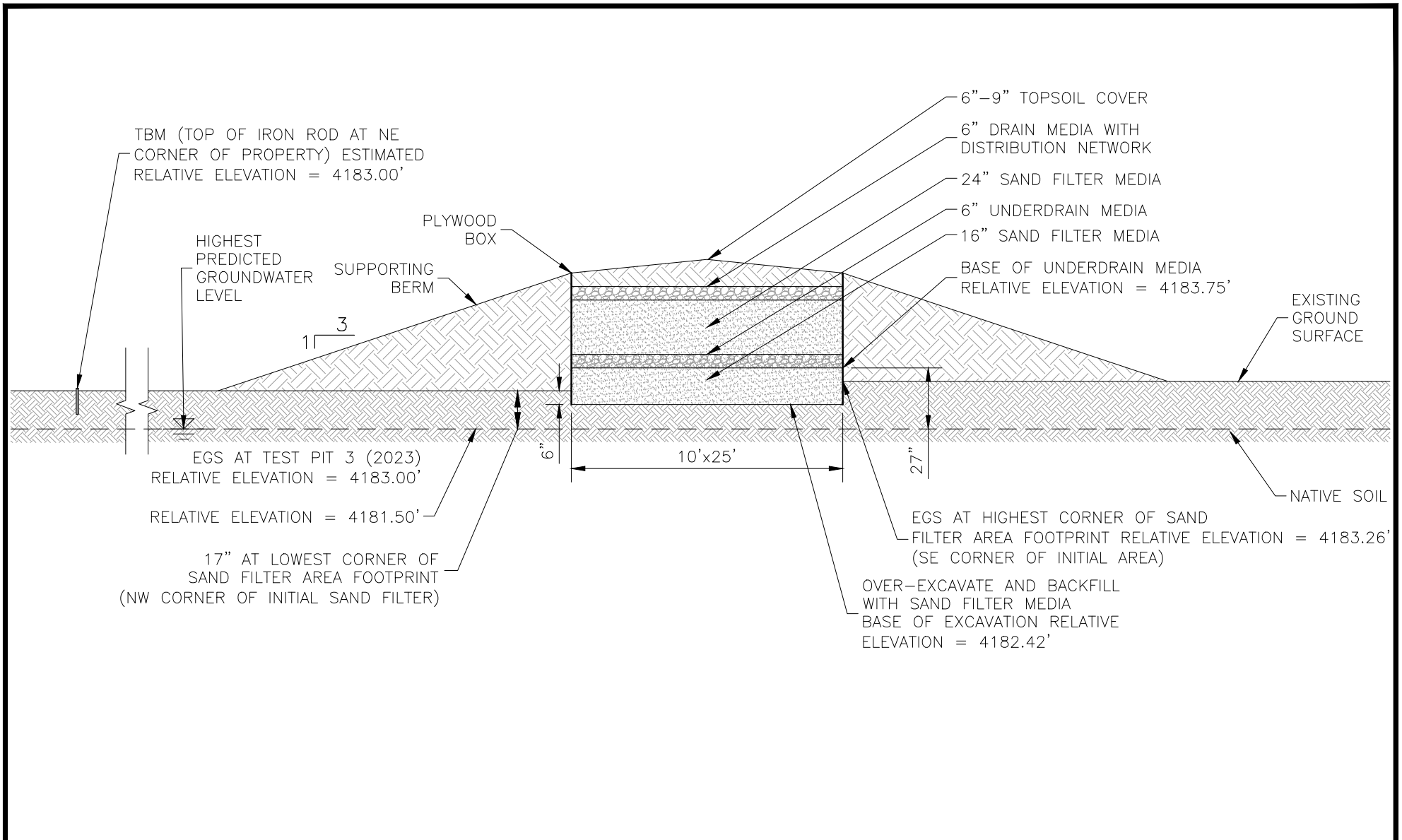



Figure 3A. Modified Bottomless Sand Filter Section – Initial



PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	
DWG NO: 2023024 F1-6.DWG	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG BY: 6NSG PROJECT MANAGER: BRIAN RABE	
REVISED:	 ELKHORN CONSULTING LLC

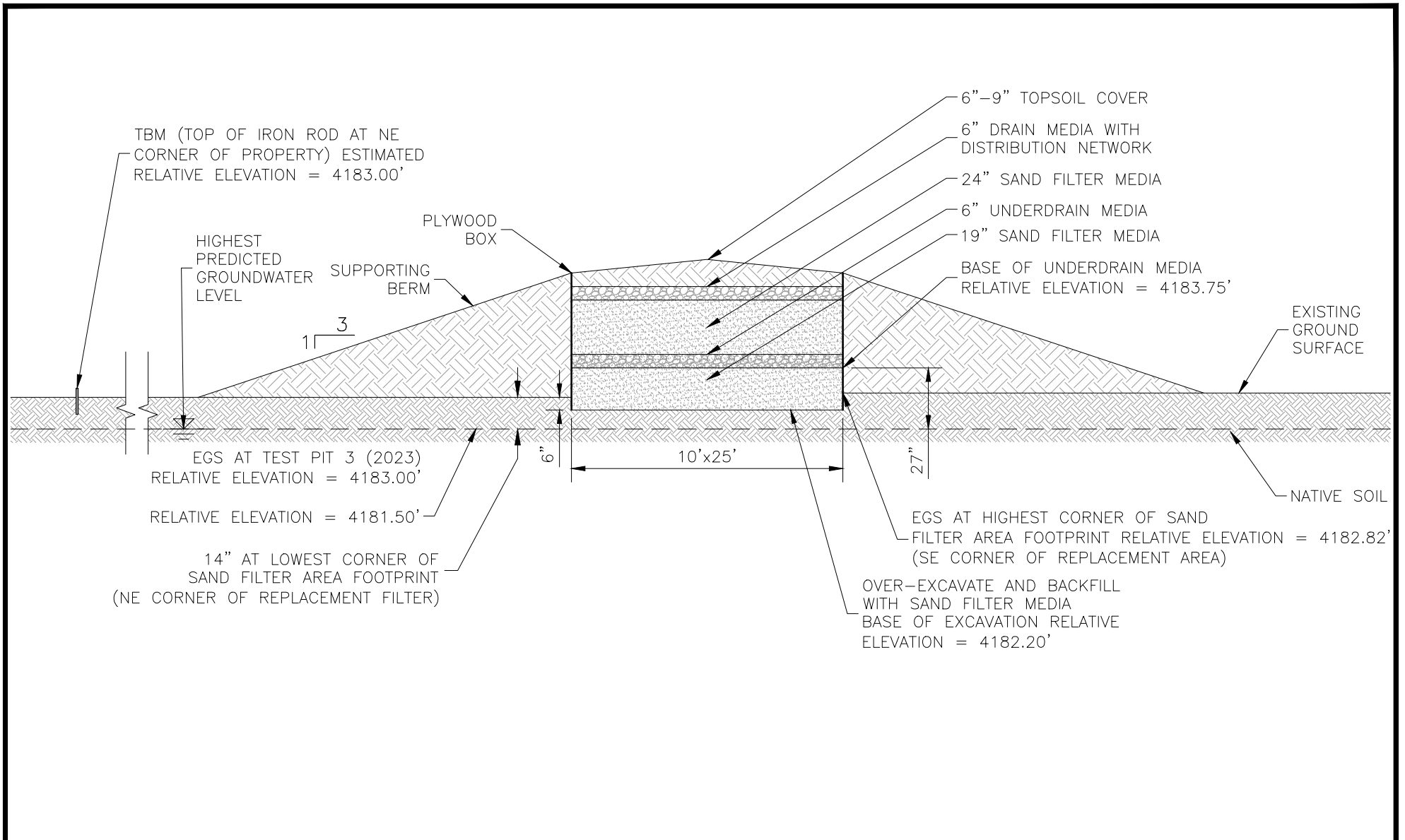

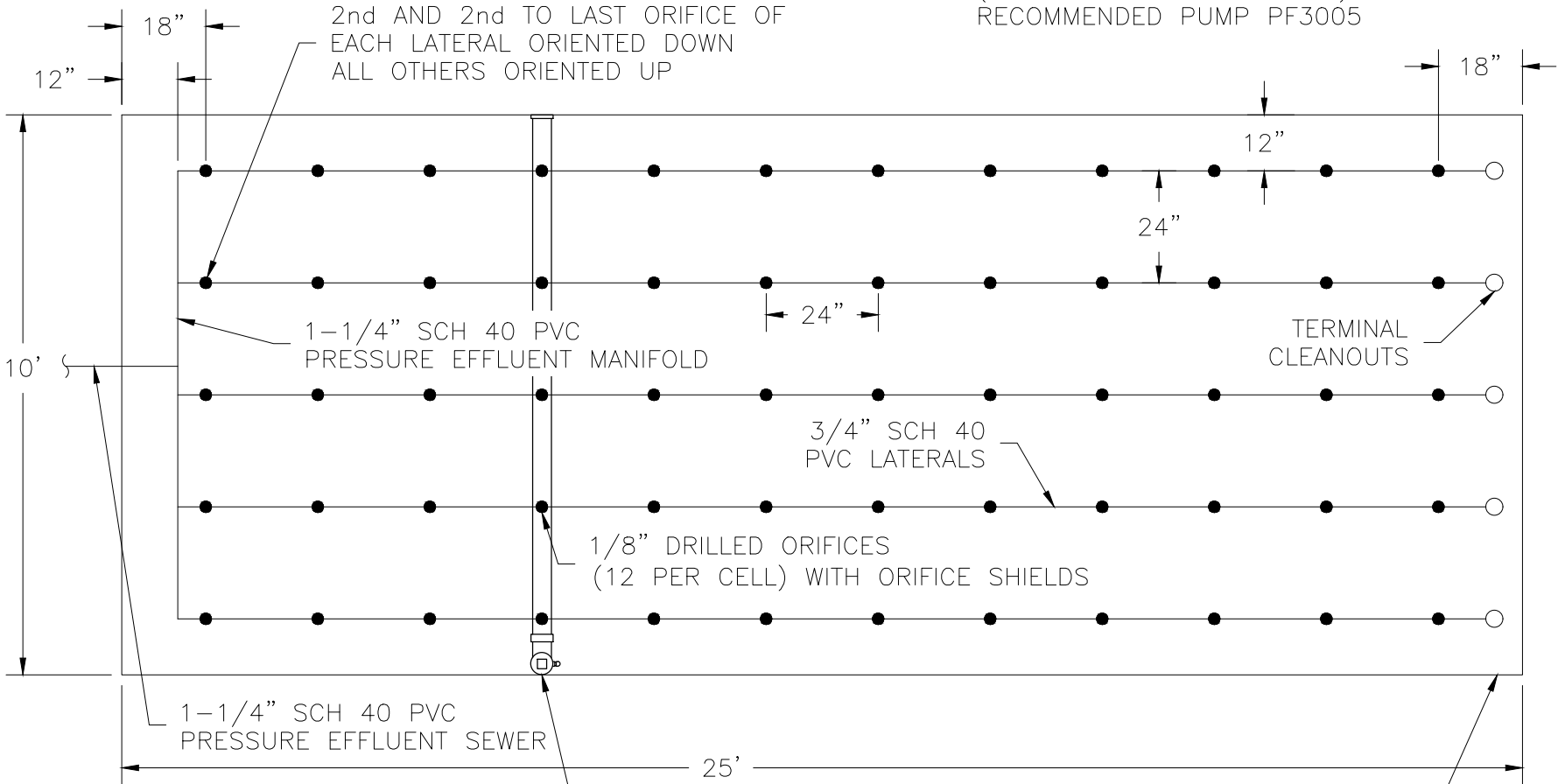


Figure 3B. Modified Bottomless Sand Filter Section – Replacement



PROJECT NUMBER: 2023024	Formal Variance
DATE: 10/17/2023	T20S, R10E, Section 12AD, Tax Lot 6300
DWG NO: 2023024 F1-6.DWG	Elsinore Shop LLC
DWG BY: 6NSG PROJECT MANAGER: BRIAN RABE	17104 Elsinore Road
REVISED:	Bend, OR 97707
	 ELKHORN CONSULTING LLC

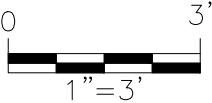
TOTAL OF 60 ORIFICES
 0.56 GALLONS PER MINUTE
 AT 8.1 FT RESIDUAL HEAD
 (33.4 GPM AT 44.6 FT TDH)
 RECOMMENDED PUMP PF3005




EFFLUENT SAMPLE COLLECTION LYSIMETER
 (BELOW SAND FILTER MEDIA) – LOCATE
 IN ALIGNMENT DIRECTLY UNDER 4TH ROW
 OF ORIFICES.

BOX CONSTRUCTED OF 3/4" (NOMINAL)
 23/32" (ACTUAL) PLYWOOD WITH 2x4
 FRAMEWORK NO MORE THAN 4 FT O.C.

Figure 4. Sand Filter Plan Detail



PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	
DWG NO: 2023024 F1-6.DWG	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG BY: 6NSG PROJECT MANAGER: BRIAN RABE	
REVISED:	 ELKHORN CONSULTING LLC

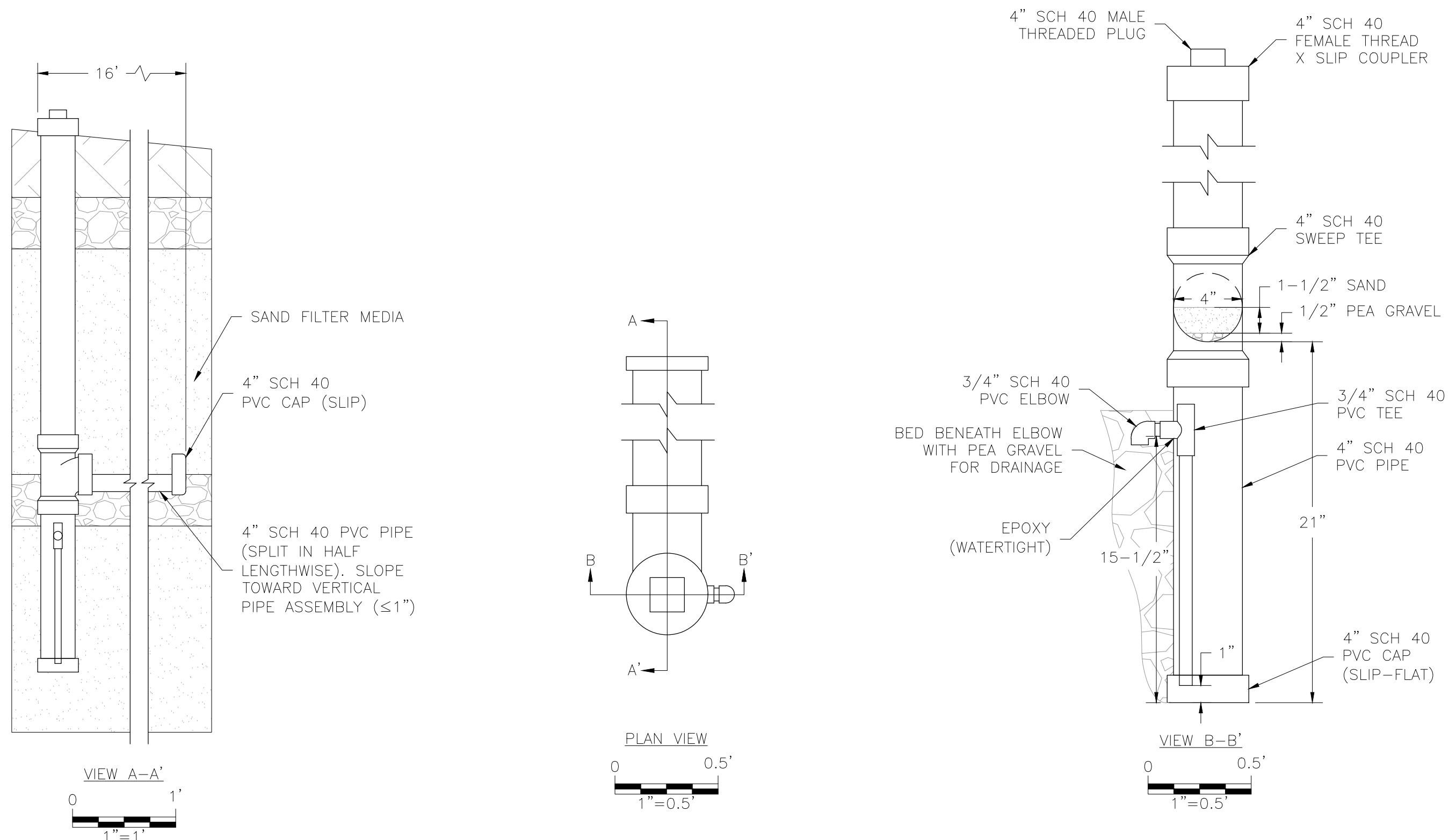

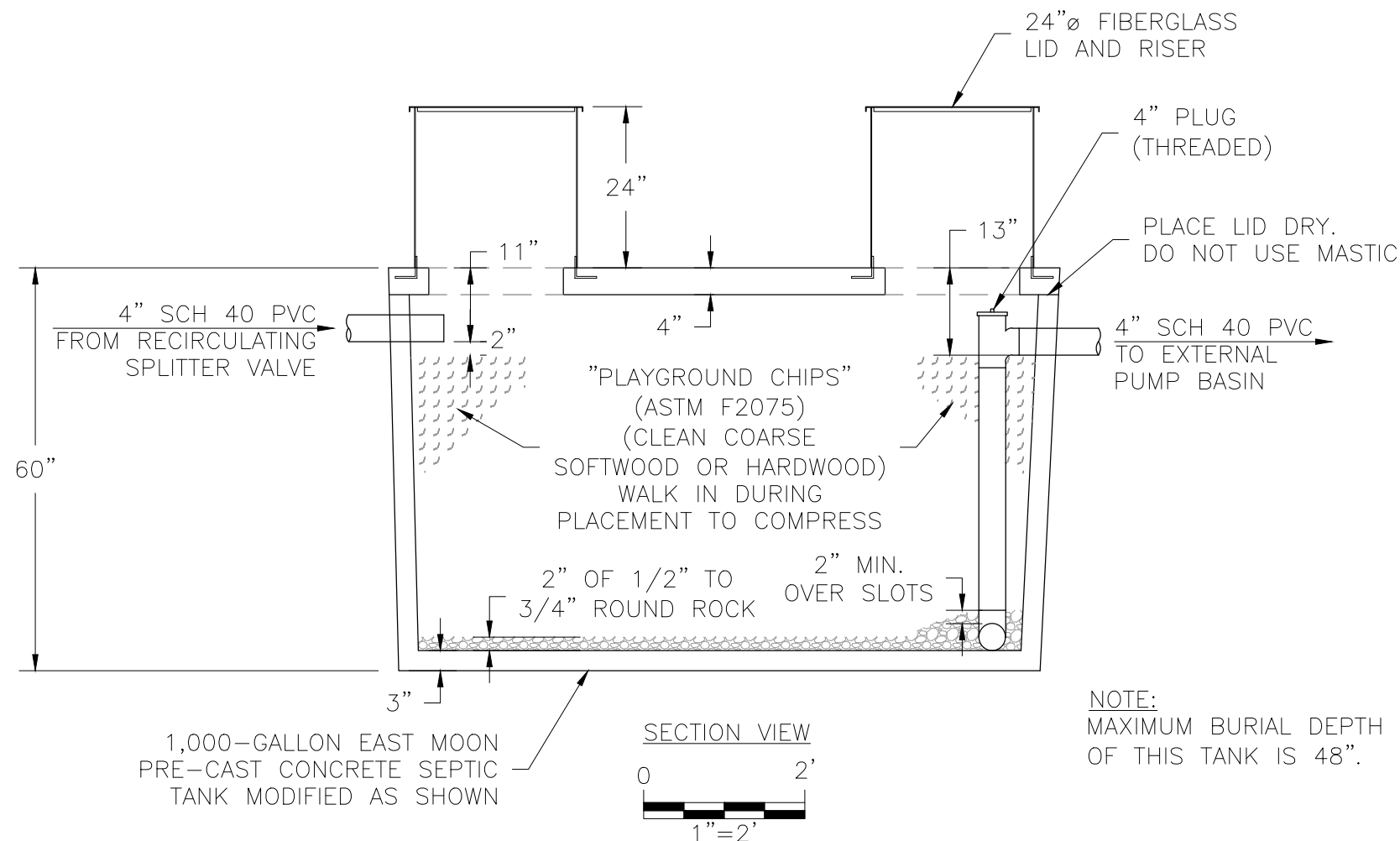
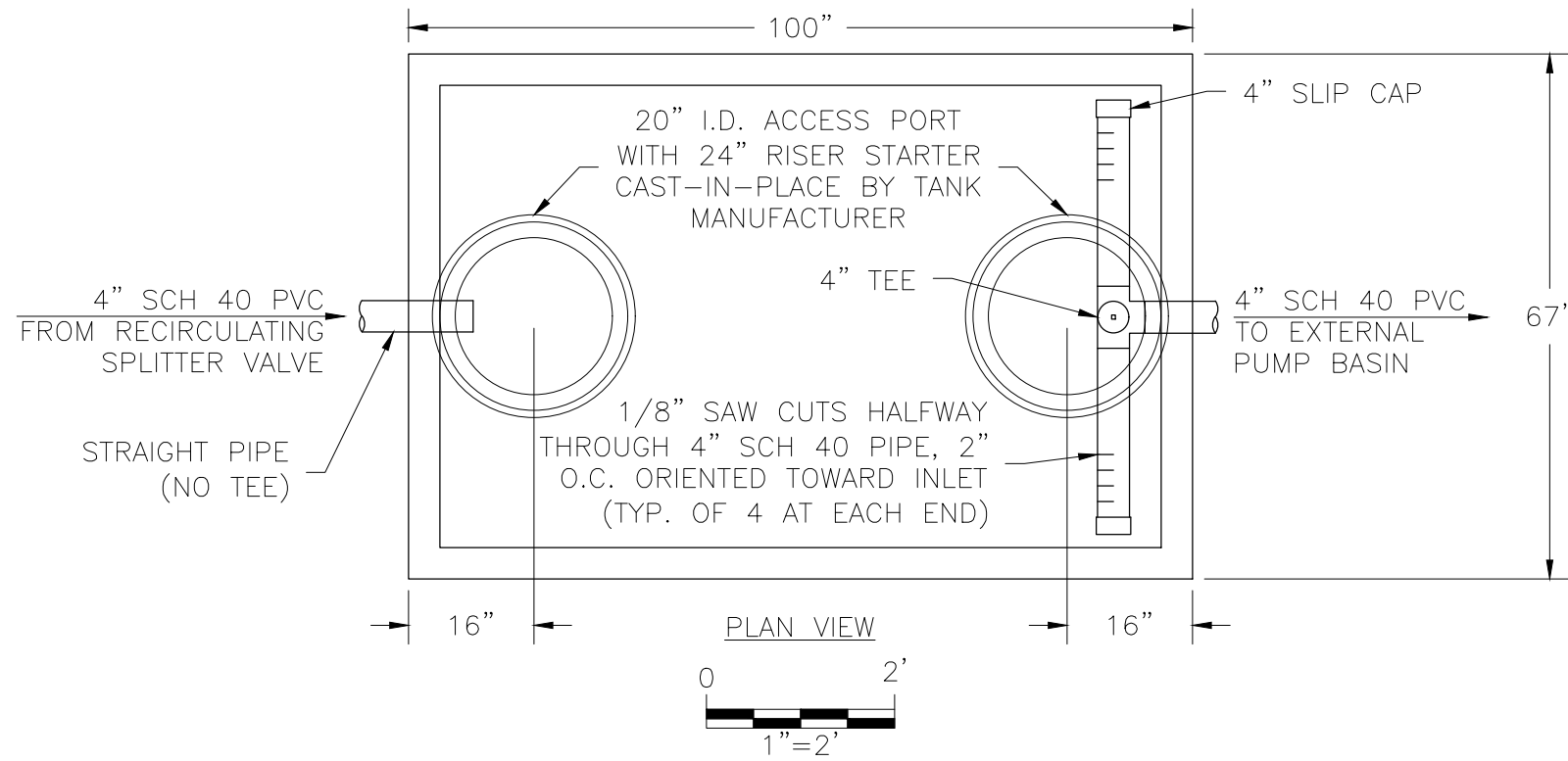


Figure 5. Lysimeter Details

PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG NO: 2023024 F1-6.DWG	
DWG BY: PROJECT MANAGER: 6NSG BRIAN RABE	
REVISED:	 ELKHORN CONSULTING LLC



NOTE:
MAXIMUM BURIAL DEPTH OF THIS TANK IS 48".

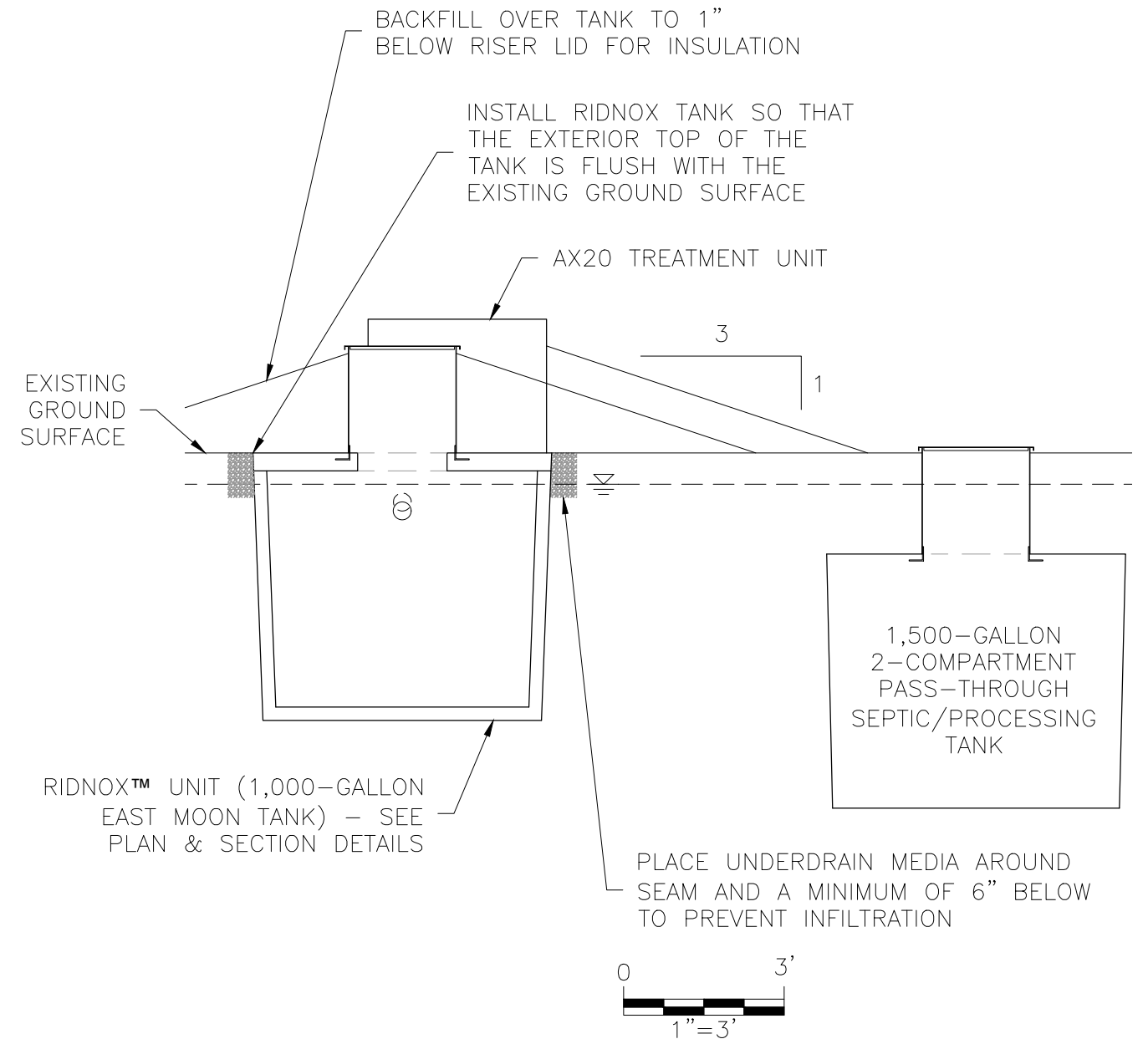



Figure 6. RidNOx™ Details

PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG NO: 2023024 F1-6.DWG	
DWG BY: PROJECT MANAGER: 6NSG BRIAN RABE	
REVISED:	 ELKHORN CONSULTING LLC

**STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY**

Certificate of Mailing

Concerning the matter of a notice of variance hearing for property owned by Elsinore Shop LLC in Deschutes County, Oregon. Re: WQ: CAS: Variance Assignment: 248-23-000458-VAR: 17104 Elsinore Rd ; T.20; R.10; Sec. 12AD; Tax Lot 6300; Lot 36, Block 18 Deschutes River Recreation Homesites Inc (Blks 18-25), 0.56 Acres.

I certify that I mailed the attached letters containing the notice of variance hearing about this matter to each of the following persons on the date shown below:

Todd Cleveland, REHS; Deschutes County Onsite Wastewater Division, 117 NW Lafayette Ave, Bend OR 97703

Brian T. Rabe, CPSS, WWS; Principal Soil Scientist, of Elkhorn Consulting LLC, 14833 Goodrich Creek Lane, Baker City, OR 97814

In Addition, To The Following Adjacent Property Owners:

Jonathon David Peterson, 4221 Pioneer Rd, Medford OR 97501

Daron and Tammy Paramenter, 2155 Ironwood St, Eugene OR 97401

Bend Development Group LLC, PO Box 2145 Bend, OR 97709

Adam C. Schmidt, PO Box 2741 Hillsboro, OR 97123

Glen Scott Reese Revocable Trust Et Al, 33723 Van Duyn Rd, Eugene, OR 97408

Third Tracks Investments LLC, PO Box 2710, Bend, OR 97707

Thomas A. Gettman, 10660 SW Citation Dr., Beaverton, OR 97008



Signature



Name



Date



Oregon

Tina Kotek, Governor

Department of Environmental Quality

Eastern Region Bend Office

475 NE Bellevue Dr., Suite 110

Bend, OR 97701

(541) 388-6146

FAX (541) 388-8283

TTY 711

May 21, 2024

Elsinore Shop LLC
1539 Santiago Dr
Newport Beach, CA 92660

Re: WQ: CAS: Variance Assignment: 248-23-000458-VAR: 17104 Elsinore Road; T.20S;
R.10E; Sec. 12AD; Tax Lot 6300; Lot 36, Block 18 Deschutes River Recreation Homesites Inc
(Blocks 18-25), 0.56 Acres; Deschutes County.

Dear Pineriver Homes LLC,

The Department of Environmental Quality is in receipt of your onsite wastewater variance application and proposal. The application has been assigned to me for further action. I plan to hold an information gathering hearing (as provided under OAR 340-71-430) regarding your proposal on **Wednesday, May 29, 2024, at 9:00 am** at the subject property. Your proposal and system plans have been prepared by Brian T. Rabe, CPSS, WWS; Principal Soil Scientist, of Elkhorn Consulting LLC. It is my understanding that Mr. Rabe will be present to answer any questions regarding the proposal.

Deschutes County conducted a site evaluation with three test pits at the subject property on September 6, 2023, where a denial was issued for the use of an onsite wastewater system on September 7, 2023. The primary reason for denial was due to the predicted depth to the seasonally high permanent water table being less than 24 inches below the ground surface. Observed conditions associated with saturation that are used to determine water table levels and site suitability were observed less than 24 inches from the ground surface between 18 and 19 inches below ground surface (bgs).

Southern Deschutes County has a shallow water table that is typically unconfined in porous pumice soils and is susceptible to contamination from soluble and mobile constituents. The most common constituent of concern is nitrate-nitrogen from septic systems.

The proposal is to overcome the site limitations by installing an Orenco® AdvanTex AX20N-Mode 3B Alternative Treatment Technology (ATT) System followed by a reduced sized Bottomless Sand Filter (BSF) system constructed with a reinforced concrete berm. The nitrate-nitrogen is proposed to be further reduced with a post-anoxic RidNOx unit. You are seeking variance from the following Oregon Administrative Rules (OARs):

OAR 340-071-0135(1): which addresses Department of Environmental Quality approval of new or innovative technologies, materials, or designs for onsite systems.

OAR 340-071-0150(4)(a)(B) which states: All criteria for approving a specific type or types of systems, as described in this division are satisfied.

OAR 340-071-0290(4)(d) which states: Bottomless sand filter. Sites may use a conventional sand filter without a bottom (BSF) if the site meets the criteria in this section and section (3) of this rule. (d) The water table is at least 24 inches below the ground surface throughout the year, and a minimum 24-inch separation is maintained between a water table and the bottom of the sand filter.

Sometimes during a hearing, it can be determined that other rules or standards need to be considered in order to finalize a proposal. Should this occur, based on the proposal, site observations, and other considerations, I may or may not proceed with the hearing and my final decision process until further information is provided.

Notice of the hearing will be mailed to the neighboring property owners and to the Deschutes County Onsite Wastewater Division staff, see copy enclosed. However, all persons who wish to attend the hearing are welcome. The hearing will provide an opportunity for you and others to offer additional facts or reasons either in support of or in opposition to the proposal and requested variance to the rules.

Please remember, it is the burden of the applicant to show that strict compliance to the rules or standards are inappropriate, or that special physical conditions render strict compliance with the rules or standards to be unreasonable, burdensome or impractical. Additionally, the applicant needs to provide prudent reasonable justification in how their proposal will still protect both public health and the environment.

Deschutes County Onsite Wastewater Division staff will get a copy of your proposal and will have an opportunity to provide both written and verbal comments on your proposal. Others wishing to review your proposal can contact me.

The Department is committed to accommodating people with disabilities. Please notify DEQ of any special physical or language accommodations needed as far in advance of the hearing date as possible. To make any of these arrangements please contact, David Hurley, at (541) 776-6130 or toll free at (866)-863-6668, or by email at: david.hurley@deq.oregon.gov. People with hearing impairments can call DEQ's TTY at (800)-735-2900.

If you have questions concerning the variance process or hearing arrangements, please give me a call. You may also visit <https://ordeq.org/septicvariance> for more information about variances.

Sincerely,

David Hurley

David Hurley, REHS
Natural Resource Specialist 4
Variance Officer – Onsite Wastewater Program

cc: Todd Cleveland, REHS; Deschutes County Onsite Wastewater Division, 117 NW Lafayette Ave, Bend OR 97703
Brian T. Rabe, CPSS, WWS; Principal Soil Scientist, of Elkhorn Consulting LLC, 14833 Goodrich Creek Lane, Baker City, OR 97814

In Addition, To The Following Adjacent Property Owners:

Jonathon David Peterson, 4221 Pioneer Rd, Medford OR 97501
Daron and Tammy Paramenter, 2155 Ironwood St, Eugene OR 97401
Bend Development Group LLC, PO Box 2145 Bend, OR 97709
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Third Tracks Investments LLC, PO Box 2710, Bend, OR 97707
Thomas A. Gettman, 10660 SW Citation Dr., Beaverton, OR 97008

Encl. Neighbor Notice

Business Name Search

[New Search](#)

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Business Entity Data

11-09-2023

10:17

Registry Nbr	Entity Type	Entity Status	Jurisdiction	Registry Date	Next Renewal Date	Renewal Due?
1475657-90	DLLC	INA	OREGON	09-11-2018		
Entity Name	ELSINORE SHOP, LLC					
Foreign Name						

[New Search](#)

[Printer Friendly](#)

Associated Names

Type	PPB	PRINCIPAL PLACE OF BUSINESS			
Addr 1	17104 ELISNORE RD				
Addr 2					
CSZ	BEND	OR	97707	Country	UNITED STATES OF AMERICA

Please click [here](#) for general information about registered agents and service of process.

Type	AGT	REGISTERED AGENT	Start Date	06-02-2020	Resign Date	
Of Record	1669016-95	CL CORPORATE SERVICES LLC				
Addr 1	644 NW BROADWAY ST					
Addr 2						
CSZ	BEND	OR	97703	Country	UNITED STATES OF AMERICA	

Type	MAL	MAILING ADDRESS		
Addr 1	PO BOX 1270			
Addr 2				
CSZ	NEWPORT BEACH	CA	92660	Country UNITED STATES OF AMERICA

Type	MEM	MEMBER		Resign Date	
Name	JAMES		OWENS		
Addr 1	1539 SANTIAGO DR				
Addr 2					
CSZ	NEWPORT BEACH	CA	92660	Country	UNITED STATES OF AMERICA





[New Search](#)[Printer Friendly](#)

Name History

Business Entity Name	Name Type	Name Status	Start Date	End Date
ELSINORE SHOP, LLC	EN	CUR	09-11-2018	

Please [read](#) before ordering [Copies](#).[New Search](#)[Printer Friendly](#)

Summary History

Image Available	Action	Transaction Date	Effective Date	Status	Name/Agent Change	Dissolved By
	CHANGE OF REGISTERED AGENT/ADDRESS	01-28-2021		FI		
	CHANGE OF REGISTERED AGENT/ADDRESS	01-25-2021		FI		
	ADMINISTRATIVE DISSOLUTION	11-12-2020		SYS		
	AMNDMT TO ANNUAL RPT/INFO STATEMENT	06-02-2020		FI	Agent	
	AMENDED ANNUAL REPORT	09-23-2019		FI		
	AMNDMT TO ANNUAL RPT/INFO STATEMENT	12-13-2018		FI	Agent	
	ARTICLES OF ORGANIZATION	09-11-2018		FI	Agent	

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For comments or suggestions regarding the operation of this site, please contact : corporation.division@sos.oregon.gov



ELKHORN CONSULTING LLC

14833 Goodrich Creek Lane
Baker City, OR 97814 • 503-881-1604
elkhornconsultingllc@gmail.com

November 3, 2023

Variance Officer
Onsite Variance Program
DEQ - Eastern Region Water Quality
475 NE Bellevue, Ste. 110
Bend, Oregon 97701

SUBJECT: Formal Variance Request – Elsinore Shop LLC – T20S, R10E, Section 12AD, Tax Lot 6300 (0.56 acres), Deschutes County, South of Bend, Oregon.

Dear Variance Officer:

A formal variance from selected onsite rules is hereby requested under the provisions of Oregon Administrative Rules, Chapter 340, Division 071, Section 0415 (OAR 340-071-0415).¹ The property is located at 17104 Elsinore Road, south of Bend in Deschutes County, Oregon (Site) (Figure 1) and consists of 0.56 acres. A Tax Lot map is attached in Appendix A and a copy of the Deed is attached in Appendix B.

Background

A site evaluation was conducted on September 6, 2023 and issued a denial on September 7, 2023. The denial was based on conditions associated with saturation noted at 18 to 19 inches below the ground surface (bgs) in 3 test pits. Test Pit 1 was described with slightly better conditions and was in the northeastern corner of the lot. The other 2 test pits were in the north-central part of the lot and the northwestern corner of the lot. The primary reasons cited for the denial was the predicted depth to the highest level attained by a fluctuating permanent water table. A copy of the site evaluation documentation from Deschutes County is attached in Appendix C.

Southern Deschutes County has a shallow water table that is typically unconfined in porous pumice soils and is susceptible to contamination from soluble and mobile constituents. The most common constituent of concern is nitrate-nitrogen from septic systems. The onsite rules require a minimum of 24 inches of separation from the upper limit of the water table to the bottom of a bottomless sand filter as well as being 24 inches below the ground surface.

Soils

The web soil survey shows the location of the Site and a copy of the output from the web soil survey is provided in Appendix D. The entire parcel is shown within a delineation of Map Unit 144A, Sunriver sandy loam 0 to 3 percent slopes. Sunriver soils are described as very deep, somewhat poorly drained soils that formed on pumice mantled stream terraces. The typical profile generally consists of the following:

- Up to 2 inches of organic material underlain by,
- 5 inches of very dark gray ashy sandy loam underlain by,

¹ Onsite wastewater treatment systems, 340 OAR § 340.71. (2020).



- 15 inches of dark gray ashy loamy coarse sand underlain by,
- 9 inches of light brownish gray ashy coarse sand underlain by,
- 31 inches of very dark gray sandy loam.

The Sunriver series is described as having a water table that rises to about 2 to 4 feet below the surface from April to June.

The characteristics observed at the Site are reasonably similar to the Sunriver series. The primary differences between the conditions noted in the 2023 soil notes and the conditions typical for the Sunriver series are related primarily to coloration (brownier colors) that are more indicative of the Shanahan series.

Preliminary Assessment

The Site was reviewed by Brian Rabe, CPSS, WWS, on September 28, 2023. The purpose was to review the Site conditions and assess the potential to design a modified bottomless sand filter that incorporates additional fill to create adequate separation from the underlying water table following advanced secondary treatment meeting the criteria for Treatment Standard 2 (TS2). The proposed bottomless sand filter area is located on this highest ground, represented by Test Pits 2 and 3 in the 2023 site evaluation (northern part of the lot - see Figure 2 and Appendix C). While Test Pit 1 was described with a slightly greater depth to the water table, it was a few inches lower than the other test pits.

Other Considerations

This parcel and developed parcels in the surrounding area are served by individual private wells. A search of the database of the Oregon Department of Water Resources was conducted for the section that the subject property lies within (Section 12 of Township 20 South, Range 10 East of the Willamette Meridian). There are about 493 records on file for this section. A total of 12 water well records (well logs) were identified in Section 12 that could be tied to specific parcels within about one-eighth of a mile of the subject property (Appendix E).

The nearest well that could be identified is on Tax Lot 6100 and is about 140 feet east of the proposed bottomless sand filter area. This well was completed on April 28, 2022 to a depth of 100 feet. Water was described as being first found at a depth of 62 feet within a layer of “fine black sand” and had a static water level of 17 feet bgs on the date of completion with a reported yield of 19 gpm with 9 feet of drawdown after 1.5 hours with a pump.

The next closest well is for Tax Lot 6300 (Site) and is about 215 feet south of the proposed bottomless sand filter area. This well was completed on August 8, 2018 to a depth of 75 feet. Water was described as being first found at a depth of 12 feet in a layer described as “sandy loam and pumice” and had a static level of 8 feet bgs. That layer was sealed off and the next water bearing zone was found at a depth of 61 feet in layers of “greenish gray clay & sand” and “coarse sand & gravel” and had a static water level of 21 feet bgs on the date of completion with a reported yield of 22 gpm with 2 feet of drawdown after 2 hours with a pump.



The well for Tax Lot 5500 is about 300 feet west of the proposed bottomless sand filter area. This well was completed on October 11, 1993 to a depth of 80 feet. Water was described as being first found at a depth of 70 feet within a layer of “cinders” and had a static water level of 17 feet bgs on the date of completion with a reported yield of 15 gpm with 5 feet of drawdown after 12 hours with a pump.

The well for Tax Lot 4100 is about 310 feet northeast of the proposed bottomless sand filter area. This well was completed on January 9, 2015, to a depth of 59 feet. Water was described as being first found at a depth of 3 feet in a layer described as “black sand fine” and had a static level of 2 feet bgs. That layer was sealed off and the next water bearing zone was found at a depth of 57 feet in a layer of “Gray sand and gravel” and had a static water level of 14 feet bgs on the date of completion with a reported yield of 15 gpm with 12 feet of drawdown after 2 hours with a pump.

The well for Tax Lot 800 is about 365 feet southwest of the proposed bottomless sand filter area. This well was completed on September 25, 2020 to a depth of 88 feet. Water was described as being first found at a depth of 18 feet within a layer of “Green clay sands” and had a static water level of 18 feet bgs on the date of completion with a reported yield of 10 gpm with 18 feet of drawdown after 4 hours with a pump.

The well for Tax Lot 3500 is about 380 feet northeast of the proposed bottomless sand filter area, and was completed on September 20, 2018, to a depth of 77 feet. Water was described as being first found at a depth of 9 feet in a layer described as “Sandy Loam & Pumice” and had a static level of 9 feet bgs. That layer was sealed off and the next water bearing zone was found at a depth of 63 feet in layers of “Greenish Clay & Sand Layers” and “Course Sand & Gravel” and had a static water level of 22 feet bgs on the date of completion with a reported yield of 22 gpm with no drawdown after 2 hours with a pump.

The well for Tax Lot 900 is about 475 feet south-southwest of the proposed bottomless sand filter area. This well was completed on April 24, 2019 to a depth of 72 feet. Water was described as being first found at a depth of 66 feet within a layer of “soft black rock fractured” and had a static water level of 15 feet bgs on the date of completion with a reported yield of 22 gpm with 15 feet of drawdown after 1 hour with a pump.

The well for Tax Lot 3100 is about 535 feet to the south-southeast of the proposed bottomless sand filter area and was completed on August 2, 2006, to a depth of 70 feet. Water was described as being first found at a depth of 69 feet in a layer of “broken rock” and had a static water level of 15 feet bgs on the date of completion with a reported yield of 20 gpm with 20 feet of drawdown after 1 hour with a pump.

The well for Tax Lot 3300 (misabeled as 3400) is about 550 feet northeast of the proposed bottomless sand filter area. This well was completed on December 4, 2021 to a depth of 75 feet. Water was described as being first found at a depth of 63 feet within a layer of “black gravel and cinder” and had a static water level of 17 feet bgs on the date of completion with a reported yield of 20 gpm with 4 feet of drawdown after 1 hour with a pump.

The well for Tax Lot 3400 is about 550 feet southwest of the proposed bottomless sand filter area and was completed on October 19, 1993 to a depth of 75 feet. Water was described as being first found at a



depth of 65 feet in a layer of “cinders” and had a static water level of 22 feet bgs on the date of completion with a reported yield of 15 gpm with 11 feet of drawdown after 4 hours with a pump.

The well for Tax Lot 3200 is about 580 feet northeast of the proposed bottomless sand filter area. This well was completed on April 28, 2021 to a depth of 75 feet. Water was described as being first found at a depth of 70 feet within a layer of “gray rock” and had a static water level of 18 feet bgs on the date of completion with a reported yield of 20 gpm with 5 feet of drawdown after 1 hour with a pump.

The regional groundwater gradient, as indicated in a study published by the U.S. Geological Survey, is to the east-northeast toward the Deschutes River.² The subject property is located within Management Area 3, which recommends a 79% to 100% reduction from the base scenario loading (standard systems) for existing and future homes. The results of the Nitrate Loading Management Model within the study (Figures 25 and 26) suggest that this area represents a moderate to high risk of adverse impacts to groundwater quality. According to the interactive map for Oregon Domestic Well Testing, this part of Deschutes County has an average nitrate-nitrogen concentration in domestic wells of 0.51 milligrams per liter (mg/L) with 7.58% exceeding 3 mg/L and none exceeding 10 mg/L (based on 211 test results, viewed on October 17, 2023).³

Formal Variance Request

Variance is requested from the following rules:

1. OAR 340-071-0135(1) – which addresses Department of Environmental Quality (DEQ) approval of new or innovative technologies, materials, or designs for onsite systems.¹
2. OAR 340-071-0150(4)(a)(B) – which requires all criteria for approval shall be met.¹
3. OAR 340-071-0290(4)(d) – which states that the water table is at least 24 inches bgs throughout the year.¹

This request seeks to overcome the limitations of this Site by treating the sewage using a recirculating textile filter system (AdvanTex® AX20N-Mode 3B) prior to discharge into an elevated bottomless sand filter. AdvanTex units do an effective job of reducing five-day biochemical oxygen demand and total suspended solids to below 10 mg/L. Nitrogen is often fully converted from ammonia-nitrogen to nitrate-nitrogen (greater than 90%). Operating in Mode 3, the AdvanTex unit reduces total nitrogen sufficiently to meet TS2 (less than 30 mg/L). The DEQ approval of the AX20N in Mode 3B includes an ultraviolet light to satisfy the pathogen reduction requirements of TS2. However, this request includes the use of a modified bottomless sand filter to achieve the pathogen reduction requirements of TS2 instead of an ultraviolet light and, therefore, this configuration does not have (or need) an ultraviolet disinfection unit. The “B” designation indicates the AdvanTex unit is configured with the second pump for the final discharge to the modified bottomless sand filter.

The AX20 systems in the La Pine project produced a effluent with an average total nitrogen (TN) concentration of 17 mg/L. A post-anoxic process similar to what is proposed, referred to at the time as

² Morgan, D. S., & Hinkle, R. S. (2007). *Evaluation of approaches for managing nitrate loading from on-site wastewater systems near La Pine, Oregon*, (Scientific Investigations Report 2007-5237). Reston, VA: U.S. Geologic Survey.

³ ARC GIS Online. (n.d.). Oregon domestic well testing. [Data file]. Retrieved May 30, 2023, from ARC GIS Online: <https://www.arcgis.com/apps/MapSeries/index.html?appid=c0d7daea497049c1a686d07dab7106e5>



Nitrex, was tested following treatment through a lined intermittent sand filter. The Nitrex unit consisted of a 2-compartment concrete tank filled with what was described as a proprietary carbon media (wood chips).

The sand filters produced an average TN of about 50 mg/L and the final effluent from the Nitrex units had an average TN of 2.4 mg/L, representing a 96% reduction from the 60 mg/L average TN concentration in the septic tank effluent. So long as there is sufficient soluble carbon being released from the wood chips, and the hydraulic loading rate is low enough to allow the dissolved oxygen in the effluent to approach zero, the NO₃-N concentration will typically be below the method detection limit. What nitrogen remains in the effluent will often be organic, as measured by the Total Kjeldahl Nitrogen (TKN) method. The organic nitrogen may be subsequently oxidized in the bottomless sand filter, but is just as likely to be retained or recycled in the biomass that develops in the sand filter media. Therefore, the concentration of nitrogen leaving the bottomless sand filter after treatment through both the AX20 and the RidNOx unit is expected to be even lower than the results from the La Pine project.

The RidNOx unit described in this proposal is configured similar to larger units used on several systems permitted under Water Pollution Control Facilities (WPCF) permits and monitored on a regular basis. Some of these units have been in tanks and some have been in lined basins. Typical results from the post-anoxic process (prior to discharge, typically to a soil absorption system) include NO₃-N concentrations near or below the method detection limit and TKN concentrations between 1 and 3 mg/L.

A recent test result (August 2022) from a similarly configured system (predominantly residential sources using AdvanTex treatment with Mode 3-style pre-anoxic denitrification, followed by post-anoxic treatment in tanks filled with wood chips) produced a TKN concentration of 0.68 mg/L and a NO₃-N concentration of 0.13 mg/L for a TN of 0.81 mg/L.

A recent test result (July 2022) from a high-nitrogen source (150 mg/L TKN treated by AdvanTex with alkalinity augmentation to support full nitrification, configured in a Mode 3-style pre-anoxic process, followed by post-anoxic treatment in lined wood-chip beds) produced a TKN concentration of 0.99 mg/L and a NO₃-N concentration of 0.05 mg/L for a TN of 1.04 mg/L. Assuming a maximum 65 to 75% reduction from the starting concentration, the NO₃-N concentration entering the post-anoxic process is expected range between 40 and 45 mg/L, similar to the sand filter effluent from the La Pine Project and higher than what is expected from the AX20 in a residential scenario.

Based on the performance of the commercial systems described above, and a typical residential total nitrogen concentration of 60 mg/L, the typical reduction from the base scenario presented in the groundwater study cited previously would be approximately 98 percent.

The initial and replacement bottomless sand filter areas are proposed on the highest ground at the north end of the parcel. This represents an area with the appropriate spatial footprint and meets all required horizontal setback requirements.

Test Pit 3 (2023) was described as:

- Very dark grayish brown (10YR 3/2) loamy coarse sand from 0 to 25 inches with weak medium subangular blocky structure; friable; common very fine, and few fine and medium roots; with redoximorphic features described beginning at a depth of 18 inches; underlain by
- Very dark gray (10YR 3/1) sandy loam from 25 to 60 inches with weak medium and coarse subangular blocky structure; friable to firm; few roots; with redoximorphic features throughout.



Relative elevation measurements were made at all 4 corners of both the proposed initial and replacement bottomless sand filters as well as at the existing ground surface adjacent to the described profiles for all three test pits. The highest level of the water table is expected to be 17 inches below the existing ground surface at the lowest point within the area proposed for the initial sand filter and 14 inches for the replacement sand filter based on the depth to the redoximorphic features described in Test Pit 3 (2023). As mentioned previously, Test Pit 1 was lower in elevation than Test Pits 2 and 3 by about 4 inches. If we used the water table elevation from Test Pit 1, the predicted depth to the water table at lowest point for the replacement sand filter would be more like 18 inches.

The proposed system seeks to overcome this limitation by elevating the modified bottomless sand filter in a manner that provides an additional 3 inches of separation (Figures 3A and 3B). The sod and underlying sandy soil to a depth of 6 inches within the footprint of the sand filter will be excavated and replaced with sand filter media. An additional 10 inches of sand filter media (total of 16 inches) will be used to exceed the 24-inch separation from shallowest water table depth standard by providing a total separation of 27 inches for the initial sand filter with an additional 13 inches (total of 19 inches) for the replacement sand filter.

Deschutes County has noted that the results of the Nitrate Management Loading Model indicated that there was little to no surplus capacity within Management Area 3 to accommodate additional lots that were denied or otherwise not expected to be approved. More than a dozen parcels have been approved through the formal variance process in this area and concern has been expressed about the cumulative effects of the additional nutrient load on groundwater and surface water quality.

Brian Rabe will need to be involved during the construction of this system to install the lysimeter in the sand filter and oversee the installation of the RidNOx unit. Additional information regarding the installation of the RidNOx unit and the lysimeter, as well as sampling instructions, are described in Appendix F and shown in Figures 4, 5, and 6. The owner agrees to facilitate sampling of the RidNOx effluent in conjunction with routine service visits (twice per year for the first 2 years and annually thereafter) to monitor the performance. Samples will be collected from the pump basin between the RidNOx unit and the sand filter. When the media begins to show signs of depletion (as indicated by average nitrogen concentrations climbing to above 7 mg/L nitrate-nitrogen or 10 mg/L total nitrogen), the owner will schedule media replacement for the following summer when the water table is at least 30 inches below the top of the tank (to prevent displacement of the empty tank by buoyant forces). If this request is approved, a condition of approval will require access be allowed to the treatment system and sand filter by current and future property owners for periodic supplemental third-party sampling.

In addition to the high level of treatment achieved by the AdvanTex treatment system and post-anoxic denitrification process, further treatment of the effluent will occur with predominantly unsaturated flow within the imported sand and native sandy soil beneath the bottomless sand filter (minimum of 24 inches above the highest predicted level of the underlying fluctuating water table). Small doses, coupled with substantial resting periods achieved with pressure distribution (see recommended sand filter plan detail in Figure 4), will ensure unsaturated, thin-film flow through the soils above the water table. This will further reduce pathogens and other residual contaminants. The subsoil found beneath the sandy surface soils include evidence of both oxidation and reduction of iron. Conditions that support the reduction of iron will reduce nitrate-nitrogen to nitrogen gas since nitrate ions are used as electron acceptors preferentially over iron compounds. This will facilitate additional reduction of nitrate-nitrogen as the highly treated effluent is assimilated into the environment.



As described, the proposed combination of treatment components is expected to produce a final effluent with very high quality and a low potential to impact water quality, human health, or the environment. Given the unique circumstances at this Site, strict compliance with the rules is considered to be unreasonable.

It is acknowledged that detailed plans and specifications will need to be submitted and approved before any construction can take place. It is also understood that if this request is approved, there will be language included that allows the county to allow or require a prescriptive system that is demonstrated to perform equal to or better than what is described in this proposal.

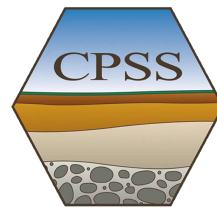
Directions to the Site as well as a map showing the ownership of adjacent parcels along with a list of names and addresses are attached in Appendix G. If you have any questions or comments, please do not hesitate to contact me directly at (503) 881-1604.

Sincerely,
ELKHORN CONSULTING LLC

A blue ink handwritten signature, appearing to read "Brian T. Rabe".

Brian T. Rabe, CPSS, WWS
Principal Soil Scientist

BTR/ddr
Enc: Figures 1-6, Appendices A-G
c: Adam Bledsoe
Todd Cleveland, REHS – Deschutes County



Certified Professional
Soil Scientist
BRIAN T. RABE
15239 Exp. 31DEC23
Registered Wastewater Specialist
No. EH-W-448430 Exp. 30SEP24

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FIGURES

- Figure 1. Vicinity Map**
- Figure 2. Site Plan**
- Figure 3. Modified Bottomless Sand Filter**
- Figure 4. Sand Filter Plan Detail**
- Figure 5. Lysimeter Details**
- Figure 6. RidNOx™ Details**

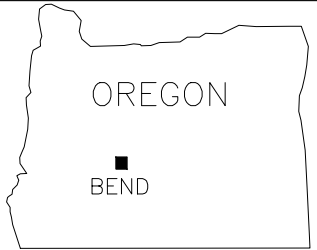
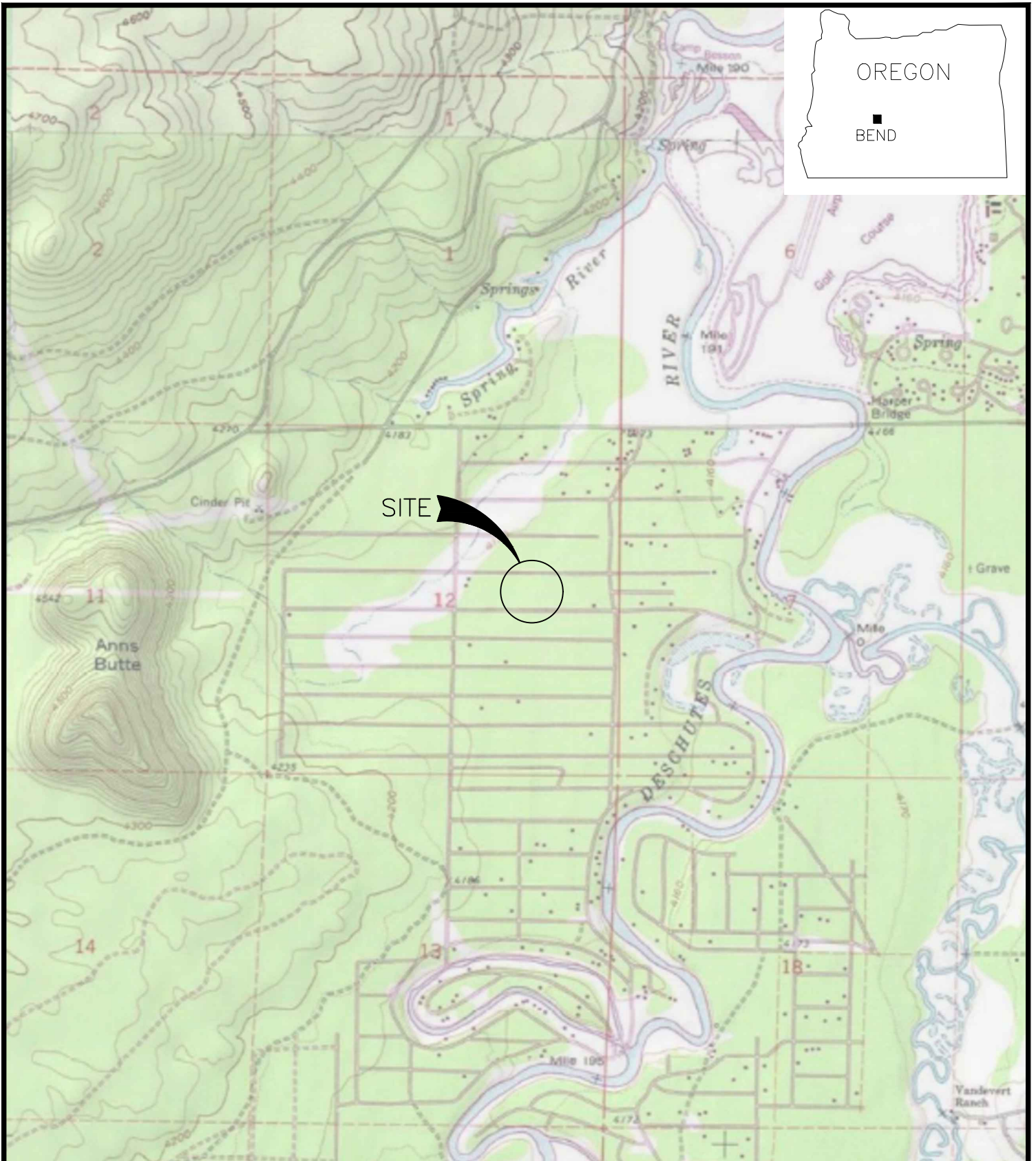
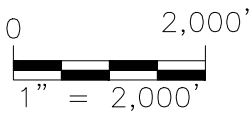



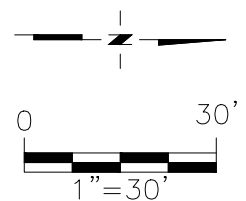
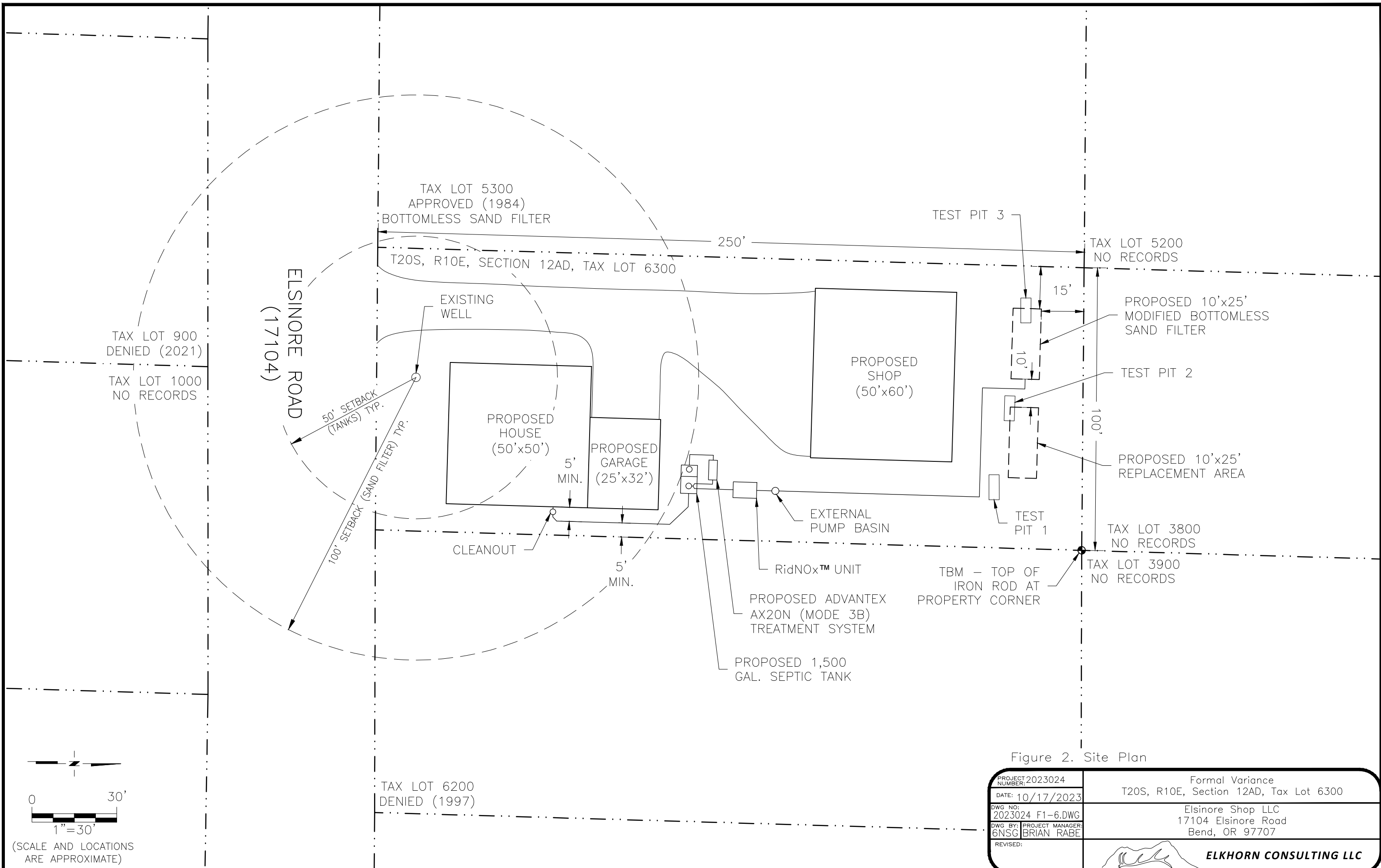
Figure 1. Vicinity Map



(LOCATIONS AND SCALE ARE APPROXIMATE)

(SOURCE: ©2013 National Geographic Society, i-cubed)

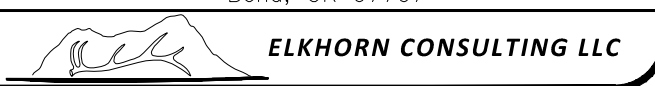
PROJECT NUMBER: 2023024	Formal Variance
DATE: 10/17/2023	T20S, R10E, Section 12AD, Tax Lot 6300
DWG NO: 2023024 F1-6.DWG	Elsinore Shop LLC
DWG BY: PROJECT MANAGER: 6NSG BRIAN RABE	17104 Elsinore Road
REVISED:	Bend, OR 97707
 ELKHORN CONSULTING LLC	



(SCALE AND LOCATIONS ARE APPROXIMATE)

Figure 2. Site Plan

PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG NO: 2023024 F1-6.DWG	
DWG BY: PROJECT MANAGER: 6NSG BRIAN RABE	
REVISED:	



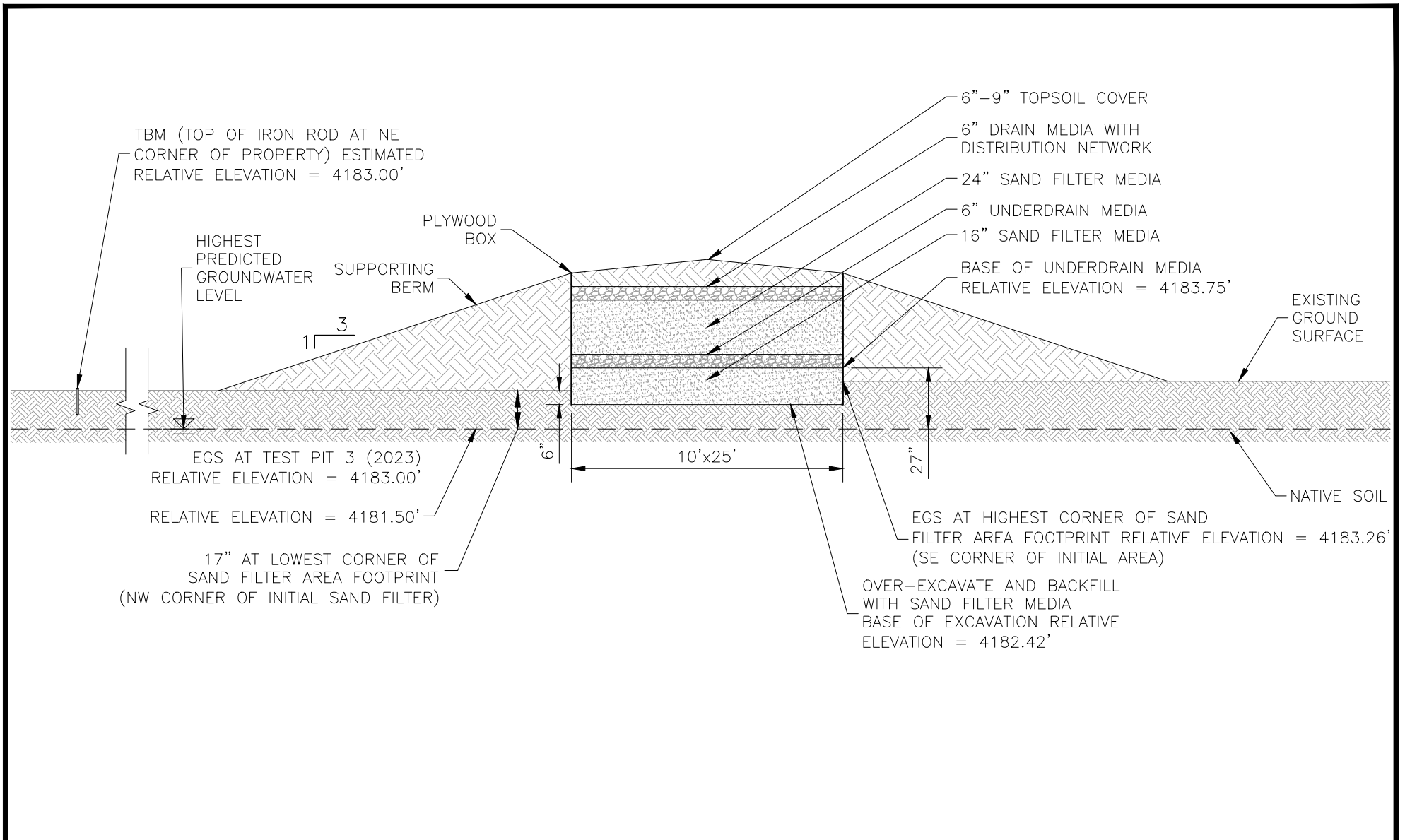



Figure 3A. Modified Bottomless Sand Filter Section – Initial



PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	
DWG NO: 2023024 F1-6.DWG	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG BY: 6NSG PROJECT MANAGER: BRIAN RABE	
REVISED:	 ELKHORN CONSULTING LLC

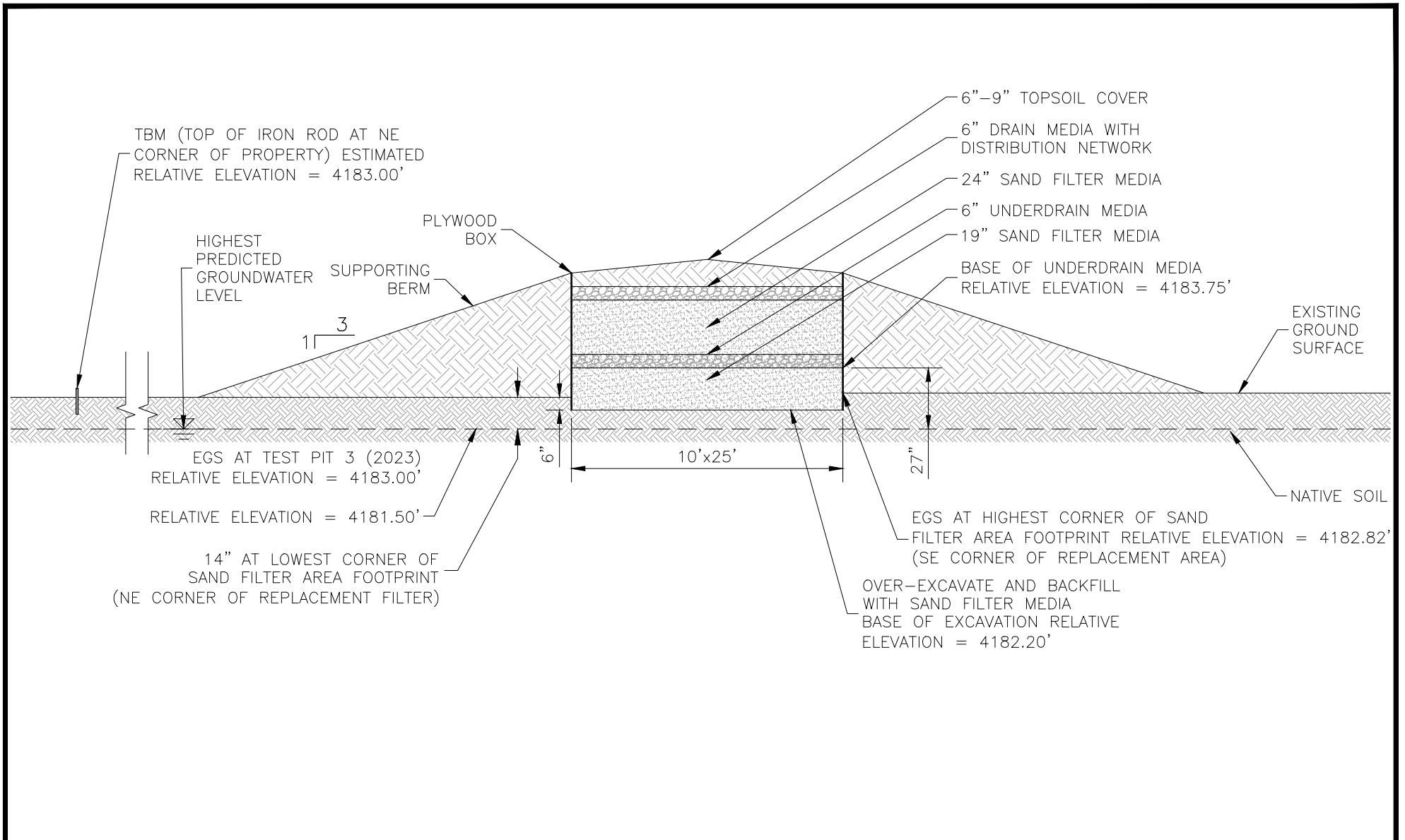
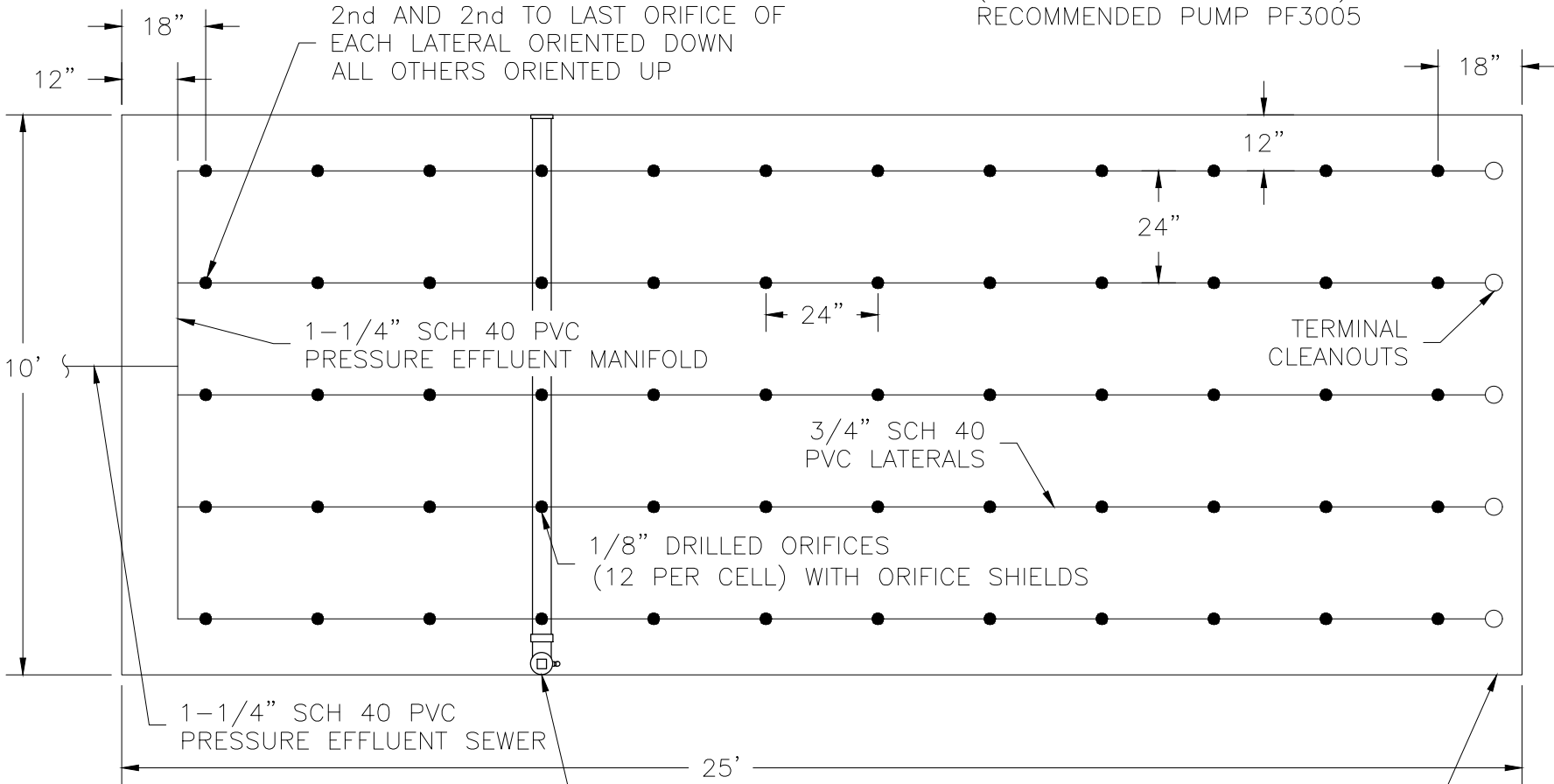


Figure 3B. Modified Bottomless Sand Filter Section – Replacement

PROJECT NUMBER: 2023024	Formal Variance
DATE: 10/17/2023	T20S, R10E, Section 12AD, Tax Lot 6300
DWG NO: 2023024 F1-6.DWG	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG BY: PROJECT MANAGER: 6NSG BRIAN RABE	
REVISED:	 ELKHORN CONSULTING LLC

TOTAL OF 60 ORIFICES
 0.56 GALLONS PER MINUTE
 AT 8.1 FT RESIDUAL HEAD
 (33.4 GPM AT 44.6 FT TDH)
 RECOMMENDED PUMP PF3005



2nd AND 2nd TO LAST ORIFICE OF EACH LATERAL ORIENTED DOWN ALL OTHERS ORIENTED UP

1-1/4" SCH 40 PVC PRESSURE EFFLUENT MANIFOLD

3/4" SCH 40 PVC LATERALS

1/8" DRILLED ORIFICES (12 PER CELL) WITH ORIFICE SHIELDS


1-1/4" SCH 40 PVC PRESSURE EFFLUENT SEWER

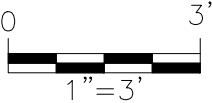
TERMINAL CLEANOUTS

BOX CONSTRUCTED OF 3/4" (NOMINAL) 23/32" (ACTUAL) PLYWOOD WITH 2x4 FRAMEWORK NO MORE THAN 4 FT O.C.

EFFLUENT SAMPLE COLLECTION LYSIMETER (BELOW SAND FILTER MEDIA) – LOCATE IN ALIGNMENT DIRECTLY UNDER 4TH ROW OF ORIFICES.

Figure 4. Sand Filter Plan Detail

PROJECT NUMBER: 2023024	Formal Variance
DATE: 10/17/2023	T20S, R10E, Section 12AD, Tax Lot 6300
DWG NO: 2023024 F1-6.DWG	Elsinore Shop LLC
DWG BY: 6NSG PROJECT MANAGER: BRIAN RABE	17104 Elsinore Road
REVISED:	Bend, OR 97707
	 ELKHORN CONSULTING LLC



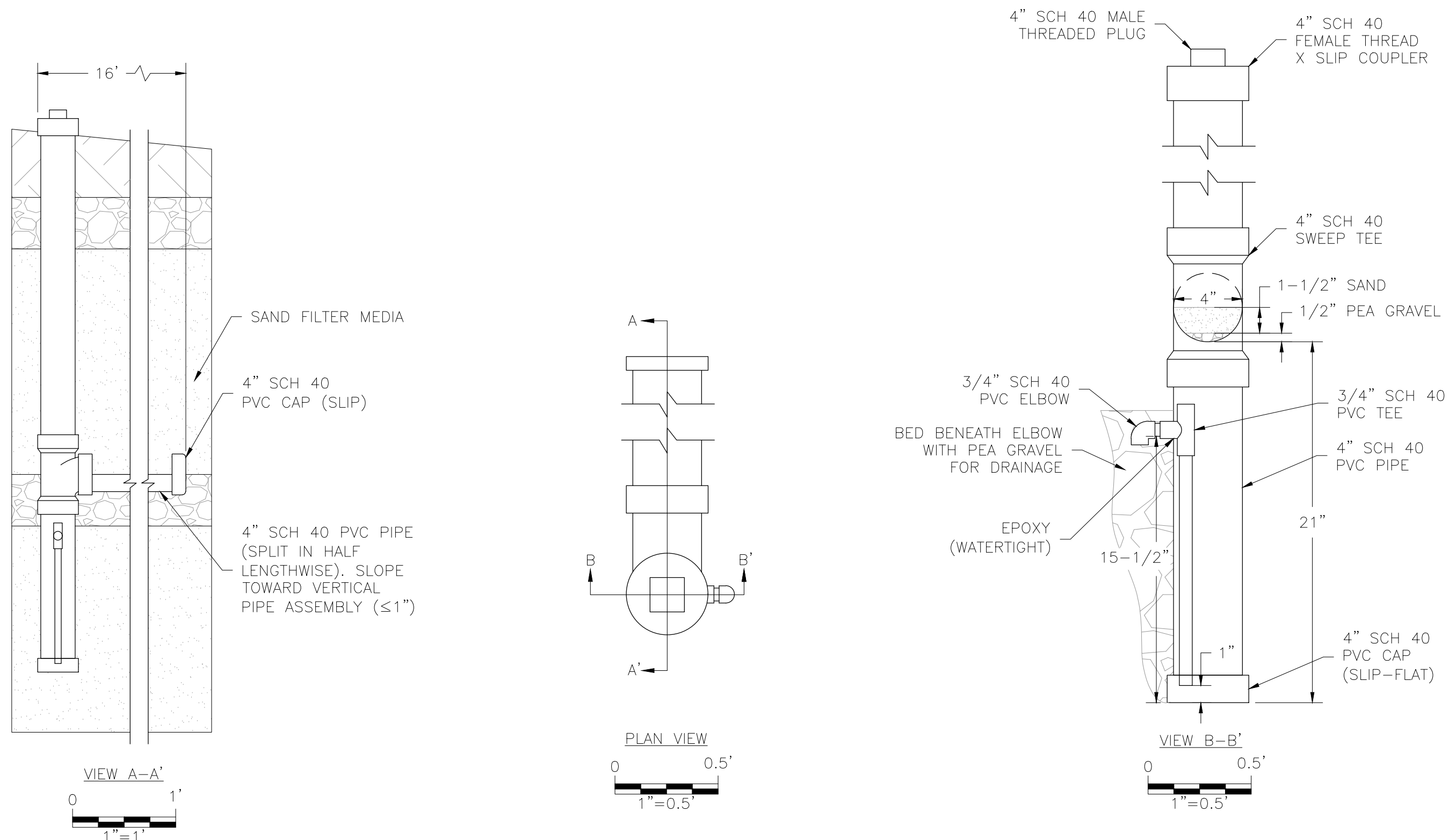

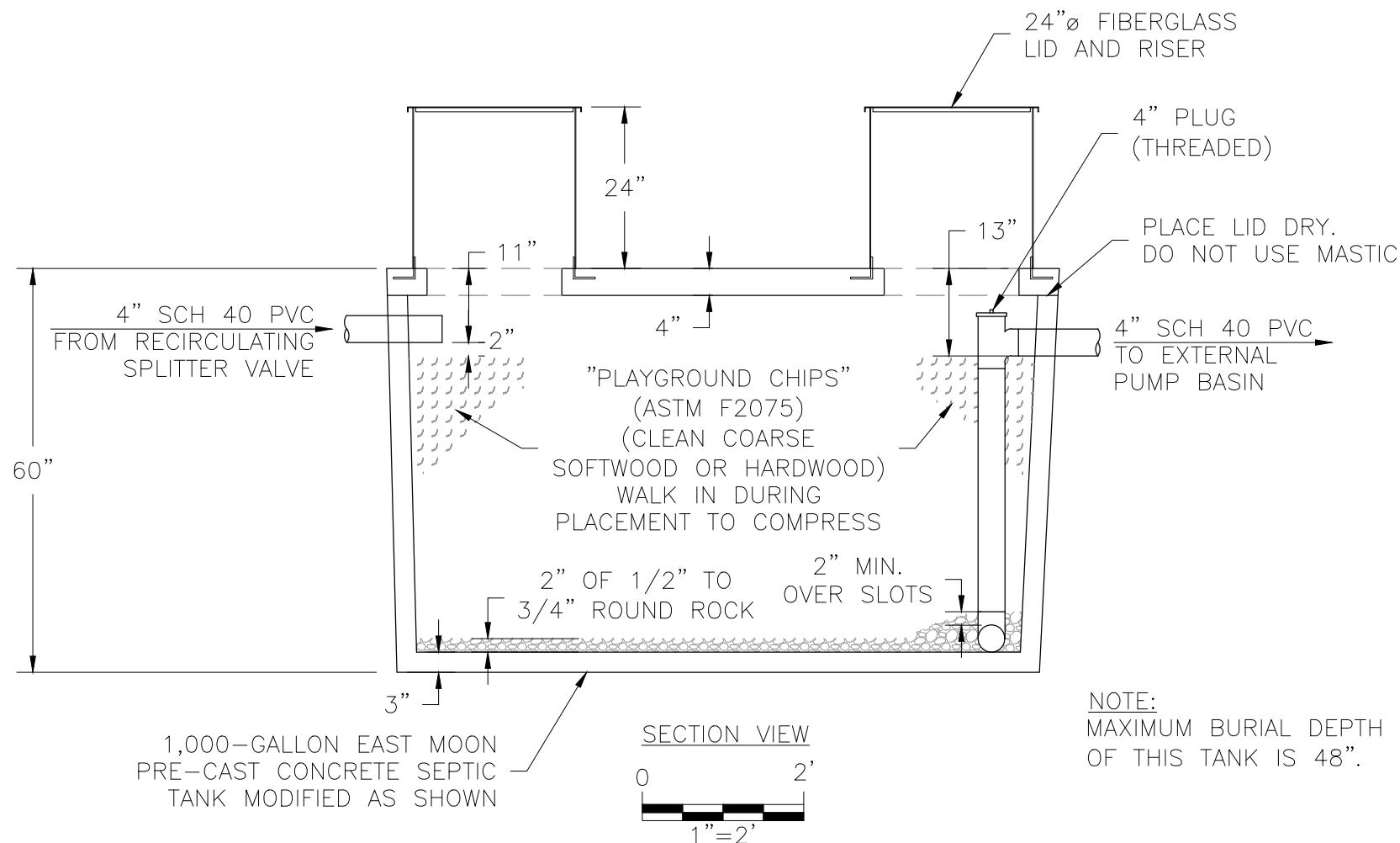
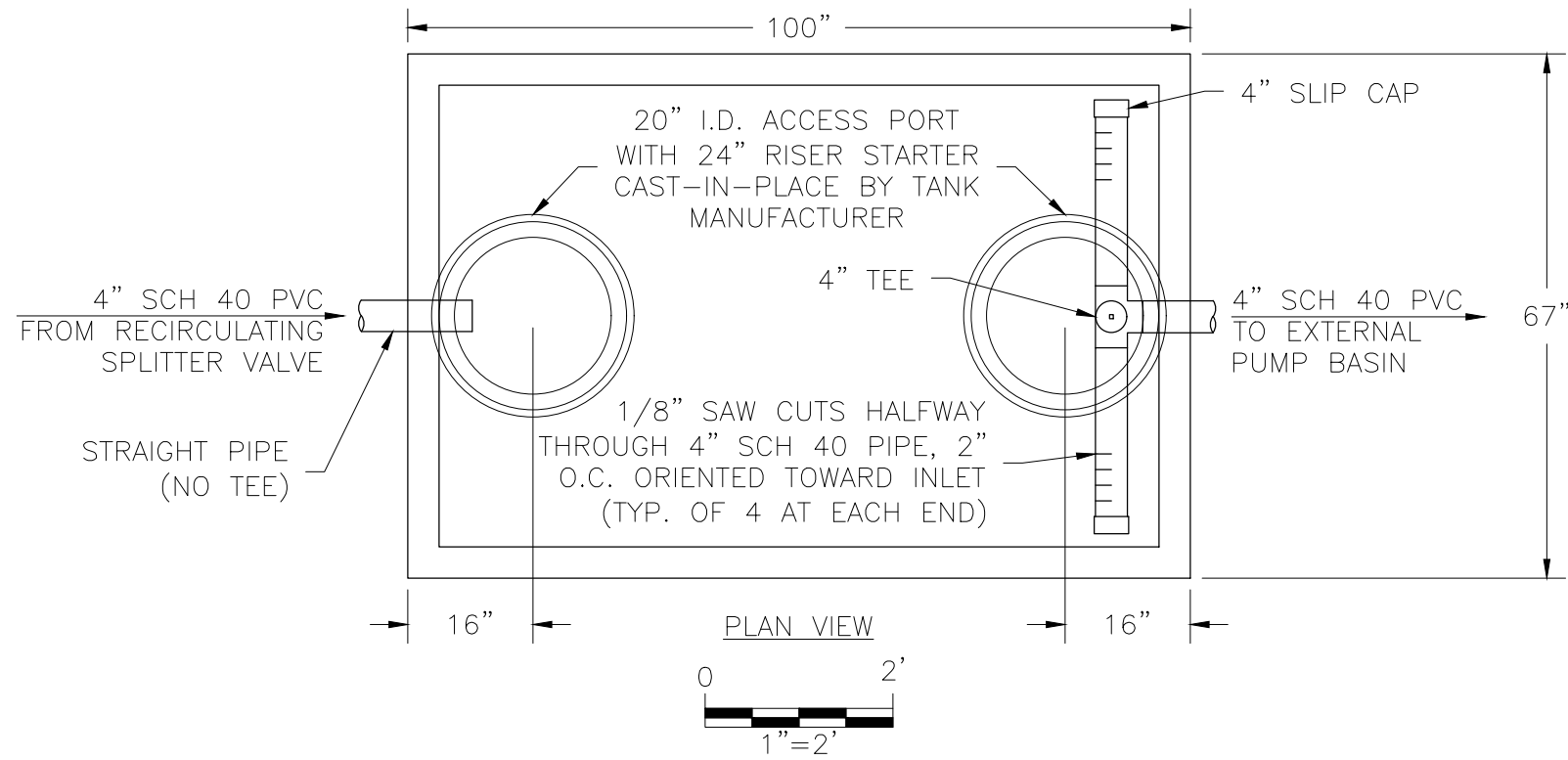


Figure 5. Lysimeter Details

PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG NO: 2023024 F1-6.DWG	
DWG BY: PROJECT MANAGER: 6NSG BRIAN RABE	
REVISED:	 ELKHORN CONSULTING LLC



NOTE:
MAXIMUM BURIAL DEPTH OF THIS TANK IS 48".

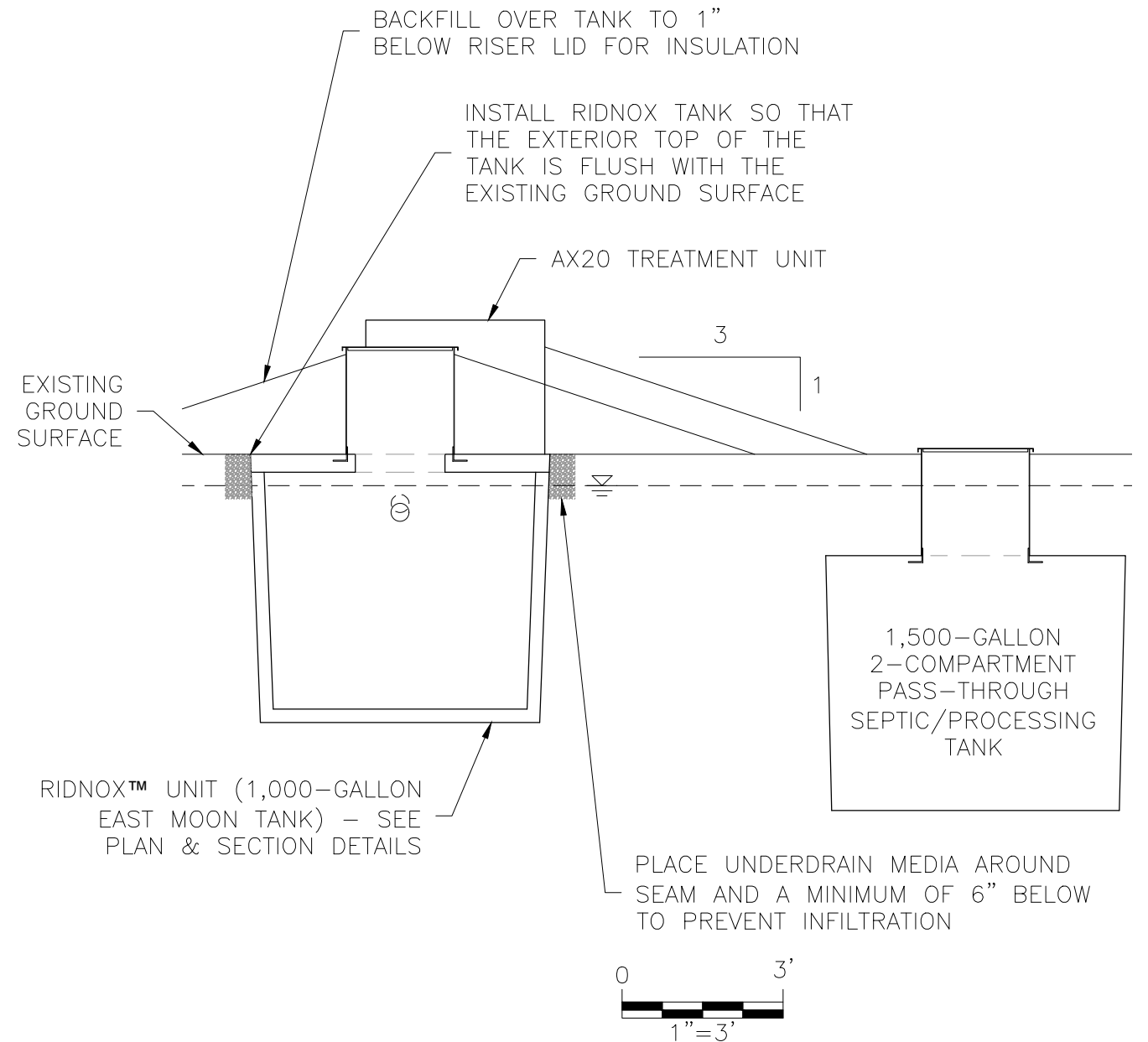



Figure 6. RidNOx™ Details

PROJECT NUMBER: 2023024	Formal Variance T20S, R10E, Section 12AD, Tax Lot 6300
DATE: 10/17/2023	Elsinore Shop LLC 17104 Elsinore Road Bend, OR 97707
DWG NO: 2023024 F1-6.DWG	
DWG BY: PROJECT MANAGER: 6NSG BRIAN RABE	
REVISED:	 ELKHORN CONSULTING LLC

APPENDICES

- Appendix A. Tax Lot Map**
- Appendix B. Deed**
- Appendix C. Site Evaluation Reports**
- Appendix D. NRCS Soil Report**
- Appendix E. Water Well Reports**
- Appendix F. RidNOxTM and Lysimeter Installation
and Sampling Instructions**
- Appendix G. Directions to Site, List of Names and Addresses
for Neighboring Property Owners**

Appendix A.

Tax Lot Map

THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSE ONLY

S.E. 1/4 N.E. 1/4 SEC. 12 T.20S. R. 10E. W.M.
DESCHUTES COUNTY
1" = 100'

20 10 12AD

5/2/2018



20 10 12AD

Appendix B.

Deed

Deschutes County Official Records **2018-49494**
D-D
Stn=1 BN 12/17/2018 03:22 PM
\$10.00 \$11.00 \$10.00 \$61.00 \$6.00 **\$98.00**

I, Nancy Blankenship, County Clerk for Deschutes County, Oregon,
certify that the instrument identified herein was recorded in the Clerk
records.

Nancy Blankenship - County Clerk

After Recording Return To:

Merrill O'Sullivan, LLP
c/o Peter A. Christoff
805 SW Industrial Way, Suite 5
Bend, Oregon 97702

Until a change is requested, send tax statements to:

James Owens
1539 Santiago Drive
Newport Beach, California 92660

STATUTORY BARGAIN AND SALE DEED

James Owens, Grantor, hereby conveys to Elsinore Shop, LLC, an Oregon limited liability company, Grantee, the following-described real property:

Lot 36 in Block 18 of DESCHUTES RIVER RECREATION HOMESITES, Records of Deschutes County, Oregon.

(Commonly known as 17104 Elsinore Road, Bend, Deschutes County, Oregon)

The above-described property is free of encumbrances except: (a) all covenants, conditions, restrictions, reservations, easements and any other items of record and those apparent upon the land, if any, as of the date of this deed; and (b) liens for taxes not yet due as of the date of this deed.

The consideration for this transfer is other value given or promised.

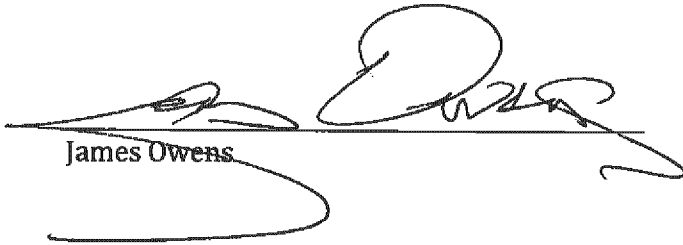
BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11,

STATUTORY BARGAIN AND SALE DEED – PAGE 1 OF 2

MERRILL O'SULLIVAN, LLP
805 SW INDUSTRIAL WAY, SUITE 5
BEND, OREGON 97702
541-389-1770

CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

By execution of this instrument, Grantor certifies that he is not a "foreign person" as that term is defined in the Internal Revenue Code, Section 1445.


James Owens

Dated: 12-13, 2018

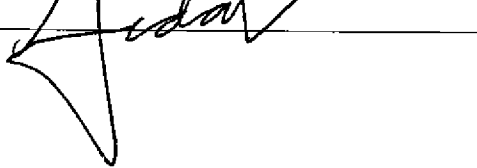
A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY, OR VALIDITY OF THAT DOCUMENT.

STATE OF CALIFORNIA }
 } S.S.
COUNTY OF ORANGE }

On December 13, 2018, before me, Aidan Andrade, a Notary Public, personally appeared James Owens, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person executed the instrument.

I certify under PENALTY of PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature 



(Seal)

Appendix C.

Site Evaluation Reports



September 7, 2023

ELSINORE SHOP LLC
1539 SANTIAGO DR
NEWPORT BEACH, CA 97707

RE: 247-23-000698-EVAL
17104 ELSINORE RD, BEND

A site evaluation for an onsite wastewater treatment system for a single family dwelling was recently completed at the property noted above. Test pits were evaluated on 9/6/23. Part of the evaluation is to determine the level to which the groundwater rises during the wet season of a normal weather year. Permanent water tables are present throughout the year although they may fluctuate in elevation seasonally. The soil indicators used to determine the level to which the water table rises include gray soils and discoloration of the soil.

In the test pits on the property the indicators suggest the water table may rise to within 18 inches of the ground surface. Stripping and staining, observed as a splotchy pattern in the soil profile, was observed starting between 18 and 19 inches below ground surface, which is a condition associated with saturation. Past observations and site evaluations in the surrounding area also verify the presence of a high water table. Extensive study and modeling of the groundwater in south Deschutes County has demonstrated that this area is sensitive to added loading from areas that do not meet separation to groundwater. **This site is denied due to high permanent groundwater observed and conditions associated with saturation.**

The site is denied based on the following:

- Does not meet minimum separation from permanent water table (OAR 340-071-0220, 0260, 0265, 0275, 0280, 0285, 0290, 0302).
- Installation of an onsite wastewater system in the area evaluated will likely lead to nitrate pollution of public waters. The Nitrate Loading Management Model indicates this area, Management Area 3, cannot sustain added loading from high groundwater lots if nitrate levels are to remain below the action level in groundwater (Morgan, Hinkle, Weick. USGS. 2007). Groundwater shall be protected from pollution that could impair existing and future beneficial uses, including domestic drinking water from wells (OAR 340-040-0020).
- Deschutes County, may not authorize installation or use of a system that is likely to pollute public waters or create a public health hazard (OAR 340-071-0130(1)).

You have 90 days from the initial site visit to provide additional test pits for evaluation at no additional fee. However, it appears that other areas on the property would not be suitable because the remainder of the lot is at a similar landscape position or is impacted by the setback to the well.

REVIEW AVAILABLE

Pursuant to Oregon Administrative rules (OAR 340-071). You may request a site evaluation report review if you believe this report to be in violation of the rules. The Oregon DEQ conducts report reviews upon submission of the appropriate application materials including: a written request that includes all information you have received from Deschutes County, the reason the report is in error including the specific Oregon Administrative Rules that

conflict with the report, and the application fee. The DEQ will review the county's report and visit the site to determine the report's compliance with the appropriate rules.

Also pursuant to this rule, you may request a variance from these rules. The Oregon DEQ reviews variance requests upon application. This is not an automatic variance. You must provide technical justification that demonstrates your proposed system will operate over an extended period of time, will not degrade the environment, and will provide public health protection.

An application, application fee, justification and exhibits, including this report, a land use compatibility statement and detailed plans of your proposed system are required for the application. Technical advice from a knowledgeable consultant is recommended. A Variance Office from DEQ will review your application and the property and issue a written determination following an informational hearing.

Deschutes County recognizes your right to a variance request. This property, however, has severe limitations for onsite wastewater treatment as noted above. Unless public health and environmental protection can be assured, a variance request cannot be supported by the Deschutes County Onsite Wastewater Division and will not likely be approved by DEQ.

For further information regarding a report review for a variance request, please contact the Oregon Department of Environmental Quality at 471 NE Bellevue Dr., #110, Bend, OR 97701, phone 541-388-6146.

If you have any questions, please do not hesitate to call this office at 541-388-6519.

Sincerely,
Onsite Wastewater Division

A handwritten signature in blue ink, appearing to read "Kiley Rucker Clamons, Rehs". The signature is fluid and cursive.

KILEY RUCKER CLAMONS, REHS
Onsite Wastewater Specialist II



SITE EVALUATION FIELD INSPECTION FORM

Applicant: James Owens Site Evaluation # 247-23-000698-EVAL

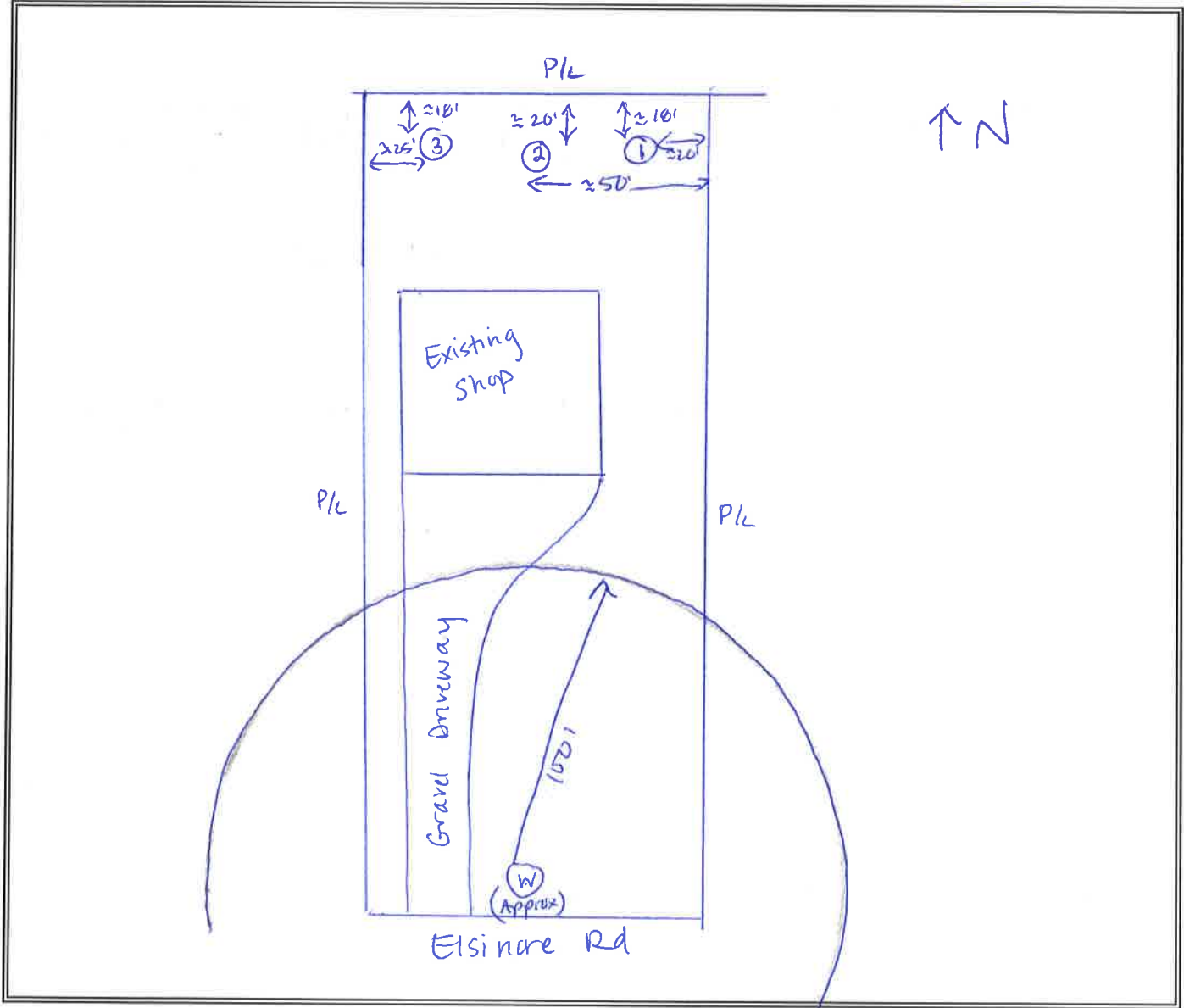
Evaluator: K. Rucker Clamons Date: 9/6/2023 Parcel Size: 0.56 Acres

Subdivision: DARH (Blks 18-25) T 20 R 10 S 12 TL 6300 L 36 B 18

Suitable

Sketch/Not to Scale

Unsuitable



*systems approved are the **minimum** to meet current DEQ rules and are not design specifications

System type approved: _____

Absorption facility: _____

Initial _____

Min. Size _____ Max. Depth _____ Min. Depth _____

Replacement _____

Min. Size _____ Max. Depth _____ Min. Depth _____

Tank Size _____

Sewage Flow _____

Special Conditions: _____

Denied



SITE EVALUATION FIELD INSPECTION FORM

Applicant: James Owens Site Evaluation # 247-23-000698-EVAL
 Evaluator: K. Rucker Claman Date: 9/6/2023 Parcel Size: 0.56 Acres
 Subdivision: DRRH (Blks 18-25) T 20 R 10 S 12 TL 6300 L 36 B 18

DEPTH	TEXTURE	COLOR	Notes on roots, structure, rock frag, redox, limiting layer type & depth
1 0-22" 22-57"	LCOS sl	10YR3/2 10YR3/1	2vf flm; 1f, msbk; FR; stripping (10YR 4/2) + staining (04R 4/6) @ 19" few roots; 1m, csbk; FR → 1fl; C2d Fe concentrations
2 0-29" 29-56"			} Similar to Pit #1; stripping + staining @ 18"
3 0-25" 25-60"			} Similar to Pit #1; stripping + staining @ 18"
4			
5			
6			
7			

Landscape Note: Lodgepole; Idaho fescue; Currant; bitterbrush
 Slope: +1-1% Aspect: NE Groundwater: permanent
 Other site notes: _____

Comments: Conditions associated with saturation: stripping and staining

Reason for Unsuitability: (Include Rule Reference)
See Site Evaluation Report letter dated 9/7/23 for details
0AR 340-071-0220, 0260, 0265, 0275, 0280, 0285, 0290, 0302
0AR 340-040-0020
0AR 340-071-0130(1)

Appendix D.
NRCS Soil Report



A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties

17104 Elsinore



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

Custom Soil Resource Report

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

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

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

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

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

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

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

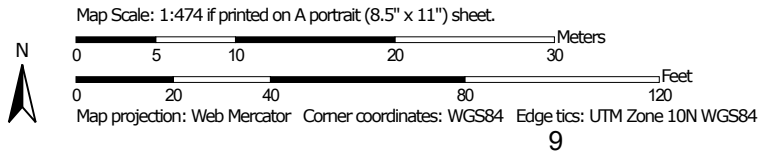
Custom Soil Resource Report

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

Soil Map


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

Custom Soil Resource Report Soil Map (17104 Elsinore)




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






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

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

Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties
 Survey Area Data: Version 21, Sep 8, 2023

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

Date(s) aerial images were photographed: Nov 1, 2019—Nov 4, 2019

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

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (17104 Elsinore)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
144A	Sunriver sandy loam, 0 to 3 percent slopes	0.6	100.0%
Totals for Area of Interest		0.6	100.0%

Map Unit Descriptions (17104 Elsinore)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Custom Soil Resource Report

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties

144A—Sunriver sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2411

Elevation: 4,000 to 4,300 feet

Mean annual precipitation: 18 to 25 inches

Mean annual air temperature: 40 to 44 degrees F

Frost-free period: 10 to 50 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Sunriver and similar soils: 85 percent

Minor components: 8 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sunriver

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over old alluvium

Typical profile

H1 - 0 to 5 inches: sandy loam

H2 - 5 to 20 inches: loamy coarse sand

H3 - 20 to 29 inches: coarse sand

H4 - 29 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: About 24 to 48 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6c

Hydrologic Soil Group: B

Ecological site: F006XE807OR - Cryic Aquic Pumice Basins

Hydric soil rating: No

Minor Components

Cryaquolls

Percent of map unit: 8 percent

Custom Soil Resource Report

Landform: Mountains

Ecological site: R006XB102OR - COLD WET MEADOW

Hydric soil rating: Yes

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

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

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

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix E.

Water Well Reports

STATE OF OREGON WATER SUPPLY WELL REPORT

DESC 63336

WELL I.D. LABEL# L

145474

START CARD #

1056334

ORIGINAL LOG #

(as required by ORS 537.545 & 537.765 and OAR 690-205-0210)

4/29/2022

(1) LAND OWNER

Owner Well I.D.

First Name JEFF Last Name NEAMAN Company Address 3098 NE DELMAS ST. City BEND State OR Zip 97701

(2) TYPE OF WORK

[X] New Well [] Deepening [] Conversion

[] Alteration (complete 2a & 10) [] Abandonment (complete 5a)

(2a) PRE-ALTERATION

Casing: Dia + From To Gauge Stl Plstc Wld Thrld Seal: Material From To Amt sacks/lbs

(3) DRILL METHOD

[] Rotary Air [] Rotary Mud [X] Cable [X] Auger [] Cable Mud [] Reverse Rotary [] Other

(4) PROPOSED USE

[X] Domestic [] Irrigation [] Community [] Industrial/ Commercial [] Livestock [] Dewatering [] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION

Special Standard [] (Attach copy)

Depth of Completed Well 100.00 ft.

Table with columns: Dia, From, To, Material, SEAL, Amt, lbs. Includes Bentonite Chips and Calculated rows.

How was seal placed: Method [] A [] B [] C [] D [] E

[X] Other POURED

Backfill placed from ft. to ft. Material

Filter pack from ft. to ft. Material Size

Explosives used: [] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Table with columns: Casing, Liner, Dia, From, To, Gauge, Stl, Plstc, Wld, Thrld. Includes shoe location and temp casing info.

(7) PERFORATIONS/SCREENS

Perforations Method

Screens Type Material

Table with columns: Perf/Screen, Casing/Liner, Dia, From, To, Scrn/slot width, Slot length, # of slots, Tele/pipe size.

(8) WELL TESTS: Minimum testing time is 1 hour

[X] Pump [] Bailer [] Air [] Flowing Artesian

Table with columns: Yield gal/min, Drawdown, Drill stem/Pump depth, Duration (hr). Includes values 19, 9, 27, 1.5.

Temperature 46 °F Lab analysis [] Yes By

Water quality concerns? [] Yes (describe below) TDS amount 58 ppm

Table with columns: From, To, Description, Amount, Units.

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM

Sec 12 SE 1/4 of the NE 1/4 Tax Lot 6100

Tax Map Number Lot

Lat " or 43.85599254 DMS or DD

Long " or -121.47060784 DMS or DD

[X] Street address of well [] Nearest address

17116 ELSINORE RD BEND OR 97707

(10) STATIC WATER LEVEL

Date SWL(psi) + SWL(ft)

Table with columns: Existing Well / Pre-Alteration, Completed Well, Date, SWL(psi), SWL(ft).

Flowing Artesian? [] Dry Hole? []

WATER BEARING ZONES

Depth water was first found 62.00

SWL Date From To Est Flow SWL(psi) + SWL(ft)

Table with columns: SWL Date, From, To, Est Flow, SWL(psi), SWL(ft). Includes row for 4/28/2022.

(11) WELL LOG

Ground Elevation

Table with columns: Material, From, To. Lists soil types like brown sand and clay, gray clay, etc.

Date Started 4/25/2022 Completed 4/28/2022

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards.

License Number 2078 Date 4/28/2022

Signed RICK KING (E-filed)

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above.

License Number 1528 Date 4/28/2022

Signed STEVE MATHERS (E-filed)

Contact Info (optional) 5413890743

WATER SUPPLY WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

DESC 63336

4/29/2022

Map of Hole

**STATE OF OREGON
WELL LOCATION MAP**


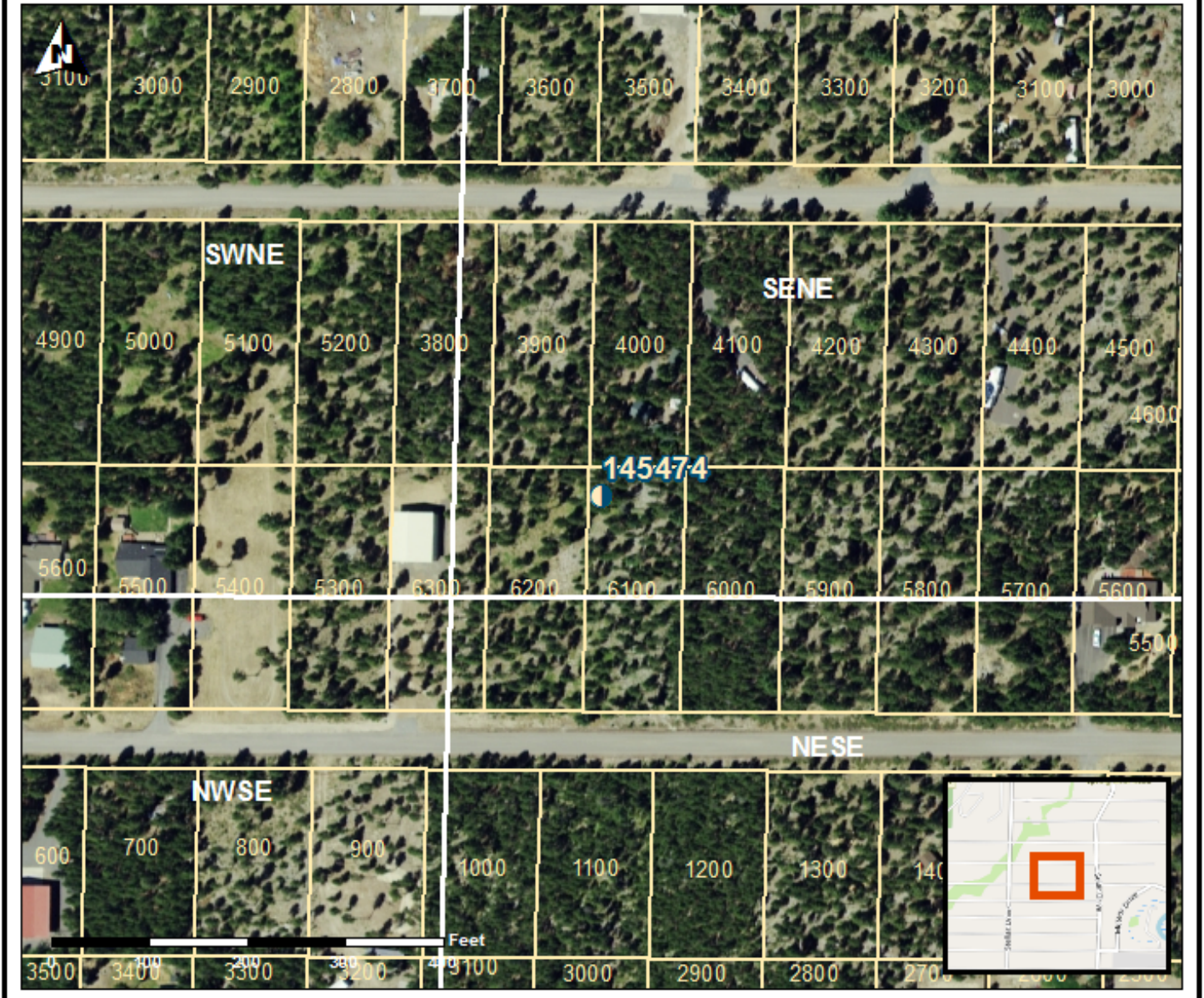
Oregon Water Resources Department
725 Summer St NE, Salem OR 97301
(503)986-0900

This map is supplemental to the WATER SUPPLY WELL REPORT

Well Label: 145474
Printed: April 28, 2022

LOCATION OF WELL
Latitude: 43.8559254 Datum: WGS84
Longitude: -121.47060784
Township/Range/Section/Quarter-Quarter Section:
WM20.00S10.00E12SENE
Address of Well:
17116 ELSINORE RD BEND OR 97707

DISCLAIMER: This map is intended to represent the approximate location the well. It is not intended to be construed as survey accurate in any manner.
Provided by well constructor

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

DESC 61440

3/6/2019

WELL I.D. LABEL# L 129731
START CARD # 1039893
ORIGINAL LOG #

(1) LAND OWNER
Owner Well I.D.
First Name PAUL Last Name HUMPHREY
Company
Address 62935 FLORENCE DRIVE
City BEND State OR Zip 97701

(2) TYPE OF WORK
[X] New Well [] Deepening [] Conversion
[] Alteration (complete 2a & 10) [] Abandonment(complete 5a)

(2a) PRE-ALTERATION
Dia + From To Gauge Stl Plstc Wld Thrd
Casing:
Material From To Amt sacks/lbs
Seal:

(3) DRILL METHOD
[X] Rotary Air [] Rotary Mud [] Cable [] Auger [] Cable Mud
[] Reverse Rotary [] Other

(4) PROPOSED USE
[X] Domestic [] Irrigation [] Community
[] Industrial/ Commercial [] Livestock [] Dewatering
[] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION
Special Standard [] (Attach copy)
Depth of Completed Well 75.00 ft.
BORE HOLE
Dia From To Material From To Amt sacks/lbs

How was seal placed: Method [] A [] B [] C [] D [] E
[X] Other POURED DRY
Backfill placed from ft. to ft. Material
Filter pack from ft. to ft. Material Size
Explosives used: [] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE
Proposed Amount Actual Amount

(6) CASING/LINER
Casing Liner Dia + From To Gauge Stl Plstc Wld Thrd
Shoe [] Inside [X] Outside [] Other Location of shoe(s) 67
Temp casing [] Yes Dia From + To

(7) PERFORATIONS/SCREENS
Perforations Method
Screens Type Material
Perf/ Casing/ Screen Scrn/slot Slot # of Tele/
Screen Liner Dia From To width length slots pipe size

(8) WELL TESTS: Minimum testing time is 1 hour
Pump [X] Bailer [] Air [] Flowing Artesian []
Yield gal/min Drawdown Drill stem/Pump depth Duration (hr)

Temperature 51 °F Lab analysis [] Yes By
Water quality concerns? [] Yes (describe below) TDS amount 89 mg/L
From To Description Amount Units

(9) LOCATION OF WELL (legal description)
County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 12 NW 1/4 of the SE 1/4 Tax Lot 6300
Tax Map Number Lot
Lat " or 43.85541100 DMS or DD
Long " or -121.47126800 DMS or DD
[] Street address of well [X] Nearest address
17104 ELSINORE ROAD, BEND, OREGON 97707

(10) STATIC WATER LEVEL
Date SWL(psi) + SWL(ft)
Existing Well / Pre-Alteration
Completed Well 8/8/2018 21
Flowing Artesian? [] Dry Hole? []

Table with columns: SWL Date, From, To, Est Flow, SWL(psi), + SWL(ft). Rows include data for 8/7/2018 and 8/8/2018.

(11) WELL LOG
Ground Elevation 4183.00
Material From To
Sandy Loam & Pumice 0 12
Black Silty Sand 12 14
Black Clay & Sand Streaks 14 28
Greenish Gray Clay & Sand 28 63
Coarse Sand & Gravel 63 75

Date Started 8/7/2018 Completed 8/8/2018

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
License Number Date
Signed

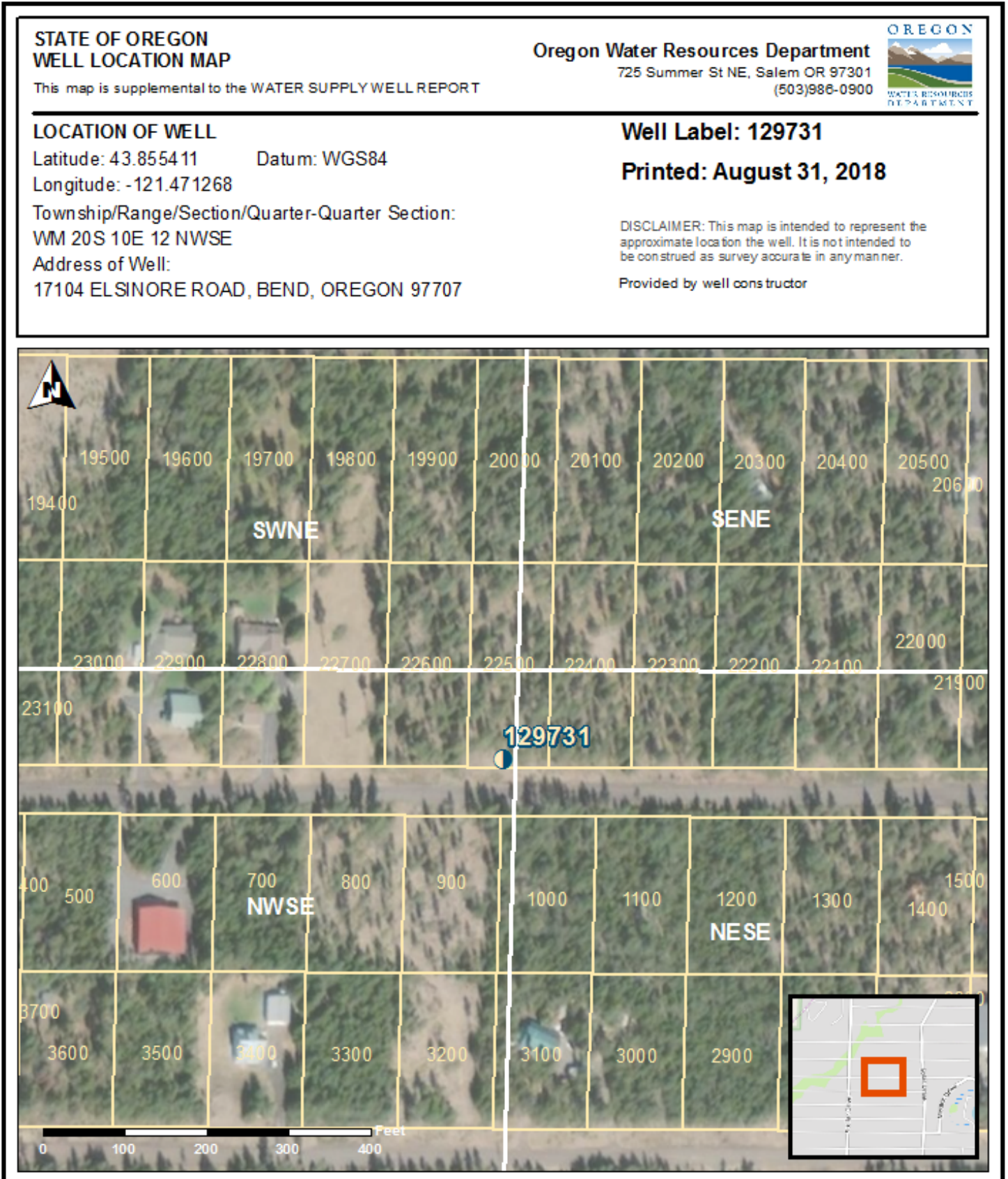
(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
License Number 1385 Date 3/6/2019
Signed ROBERT BUCKNER (E-filed)
Contact Info (optional)

WATER SUPPLY WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

DESC 61440

3/6/2019

Map of Hole



STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)

DESC 8583

DESC 8583

OCT 18 1993

NOV 17 1993

20S/10E/12a
455882

WATER RESOURCES DEPARTMENT

(1) OWNER: Well Number SALEM, OREGON
Name DENALI CONSTRUCTION
Address 604 N.E. 20th
City Portland State OR Zip 97232

(2) TYPE OF WORK:
 New Well Deepen Recondition Abandon

(3) DRILL METHOD:
 Rotary Air Rotary Mud Cable
 Other

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval Yes No Depth of Completed Well 80 ft.
Explosives used Yes No Type Amount

HOLE			SEAL			Amount sacks or pounds
Diameter	From	To	Material	From	To	
10	0	18	CEMENT	0	18	5 sacks
6	18	80				

How was seal placed: Method A B C D E
 Other

Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

Casing/Liner	Diameter	From	To	Gauge	Material			
					Steel	Plastic	Welded	Threaded
Casing	6	11	80	250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:
 Perforations Method Touch cut
 Screens Type 250 Material steel

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
69	79	1/2 x 1/2	20	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour

Yield gal/min	Drawdown	Drill stem at	Time
15	5'		12 hr.

Temperature of Water 44 Depth Artesian Flow Found _____
Was a water analysis done? Yes By whom _____
Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other No
Depth of strata: _____

(9) LOCATION OF WELL by legal description:
County Deschutes Latitude _____ Longitude _____
Township 20S N or S. Range 10-E E or W. WM. _____
Section 12A0 NE 1/4 NE 1/4
Tax Lot 22800 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) 17084 ELKWOOD
BEND OR 97702

(10) STATIC WATER LEVEL:
17 ft. below land surface. Date Oct 11-93
Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:
Depth at which water was first found 20'

From	To	Estimated Flow Rate	SWL
70	80	25	17

(12) WELL LOG: Ground elevation _____

Material	From	To	SWL
gravel	0	3	
clay	3	12	
clay sand	12	14	
clay	14	20	17
clay	20	80	

Date started Oct 7-93 Completed Oct 11-93

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.
Signed _____ WWC Number _____
Date _____

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
Signed _____ WWC Number 1525
Date Oct 12-93

WELL IDENTIFICATION FORM

Owner's Well Number: _____

CURRENT WELL OWNER:

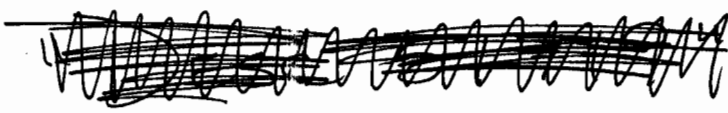
Phone 541-593-1246

Name: Howard and Anita Blankley

Mailing Address: 17084 Elsinore Rd

City: Bend State: OR Zip: 97707

WELL LOCATION:



County: Deschutes Latitude: _____ Longitude: _____

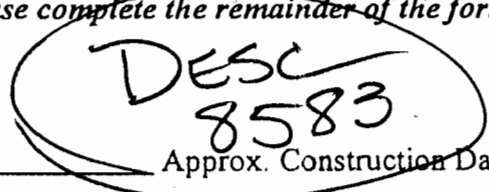
Township: 20 N or (S) Range: 10 (E) or W Section: 12 NE 1/4 NE 1/4

Tax Lot Number: 22800

Street Address of Well (if different from above): _____

If a well report is available for this well, please attach a copy of it to this form and return. It is not necessary for you to complete the remainder of the form if the well report is attached. If a well report is not available, please complete the remainder of the form to the best of your ability.

WELL INFORMATION:



Start Card Number: _____ Approx. Construction Date: _____

Well Constructor: _____

Name of Owner at Time of Construction: _____

Well Depth (in feet): _____ Static Water Level (in feet): _____

Diameter of Exposed Well Casing (in inches): _____

Does this well have a formal water right associated with it? Yes: _____ No: _____ If yes:

Application #: _____ Permit #: _____ Certificate #: _____

Please Return Completed Form to: **Oregon Water Resources Department
158 12th Street NE
Salem, OR 97310**

(Office use only)

Well Identification Number: _____

26171

WATER RESOURCES DEPT.
SALEM, OREGON

JUN - 3 1998

RECEIVED

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

DESC 60185

1/27/2015

WELL I.D. LABEL# L 116843
START CARD # 1025332
ORIGINAL LOG #

(1) LAND OWNER
Owner Well I.D.
First Name SHERRI Last Name MARTINELLI
Company
Address 9243 SE 129TH
City HAPPY VALLEY State OR Zip 97086

(2) TYPE OF WORK
[X] New Well [] Deepening [] Conversion
[] Alteration (complete 2a & 10) [] Abandonment (complete 5a)

(2a) PRE-ALTERATION
Dia + From To Gauge Stl Plstc Wld Thrld
Casing:
Material From To Amt sacks/lbs
Seal:

(3) DRILL METHOD
[] Rotary Air [] Rotary Mud [] Cable [X] Auger [] Cable Mud
[] Reverse Rotary [] Other

(4) PROPOSED USE
[X] Domestic [] Irrigation [] Community
[] Industrial/ Commercial [] Livestock [] Dewatering
[] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION
Special Standard [] (Attach copy)
Depth of Completed Well 59.00 ft.

Table with columns: Dia, From, To, Material, SEAL, Amt, lbs. Rows include Bentonite Chips and Calculated values.

How was seal placed: Method [] A [] B [] C [] D [] E
[X] Other 3 MIN POUR

Backfill placed from ft. to ft. Material
Filter pack from ft. to ft. Material Size

Explosives used: [] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE
Proposed Amount Actual Amount

(6) CASING/LINER
Casing Liner Dia + From To Gauge Stl Plstc Wld Thrld
Shoe [] Inside [] Outside [] Other Location of shoe(s)
Temp casing [] Yes Dia From To

(7) PERFORATIONS/SCREENS
Perforations Method
Screens Type Material
Perf/ Casing/ Screen Scrn/slot Slot # of Tele/
Screen Liner Dia From To width length slots pipe size

(8) WELL TESTS: Minimum testing time is 1 hour
[] Pump [] Bailer [] Air [] Flowing Artesian

Table with columns: Yield gal/min, Drawdown, Drill stem/Pump depth, Duration (hr). Row 1: 15, 12, 26, 2

Temperature 43 °F Lab analysis [] Yes By
Water quality concerns? [] Yes (describe below) TDS amount
From To Description Amount Units

(9) LOCATION OF WELL (legal description)
County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 12 SE 1/4 of the NE 1/4 Tax Lot 20300
Tax Map Number Lot
Lat " or " DMS or DD
Long " or " DMS or DD
[] Street address of well [] Nearest address

17125 DOWNEY RD, BEND

(10) STATIC WATER LEVEL
Date SWL(psi) + SWL(ft)
Existing Well / Pre-Alteration
Completed Well 1/9/2015 14
Flowing Artesian? [] Dry Hole? []

WATER BEARING ZONES
Depth water was first found 3.00
SWL Date From To Est Flow SWL(psi) + SWL(ft)
1/9/2015 3 6 5 2
1/9/2015 57 59 15 14

(11) WELL LOG
Ground Elevation
Material From To
Pummie 0 2
Brown sand course Clay mix 2 3
Black sand fine 3 6
Gray Clay 6 57
Gray sand and gravel 57 59

Date Started 1/7/2015 Completed 1/9/2015

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
License Number Date
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
License Number 1614 Date 1/27/2015
Signed SAM J OLSON (E-filed)
Contact Info (optional) 541-536-5339

STATE OF OREGON
WATER WELL REPORT
 (as required by ORS 537.765)

DESC 834

"This well log was prepared from a well inspection only"

20S/10E/12 ad

(PROVISIONAL WELL LOG)

Start Card Unknown

(1) OWNER:

Name Unknown Owner

Well Number: _____

Address _____

City _____ State _____ Zip _____

(2) TYPE OF WORK:

Older Well

New Well Deepen Recondition Abandon

(3) DRILL METHOD

Rotary Air Rotary Mud Cable (Unknown)

Other _____

(4) PROPOSED USE:

Domestic Community Industrial Irrigation

Thermal Injection Other _____

BORE HOLE CONSTRUCTION:

Special Construction approval Yes No Depth of Completed Well 60 ft.

Explosives used Yes No Type _____ Amount _____

HOLE			SEAL			Amount sacks or pounds
Diameter	From	To	Material	From	To	
10"	0'	?	Bentonite	0"	?	
6"	?	?				

How was seal placed: Method A B C D E

Other Unknown

Backfill placed from _____ ft. to _____ ft. Material _____

Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing: 6"	+1'	?	.250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liner: Unknown				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) _____

PERFORATIONS/SCREENS: (Unknown)

Perforations Method _____
 Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
(Unknown)						<input type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour

Pump Bailer Air Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
(Unknown)			1 hr.

Temperature of water Unk. Depth Artesian Flow Found _____

Was a water analysis done? Yes No By whom _____

Did any strata contain water not suitable for intended use? Too little Unk.

Salty Muddy Odor Colored Other _____

Depth of strata: _____ Unk.

(9) LOCATION OF WELL by legal description:

County Deschutes Latitude _____ Longitude _____
 Township 20S N or S, Range 10E E or W, WM.
 Section 12A SE $\frac{1}{4}$ NE $\frac{1}{4}$
 Tax Lot 17900 Lot 35 Block 19 Subdivision DRH
 Street Address of Well (or nearest address) Vacant Lot Evergreen Rd. (Downey)

(10) STATIC WATER LEVEL:

11.47 ft. below land surface. Date 12-4-90

Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:

Depth at which water was first found Unknown

From	To	Estimated Flow Rate	SWL
Unknown			

(12) WELL LOG:

Ground elevation _____

Material	From	To	SWL
(Unknow Formations)			
I inspected this well on 12-4-90. It appears this well was drilled some time ago. There is a RV dump outlet and power pole approx: 50' north of this well.			
The septic tank is approx: 70-75' north of this well.			
After digging around the casing, I would say the annular seal is questionable.			
See Inspection Form Dated 12-4-90			
Larry L. Carey		DEC 10 1991	
<i>Larry L. Carey</i>		DEC 10 1991	
Well Inspector		WATER RESOURCES DEPT	
South Central Region		TALENT, OREGON	

Date started Unk. Completed Unk.

(unbonded) Water Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.

WWC Number _____
 Signed Unknown Date _____

(bonded) Water Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. all work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

WWC Number _____
 Signed Unknown Date _____

RECEIVED

APR 16 1991

WATER RESOURCES DEPARTMENT WELL INSPECTION FORM

Owner Name UNKNOWN OWNER

Address _____

Purpose of Inspection Request from Kari Korhan of Linda Blankenship Realty

Well Location T 20 N 10 E R 100 W Section 12A SE & NE County Deschutes

Street Address _____

Distance & direction from house, barn, etc. Approx: 70'-75' south of septic tank, yellow fiber glass outbuilding 10' east of septic tank

Well Type Type of well: Drilled _____ Dug _____ Driven _____ Bored _____

Use of well: Domestic Stock _____ Irrigation _____ Industrial _____ Municipal _____ Test Well _____

Drilling Machine Type of drilling machine used to construct the well:

Cable tool _____ Air rotary _____ Mud rotary _____ Reverse rotary _____

Was the drilling machine present at the well site during the inspection: yes _____ no

Construction Dates Date started Unk. Date completed Unk.

Well Contractor and Driller Well contractor's name Unk. License number _____

Well driller's name Unk. License number _____

Well Inspection Diameter of casing 6 in. Thickness of casing wall 1.50 in. Diameter of drillhole 10 in.

Maximum thickness of annular space 2 in. Minimum thickness of annular space 1 in.

Casing cap or seal (describe) Casing is covered with plastic bucket

Describe the Measuring Point (M.P.) TOP OF CASING

M.P. is 1.10 ft. (above or below) the Land Surface Datum (LSD)

Water Level Measurements

Tape reading 127.57 ft. Sounded Well Depth 61.37 ft. Sounded Open Annulus ?

M.P. (+ or -) -1.10 ft. M.P. (+ or -) -1.10 ft. Annulus depth _____ feet Below LSD

Depth to water 11.47 ft. Depth of well 60.27 ft.

Well Seal Dug 2 ft. + Augered _____ ft. + Drilled _____ ft. = 2 ft.

Describe material found in seal Benonite

Were seal samples taken: yes no _____ Number of photographs taken 1

Apparent deviation from the well construction standards No sanitary seal and annular seal would be questionable.

Remarks There is an R.U. Dump and Power Pole, hose bib approx: 50' north of well.

Pump Type _____ Make _____ HP _____

Inspector Name Larry L. Carey & Ralph Sutterfield Date 12-V-90 Time of day 3:30 PM

Title Well Inspector

Witnesses during the inspection yes _____ no Name _____

Address _____ Telephone _____

OFFICE USE ONLY

Was a well log filed yes _____ no _____ Date the well log was filed _____

Was a notice card filed yes _____ no _____ Date the notice card was filed _____

Notes: _____

127.57
115.00

12.57
- 1.10

11.47

60.27
11.47

48.80' water



STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

DESC 62269

10/7/2020

WELL I.D. LABEL# L

START CARD #

ORIGINAL LOG #

139818
1049096

(1) LAND OWNER

Owner Well I.D.
First Name JOHN Last Name STOVER
Company
Address 28568 SANTA CATARINA RD
City SANTA CLARIDA State CA Zip 91350

(2) TYPE OF WORK

[X] New Well [] Deepening [] Conversion
[] Alteration (complete 2a & 10) [] Abandonment (complete 5a)

(2a) PRE-ALTERATION

Casing: Dia + From To Gauge Stl Plstc Wld Thrld
Material From To Amt sacks/lbs
Seal:

(3) DRILL METHOD

[X] Rotary Air [] Rotary Mud [] Cable [] Auger [] Cable Mud
[] Reverse Rotary [] Other

(4) PROPOSED USE

[X] Domestic [] Irrigation [] Community
[] Industrial/ Commercial [] Livestock [] Dewatering
[] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION

Depth of Completed Well 87.00 ft. Special Standard [] (Attach copy)

Table with columns: Dia, From, To, Material, SEAL, Amt, lbs. Rows include Bentonite and Calculated values.

How was seal placed: Method [] A [] B [] C [] D [] E

[X] Other BENTONITE DRY

Backfill placed from ft. to ft. Material

Filter pack from ft. to ft. Material Size

Explosives used: [] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Table with columns: Casing, Liner, Dia, From, To, Gauge, Stl, Plstc, Wld, Thrld. Includes rows for 8" and 5" diameters.

Shoe [] Inside [] Outside [] Other Location of shoe(s)

Temp casing [] Yes Dia From + To

(7) PERFORATIONS/SCREENS

Perforations Method

Screens Type pvc Material Pvc screens

Table with columns: Perf/ Screen, Casing/ Liner, Dia, From, To, Scrn/slot width, Slot length, # of slots, Tele/ pipe size.

(8) WELL TESTS: Minimum testing time is 1 hour

[X] Pump [] Bailer [] Air [] Flowing Artesian

Table with columns: Yield gal/min, Drawdown, Drill stem/Pump depth, Duration (hr). Row 1: 10, 18, 70, 4.

Temperature 48 °F Lab analysis [] Yes By

Water quality concerns? [] Yes (describe below) TDS amount 35 ppm

Table with columns: From, To, Description, Amount, Units.

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 12 NW 1/4 of the SE 1/4 Tax Lot 800
Tax Map Number Lot
Lat " or 43.85511910 DMS or DD
Long " or -121.47204145 DMS or DD
[] Street address of well [X] Nearest address

17089 ELINORE RD SUNRIVER OR

(10) STATIC WATER LEVEL

Table with columns: Existing Well / Pre-Alteration, Date, SWL(psi), SWL(ft). Row 1: 9/23/2020, 18.

Flowing Artesian? [] Dry Hole? []

WATER BEARING ZONES

Depth water was first found 18.00

Table with columns: SWL Date, From, To, Est Flow, SWL(psi), SWL(ft). Row 1: 9/25/2020, 18, 88, 25, 18.

(11) WELL LOG

Ground Elevation

Table with columns: Material, From, To. Rows include Sand and Pumice, Gravel congl, Green clay sands, sand gravels black brown with clay, lava gravel congl.

Date Started 9/23/2020 Completed 9/25/2020

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number 2025 Date 10/7/2020

Signed SHAUN ALEXANDER (E-filed)

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1970 Date 10/7/2020

Signed NEIL FAGEN (E-filed)

Contact Info (optional) 541-548-1245

WATER SUPPLY WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

DESC 62269

10/7/2020

Map of Hole



STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

DESC 61441

3/6/2019

WELL I.D. LABEL# L 129732
START CARD # 1039892
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name PAUL Last Name HUMPHREY
Company
Address 62935 FLORENCE DRIVE
City BEND State OR Zip 97701

(2) TYPE OF WORK

[X] New Well [] Deepening [] Conversion
[] Alteration (complete 2a & 10) [] Abandonment (complete 5a)

(2a) PRE-ALTERATION

Casing: Dia + From To Gauge Stl Plstc Wld Thrld
Material From To Amt sacks/lbs
Seal:

(3) DRILL METHOD

[X] Rotary Air [] Rotary Mud [] Cable [] Auger [] Cable Mud
[] Reverse Rotary [] Other

(4) PROPOSED USE

[X] Domestic [] Irrigation [] Community
[] Industrial/ Commercial [] Livestock [] Dewatering
[] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION

Depth of Completed Well 77.00 ft. Special Standard [] (Attach copy)

Table with columns: Dia, From, To, Material, SEAL, Amt, lbs. Includes rows for Bentonite Chips and Calculated values.

How was seal placed: Method [] A [] B [] C [] D [] E

[X] Other POURED DRY

Backfill placed from ___ ft. to ___ ft. Material

Filter pack from ___ ft. to ___ ft. Material Size

Explosives used: [] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Table with columns: Casing, Liner, Dia, From, To, Gauge, Stl, Plstc, Wld, Thrld. Includes checked boxes for material types.

Shoe [] Inside [X] Outside [] Other Location of shoe(s) 77

Temp casing [] Yes Dia From + To

(7) PERFORATIONS/SCREENS

Perforations Method

Screens Type Material

Table with columns: Perf/Screen, Casing/Liner, Dia, From, To, Scrn/slot width, Slot length, # of slots, Tele/pipe size.

(8) WELL TESTS: Minimum testing time is 1 hour

[X] Pump [] Bailer [] Air [] Flowing Artesian

Table with columns: Yield gal/min, Drawdown, Drill stem/Pump depth, Duration (hr). Values: 22, 0, 50, 2.

Temperature 51 °F Lab analysis [] Yes By

Water quality concerns? [] Yes (describe below) TDS amount 92 ppm

Table with columns: From, To, Description, Amount, Units. Values: 63, 77, PH, 7.8, ppb.

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 12 SE 1/4 of the NE 1/4 Tax Lot 3500
Tax Map Number Lot
Lat ' " or DMS or DD
Long ' " or DMS or DD

[X] Street address of well [] Nearest address

17118 DOWNEY ROAD, BEND, OREGON 97707

(10) STATIC WATER LEVEL

Table with columns: Existing Well / Pre-Alteration, Date, SWL(psi), SWL(ft). Values: 9/20/2018, 22.

Flowing Artesian? [] Dry Hole? []

WATER BEARING ZONES

Depth water was first found

Table with columns: SWL Date, From, To, Est Flow, SWL(psi), SWL(ft). Includes rows for 9/19/2018 and 9/20/2018.

(11) WELL LOG

Ground Elevation 4185.00

Table with columns: Material, From, To. Includes rows for Sandy Loam & Pumice, Black Clay with Sand Streaks, Greenish Clay & Sand Layers, Coarse Sand & Gravel.

Date Started 9/19/2018 Completed 9/20/2018

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards.

License Number Date

Signed

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above.

License Number 1385 Date 3/6/2019

Signed ROBERT BUCKNER (E-filed)

Contact Info (optional)

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

DESC 61478

WELL I.D. LABEL# L 133435
START CARD # 1041908
ORIGINAL LOG #

4/24/2019

(1) LAND OWNER
Owner Well I.D.
First Name TOM Last Name MILLER
Company
Address 24155 SKYLANE DR.
City CANBY State OR Zip 97013

(2) TYPE OF WORK
[X] New Well [] Deepening [] Conversion
[] Alteration (complete 2a & 10) [] Abandonment(complete 5a)

(2a) PRE-ALTERATION
Dia + From To Gauge Stl Plstc Wld Thrd
Casing:
Material From To Amt sacks/lbs
Seal:

(3) DRILL METHOD
[] Rotary Air [] Rotary Mud [X] Cable [X] Auger [] Cable Mud
[] Reverse Rotary [] Other

(4) PROPOSED USE
[X] Domestic [] Irrigation [] Community
[] Industrial/ Commercial [] Livestock [] Dewatering
[] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION
Special Standard [] (Attach copy)
Depth of Completed Well 72.00 ft.

Table with columns: Dia, From, To, Material, SEAL, Amt, sacks/lbs. Includes rows for Bentonite Chips and Calculated values.

How was seal placed: Method [] A [] B [] C [] D [] E
[X] Other POURED
Backfill placed from ___ ft. to ___ ft. Material
Filter pack from ___ ft. to ___ ft. Material Size
Explosives used: [] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE
Proposed Amount Actual Amount

(6) CASING/LINER
Casing Liner Dia + From To Gauge Stl Plstc Wld Thrd
Shoe [] Inside [] Outside [] Other Location of shoe(s)
Temp casing [] Yes Dia From + To

(7) PERFORATIONS/SCREENS
Perforations Method
Screens Type Material
Perf/ Casing/ Screen Scrn/slot Slot # of Tele/
Screen Liner Dia From To width length slots pipe size

(8) WELL TESTS: Minimum testing time is 1 hour
[X] Pump [] Bailer [] Air [] Flowing Artesian
Yield gal/min Drawdown Drill stem/Pump depth Duration (hr)
22 15 40 1
Temperature 50 °F Lab analysis [] Yes By
Water quality concerns? [] Yes (describe below) TDS amount 54 ppm
From To Description Amount Units

(9) LOCATION OF WELL (legal description)
County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 12 1/4 of the 1/4 Tax Lot 900
Tax Map Number Lot
Lat " or 43.85495700 DMS or DD
Long " or -121.47150100 DMS or DD
[] Street address of well [X] Nearest address
17097 ELSINORE SUNRIVER OR 97707

(10) STATIC WATER LEVEL
Date SWL(psi) + SWL(ft)
Existing Well / Pre-Alteration
Completed Well 4/24/2019 15
Flowing Artesian? [] Dry Hole? []

WATER BEARING ZONES
Depth water was first found 60.00
SWL Date From To Est Flow SWL(psi) + SWL(ft)
4/24/2019 66 72 30 15

(11) WELL LOG
Ground Elevation
Material From To
soil and pumice 0 4
clay and gravel 4 12
pink ash 12 20
gray clay and green diatomite 20 60
black silt 60 66
soft black rock fractured 66 72

Date Started 1/28/2019 Completed 4/24/2019

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
License Number Date
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
License Number 1528 Date 4/24/2019
Signed STEVE MATHERS (E-filed)
Contact Info (optional) 541 389 0743

STATE OF OREGON
 WATER SUPPLY WELL REPORT
 (as required by ORS 537.765 & OAR 690-205-0210)

DESC 58067
 06-18-2007

WELL LABEL # L 80925-85935
 START CARD # 183441

(1) LAND OWNER Owner Well I.D. _____
 First Name charles Last Name officer
 Company _____
 Address 17065 island loop way
 City sunriver State or Zip 97707

(2) TYPE OF WORK New Well Deepening Conversion
 Alteration (repair/recondition) Abandonment

(3) DRILL METHOD
 Rotary Air Rotary Mud Cable Auger Cable Mud
 Reverse Rotary Other _____

(4) PROPOSED USE Domestic Irrigation Community
 Industrial/ Commercial Livestock Dewatering
 Thermal Injection Other _____

(5) BORE HOLE CONSTRUCTION Special Standard (Attach copy)
 Depth of Completed Well 70.00 ft.

BORE HOLE			SEAL			sacks/	
Dia	From	To	Material	From	To	Amt	lbs
11	0	40	Bentonite Chips	0	20	18	S
6	40	70					

How was seal placed: Method A B C D E

Other poured
 Backfill placed from 20 ft. to 40 ft. Material native
 Filter pack from _____ ft. to _____ ft. Material _____ Size _____
 Explosives used: Yes Type _____ Amount _____

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6		1	69	250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Shoe Inside Outside Other Location of shoe(s) _____

Temp casing Yes Dia _____ From _____ To _____

(7) PERFORATIONS/SCREENS

Perforations Method torch
 Screens Type _____ Material _____

Perf	Casing/Screen	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/pipe size
			66	69	0	0	20	6

(8) WELL TESTS: Minimum testing time is 1 hour

Pump Bailer Air Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
20	20	40	1

Temperature 49 °F Lab analysis Yes By _____

Water quality concerns? Yes (describe below)

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County Deschutes Twp 20.00 S N/S Range 10.00 E E/W WM
 Sec 12 NW 1/4 of the SW 1/4 Tax Lot 3100
 Tax Map Number _____ Lot _____
 Lat _____ ° 0' _____ " or _____ DMS or DD
 Long _____ ° 0' _____ " or _____ DMS or DD
 Street address of well Nearest address

17100 fontana

(10) STATIC WATER LEVEL

Date	SWL(psi)	+	SWL(ft)
Existing Well / Predeepening			
Completed Well	08-01-2006		15

Flowing Artesian? Dry Hole?

WATER BEARING ZONES

SWL Date	From	To	Est Flow	SWL (psi)	+	SWL (ft)
08-01-2006	69	70	40			15

(11) WELL LOG

Material	From	To
soil and pumice	0	3
clay and gravel	3	15
pink ash	15	22
green diatomite	22	69
brocken rock	69	70

Date Started 07-26-2006 Completed 08-02-2006

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number _____ Date _____
 Electronically Filed
 Signed _____

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1528 Date 06-18-2007
 Electronically Filed
 Signed STEVE W MATHERS (E-filed)
 Contact Info (optional) _____

STATE OF OREGON
WATER WELL REPORT
 (as required by ORS 537.765)

DESC 8609

RECEIVED

OCT 29 1993

20s/10e/12db
 W56445

WATER RESOURCES DEPT.

(START CARD) #

(1) OWNER:

Name ALVIN C. ELLENWOOD III Well Number SALEM
 Address 9715 INDEPENDENCE DRIVE NE 303
 City ANCHORAGE State AK Zip 99507

(9) LOCATION OF WELL by legal description:

County DESKRUIS Latitude _____ Longitude _____
 Township 20-S N or S. Range 10-E E or W. WM.
 Section 12.0 N.W. ¼ S.E. ¼
 Tax Lot 3400 Lot _____ Block _____ Subdivision _____
 Street Address of Well (or nearest address) BEND RD. 97707

(2) TYPE OF WORK:

New Well Deepen Recondition Abandon

(3) DRILL METHOD:

Rotary Air Rotary Mud Cable
 Other _____

(4) PROPOSED USE:

Domestic Community Industrial Irrigation
 Thermal Injection Other _____

(5) BORE HOLE CONSTRUCTION:

Special Construction approval Yes No Depth of Completed Well 75 ft.
 Explosives used Yes No Type _____ Amount _____

HOLE			SEAL			Amount sacks or pounds
Diameter	From	To	Material	From	To	
10	0	18	CEMENT	0	18	5 sacks
6	18	75				

How was seal placed: Method A B C D E
 Other _____

Backfill placed from _____ ft. to _____ ft. Material _____

Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing: 6	11	75	250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner:				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:

Perforations Method TOUCH-CUT
 Screens Type 250 Material STEEL

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
65	75	1/2	20	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour

Pump Bailer Air Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
15	11		4 hr.

Temperature of Water 44 Depth Artesian Flow Found _____

Was a water analysis done? Yes By whom _____

Did any strata contain water not suitable for intended use? Too little

Salty Muddy Odor Colored Other NO

Depth of strata: _____

(10) STATIC WATER LEVEL:

22 ft. below land surface. Date Oct-19-93

Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:

Depth at which water was first found 65

From	To	Estimated Flow Rate	SWL
65	75	20	22

(12) WELL LOG:

Ground elevation _____

Material	From	To	SWL
PUMICE	0	2	
CLAY SAND	2	9	
CINDERS	9	11	
CLAY	11	65	
CINDERS	65	75	22

Date started Oct 19-93 Completed Oct 19-93

(unbonded) Water Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.

Signed _____ WWC Number _____
 Date _____

(bonded) Water Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed James B. Palmer WWC Number 1525
 Date Oct 20-93

Appendix F.

**RidNO_x[™] and
Lysimeter Installation,
and Sampling Instructions**



ELKHORN CONSULTING LLC

14833 Goodrich Creek Lane
Baker City, OR 97814 • 503-881-1604
elkhornconsultingllc@gmail.com

RidNOx Installation Instructions

RidNOx Installation

1. Excavate to a depth that will result in the top of the RidNOx tank being at the same elevation as the existing ground surface.
2. Prepare a level, stable base.
3. Set the body of the tank in the hole.
4. Prepare and install inlet and outlet fittings as shown on the approved plans.
5. Place a 2-inch layer of ½ to ¾-inch round rock on the floor of the tank.
6. Cover the slotted outlet pipe with the same rock to a minimum depth of 2 inches.
7. Install the clean wood media (playground chips meeting ASTM F2075) in 6 inch lifts, walking in each lift to compress the media, to the bottom of the outlet fitting.
8. Set the lid on the tank. **Do not use mastic.**
9. Backfill the tank to 6 inches below the seam between the body and the lid.
10. Place underdrain media to the top of the tank.
11. Backfill over the tank with native soil after the risers are attached.

Media Replacement

- Pothole near tank to make sure the water table is at least 30” below the top of the tank to prevent buoyancy during replacement operations.
- Carefully remove the soil cover from over and around the tank to a level below the seam.
- Carefully remove the lid from the tank.
- Use a sump pump to transfer free water from the media to the pump basin.
- Scoop the media from the tank being careful not to damage the inlet and outlet piping or the underdrain media.
- After the excess moisture drains from the spent media, it can be loaded into a dump truck and hauled to a sanitary landfill.
- Install fresh media and re-install the lid as described in steps 7 through 11 above.



Lysimeter Installation Instructions

Lysimeter Installation in a Bottomless Sand Filter

- Remove duff and surface soil layer (typically 6 inches) to provide an infiltrative surface free of roots.
- When installing sampling devices (trough lysimeters), carefully mark the location of the orifice positions on each side of the sand filter container.
- Also mark the target elevations for each layer on the walls.
- Install the lower layer of medium sand and the underdrain media.
- Remove enough underdrain media from a 4-inch wide strip (trough) across the bottom aligned with a row of orifices (typically the 4th row from either end).
- With an auger or a tile spade, dig a hole at one end of the trough large enough and deep enough to set the vertical part of the lysimeter against the wall.
- Fine-grade the placement of the body of the lysimeter with the horizontal fitting of the sanitary tee aligned with the trough.
- Bed the half pipe with a slight slope (no more than 1 inch in 10 feet) toward the body of the lysimeter.
- Glue one end of the half pipe into the coupler extending from the sanitary tee with a cap glued at the opposite end.
- Place about one-half inch of underdrain media (pea gravel) in the bottom of the trough with enough ramped up inside the sanitary tee to cover the drilled holes in the debris cap.
- Backfill around the lysimeter with pea gravel to provide drainage from the self-emptying port.
- Secure the body of the lysimeter to the wall with a metal strap or other device to stabilize it during the placement of the various layers of media.
- The rest of the sand filter will be constructed in a customary fashion.



RidNOx and Bottomless Sand Filter Sampling Instructions

General

- Contact the laboratory to coordinate scheduling and acquire sample containers,
- Target parameters are total Kjeldahl nitrogen (TKN) and nitrate-nitrogen (NO₃-N).
- Make sure you have the proper sampling equipment, chain-of-custody forms, and a cooler with ice.
- Label all sample bottles in advance.

RidNOx Sampling Procedures

- Remove the lid from the pump basin.
- Use a bailer, peristaltic pump, or other appropriate sampler, to carefully collect a sample from the pump basin without disturbing and attached growth on the surfaces of pipes, floats, etc.
- Transfer sample into sample bottles.
- Repeat as necessary until all bottles are filled.
- Secure the caps on each bottle and place them immediately in a cooler with ice.
- Deliver samples to the laboratory (nitrate-nitrogen samples need to be analyzed within **48 hours** of sample collection).

Lysimeter Sampling Procedures (if/when desired)

- Loosen the square nut plug on the lysimeter.
- Shine a flashlight down the pipe to confirm the presence of filtrate.
- Use a bailer (disposable or cleaned) on a string to collect sample from the body of the lysimeter.
- Transfer sample into sample bottles.
- Repeat as necessary until all bottles are filled.
- Secure the caps on each bottle and place them immediately in a cooler with ice.
- Replace the square nut plug.
- If funding allows, collect sample of the AdvanTex-treated effluent as it flows into the RidNOx unit at the inlet of the tank.
- Deliver samples to the laboratory (nitrate-nitrogen samples need to be analyzed within **48 hours** of sample collection).

Appendix G.

**Directions to Site, List of Names and
Addresses for Neighboring Property Owners**



475 NE Bellevue Dr, Bend, OR 97701 to 17104 Elsinore Rd, Bend, OR 97707

You can enter notes here.

475 NE Bellevue Dr
Bend, OR 97701

Take NE Dalton St to US-20

- 26 sec (361 ft)
- ↑ 1. Head east toward NE Dalton St
 - ↪ 2. Turn right onto NE Dalton St
- 125 ft
- 236 ft

Take SE 27th St, Knott Rd and US-97 S to Solar Dr

- 27 min (20.9 mi)
- ↪ 3. Turn right onto US-20
 - ↶ 4. Turn left onto SE 27th St
 - ↑ 5. Continue onto Knott Rd
 - ↷ 6. Slight right
 - ⬆ 7. Merge onto US-97 S
 - ↪ 8. Take exit 153 for S Century Dr toward Sunriver
 - ↪ 9. Turn right onto S Century Dr/Lava Cast Forest Rd/NF-9720 (signs for Sunriver/Mt Bachelor)
[Continue to follow S Century Dr](#)
 - ⤵ 10. At the traffic circle, take the 2nd exit and stay on S Century Dr
 - ↑ 11. Continue onto Spring River Rd
- 0.2 mi
- 3.3 mi
- 4.2 mi
- 0.3 mi
- 9.4 mi
- 0.2 mi
- 1.5 mi
- 0.6 mi
- 1.2 mi

Continue on Solar Dr. Drive to Elsinore Rd

- 2 min (0.8 mi)
- ↶ 12. Turn left onto Solar Dr
 - ↪ 13. Turn right onto Elsinore Rd
[Destination will be on the right](#)
- 0.5 mi
- 0.3 mi

17104 Elsinore Rd
Bend, OR 97707

Adjacent Parcels Property Owners

17104 Elsinore Road, Bend, Oregon
(T20S, R10E, Section 12AD, Tax Lot 6300, 0.56 acres)

* Tax Lot	6300	Elsinore Shop LLC 1539 Santiago Drive Newport Beach, CA 92660
A. Tax Lot	3800	Peterson, Jonathon David 4221 Pioneer Road Medford, OR 97501
B. Tax Lot	3900	Parmenter, Daron and Tammy 2155 Ironwood Street Eugene, OR 97401
C. Tax Lot	6200	Bend Development Group LLC PO Box 2145 Bend, OR 97709
D. Tax Lot	1000	Schmidt, Adam C. and Redding, Jeremy P. PO Box 2741 Hillsboro, OR 97123
E. Tax Lot	900	Glen Scott Reese Revocable Trust Et Al 33723 Van Duyn Road Eugene, OR 97408
F. Tax Lot	5300	Third Tracks Investments LLC PO Box 2710 Bend, OR 97707
G. Tax Lot	5200	Gettman, Thomas A. and H. Georgia 10660 SW Citation Drive Beaverton, OR 97008

