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Installation of Lysimeters and Monitoring Wells in Support of the Revised Approach to E-Area Performance Monitoring

K. L. Dixon W. D. Joyce July 28, 2021 SRNL-STI-2021-00290, Revision 0

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K. L. Dixon W. D. Joyce

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EXECUTIVE SUMMARY

Savannah River Site (SRS) has developed a revised approach to performance monitoring of the E-Area Low Level Waste Facility (ELLWF) that adds a saturated zone component to the existing vadose zone monitoring program (Kubilius, 2019). The revised approach specifies modifications to the vadose zone monitoring program, the addition of new lysimeters at Engineered Trench 3 (ET3), and the installation of water table monitoring wells to complement the existing well network surrounding the ELLWF. This project summary report is intended to provide the final construction details and layout for the new vadose zone lysimeters at ET3 and the water table monitoring wells installed as part of the new saturated zone component of the revised performance monitoring program.

In October 2020, three new lysimeter stations were installed on the north rim of ET3 (Figure ES-1). These stations were designated as ET3-VL-3, ET3-VL-4, and ET3-VL-5. The stations were installed in a line with the two existing stations (ET3-VL-1 and ET3-VL-2) and spaced approximately 100 ft apart. Two lysimeters were installed at each station at the depths shown in Table ES-1. Lysimeter placement was based on borehole lithology and was comparable to the existing lysimeter stations. The deepest lysimeter at each of the three new lysimeter stations was designated as the action-level lysimeter (Dixon, 2020a).

With the addition of the new lysimeters at ET3, the E-Area Vadose Zone Monitoring System (VZMS) is now comprised of 307 suction lysimeters at 102 stations surrounding 14 waste trenches. At 93 of 102 lysimeter stations, a deep lysimeter is designated as an Action-Level (AL) lysimeter. The revised monitoring approach proposes reducing the number of lysimeters sampled and reducing the sampling frequency for some lysimeters from twice per year to once per year (Kubilius, 2019). However, all AL lysimeters will continue to be sampled twice per year. It is not uncommon for a small subset of AL lysimeters to fail to produce a sample during any given sampling event. Bi-annual sampling of the AL lysimeters increases the chances that all AL lysimeters will be successfully sampled at least once per year.

Finally, eight water table monitoring wells were installed in May/June 2021: four north of Engineered Trench 2 (ET2), two north of Slit Trench 1 (ST1), and two south of ST1 near well cluster BGX-2. Figure ES-2 shows the locations for the new wells and construction details are provided in Table ES-2. Each well was constructed of 4-inch diameter PVC casing. Wells ELF001D, ELF002D, ELF003D, and ELF004D were not equipped with pumps as these wells will be sampled using passive methods. This is because these wells are screened in a thin zone at the top of the water table aquifer determined to be free of Mixed Waste Management Facility (MWMF) contamination (Kubilius, 2019; Dixon, 2020b). Passive sampling methods will help ensure that MWMF contaminated water, which lies below this thin layer, will not be drawn into the well by pumping for sampling activities. Wells ELF005D, ELF006D, ELF007D, and ELF008D will be equipped with bladder pumps since the upper portion of the water table aquifer at these locations is impacted by MWMF contamination and passive sampling methods are unnecessary.

Installation of the three lysimeters along the north rim of ET3 and installation of the eight new water table monitoring wells completes the field work required for the revised approach to performance monitoring (Kubilius, 2019). As a result, the performance assessment monitoring plan (Millings, 2012) will be updated to reflect the revised monitoring approach.

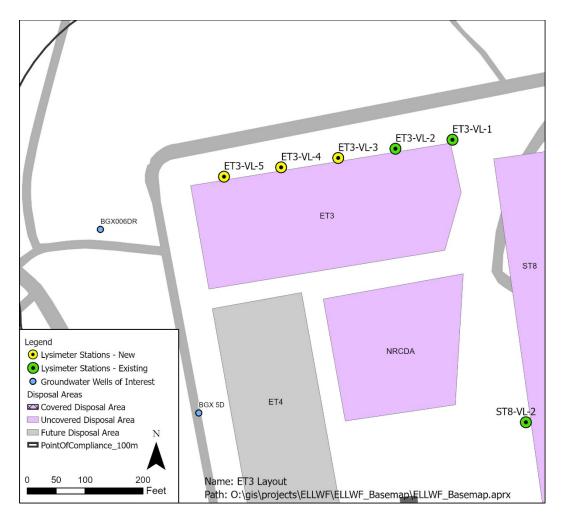


Figure ES-1. New Lysimeter Locations at ET3

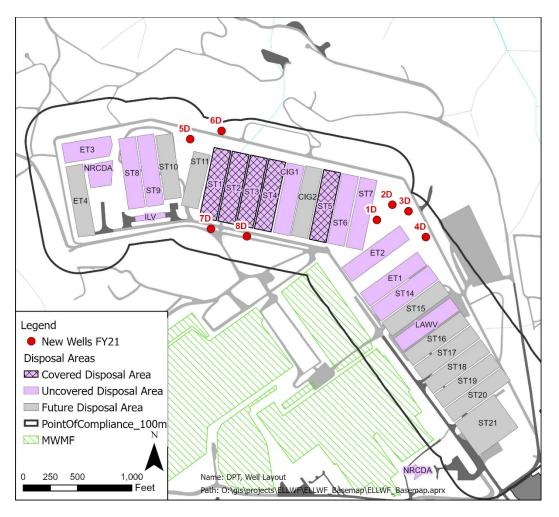


Figure ES-2. New ELLF Water Table Wells (red symbols)

Station Name	SRS North (ft)	SRS East (ft)	Ground Elevation (ft msl)	Lysimeter Elevation (ft msl)	Lysimeter Depth (ft bgs)	Action Level (pCi/ml)	Tritium Concentration (pCi/ml)
ET3-VL-3 (236)	78614.41	57764.17	275.9	236	40	43.7	2.26
ET3-VL-3 (222) ¹	78614.41	57764.17	275.9	222	54	43.7	1.68
ET3-VL-4 (233)	78659.91	57674.15	275.2	233	42	43.7	0.95
ET3-VL-4 (224) ¹	78659.91	57674.15	275.2	224	51	43.7	1.67
ET3-VL-5 (236)	78705.96	57584.55	274.9	236	39	43.7	0.83
ET3-VL-5 (222) ¹	78705.96	57584.55	274.9	222	53	43.7	27.5

Table ES-1. Construction Details for New ET3 Lysimeters.

¹Action-Level Lysimeter

 Table ES-2.
 Construction Details for New Water Table Monitoring Wells.

Well Name ¹	SRS North (ft)	SRS East (ft)	Ground Elevation (ft msl)	Top of Casing (ft msl)	Water Table (ft msl)	Top of Screen (ft msl)	Bottom of Screen (ft msl)	Pump
ELF001D	76452.42	59464.49	286.38	286.78	226	230	215	No
ELF002D	76480.48	59661.53	277.59	277.80	225	231	216	No
ELF003D	76344.35	59747.24	274.95	275.14	224	230	220	No
ELF004D	76058.15	59737.53	275.19	275.43	226	230	215	No
ELF005D	78066.88	58512.30	276.17	276.49	204	215	195	Yes
ELF006D	77957.22	58790.48	268.19	268.45	204	209	189	Yes
ELF007D	77285.60	58180.25	288.15	288.70	212	211	191	Yes
ELF008D	77034.00	58406.55	288.07	288.57	213	188	178	Yes

¹All wells are 4 inches in diameter.

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AL	Action Level
bgs	Below ground surface
CIG	Component-In-Grout
CPT	Cone Penetrometer Technology
DOE	Department of Energy
ELLWF	E-Area Low Level Waste Facility
EPA	Environmental Protection Agency
ET	Engineered Trench
ft	Feet
FY	Fiscal Year
GSA	General Separations Area
ILV	Intermediate Level Vault
LAWV	Low Activity Waste Vault
MCL	Maximum Contaminant Level
msl	Mean sea level
MWMF	Mixed Waste Management Facility
NRCDA	Naval Reactor Component Disposal Area
NTU	Nephelometer Turbidity Units
PA	Performance Assessment
pCi/ml	Picocurie per milliliter
PVC	Polyvinyl chloride
SRNL	Savannah River National Laboratory
SRNS	Savannah River Nuclear Solutions
SRS	Savannah River Site
ST	Slit Trench
SWM	Solid Waste Management
VZMS	Vadose Zone Monitoring System
WSRC	Westinghouse Savannah River Company

1.0 Introduction

The E-Area Low-Level Waste Facility (ELLWF) is a radioactive waste disposal site at the Savannah River Site (Figure 1). It is approximately 200 acres in size with a 100m buffer zone that extends out to the point of compliance. Disposal units within the footprint of the low-level waste facilities include the Slit Trenches (ST), Engineered Trenches (ET), Component-in-Grout Trenches (CIG), the Low-Activity Waste Vault (LAWV), the Intermediate-Level Vault (ILV), and the Naval Reactor Component Disposal Area (NRCDA) (WSRC, 2007). The facility provides disposal capacity for solid, low-level, non-hazardous radioactive waste and has been accepting waste since 1994 (WSRC, 2007). The ELLWF is situated within the General Separations Area (GSA) of the Savannah River Site (SRS) immediately north of the Mixed Waste Management Facility (MWMF).

The ELLWF is regulated under Department of Energy (DOE) Order 435.1 (DOE 1999) and is operated in accordance with a DOE approved Performance Assessment (PA) (WSRC, 2007). The E-Area Performance Monitoring Program provides assurance that the facility is operating as expected and predicted by the PA. The performance monitoring program includes a vadose zone monitoring system (VZMS) used to monitor tritium migrating from waste disposal trenches. The VZMS is comprised of about 307 active lysimeters at 102 lysimeter stations to monitor the release of tritium from the disposal trenches. At 93 of the 102 stations, the deepest or second deepest lysimeter is designated as the Action-Level (AL) lysimeter. Samples are collected from the lysimeter network biannually and analyzed for tritium. Tritium data from these lysimeters are compared to administrative limits as a guideline for whether further action is needed to assess performance at the 100-m compliance point of assessment. The administrative limit for a given trench is 25% of the tritium concentration in the vadose zone which, if it occurred beneath the entire areal footprint of the trench, would cause groundwater concentrations at the 100-meter boundary to reach the Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) for tritium of 20 pCi/ml.

The performance of the ELLWF is assessed based on the tritium concentrations measured in the VZMS. This approach to monitoring was taken because ELLWF lies down-gradient of the Mixed Waste Management Facility (MWMF) and contaminants (tritium, volatile organic compounds, refrigerant compounds, etc.) from MWMF have migrated beneath ELLWF in the water table aquifer. Contamination from MWMF was measured in down-gradient water table wells prior to construction of ELLWF (Kubilius, 2019). Therefore, it was assumed any contamination migrating from ELLWF would overlap and comingle with MWMF contamination making it difficult to determine the source.

Since 1999, the VZMS has been used to successfully demonstrate that the ELLWF performance meets the requirements and predictions of the approved PA (WSRC, 2007). However, over time, several AL lysimeters have exceeded their established administrative limits. In FY2020, ten AL lysimeters exceeded the assigned administrative limit (LaBone et al., 2020). Additionally, as various waste trenches have been closed and capped with low permeability covers, vadose zone moisture has been reduced to the point that some of the shallower lysimeters routinely fail to produce a water sample. Although AL lysimeters are not expected to be significantly affected by reduced vadose zone moisture content due to closure capping, the shallower lysimeters may be

impacted. These factors have provided the motivation to revisit saturated zone monitoring for the ELLWF as a complement to the successful vadose zone monitoring program.

Kubilius (2019) provided an updated approach to performance monitoring at ELLWF that optimizes the VZMS and adds a saturated zone component to the existing vadose zone monitoring program. This approach specified a reduction in the frequency of sampling for a majority of lysimeters in the VZMS, eliminated several historically dry lysimeters from the sampling schedule, and added three new lysimeter stations on the north rim of ET3. The revised strategy results in a substantial reduction in the level of effort required for sampling while maintaining the effectiveness of the monitoring system by preserving all AL lysimeters and at least one shallower lysimeter at each station.

The revised monitoring approach also specified that eight new water table monitoring wells be installed at various locations around ELLWF. Four wells were specified for areas where there is known MWMF contamination, and four wells were specified for areas free of MWMF contamination in the shallow water table (Dixon, 2020b). These new wells will complement the existing monitoring well network and will be used in combination with the VZMS to assess the performance of the facility.

This project summary report is intended to provide the final construction details and layout for the new vadose zone lysimeters at ET3 and the water table monitoring wells installed as part of the updated approach to the performance monitoring program for ELLWF.

2.0 Vadose Zone Monitoring – Lysimeter Installation

The details of the lysimeter installation at ET3 are given by Dixon (2020a) and are summarized here. Drilling and lysimeter installation occurred during October 2020. Drilling services were provided by Cascade Environmental, LLC. Technical oversight of the drilling activities was provided by SRNS Geotechnical Engineering personnel. Three new lysimeter stations were installed along the north perimeter of ET3. These lysimeter stations were installed in a line with the two existing lysimeter stations (ET3-VL-1 and ET3-VL-2) and were spaced approximately 100 ft apart. The new lysimeter stations were identified as ET3-VL-3, ET3-VL-4, and ET3-VL-5. Figure 2 and Appendix A provides the layout of the lysimeter stations at ET3. The new lysimeter stations, together with the existing stations, span the length of ET3 on the north side of the disposal trench.

2.1 Lysimeter Placement

The conceptual model for placement of the new lysimeters at ET3 was to maintain consistency with the existing lysimeter stations (ET3-VL-1 and ET3-VL-2) while honoring the local lithology observed in each new borehole. The existing lysimeter stations ET3-VL-1 and ET3-VL-2 each have two lysimeters with the deeper of the two lysimeters being designated the action level lysimeter. The strategy for the placement was to locate the new lysimeters in sandy zones above silt/clay layers while maintaining consistency with the elevations of the existing lysimeters. This may improve the odds of collecting samples due to perched water at this interface. Lysimeters were not placed near the water table and capillary fringe due to the possibility they could be

influenced by contaminants in the water table aquifer. The water table near ET3 was at 71 ft bgs surface at the time of installation.

The placement of each lysimeter was based on core description, gamma logs, and CPT logs (when available). More weight was given to the core description for lysimeter placement in cases where the logging results and the core description differed. Construction details for the lysimeters are presented in Table 1. The initial tritium concentrations measured in the lysimeters are presented in Table 2.

3.0 Saturated Zone Monitoring – Well Installation

In addition to the new lysimeters installed at ET3, the updated monitoring approach called for the installation of new water table monitoring wells to complement the existing well network surrounding the ELLWF. The location and target screen zones for the news wells were identified by Kubilius (2019) and Dixon (2020b).

Drilling and well installation occurred during May/June 2021. Drilling services were provided by Cascade Environmental, LLC. Technical oversight of the drilling activities was provided by SRNS Geotechnical Engineering personnel.

3.1 Well Installation

Eight new water table monitoring wells were installed at the ELLWF as shown in Figure 3. The new wells were assigned the prefix "ELF". Wells were installed using sonic drilling technology. At each location, six-inch diameter steel casing was advanced to a depth of about ten feet above the screen zone. Then, four-inch diameter core barrel was used to collect core to total depth through six-inch diameter steel override casing. Finally, each borehole was over-reamed with eight-inch diameter steel casing. Sediment core was visually described, and detailed logs were documented for each borehole (Appendix B). In general, sediments encountered can be described as silty sands with occasional interbedded clayey layers.

Soil plug samples were collected from the sediment cores on two-foot intervals. These samples were analyzed for trichloroethylene (TCE) and perchloroethylene (PCE). All results were below analytical detection limits except for samples collected from ELF007D. For well ELF007D, TCE was detected in the interval from 93 to 97 ft below ground surface (bgs) (Table 3).

Each well was constructed of four-inch diameter schedule 40 polyvinyl chloride (PVC) casing. The wells were screened with 0.010 slot PVC screen as indicated in Table 4. All wells were completed to the ground surface with schedule 40 PVC riser. Well construction diagrams are provided in Appendix C and the final layout of the wells is provided in Appendix D.

3.2 Well Development

Well development was conducted according to the guidelines specified in SRS environmental compliance manual 3Q1 Procedure 9007 (SRNS, 2020). Proper development reduces the turbidity

of the water in the well and improves the quality of samples collected from the well. Water quality parameters monitored during the development process included turbidity, pH, temperature, and specific conductance. For each well, these parameters were measured and used to determine when development was complete. Development was considered complete when the change in water quality parameters was less than $\pm 10\%$ for three consecutive readings and turbidity less than 15 Nephelometer Turbidity Units (NTU).

Development was completed in two stages. During the first stage each well was pumped (air lifted) to remove particulates remaining from well drilling and construction. Subsequently, a low flow submersible pump was used to continue the development process. For wells ELF005D, ELF006D, ELF007D, and ELF008D, pumping continued until development criteria were met.

Wells ELF001D, ELF002D, ELF003D, and ELF004D all pumped dry during the development process. The effluent from each well was very turbid. To aid with the development process, two gallons of potable water were added to each well. The wells were then swabbed with a surge block and pumped dry. This process was repeated three times after which the wells were allowed to fully recover. Wells ELF001D, ELF002D, and ELF003D were hand bailed until development criteria were met. For ELF004D, a low flow pump was used for development rather than a hand bailer. Water was pumped from the well at a flow rate of about 0.25 gpm until development criteria were met.

At the conclusion of development, samples were collected from all wells according to the guidelines specified in SRS environmental compliance manual 3Q1 Procedure 9015 (SRNS, 2019). Samples were collected for tritium, VOCs, technetium-99 (Tc-99), and iodine-129 (I-129). Water quality parameters monitored during sampling included turbidity, pH, temperature, and specific conductance. The same criteria were used for sampling as was used for development (\leq 15 NTU for turbidity and \pm 10% for three consecutive readings on other parameters). All wells met the criteria except ELF003D. For ELF003D, the criteria were met for tritium, VOCs, and Tc-99. However, for the I-129 sample at ELF003D, the turbidity was slightly higher (<35 NTU).

At the time of this report, analytical data from the samples were not available.

4.0 Summary

Savannah River Site (SRS) has developed a revised approach to performance monitoring of the E-Area Low Level Waste Facility (ELLWF) that adds a saturated zone component to the existing vadose zone monitoring program (Kubilius, 2019). The revised approach specifies modifications to the vadose zone monitoring program, the addition of new lysimeters at Engineered Trench 3 (ET3), and the installation of water table monitoring wells to complement the existing well network surrounding the ELLWF. This project summary report provides the final construction details and layout for the new vadose zone lysimeters at ET3 and the water table monitoring wells installed as part of the new saturated zone component of the revised performance monitoring program. Three new lysimeter stations were installed on the north rim of ET3 and were designated as ET3-VL-3, ET3-VL-4, and ET3-VL-5. The stations were installed in a line with the two existing stations (ET3-VL-1 and ET3-VL-2) and spaced approximately 100 ft apart. Two lysimeters were installed at each station. The deepest lysimeter at each of the three new lysimeter stations was designated as the action-level lysimeter.

With the addition of the new lysimeters at ET3, the E-Area Vadose Zone Monitoring System (VZMS) is now comprised of 307 suction lysimeters at 102 stations surrounding 14 waste trenches. At 93 of 102 lysimeter stations, a deep lysimeter is designated as an Action-Level (AL) lysimeter. The revised monitoring approach proposes reducing the number of lysimeters sampled and reducing the sampling frequency for some lysimeters from twice per year to once per year (Kubilius, 2019). However, all AL lysimeters will continue to be sampled twice per year.

Eight water table monitoring wells were installed in May/June 2021: four north of Engineered Trench 2 (ET2), two north of Slit Trench 1 (ST1), and two south of ST1 near well cluster BGX-2. Each well was constructed of 4-inch diameter PVC casing. Wells ELF001D, ELF002D, ELF003D, and ELF004D will be sampled using passive methods. Wells ELF005D, ELF006D, ELF007D, and ELF008D will be equipped with bladder pumps.

Installation of the three lysimeters along the north rim of ET3 and installation of the eight new water table monitoring wells completes the field work required for the revised approach to performance monitoring (Kubilius, 2019). As such, the performance assessment monitoring plan (Millings, 2012) will be updated to reflect the revised monitoring approach.

5.0 References

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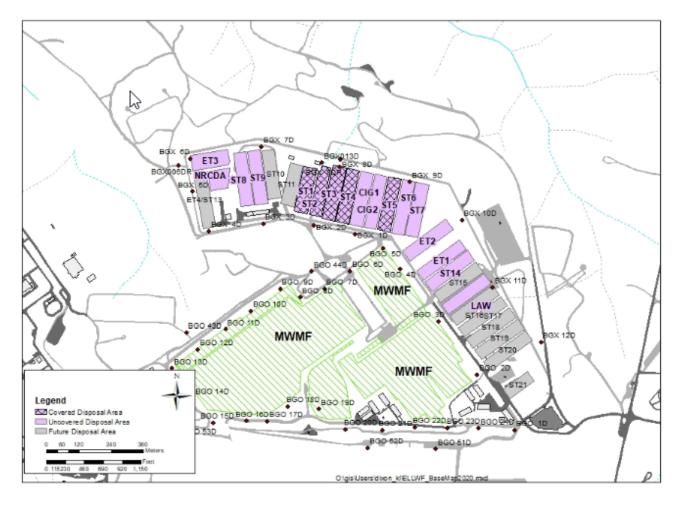


Figure 1. E-Area Low-Level Waste Facility.

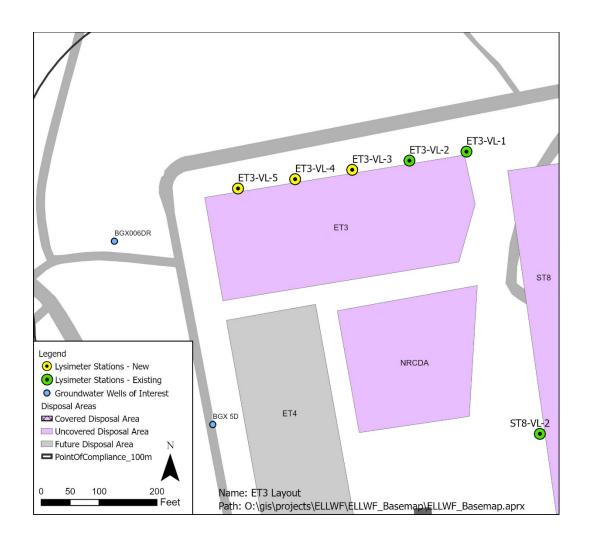


Figure 2. Layout of New Lysimeters at ET3.

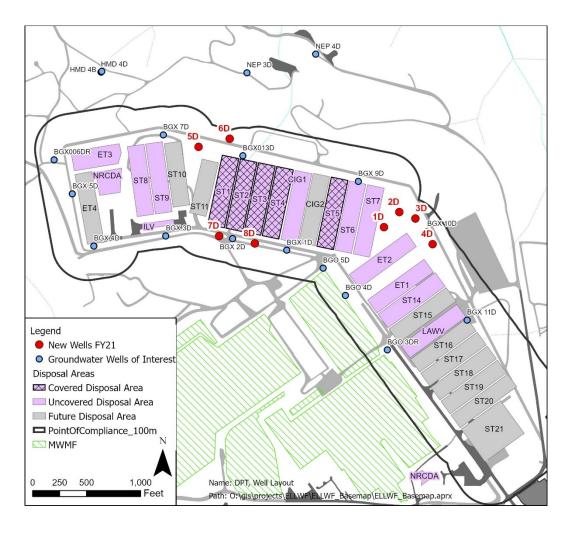


Figure 3. Layout of New Water Table Monitoring Wells.

	Dete	SRS	SRS East	Ground	Lysimeter	Lysimeter	Action	Action
Station Name	Date Installed	North (ft)	East (ft)	Elevation (ft msl)	Elevation (ft msl)	Depth (ft bgs)	Level Lysimeter	Level (pCi/ml)
ET3-VL-1 (234)	2016	78525.21	57940.98	275.6	234	42	NO	-
ET3-VL-1 (221)	2016	78525.21	57940.98	275.6	221	55	YES	43.7
ET3-VL-2 (243)	2016	78570.92	57851.84	280.1	243	37.5	NO	-
ET3-VL-2 (226)	2016	78570.92	57851.84	280.1	226	54	YES	43.7
ET3-VL-3 (236)	2020	78614.41	57764.17	275.9	236	40	NO	-
ET3-VL-3 (222)	2020	78614.41	57764.17	275.9	222	54	YES	43.7
ET3-VL-4 (233)	2020	78659.91	57674.15	275.2	233	42	NO	-
ET3-VL-4 (224)	2020	78659.91	57674.15	275.2	224	51	YES	43.7
ET3-VL-5 (236)	2020	78705.96	57584.55	274.9	236	39	NO	-
ET3-VL-5 (222)	2020	78705.96	57584.55	274.9	222	53	YES	43.7

 Table 1 Construction Details for ET3 Lysimeter Locations.

Lysimeter	Action Level (pCi/mL tritium)	Sample Volume (ml)	December 2020 Concentration (pCi/ml)
ET3-VL-3 (236)	43.7	1000	2.26
ET3-VL-3 (222)	43.7	1000	1.68
ET3-VL-4 (233)	43.7	1000	0.95
ET3-VL-4 (224)	43.7	1000	1.67
ET3-VL-5 (236)	43.7	1000	0.83
ET3-VL-5 (222)	43.7	1000	27.5

 Table 2 Initial Tritium Concentrations Measured in New ET3 Lysimeters.

Depth	ELF	001D	ELF	002D	ELF	003D	ELF	004D	ELF	005D	ELF	006D	ELF007D		ELF008D	
(ft bgs)	TCE	PCE	TCE	PCE	TCE	PCE										
37			U	U	U	U	U	U								
39			U	U	U	U	U	U								
41			U	U	U	U	U	U								
43			U	U	U	U	U	U								
45			U	U	U	U	U	U								
47	U	U	U	U	U	U	U	U								
49	U	U	U	U	U	U	U	U								
51	U	U	U	U	U	U	U	U								
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55	U	U	U	U	U	U	U	U								
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63	U	U							U	U	U	U				
65	U	U							U	U	U	U				
67	U	U							U	U	U	U	U	U		
69	U	U							U	U	U	U	U	U		
71	U	U							U	U	U	U	U	U		
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75									U	U	U	U	U	U		
77									U	U	U	U	U	U	U	U
79									U	U	U	U	U	U	U	U
81									U	U	U	U	U	U	U	U
83													U	U	U	U
85													U	U	U	U
87													U	U	U	U

 Table 3 TCE and PCE Results from Soil Plug Sampling (mg/kg)^{1,2}.

SRNL-STI-2021-00290 Revision 0

89							U	U	U	U
91							U	U	U	U
93							0.006	U	U	U
95							0.008	U	U	U
97							0.004	U	U	U
99									U	U
101									U	U
103									U	U
105									U	U
107									U	U
109									U	U

¹Shaded regions indicate samples from screen zone. ²U=Undetected

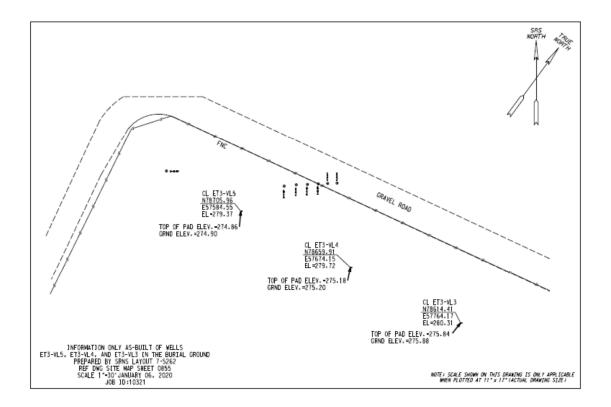
Well Name ¹	SRS North (ft)	SRS East (ft)	Ground Elevation (ft msl)	Pad Elevation (ft msl)	Top of Casing Elevation (ft msl)	Water Table (ft msl)	Water Table Depth (ft bgs)	Top of Screen (ft msl)	Bottom of Screen (ft msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Screen Length (ft)
ELF001D ²	76452.42	59464.49	286.38	286.78	76452.42	226	60	230	215	56	71	15
ELF002D ²	76480.48	59661.53	277.59	277.80	76480.48	225	53	231	216	47	62	15
ELF003D ²	76344.35	59747.24	274.95	275.14	76344.35	224	51	230	220	45	55	10
ELF004D ²	76058.15	59737.53	275.19	275.43	76058.15	226	50	230	215	45	60	15
ELF005D ³	78066.88	58512.30	276.17	276.49	78066.88	204	72	215	195	61	81	20
ELF006D ³	77957.22	58790.48	268.19	268.45	77957.22	204	64	209	189	59	79	20
ELF007D ³	77285.60	58180.25	288.15	288.70	77285.60	212	76	211	191	77	97	20
ELF008D ³	77034.00	58406.55	288.07	288.57	77034.00	213	75	188	178	100	110	10

Table 4: New E-Area Well Construction Details.

¹All wells 4-inch diameter PVC

²No pump, HYDRASleeveTM ³Bladder pump

Appendix A. Final Layout for New ET3 Lysimeters



Appendix B. Core Descriptions for ELF Monitoring Wells

OSR 30-17+(2-12-97)

Project	E Area	6	adwater Wells J	-18-21 Sheet 1 of 2		
Well Nur	nber EIE	dich (D Location E Area Drilling	Drilling Subcontractor		
Logs Pre	pared By	4012 11 To	Drille			
Compan		11 Joy	Ce.	Driller David Wilcox		
	Depth	NŠ		Rotosonie		
Run Number	Below Ground Surface (Feet)	Lithology ⁵ ercent Recovery	Sample Description	Drilling Comments/Remarks		
	4 0 1 2 3					
	4 4 5 6	<u>.</u>	5:14 SAND (silt 20-2	$(\gamma) f_{\alpha} = \beta$		
	7 8 9 7 0		Vin gen, mod reddish pron pale reddish brown (PR 5/4 to some dark yellowish oran with kaplin, shoud - sbang, b slightly moist - dry	5 (14) 4 6/6 g = a dr ng y = (14) 1A c/6) sell sorted		
/		¢φ	Grading color change			
	5 6			1, pale		
2	7 7 8 9 9 9	75	SAND (Silt 5-10 16) for gov readelish brown (10 R 5/4) - 1, (57R 5/4) Shang-Shind, well maist - wet	sortel		

OSR 30-37+(3-12-97)

			_				
Project	E Are	er C	Trou	advater Wells	5-18-21	Sheet 2 of 2	
Well Nur	mber EL,	Foo	DIS	Location Location Area	Drilling Subcontractor	ascale	
Logs Pre	epared By	8,11	Joy	ice			
Compan	M	RN-	-		Drilling Method Roto Sonic		
Run Number	5. 3L					Drilling Comments/Remarks	
2	6 0 1 2 3 4 6 5	X	75	Silty SAND (silt 15-2 pale reddish brown (brown (54R 5/6), Jorna sacted, moist	PZ) for gen POR style Jaght 1 - shary, well		
ß	6 7 8 9 7 0 1		1\$\$	SAND (Silt 10 %) for Tight Grown (SYR 5/4)- brown (10 HR 5/4) 55a mod sorted, maist - we	med gra mod yellowis ng-strad,	\$	
	2 3 4 7 5 6 7 7 8 9 9			Total Depth: 71.3"			

OSR 30-27# (2-12-97)

Project	E Are	c Grou	adviter 6 to 1/2	Date 5-/3-2/	Sheetof _2
Well Nur	ELF	0021	D Location Arec	Drilling Subcontractor	ascale
Logs Pre	epared By	11 Jo	yce	Driller Dav	id Wilcox
Compan	' JA	NS		Drilling Method	Sonic
Run Number	Depth Below Ground Surface (Feet)	Lithology Percent Recovery	Sample Description		Drilling Comments/Remarks
	3 0 1 2 3 4 3 4				
,	6 7 8 9 4 0 1 2 3	/#4	Silty SAND (silt 30- 10-15%) Vtn Srn, ligh dark gellowish oranse (White (Ng), sornd-sbang dry	35%, kaolin 14 Brown (54R 37 18 4A 6/8/ with will sorted,	
2	4 4 5 6 7 8		Calor change to mod SAND (s: H to - 5%) to Tight Grown (5 H 5/6) -, Orange (HIR 6/6), sor- sorted, dry Moist at 49.0'	red (TR 5/4) - med gran darte gellawish d- shang, mod	
	<u>ج</u>	· · · ·	Wet at So.p		

OSR 30-27+(2-12-97)

Project	and the state of the second			Date	Sheet		
	E Area 6	Sroun	luster Wells	5-13-21	2_of_2		
Well Nur	ELF OF	20	E Area	Drilling Subcontractor	scale		
Logs Pre	epared By B:11	Tou	ace	Driller David Wilcox			
Compan	SRNJ			Drilling Method Rotosonic			
Run Number	Depth Below B Ground B Surface (Feet)	Percent Recovery	Sample Descr		Drilling Comments/Remarks		
2			SAND (Silt 10-15%) S.It for gen, light b, dark gellowish orange starg, well sorted, day SAND (Silt 10-15%) to (54A 5/6) - mod yello sbrad - sborg, well so	ingen, light brown wish Grown (1044) red moist-wat			
3	7 8 9 0	•	<u>SAND</u> (Sitt 5-10%) + (SYRJ/6)-mod yellowin with pale redensh 54 mottling Strad-SSGA Saturated (free wa	h gra light brown to brown (10/1R sty to wa (10 R 5/4) s. crell forted, tes	2		
	2 :: - 3 4 5 6 7 8 9 9	•	Total Depth: 62	.3'			

OSR 30-27#(2-12-97)

Project	5 1	,		-	1 + 1111	Date 5-19.21	Sheet _/ of Z	
Well Number ELF 003D Location Arca					Location	Drilling Subcontractor		
						Cascade		
Logs Prepared By Bill Joyce						Driller David Wilcox		
Company SRNS						Drilling Method Rotosonic		
per	Depth Below							
Run Number	Ground Surfac (Feet)	d e	Lithology	Percent Recovory	Sample Description		Drilling Comments/Remarks	
	30							
	1							
	2							
	3							
	4							
	3 5							
	e	;			Silty SAND (silt 20- 5-16 %) Vla- fagan (5/R 5/4) - dark yellow) (10/R 6/6) with white (1 well sorted, dry grad,	25% kaolin		
	7	,			(54R 5/6) - dark Lellow	sh arrange		
	,				(10 YR 6/4) with white (1	Val sbrad		
	8	3			well sorres, dry grading	19. to 5694+14		
	ş	,						
1		-		100				
	4	"		<i>, ,</i>				
	1							
	2	2						
		-						
	3							
	4	<u>ا</u>						
	4							
	7	1			SAND (Silt trace for g	a with some		
	6	3	:·		1.967 grown (54R 5/4/with 5	one pale read		
	;	/			SAND (si H trace) for 9, med gra, derk yellowish light brown (str stalwith s brown (10R sty), sprut-she maist	ns, mod sorted		
2				100				
	8				Grading Siltier (5-10'1) m	ed gra		
	ş	•	F		Genling to En Gra Laft.	Srows (54R 5/c)		
	5				Genling to Engen, light.	(in the		

OSR 30-27# (2-12-97)

Well Number ELF 603D Location E Area Drilling Subcontractor	of		
Well Number ELF 6003D EArea Drilling Subcontractor			
Logs Prepared By Bill Joyce Driller David Will			
Company SRNS Drilling Method Retosonis	Driller David Wilcox Drilling Method Rotosonic		
bepth			
Sample Description Commen	rilling its/Remarks		
2 2 SAND (Silf 10-15%) vtn-fn grn, 1 2 2 Ipp our (5 YR 5%) Strail, brell sorted moist-wat, trace many 0 xide			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
0			

Duriget	_									1.0				
Project	EA	he		Frow	dus	ter	We,	1/5			Ø-2/	Sheet	of	2
Well Nur	mber FL	F	ØØ	41	7	Location	- A			Drilling Su	bcontractor	sea	la	
Logs Pre	epared By	R		Tou	ce		~ /(~ `		Driller				a.v.
Compan	M .									Drilling Ma	Del	ia	WILC	oχ
Compan	,	5x	eN-	ſ						Drining Me	Roto	501	Wile	
Ъ.	Depth									4		T		
Run Number	Below Ground		Lithology	Percent Recovery										
2	Surface		Lith	Per				Samala I	Denerichien				Drilling	
<u> </u>	(Feet)						-	sample L	Description				Comments/R	emarks
	30											+		
												+-		
	1								11			-		
	2								· · · · · ·			+		
	-													
	3													
	4	\vdash												
		<u> </u>												
	35													
	6				Silt	SAN	12 (5)	14 3	0-35%	kestin	10-15 11/2 - 10-1 11/2 - 10-1	1		
	Ĩ				Vfn-	h gin,	mod	reddi	sh orang	c (yor 6	/s/-ver	1		
	7		÷		pole .	pranse.	(1071	8/2/	-chite (Ng/ 55	end we	1/50/	ter	
			<u> </u>		5.149	TAND	(3)	17 74	0-25/1	Vfa-fa	gen.	+		
	8		<u>.</u>	ł	Pala	reddi	154 9	rown	(IPR)	19/ - 11,	941	1		
					dry	1.2.11	110/	197	10 - 13	ang, w	e// 50/	new		
	9			ļ										
1	40			104										
	7 °			144										
	1		7,7,7			101								
]	5119	1Clay	7 -	ANU	with	Kaolin				
	2	\vdash	<u> </u>		lan 1/1	n gen	1198	T 300	Up -1	R 570/	der4	>		
	3				Sheat	1-050	ne w	dis	orted	V - 60 A	// C/// 4	4		
	Ŭ						1.							
	4		tit		L									
			223		60	4 -								
	45	\vdash	2.2		5/17	SAN								
		\vdash	· _ · _	<u> </u>	S.It.	FAN	n Ci	: 14 2	a-75	116				
	6		-::		Lichs	6 hou	10	YRI	Tel-M	od Lo	Jowish	/		
	7			1	brow	n (10 %	4R 5/	45	brad-	1 bang	well 5	tel		
1				14.	mais	t-wet	۷	-			4all 5	-		
2	8			<i>Φ</i> φ										
			22									-		
	9	\vdash	111											
	-													
	₀~ر													

Project	E Area	G	and	location Drilling		2	
	ELI	r ø0	34	D E Area Drilling	Subcontractor		
Logs Pre		?.//			David Wi		
Compan		NJ		Drilling	Drilling Method Rotosonic		
Run Number	Depth Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description	c	Drilling nts/Remarks	
2		1	1\$\$	SAND (S: 1+ 10-15%) for gin a med gin / ght brown (JYR J/ yellowish Grown (Ay YR J/4) 55 well seated, moist - wet this at J43'	th some c) - mod md-sbarg clay		
3	6 7 8 9 6 0 1	\	100	CLAY - SILL SAND dark yellow (10 YR 6/6) - White CNA / Kaulin, - SANR (Silt 5-10 %) med- for gi yellowish orange (10 YR 6/6) - gr orange (10 YR 7/4), sbrod - sba sorted, wet Total Depth: 60.3	solid		
	2 3 4 5 6 7 8 9 0						

Project					Data	Chaot
	E Are	s Gr	ounc	Iwater Wells	5-25-21	Sheet of
Well Nun	^{nder} ELF	O\$	50	Location E Area	Drilling Subcontractor	cade
Logs Pre		2.11			Dellar	I Wilcox
Company		ens			Drilling Method Roto	
	Depth				1010	104/C
Run Number	Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description		Drilling Comments/Remarks
	<i>∽</i> ₀–					
	1					
	2	_				
	-	-				
	3	-				
	4	-				
	4					
	√ 5					
		_				
	6			CLAY CLUMIN	(1. 4 A	
	-			CLAY dark yellowish Clean, Jolid, slightly me	orange (10/R	/e/,
	7			Erear, sona, srightly he	Marieasi	
	8					
	9					
				Tto ballad and		
1	6 .		int	send where for and it	Clay and clay	ey
1	1		ſ¢φ	(19/R sty)-light brown (5	YR STA) Shrau	1
				Interbedded sandjer sand, vfn-fn gra, mod y (197R sty)-light brown (5 well sorted, dry trace,	Mang. Oxido	
	2				/ /-	
	_					
	3			SAND (-14 + -1) +	(1.1. (.10)	
	. –			SAND (silt to -5%) to gi pale red (roll 6/2)- grays sbrad-sbang, well sorted, oxide	m white (NY)-	alu)
	4			sbrad-shane well sorted	dry trace no	ns
	6 5			oxide		7
	–					
	6			and first to all 1 f		
				SAND (silt tr-5%) fa-	Vin gen with	
	7			(10 YR 6/6) - light banks	SWISH Orange	
		_	90	SAND (silt tr-s%) for- some med gron dark yell. (10 YR 6/6)-fight brown (. sbend, well sorted		
2	8	-	14			
	9	_		Moist at 69.0'		
	-					
	70-					
L	·			1		I

	Contraction of the second second second							
Project	E Area C	Frown	Iwater Wells	5-25-21	Sheet 2 of 2			
Well Nur	ELF Ø	Ø5 <u>/</u>	D EArea	Drilling Subcontractor	cade			
Logs Pre	pared By B:11	Joy	ice					
Company	SRN.			Driller David Wilcux Drilling Method Rotosonic				
Run Number	Depth Below boo Ground oo Surface 1 (Feet)	Percent Recovery	Sample Des		Drilling Comments/Remarks			
2	7 0 1 2 3 4 7 5	90	SAND (silt to - 5%) dark yellow; sh oran brown (5/R 5/6), sh or wet at 71.0	fn-med grn, ge (10 TR g/g) - ligh d, mod sorted,				
Ρ	6 7 8 9 9 1	100	SAND (S.H trace - A fa-med gen, pale y (10 HR 8/4) - light Stor Strad, and sorted, (nostly clean) ellowish orange wa (sHRSK) set				
	2 3 4 5 6 7 8 9 0		Totel Depth: 81.3					

Project Date 6-93-2/ Area Groundanter Wells ELF \$\$60 Location E Area Sheet 1_ of 2 Well Numb ELF ØØ6D ^{By} B:11 Joyce Drilling Subcontractor Cascade Logs Prepared By Driller avid Wilcox Company **Drilling Method** FRNS otosonic Depth Run Number Lithology Percent Recovery Below Ground Drilling Comments/Remarks Surface Sample Description (Feet) Γ_0 1 2 3 4 J 5 6 CLAY light brown (548 516) with light greenish gray (56781) and block many oxide, clean, soft, moist, malleable 8 Sandy Chay for gon light Brown (5 YR 516)-med Srown (54/ 4/4) Clean CLAY ō. 6 0 1 Sandy CLAY to gon, light brown (54R \$/s)-med Journ (544 4/4), sornd, well sorted. moist 1 2 3 4 Clayey (Silty SAND for grow, light Brown (SHR JG) strand - strang, well sorted moist with mang, axiale 6 5 1.7 6 7 100 As Above grading less sitty (5-10%) 8 2 9 70

Project	E Area	G	oune	dwater Wells	Date 6- Ø3-2/ S	heet 2 of 2		
Well Nur	nber EL	Fφ		- Lonation	Dritting Subcontractor	cale		
Logs Pre	and the second sec	2:11			Driller David	1 Wilcox		
Compan	' SA	en-	r/		Drilling Method to sonic			
mber	Depth Below	лбо	ent rery					
Run Number	Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description		Drilling Comments/Remarks		
	7 0			Intersedded ELAY and c	Clayey SAND			
2	2	· [• •] •	1\$\$	SAND (Silt J-10%) fa- light brown (SYR 5/6) se mod sorted, moist - wet, oxide	neil gra, Brad- ssaas with mang.			
	7 5 6							
3	8		¢¢	SAND (silt tr - 5%) for m yellowish orange (10 4R 6/6 (54R 5/6) with grayish or sbrowd - sbeng had sorted	- 11957 Srown ange (194R 7/4) Lawist - wet)		
	8 0	0.1.0.0						
	2			Total Depth: 81.0				
	3							
	8 5							
	6							
	7							
	8							
	9							
	9							
	0	1						

OSR 30.27# (2.12.97)

Destant		10.1 · · · · · · · · · · · · · · · · · · ·				
Project	EA	Ire	a G	Frou.	ndwater Wells G-p	Sheet of _2
Well Nur	mber EZ	F	¢¢	72		Cascale
Logs Pre	epared By		://	_	Dellar	David Wikox
Compan	v				PCE	Lavia Wilcox
		S,	PNS	<u> </u>	on any w	Rotosonic
لوًا ال	Depth		-			
Run Number	Below Ground		Lithology	Percent Recovery		
N L	Surface		itho	Perc		Drilling
đ.	(Feet))			Sample Description	Comments/Remarks
	60					
		<u></u>				
	1					
	2					
	3	_				
	5					
	4					
	65	·				
	6	·			(LAY light and shalt be	(Made)
	7				ELAY light gray -light Brow Firm mont slightly malleable.	in STROLE
					pocket at 69.0	/ - 10
	8					
	9					
1	7 °			100		
1	1		1.01	199	CLEVEY SAND Frank and lie	ht have
	· ·		-		(Jayey SAND for-med gon ligs (5485/6) stornd-stang mod so	ented
	2				maist	
	-					
	3				Chart light brown (54R 5/6) fil moist dightly matterste some	rus
					mois slightly madleaste some	many
	4				Ouil a	
	7 5					
	6					
	Ŭ				Sanily CLAY For med goo with co	JE GM
	7	-			Sanity CLAY for med goo with con light gray -light brown (STR STE) with	2. Glack
		F.			prang. attle moist soft	
2	8			1\$\$	Clayer Silly SAND (silt 15-20)	cley 51
	-	-	2:::	''	franced gra Tight brown (5/1P 5/6) Ibang, nod Sorted mist	55cmil
	9				and mor series mont	
	8.				CLAY greenish gray rolt moist	malleable
	00			[1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

OSR 30.27# (2-12-90)

	and the second se	1.00			A1
EAre	c G	rou	adwater Wells	6-01-21	Sheet 2 of 2
mber			E Arec	Drilling Subcontractor	endo
enared By		-		Driller	il Wilcox
				Drilling Mothod	
Depth				1000	IONIC
Below Ground Surface (Feet)	Lithology	Percent Recovery	Sample Desc	ription	Drilling Comments/Remarks
8 0 1 2 3 4 8 5		1¢¢	CLAY with occ. som (82.6' 83.2') green; moist mallcable, with oxide) CLAY As Above	ty pochets sh gray soft black (mang.	
6 7 8 9 9 9 1 2 3		IØ¢			2
4 9 5 6 7 8 9	6.0. 6.0. 6.0. 6.0. 6.0.		SAND Ar Above 5. siltier (5%) Total Depth: 97.5	t grudes slightly	
	mber ELA epared By Below Ground Surface (Feet) S 0 1 2 3 4 S 5 6 7 8 9 9 9 9 9 1 2 3 4 5 6 7 8 9 9 9 9 9 7 8 8 9 9 9 9 7 8 8 9 9 9 8 1 2 3 4 8 5 6 7 8 8 9 9 9 9 8 1 2 3 4 8 5 6 7 8 8 9 9 9 8 8 8 8 8 8 8 8 9 9 9 8 8 8 8 8 8 8 8 8 8 8 8 8	mber $E L F $	mber $ELF \phi \phi T$ epared By $Bill Joy$ Depth Below Ground Surface (Feet) $8 \circ$ 1 2 $9 \circ$ 1 2 3 4 4 $8 \circ$ 6 7 1 2 3 4 4 8 5 6 7 1 2 3 1 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 1 2 3 1 1 2 3 1 1 2 3 1 1 2 3 1 1 3 1 1 3 1 1 1 1 1 1 1 1	ELF $\phi\phi$ TD Epared By Bill Joyce W Spens Depth Below Ground Surface 1 2 1 2 1 2 1 4 5 5 5 5 5 5 5 5 5 5 5 5 5	E Arec Groundwater Wells 6-01-21 more ELF \$\$\$7D Location E Area Drilling Subcontractor ELF \$\$\$7D Location E Area Drilling Subcontractor Bail Joyce Ditling Method Cast Below Depth Below Ditling Method Rota Below Bail & Sense Description Sound States State and Cast and Charles John State Charles State State State Charles State State State Charles State State State Charles State Sta

Project	E Area	, G	Fron	aduater Wells	Date 5-26-21	Sheet of _2	
Well Nur	mber ELF			Location	Drilling Subcontractor	seale	
Logs Pre	pared Bu	:11	-		Driller Dev	il Wilcox	
Compan		.N~	_		Drilling Method Rate	JONIC	
mber	Depth Below	vgo	ent very				
Run Number	Ground Surface (Feet)	Lithology	Percent Recovery	Sample Description		Drilling Comments/Remarks	
	7 •						
	1						
	2						
	3						
	4						
	75						
	6			C.L.A.Y light brown (JYR	5/6) with some		
	7			CLAY light brown (JYR interbedded sand firm, a slightly moist			
	8			Signily moist Clayey (ANI) for gra log date yellowith orange (10114 sorted, moist CLAY stiff light brown firm, molleable	94t Stown (54K 16) Strad, wel	17/6/- 1	
	9			CLAY stiff light brown	(THR 5/6),		
1	8.		1,00	firm, mollechle			
	1						
	2						
	3			Clayer SAND (1.14 5-10%) for gen dark gellowish ore sbrad, well sorted, moist	c/ay 25-30%) nga (10/R6/8/		
	4			sprad, well sorted, moist			
	8 5						
	6			CLAY with inter bedded J	andy sections,		
	7			CLAY with interbodded J dark yellowish orange (10 malleaste	YR 6/6), soft		
2	8	<u></u>	1 pp	1			
	9			Claycy S. Hy SAND (silt. In gra, dark yellowish or sornd, well sorted, moist	ance (10 YR c 16)		
	90						

Depinet					10-11 T	
Project	EAN	ea C	Frou	adwater Wells	5-26-21	Sheet 2 of 2
Well Nur	The ELF	- \$\$		Location	Drilling Subcontractor	cade
Logs Pre	epared Bv	3.11			D-38	I Wilcox
Compan	y J	RN.	s		Drilling Method Rots	conic
-ia	Depth		Percent Recovery		10010	
Run Number	Below Ground Surface (Feet)	Lithology		Drilling Comments/Remarks		
	90-	<u> </u>		Clayer / Silty SAND AS A	Laine	
	1	<u> </u>		· · ·		
		• •		(548/1)-pale stand 4	ellowish gray	
2	2	- /	itod	(J 7 8/1) - porte olive, 50/1	e, tim	
~	3		raq			
	4		1			
	95-	a / • ;		Clayey SAND		
	6	<u> </u>		//-		
		-		SAND (Silt 5%) for-mail of (SYR 5/6) Strad Stang no	in light brown	N
	7			JIR (/4) JUFAC JSANG MO	a sorted wet	
	8	4.5				
	9			SAND (SHI trace) En-med	ern light bru	*^
		·		SAND (SHI trace) En-med (59R 5/6), stend-stang, no	I sorted, wet	
	100-	-				
3	1		1\$\$\$			
				Silty/Clayer SAND (Silt)	0-15%, clay 5%)	
	2			Grown (SYR5/6) SSens-	ibrad mod	
	3			Silty/Clayer SAND (Silt) med for gin with some of brown (SYRS/6) sbenge. sorted, moit-wet, with	Mang, Oxide	
	4	10-1				
				- A.IA A A I		
	19 5-	2.		SAND As Above		
	6	5.7				
				SAND (sitt tr-51) En-me	el gra with same	2
	7	<u>°: -</u> :	100	strad mod souted wet	Vrej JORAG-	
4	8		149			
	9	- 0.				
				This CLAY layer		
	110-			SAND (silt theirs) the med Brown (54816) shound, me	gran, light of sorted mosst	6
				Total Depth: 11p.3'	a (1/100 / //0///	
				10101 Depin. 11 p.3		

Appendix C. Well Construction Diagrams for ELF Series Monitoring Wells

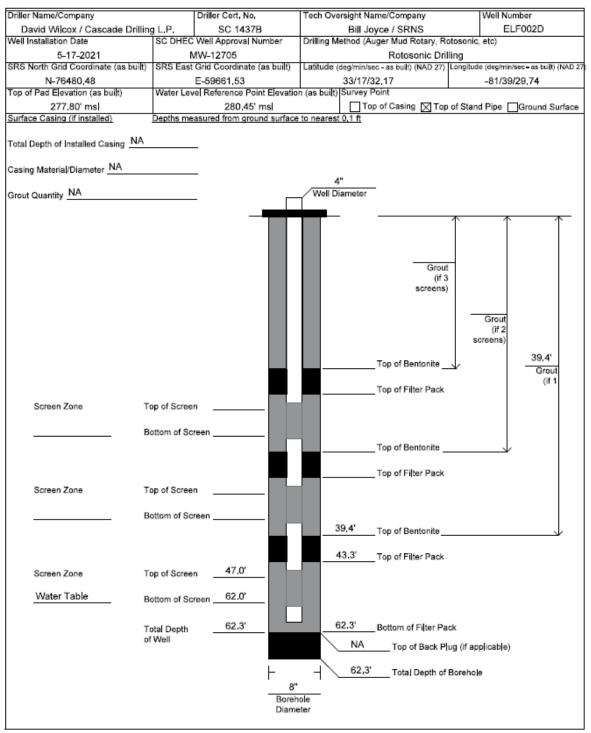
Driller Name/Company	Driller Cert, No,		Tech Oversight Na	me/Company		Well Number	
			-				
David Wilcox / Cascade Drilling		an la a a		yce / SRNS iger Mud Rotary, Ro	tererie	ELF001D	
Well Installation Date	SC DHEC Well Approval Nur	nber	Chilling Method (Au	•		, etc)	
5-18-2021	MW-12705 SRS East Grid Coordinate (a	a huile	atituda /dealeriste	Rotosonic Dril		e (deg/min/sec – as built) (NAP 27
SRS North Grid Coordinate (as built)		es puilt)			Longitud		NAD 27
N-76452,42	E-59464,49		33/17/3			-81/39/31.41	
Top of Pad Elevation (as built)	Water Level Reference Point						
286.78' msl	288.98' m			of Casing 🔀 Top	of Stand	d Pipe Ground Su	rface
Surface Casing (if installed)	Depths measured from ground	d surface	to nearest 0,1 ft				
Total Depth of Installed Casing NA							
Casing Material/Diameter NA			4"				
Grout Quantity NA			/ Well Diameter				
Grout Quantity							
	op of Screen			Grout (if 3 screens) Top of Bentonite _ Top of Filter Pack	_	Grout (if 2 creens) 47.9' Grout (if 1	
				Top of Bentonite _			
Screen Zone To	op of Screen						
_							
Bo	ottom of Screen	·					
			47.9	Top of Bentonite			/
Screen Zone To	op of Screen56.0'		52.4'	Top of Filter Pack			
Water Table Bo	ottom of Screen 71.0'						
	otal Depth71.3' Well	[_ - 8"	NA 	Bottom of Filter Pa Top of Back Pl Total Depth of	ug (if ap		
		Boreh					
		Diame					

Program Plan Name Location Description Ste ID Project Manager. ELLWF Water Table Monitoring Wells E Area N3 / W2 Virginia Rigstry Station Type (Monitoring Wells Drilling and Sampling Total Dilled Depth Total Dilled Depth Station Type (Monitoring Well Drilling Completion Date Total Dilled Depth Total Dilled Depth Station Type (Monitoring Well Drilling Completion Date Total Dilled Depth Total Dilled Depth Station Type (Monitoring Well 0.0° 46,0° 6° Core / Rotosonic Drill 0.0° 71.3° 6° Over-Ream 0.0° 71.3° 6° Over-Ream 0.0° 71.3° 6° Dilling and Sampling Comments (lost circulation zones, drilling problems, etc.) Image: Completion Distructions, No problems were encountered. Soil plug samples were collected every 2 ft beginning at 47° (47° - 71°), The screen interval was predetermined based on CPT/DPT results. Ground Surface Elevation: 280.38° msl NA NA NA Date Logging Top Depth Logging Solom Depth Logging Toxic Operator NA NA A NA NA NA NA	Monitoring W	ell Installat	tion R	eport	(Cor	ntinued)	Well Numb			
ELUNE Water Table Monitoring Wells E Area N3 / W2 Virginia Rigity Monitoring Well Drilling and Sampling Drilling and Sampling Total Drilled Depth 71.3' Borling Start Date Drilling Completion Date 71.3' 0'' 71.3' Borling Start Date Drilling Completion Date 71.3' 0'' 0'' Borling Start Date Drilling Completion Date 71.3' 0'' 0'' Rotosonic Drill 0.0' 46.0' 71.3' 0'' Core / Rotosonic Drill 46.0' 71.3' 0'' 0'' Over-Ream 0.0' 71.3' 0'' 0'' 0'' Diriling and Sampling Comments (lost circulation zones, drilling problems, etc.) I I I I Drilling and Sampling Comments (lost circulation zones, drilling problems, etc.) Hand-augered from 0.0' - 6.0' to ensure there were no underground obstructions. No problems were encountered. Soli plug samples were collected every 2 th beginning at 47' (47 - 71), The screen interval was predetermined based on CPT/DPT results. Group yeak Logging Top Depth Logging Botom Depth Logging Contractor NA NA Cale Logging Top Depth NA	-			•	<u> </u>	,				
Station Type (Mainloring Weil, Pleizometer, etc.)			-	1				.		
Mentering Well Drilling and Sampling Drilling Start Date 5-18-2021 Top Depth Top Depth Bottom Depth 71.3' Drilling Start Date 5-18-2021 5-18-2021 Top Depth Bottom Depth Dameter Rotesonic Drill 0.0' 46.0' 6'' Cere / Rotesonic Drill 0.0' 71.3' 6'' Over-Ream 0.0' 71.3' 8'' - <td< td=""><td></td><td></td><td>E Area</td><td></td><td></td><td>N3 / W2</td><td>Virginia Ri</td><td>gsby</td></td<>			E Area			N3 / W2	Virginia Ri	gsby		
Drilling and Sampling Total Drillic Depth Drilling Start Date 5-18-2021 71.3' Drilling Sampling Method Top Depth Bottom Depth Drilling Complexing Method 0.0' 46.0' 6' Core / Rotosonic Drill 0.0' 46.0' 6' Over-Ream 0.0' 71.3' 8' Over-Ream 0.0' 71.3' 8' Over-Ream 0.0' 71.3' 8' Drilling and Sampling Comments (lost circulation zones, drilling problems, etc.) Image: Complexition cones, drilling problems, etc.) Hand-augered from 0.0' - 6.0' to ensure there were no underground obstructions. No problems were encountered. Soil plug samples were collected every 2 th beginning at 47' (47' - 71'), The screen interval was predetermined based on CPT/DPT results. Ground Surface Elevation: 286.38' msl Date Logged Logging Top Depth Logging Botom Depth Logging Truck Operator NA NA NA NA NA NA		cometer, etc.)								
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Over-Ream 0.0' 71.3' 8'' Over-Ream 0.0' 71.3' 8'' Image: Comparison of the second seco	Rotosonic Drill			0.0)'	46.0		6"		
Over-Ream 0.0' 71.3' 8'' Over-Ream 0.0' 71.3' 8'' Image: Comparison of the second seco										
Calibre	Core / Rotosonic Drill			46.	0"	71.3		6"		
Calibre										
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Caliper Natural Neutron Resistivity Single Pt. Resis- L & S Normal Spontaneous Gamma Density Resistivity Resistivity Potential Other (List) Backfill Bottom Depth Backfill Material (Include Type, Quantity) NA NA NA	NA	NA		NA		NA		NA		
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Backfill Top Depth Backfill Bottom Depth Backfill Material (Include Type, Quantity) NA NA NA										
Backfill Top Depth Backfill Bottom Depth Backfill Material (Include Type, Quantity) NA NA NA	Other (List)									
NA NA NA	Other (List)									
NA NA NA						K 110 x				
			Backfill M		e Type, C	zuantity)				
Depths measured from ground surface to nearest 0.1 ft.				NA						

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	ing W	ell Ins	stallation Re	eport (Contin	ued)	Well Num	ber		
	-				-	Plat P		F001D	
	гор	Depth	Bottom Depth	Material/Schedule	Diameter	Slot Si	ze	Slot Type	
Casing	-2	.6'	56.0	PVC / Schedule 40	4"				
				51/0 / 0 / 1 / 10		10.1			
	56	6.0'	71.0'	PVC / Schedule 40	4"	10 slo	ot	Slotted	
Screen									
Sump	N	IA	NA	NA	NA				
Sump Cap	71	.0'	71.3'	PVC / Schedule 40	4"				
		Depth	Bottom Depth	Amount (sacks and size)		Trade N	ame		
	52	.4	71.3'	7.5 bags (50 lbs/bag)	Sout	outhern Products GP-1A			
Filter Pack									
	Top	Depth	Bottom Depth	Amo	unt/Size (sack	bucket ef	(r)		
	TOP	Deptil	Bottom Bepti		unroize (aack,	Ducket, et			
Bentonite Sea	47.9' 52.4'			2 buckets / Ber	ntonite Pellets	(3/8"), 5 g	allon	bucket	
Donto into oour									
	Тор	Depth	Bottom Depth	Amount (sacks and size)	Grout Da	ite	Grout Weight		
	0.	.0'	47.9	16 bags / 46.2 bs/bag	5-19-202	21	14.0 -	15.0 lbs/gal	
Grout									
Neat Cement									
Bentonite Cement									
High Solids Bentonite									
Well Installation Commer Hydrosleeve to be inst		ater date,							
Pump Installation Informa	ation								
	Pump Not Installed								
Installation Date		Installer/Co	mpany	Model/Manufacturer		Diam	eter		
Single Spee	d		Variable Speed	Depth from Top of Casing	to Top of Pump)			
Report Prepared By	Bi	I Joyce		1		Date	7_1	6-2021	
Depths measured from or			0.4.8				7-11	2021	

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		elopme	ent Data		aramete	ers	Well Number ELF001D
Well Developed	,	Developmen	t Oversight		ent Method		Final Yield (gpm)
Cascade Drillin		Bill Joyce			Pump / Bail		NA
Date	Time	pH	Conductivity	Turbidity	Temperature		s (additives, problems, etc.)
6-09-2021	12:16 PM		uS	NTUs	Celsius	vvater Level - surface)	60.13' bgs (below ground
	12:29 PM					Air Lift for 79	minutes
6-10-2021	8:25 AM					Water Level -	60.8' bgs
0 10 2021	8:48 AM						v flow mega-monsoon pump. Pumps dry. Let recover
							1-2 minutes, Pump dry ever
	3:35 PM	7.13	126.8	Over-Range	25.6		Still pumps dry, Recharge is
6-24-2021	9:20 AM					Water Level -	
	9:43 AM						Pump - unsuccessful, Lost check valve in the well
	11:00 AM					Pump with me dry after 6.5 g	ega-monsoon pump, Pumpe gallons
	11:05 AM					3 times: Add swab/surge, p	2 gallons potable water, pump dry
6-28-2021	11:35 AM					Water Level - 60,85' bgs	
7-08-2021	1:38 PM					Water Level - 60.40' bgs	
7-13-2021	12:25 PM					Water Level -	60.28' bgs
	12:35 PM	6.83	106.8	1,55	24.9	Bail #1 - total	is less than 1/2 gallon
	12:48 PM	6.93	107.3	4.15	24.6	Bail #2 - total	is greater than a 1/2 gallon
	12:56 PM	6,89	106,6	6,95	24,3		is less than 1 gallon
	1:04 PM	6.97	107.7	9.37	24.4	- 61.47 bgs	is 1 1/4 gallons, Water Leve
	1:16 PM	6.96	107.2	52.5	24.2		is 1 1/2 gallons
	1:24 PM	6,96	107,1	79,3	24.2	- 61.92' bgs	is 1 3/4 gallons. Water Leve
7-14-2021	12:43 PM					sample to cle	60,25' bgs, Collected Rad ar for shipping
7-15-2021	9:10 AM					Water Level -	
	9:20 AM	6,82	106.2	4.57	24,3	Samples had	le ELLWF-NEW0004 at 0920 a turbidity below 15 NTUs
	12:50 PM		ļ	11.8		Completed sa	ampling
			ļ				

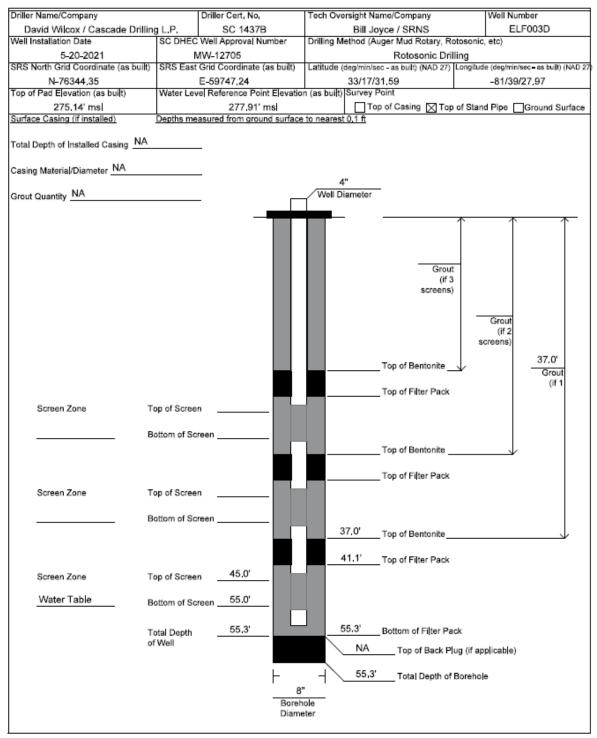


Monitoring V	Nell Instal	lation R	Report	(Co	onti	inued)		lumber	
			-	-		,	1	ELF002D	
Program Plan Name		ation Descriptio	n	Site ID				t Manager	
ELLWF Water Table Monitor Station Type (Monitoring Well, P	ing vvelis	E Area			N3	/ W2	Virgini	a Rigsby	
Monitoring Well	reconnotor, otory								
Wontoning well		Drillin	g and Samplin	a					
Drilling Start Date	Dril	ling Completion	· ·	3		Total Drilled Depth			
5-13-2021		5-	17-2021				62,3'		
Drilling Sa	ampling Method		Top D	epth		Bottom Depti	h	Diar	meter
Rotosonic Drill			0.0)'		36,0'			6"
Core / Rotosonic Drill			36.	0'		62.3			6"
Over-Ream		0,0)'		62,3		1	8"	
Drilling and Sampling Comments	s (lost circulation zone)	s drilling probler	ms.etc.)						
Hand-augered from 0.0' - 6.0				ctions	. No i	problems were en	counte	red.	
Soil plug samples were colle		-							
The screen interval was pre-	determined based o	n CPT/DPT re	sults.						
Ground Surface Elevation: 2	277.59' msl								
			hysical Loggin	g					
	ogging Top Depth	Logging E	Bottom Depth		Loggir	ng Contractor	Log	gging Truck (Operator
NA	NA		NA			NA		NA	
Geophysical Logs			Resistivity		Single tivity	e Pt, Resis- □ L & Res	S Norm istivity		oontaneous otential
Other (List)									
Backfill Top Depth B	ackfill Bottom Depth	Backfill M	faterial (Includ	е Туре	, Quar	ntity)			
NA	NA		NA						
Depthe measured from around a									

Monitori	na W	ell Ins	stallation Re	eport (Contin	nued) ात	Well Number				
							_F002D			
	Тор	Depth	Bottom Depth	Material/Schedule	Diameter	S ot Size	Slot Type			
Casing	-2	.8'	47.0'	PVC / Schedule 40	4"					
	47	7.0'	62.0'	PVC / Schedule 40	4"	10 slot	Slotted			
Screen										
Sump	Ν	A	NA	NA	NA					
Sump Cap	62	2.0'	62.3	PVC / Schedule 40	4"					
		Depth	Bottom Depth	Amount (sacks and size)	-	Trade Name				
	43	3.3'	62.3	8.5 bags (50 lbs/bag)	South	ern Products (GP-1A			
Filter Pack			02.10	olo bugo (co loc bug)						
	Тор	Depth	Bottom Depth	Amo	ount/Size (sack, bucket, etc.)					
	39.		43.3	1.5 buckets / Be	entonite Pellets	(3/8"), 5 gallor	n bucket			
Bentonite Seal										
	Тор	Depth	Bottom Depth	Amount (sacks and size)	Grout Date	te Grout Weight				
							-			
Grout	0	.0'	39.4	12 bags / 46,2 bs/bag	5-17-2021	1 14.0	- 15,0 bs/ga			
Grout										
Neat Cement										
Bentonite Cement										
High Solids										
Bentonite Well Installation Commer	te									
Hydrosleeve to be inst		ater date.								
Pump Installation Informa	tion			Pump Not Installed						
Installation Date		Installer/Co	mpany	Model/Manufacturer		Diameter				
				Depth from Top of Casing	to Top of Pump					
Single Spee	d		Variable Speed	soper non rop or dealing	is reportantly					
Report Prepared By	в	ill lovee				Date 7.1	6 2021			
Depths measured from gr	Bill Joyce 7-16-2021 Depths measured from ground surface to nearest 0.1 ft.									

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- Well Developed		Developmer			Paramete	ELF002D Final Yield (gpm	
Cascade Drillir	-	Bill Joyce	it Oversignt		Pump / Bail	NA	
Date	Time	pH	Conductivity	Turbidity	Temperature	Comments (additives, problems, etc.)	
6-09-2021	11:15 AM					Water Level - 52.45' bgs (below ground surface)	
	11:34 AM					Air Lift for 22 minutes	
6-24-2021	12:08 PM					Water Level - 52,53' bgs	
	12:50 PM					Pump with mega-monsoon pump. Pum dry after 7 gallons	
						3 times: Add 2 gallons potable water, swab/surge, pump dry	
6-29-2021	12:10 PM					Water Level - 52.80' bgs	
7-08-2021	1:44 PM					Water Level - 52.59' bgs	
7-13-2021	2:20 PM					Water Level - 52,64' bgs	
	2:25 PM	7.00	142.7	1.34	24.7	Bail #1 - total is greater than 1/4 gallon	
	2:32 PM	7.00	139,9	24.7	23,5	Bail #2 - total is greater than 1/2 gallon	
	2:40 PM	6.93	139.6	40,3	23.6	Bail #3 - total is greater than 3/4 gallon	
	2:48 PM	6.93	137.5	95.1	23.8	Bail #4 - total is greater than 1 gallon. Water Level - 53.72' bgs	
7-14-2021	1:00 PM					Water Level - 52.64' bgs. Collected Rac sample to clear for shipping	
7-15-2021	10:20 AM					Water Level - 52,64' bgs	
	10:40 AM	6.96	141.3	7.99	25.6	Collect Sample ELLWF-NEW0006 at 10 Only collected Volatiles/Tritium	
						1/2 liter placed in storage - insufficient volume to send other samples	
				34.3		Bail #2 exceeded 15 NTUs - no sample	
		6.92	140.9	39.7	25.6	Bail #3 -no sample	
		6,95	138,9	104	24.9	Bail #4 - no sample	
7-19-2021	10:30 AM			5.93		Water Level - 52,62' bgs, Sample collect and added to volume for Tech-99/lodine	
	10:40 AM			27.5		Bail #2 - no sample	
7-20-2021	8:55 AM			10,1		Water Level - 52.65' bgs. Sample collect and added to volume for Tech-99/lodine	
	9:05 AM			8,95		Sample collected and added to volume t Tech-99/lodine	
	9:13 AM			30.4		Bail #3 - no sample	
7-21-2021	9:40 AM					Water Level - 52.69' bgs	
	10:10 AM			10.7		Finished sample ELLWF-NEW0006A (fo Tech-99 and lodine-129)	



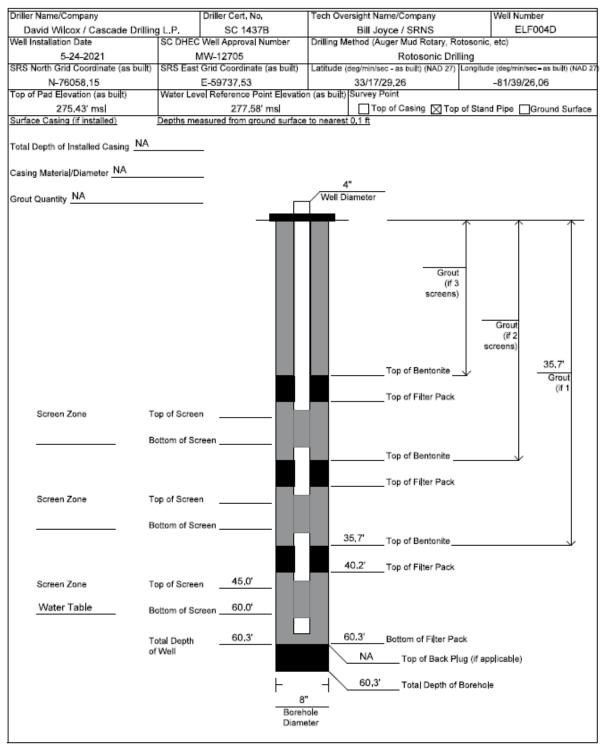
Monitoring V	Vell Installa	tion Repo	ort (Cor	ntinued)	Well Number	
Program Plan Name	Locatio	n Description	Site ID		ELF003D Project Manager	
ELLWF Water Table Monitorin		E Area		N3 / W2		
Station Type (Monitoring Well, Pie		E Alea	N37 W2		Virginia Rigsby	
Monitoring Well	,					
		Drilling and S	ampling			
Drilling Start Date	Drilling	Completion Date		Total Drilled Depth		
5-19-2021		5-19-202	1		55,3'	
Drilling Sar	npling Method		Top Depth	Bottom Depth	Diameter	
Rotosonic Drill			0.0'	35.5	6*	
Core / Rotosonic Drill			35.5'	55.3'	6"	
Over-Ream			0.0'	55,3'	8"	
Drilling and Sampling Comments	(lost circulation zones, d	rilling problems, etc.)				
Hand-augered from 0.0' - 6.0 Soil plug samples were colled	to ensure there were	no underground o	bstructions. N	No problems were end	countered.	
The screen interval was pred	etermined based on (PT/DPT results				
Ground Surface Elevation: 2						
		Combusies	Logging			
Date Logged Log	ging Top Depth	Geophysical Logging Bottom [ogging Contractor	Logging Truck Operator	
NA	NA	NA		NA	NA	
Geophysical Logs Caliper Natura Gamm Other (List)	Neutron	Resistiv		ingle Pt, Resis- 🔲 L & S		
Backfill Top Depth Ba	ckfill Bottom Depth	Backfill Material	Include Type, C	Quantity)		
NA	NA	NA	`			
Depths measured from ground su	face to nearest 0.1 ft					

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10		

Monitori	ina W	ell Ins	stallation Re	eport (Contin	ued) 🖪	Well Number		
Wieffitteri	ing v					ELF003D		
	Тор	Depth	Bottom Depth	Material/Schedule	Diameter	S ot Size	Slot Type	
Casing	-2	.9'	45.0	PVC / Schedule 40	4"			
Screen	45	5.0'	55.0'	PVC / Schedule 40	4"	10 slot	Slotted	
Sump	Ν	A	NA	NA	NA			
Sump Cap	55	5.0'	55.3'	PVC / Schedule 40	4"			
		Depth	Bottom Depth	Amount (sacks and size)		Trade Name		
Filter Pack	41	.1'	55.3'	7.5 bags (50 lbs/bag)	South	ern Products	GP-1A	
	Тор	Depth	Bottom Depth	Amo	ount/Size (sack, I	bucket, etc.)		
Bentonite Seal	37	7.0'	41.1'	1.5 buckets / Be	entonite Pellets	(3/8"), 5 gallo	n bucket	
	Тор	Depth	Bottom Depth	Amount (sacks and size)	Grout Date	8 6	irout Weight	
Grout	0	.0'	37,0'	16 bags / 47 lbs/bag	5-20-2021	1 14.0	- 15,0 bs/ga	
Neat Cement								
Bentonite Cement								
High Solids Bentonite								
Well Installation Commen Hydrosleeve to be inst		ater date,						
Pump Installation Informa	ation			Pump Not Installed				
Installation Date		Installer/Co	mpany	Model/Manufacturer		Diameter		
Single Spee	d	L C	Variable Speed	Depth from Top of Casing	to Top of Pump			
Report Prepared By	В	ill Joyce	0.1.9			Date 7-	16-2021	

Depths measured from ground surface to nearest 0.1 ft.

N N	Vell Dev	elopme	ent Data	Field P	aramete	ELF003D
Well Developed	By	Developmen	t Oversight	Developn	nent Method	Final Yield (gpm)
Cascade Drillir	ng	Bill Joyce	_	Air Lift /	Pump / Bail	NA
Date	Time	pH	Conductivity	Turbidity	Temperature	Comments (additives, problems, etc.)
6-09-2021	10:12 AM					Water Level - 50,35' bgs (below ground surface)
	10:30 AM					Air Lift for 31 minutes
6-24-2021	1:50 PM					Water Level - 50.65' bgs. Pump with mega-monsoon pump - dry after 4.75 gals
	2:05 PM					3 times: Add 2 gallons potable water, swab/surge, pump dry
6-28-2021	10:00 AM					Water Level - 50,65' bgs
7-08-2021	1:52 PM					Water Level - 50,51' bgs
7-14-2021	1:30 PM	6.81	126,5	7.54	26,6	Water Level - 50.59' bgs. Bail #1 - total is greater than 1/4 gallon
	1:40 PM	6.95	125.3	22.6	25.7	Bail #2 - total is greater than 1/2 gallon
	1:45 PM	7.00	123.8	33.8	25.3	Bail #3 - total is less than 1 gallon
	1:50 PM	6,99	126,7	41.7	24.2	Bail #4 - total is 1 1/4 gallons.
	1:54 PM	6.97	124.8		24.0	Bail #5 - total is greater than 1 1/4 gallons, Sample discharged before turbidity
	1:56 PM					Water Level - 51,89' bgs
7-15-2021	11:40 AM					Water Level - 50.60' bgs
	11:50 AM	6.83	115.0	12.8	25.5	Collect Sample ELLWF-NEW0007 at 1150, Only collected Volatiles/Tritium
						About 3/4 of a liter placed in storage - insufficient volume to send other samples
		6,82	116,2	25,9	25,2	Bail #2 exceeded 15 NTUs - no sample
				30.3		Bail #3 -no sample
		6.82	119.4	53.0	25.3	Bail #4 - no sample
7-19-2021	11:10 AM			51.1		Water Level - 50.59' bgs. Bail #1 exceeded 15 NTUs - no sample
	11:15 AM			52.6		Bail #2 exceeded 15 NTUs - no sample
7-20-2021	9:35 AM			34.7		Water Level - 50,56' bgs, Bail #1 exceeded 15 NTUs - no sample
	9:45 AM			40,7		Bail #2 exceeded 15 NTUs - no sample
7-21-2021	11:00 AM			28.5	Bail #1	Finished sample ELLWF-NEW0007A, Collected Iodine-129 sample with turbidity
				26.0	Bail #2	above 15 NTUs. Previously collected sample (12.8 NTUs) used for Tech-99
				35,0	Bail #3	Sampling completed
				32.3	Bail #4	Sampling completed

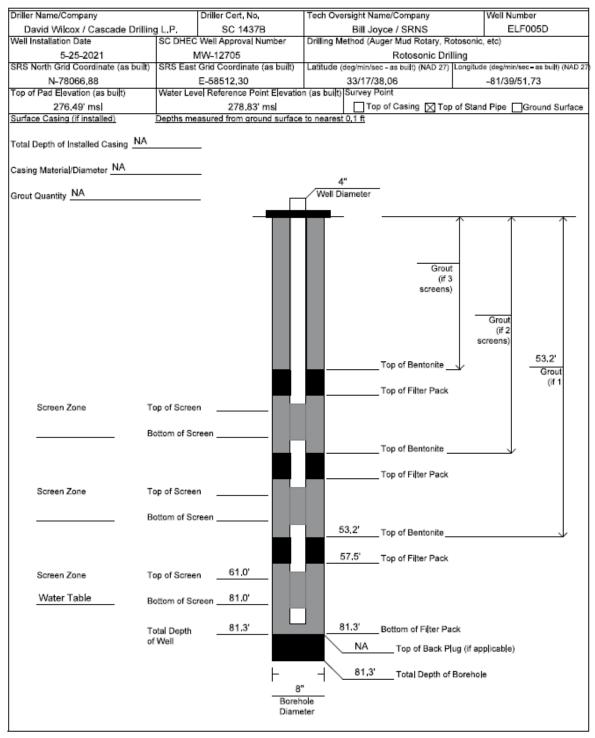


Monitoring V	Nell Inst	allation F	Report	(Cor	ntinued)	Well Number		
-					,	ELF004		
Program Plan Name		Location Description	on	Site ID		Project Manag	-	
ELLWF Water Table Monitor		E Area			N3 / W2	Virginia Rigsb	У	
Station Type (Monitoring Well, P	lezometer, etc.)							
Monitoring Well		Daill	ing and Comple					
Drilling Start Date		Drilling Completion	ing and Samplin Date	ıg	Total Drilled Depth			
5-20-2021		•	i-20-2021		Fotal Drinou Dopur	60,3'		
	ampling Method	5		Depth	Bottom Depth		Diameter	
Rotosonic Drill			0.	0'	35.5		6"	
Core / Rotosonic Drill	35	.5'	60.3		6"			
Over-Ream			0.	0'	60.3		8"	
			-					
Drilling and Sampling Comments	s (lost circulation z	ones, drilling proble	ems, etc.)					
Hand-augered from 0.0' - 6.0	0' to ensure ther	e were no underg	ground obstru	ctions. N	lo problems were en	countered.		
Soil plug samples were colle	ected every 2 ft t	eginning at 37' (37' – 59'),					
The screen interval was pre-	determined base	d on CPT/DPT n	oculte					
The acreen interval was pre-	determined base	d on of the first	coulto.					
Ground Surface Elevation: 2	275.19' msl							
		Geo	physical Loggi	10				
Date Logged Lo	ogging Top Depth		Bottom Depth		gging Contractor	Logging Tr	ruck Operator	
NA	NA		NA		NA		NA	
Geophysical Logs		I					d	
	al 🗆 Ma	utron 🗖	Decistivity		ngle Dt Regio D I e	S Normal	Spontaneous	
Caliper Natural Neutron Resistivity Single Pt. Resis- L & S Normal Spontaneous Gamma Density tivity Resistivity Potential								
_								
Other (List)								
Backfill Top Depth B	ackfill Bottom Dep	th Backfill	Material (Includ	e Type, Q	luantity)			
NA	NA		NA					
Depths measured from ground s	urface to nearest (),1 ft.						

Monitori	ng Well Ins	stallation R	eport (Contin	nued) 🛛	Well Number		
	-		· ·	_	E	_F004D	
	Top Depth	Bottom Depth	Materia//Schedule	Diameter	S ot Size	Slot Type	
Casing	-2.4'	45.0	PVC / Schedule 40	4"			
	45.0	60.0'	PVC / Schedule 40	4"	10 slot	Slotted	
Screen							
Sump	NA	NA	NA	NA			
Sump Cap	60.0'	60.3'	PVC / Schedule 40	4"			
	Top Depth	Bottom Depth	Amount (sacks and size)	-	Trade Name		
	40.2'	60.3'	10.5 bags (50 lb/bag)	South	ern Products (SP-1A	
Filter Pack	1012	00.0					
	Top Depth	Bottom Donth		unt/Circ /oack	unket etc.)		
	тор Беріл	Bottom Depth	Amo	ount/Size (sack, t	bucket, etc.)		
	35.7	40.2'	2 buckets / Ber	ntonite Pellets (3/8"), 5 gallon	bucket	
Bentonite Sea							
	Top Depth	Bottom Depth	Amount (sacks and size)	Grout Date	e G	rout Weight	
	0.0'	35.7	16 bags / 46.2 bs/bag	5-24-2021	14,0	- 15.0 bs/gal	
Grout							
Neat Cement							
Bentonite Cement							
Bentonite Well Installation Commer	to.						
Hydrosleeve to be inst							
Pump Installation Informa	tion		Pump Not Installed				
Installation Date	Installer/Co	ompany	Model/Manufacturer Diame				
Single Spee	d L	Variable Speed	Depth from Top of Casing to Top of Pump				
Report Prepared By					Date		
Depths measured from gr	Bill Joyce	0.1.8			7-1	6-2021	

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V	veli Dev	elopme	ent Data	Field P	raramete	ELF004D
Well Developed	2		nt Oversight		nent Method	Final Yield (gpm)
Cascade Drillir	5	Bill Joyce		air Lift /		1/4 gpm
Date	Time	pH	Conductivity	Turbidity	Temperature	Comments (additives, problems, etc.)
6-08-2021	3:55 PM		uS	NTUs	Celsius	Water Level - 49.52' bgs (below ground surface)
						Air Lift for 21 minutes
	4:14 PM					Air Lift for 13 minutes
6-09-2021	9:39 AM					Air Lift for 13 minutes
6-24-2021	2:50 PM					Water Level - 49.70' bgs. Pump with mega-monsoon pump - dry after 10.75 g
	3:02 PM					3 times: Add 2 gallons potable water, swab/surge, pump dry
6-29-2021	2:15 PM					Water Level - 49,70' bgs
7-08-2021	2:02 PM					Water Level - 49,69' bgs
	3:30 PM					Begin to pump, Started at 1/2 gpm but worked down to 1/4 gpm
	3:40 PM					Water Level - 52,86' bgs
	3:47 PM	6,93	139,1	6,16	24,4	Water Level - 53,51' bgs
	3:52 PM					Water Level - 55,51 bgs
	4:00 PM	6.89	134.8	6.58	24.0	
	4:05 PM					Water Level - 54.06' bgs
	4:20 PM	6.80	126.2	5,25	24.2	Motor Louis Ed Ed Louis
	4:25 PM					Water Level - 54.51' bgs
	4:30 PM	6,82	123.2	4.68	24.6	Pumping at 1/4 gpm. Stop pumping at 1633
7-12-2021	10:15 AM					Water Level - 49,81' bgs
7-12-2021	10:50 AM					Begin to pump. Flow rate set at 1/4 gpm
	11:00 AM	6,54	100.5	16.4	24.2	
	11:15 AM	6.60	97.65	10.3	24.6	
	11:30 AM	6,60	94.05	7.77	26.3	Water Level - 53,39' bgs
	11:45 AM	6,60	92,70	9,33	26,8	Pumping at 1/4 gpm Water Level - 53,68' bgs
	11:50 AM	6.56	94.21	7.99	26.7	Flow rate had fallen below 1/4 gpm,
	12:00 PM	6.52	91.33	6.25	26.1	Raised the flow rate to 1/4 gpm Collect Sample ELLWF-NEW0003 at 12
	12:10 PM	6.42	85,14	6,76	25,3	Sampling completed, Water Level - 55,2
	12:33 PM					bgs, Turn off the pump,

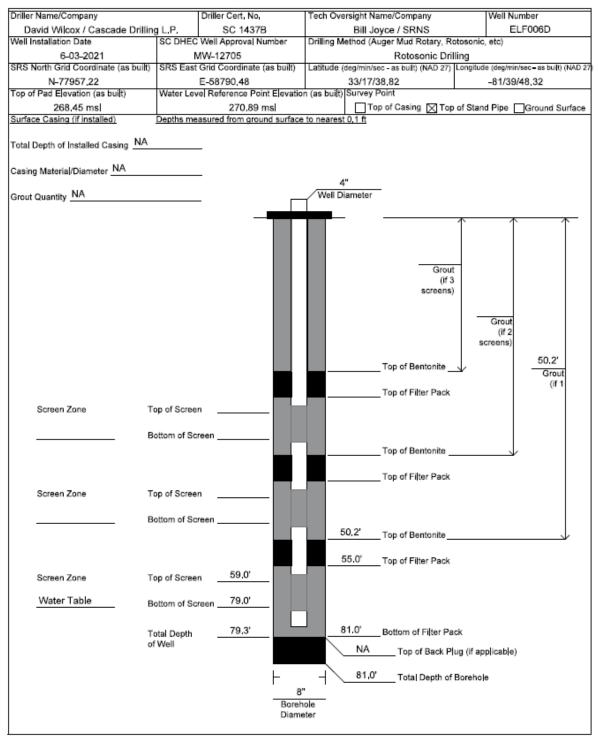


Monitoring Well In	stallation R	epon (C	onunuea)	Well Number ELF005D
Program Plan Name	Location Description	n Site	D	Project Manager
ELLWF Water Table Monitoring Wells	E Area		N3 / W2	Virginia Rigsby
Station Type (Monitoring Well, Piezometer, etc	2.)			
Monitoring Well				
Drilling Start Date	Drilling Completion	g and Sampling Date	Total Drilled Depth	
5-24-2021		25-2021	Total Dimov Dopu	81,3'
Drilling Sampling Metho		Top Depth	Bottom Dep	
0,0				
Rotosonic Drill		0.0'	56.0	6"
Core / Rotosonic Drill		56.0'	81.3'	6*
Over Been		0.01	04.21	8"
Over-Ream		0.0'	81.3	8
Drilling and Sampling Comments (lost circulati	on zones, arilling problem	ns, etc.)		
Hand-augered from 0.0' - 6.0' to ensure	here were no underar	ound obstruction	s. No problems were er	ncountered.
	anoro noro no anaorgi			
Soil plug samples were collected every 2	t beginning at 57' (52)?	7' – 81'),		
The screen interval was predetermined to	acad on CPT/DPT rea	aulto.		
The screen interval was predetermined t	ased on CFI/DFITE:	suits.		
Ground Surface Elevation: 276.17' msl				
		hysical Logging		
Date Logged Logging Top De	epth Logging B	lottom Depth	Logging Contractor	Logging Truck Operator
NA NA Geophysical Logs		NA	NA	NA
		_		
Caliper Natural Gamma	Neutron F Density	Resistivity	Single Pt. Resis- L 8 tivity Re	& S Normal Spontaneous esistivity Potential
	Density		uvity Re	anativity Potential
Other (List)				
Backfill Top Depth Backfill Bottom	Depth Backfill M	aterial (Include Typ	e, Quantity)	
NA NA Depths measured from ground surface to near		NA		

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Monitori	ng Well In	stallation R	eport (Contin	ued)	Well Number	
<u> </u>	Top Depth	Bottom Depth	Material/Schedule	Diameter	Slot Size	LF005D Slot Type
Casing	-2.6	61.0'	PVC / Schedule 40	4"		
Casing	-2.0	61.0	PVC/ Schedule 40	7		
	61.0'	81.0'	PVC / Schedule 40	4"	10 slot	Slotted
Screen						
-						
Sump	NA	NA	NA	NA		
Sump Cap	81.0'	81.3'	PVC / Schedule 40	4"		
	Top Depth	Bottom Depth	Amount (sacks and size)		Trade Name	
	57.5	81.3'	12 bags (50 lbs/bag)	South	ern Products	GP-1A
Filter Pack						
-						
	Top Depth	Bottom Depth	Amo	unt/Size (sack,	bucket etc.)	
Bentonite Sea	53,2	57.5	1.5 buckets / Be	entonite Pellets	(3/8"), 5 gallo	on bucket
-	Top Depth	Bottom Depth	Amount (sacks and size)	Grout Da	te C	Grout Weight
	0.0'	53,2'	16 bags / 46,2 bs/bag	5-25-202	1 14.0) - 15,0 bs/ga
Grout						
Neat Cement						
Bentonite Cement						
 High Solids Bentonite 						
Well Installation Comment A bladder pump will be		ate.			•	
Pump Installation Informat	ion		Pump Not Installed			
Installation Date	Installer/Co	ompany	Model/Manufacturer		Diameter	
			Depth from Top of Casing	to Top of Pump		
Single Speed	1	Variable Speed				
Report Prepared By	Bill Joyce				Date 7-	16-2021
Depths measured from gro		t 0,1 ft,				

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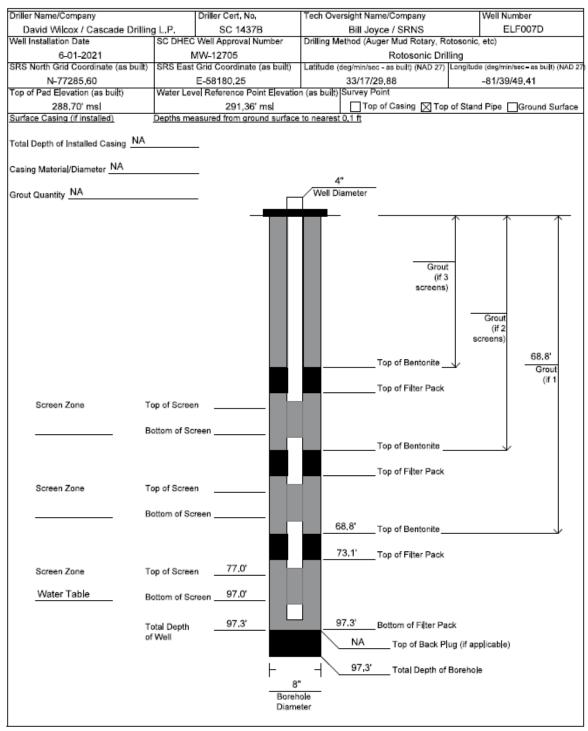
Nell Developed	-	Developmen	nt Oversight		nent Method	Final Yield (gpm	
Cascade Drillir	÷	Bill Joyce		Air Lift /			
Date	Time	pH	Conductivity	Turbidity	Temperature	Comments (additives, problems, etc	
6-09-2021	2:06 PM		uS	NTUs	Celsius	Water Level - 72.00' bgs (below ground surface)	
						Air Lift for 31 minutes	
	2:28 PM					Water Level - 72,15' bgs	
6-28-2021	3:05 PM					Water Level - 72,15 bgs	
7-01-2021	2:42 PM					Water Level - 72.15' bgs	
	3:25 PM					Pumped wide open with mega-monsoor pump - pumped dry after 10,25 gallons	
						Water Level - 72,14' bgs	
7-07-2021	4:30 PM					Water Level - 72.14' bgs	
7-08-2021	8:55 AM					Water Lever- 72.14 bgs	
	9:10 AM					Swab /Surge (S/S) with swab	
	9:30 AM					Begin to pump. Very turbid but clears, at 1/4 gpm	
	9:40 AM					Water Level - 73.24' bgs. Set flow rate 1/2 gpm	
	9:45 AM	6,65	149.4	689	22.3		
	9:50 AM					Water Level - 74.44' bgs	
	9:53 AM					S/S with the pump	
	10:10 AM					S/S with the pump, Pumping 1/2 gpm	
	10:20 AM	6.48	114.0	82.6	22.2		
	10:30 AM	6,49	111.0	18,2	22,1		
	10:40 AM	6.34	92,54	6,78	22.1		
	10:45 AM					Water Level - 76.94' bgs	
	10:50 AM	6,32	92,75	3,73	22.4		
	11:00 AM	6.21	81.67	2,19	22.3		
	11:10 AM	6,21	82.06	1.83	22.2	Collect Sample ELLWF-NEW0008 at 11	
	11:24 AM					Sampling completed. Turn off the pump	



Monitoring Well Ins	tallation Rep	ort (Con	tinued) 🛛	Well Number	
Program Plan Name	Location Description	Site D		ELF006D Project Manager	
	E Area			, .	
ELLWF Water Table Monitoring Wells Station Type (Monitoring Well, Plezometer, etc.)	E Area	IN S	57 VVZ	/irginia Rigsby	
Monitoring Well					
Monitoring Well	Drilling and	Sampling			
Drilling Start Date	Drilling Completion Date	oamping	Total Drilled Depth		
6-02-2021	6-03-20	21	81.0'		
Drilling Sampling Method		Top Depth	Bottom Depth	Diameter	
Rotosonic Drill		0.0'	56.0	6"	
Core / Rotosonic Drill		56.0'	81.0'	6"	
Over-Ream		0,0'	81.0	8"	
Drilling and Sampling Comments (lost circulation	zones, drilling problems, etc	5,)			
Hand-augered from 0.0' - 6.0' to ensure the	ere were no underground	obstructions. N	o problems were enco	ountered.	
_	-				
Soil plug samples were collected every 2 f	t beginning at 57' (57' – 81	l'),			
The second state of the se	OPTIDET				
The screen interval was predetermined ba	sed on CPT/DPT results.				
Ground Surface Elevation: 268,19' msl					
Ground Condee Elevation. 200,10 mar					
Bala Langad	Geophysica	00 0	Contra 1	Lessing Touri Committee	
Date Logged Logging Top Dept		Depth Log	iging Contractor	Logging Truck Operator	
NA NA	NA		NA	NA	
Geophysical Logs					
	Neutron Resist		gle Pt. Resis- 🗌 L & S		
Gamma	Density	tivit	y Resis	tivity Potential	
Other (List)					
Backfill Top Depth Backfill Bottom De	enth Backfill Materia	(Include Type, Qu	uantity)		
NA NA Depths measured from ground surface to neares	10.1 ft.	1			

OSR 30-11 (Rev. 05-15-2016) Page 3 of 4							
Monitori	ng Well In	stallation Re	eport (Contin	ued)	Well Numbe		
	Top Depth	Bottom Depth	Material/Schedule	Diameter	Slot Size	ELF006D Slot Type	
Casing	-2.7	59.0'	PVC / Schedule 40	4"			
-							
	59.0'	79.0'	PVC / Schedule 40	4"	10 slot	Slotted	
Screen							
Sump	NA	NA	NA	NA			
Sump Cap	79.0'	79.3'	PVC / Schedule 40	4"			
	Top Depth	Bottom Depth	Amount (sacks and size)		Trade Nan	ne	
	55.0'	81.0'	13 bags (50 lbs/bag)	Souti	hern Produc	ts GP-1A	
Filter Pack							
	Top Depth	Bottom Depth	Amo	ount/Size (sack,	, bucket, etc.)	
Bentonite Seal	50.2'	55.0'	2 buckets / Ber	ntonite Pellets (3/8"), 5 gallon bucket			
	Top Depth	Bottom Depth	Amount (sacks and size)	Grout Da	te	Grout Weight	
	0,0'	50,2'	16 bags / 46,2 bs/bag	6-03-202		4,0 - 15,0 bs/ga	
Grout							
Neat Cement							
Bentonite Cement							
High Solids Bentonite							
Well Installation Comment A bladder pump will be		late.	I		1		
Pump Installation Informat	ion		Pump Not Installed				
Installation Date	Installer/C	ompany	Model/Manufacturer Diameter			er	
Single Speed		Variable Speed	Depth from Top of Casing to Top of Pump				
Report Prepared By	Bill Joyce			Date 7, 16, 2021			
Depths measured from gro		t 0,1 ft,				7-16-2021	

Well Developed By		Development Oversight		Development Method			Final Yield (gpm)	
Cascade Drilli	-	Bill Joyce		Air Lift /		1/2 gpm		
Date	Time	pН	Conductivity	Turbidity	Temperature	Comments (additives, problems, e		
6-08-2021	8:55 AM		uS	NTUs	Celsius	Water Level - 63.15' bg surface)	gs (below ground	
	9:10 AM					Air Lift for 45 minutes		
7-01-2021	4:03 PM					Water Level - 64,40' bg	js	
	4:09 PM					Pumped wide open wit pump - stopped pumpi		
7-06-2021	9:15 AM					Water Level - 64,50' bo		
	10:10 AM					Swab/Surge (S/S)		
	10:34 AM					Pumping wide open. T slightly turbid	urbid turns to	
	10:45 AM	6.14	90.45	Over-Range	22.2			
	10:50 AM					S/S with the pump		
	10:54 AM					Pumped wide open. P recover		
	11:00 AM					Begin to pump at 1/4 g minute), Raise to 1/2 g		
	11:05 AM	6.31	96.94	20.1	22.3			
	11:09 AM					S/S with the pump		
	11:18 AM					Pumping at 1/2 gpm		
	11:20 AM					Water Level - 73.70' bç	js	
	11:25 AM	6,29	96,83	14.3	23,2			
	11:40 AM					Water Level- 74,00' bgs	S	
	11:45 AM	6.20	93.88	2.66	23.0			
	12:00 PM	6,15	90,15	2,18	23.2			
	12:35 PM	6.05	84.20	0.76	24.5			
	12:40 PM					Water Level - 74.25' bg 59.0' - 79.0'	gs. Screen Zone is	
	12:45 PM	6,03	85,91	1,95	24,5	Pumping at 1/2 gpm		
	1:00 PM	6.06	84.53	1.21	24.2	Collect Sample ELLWF		
	1:11 PM					Sampling completed,	Turn off the pump.	
7-08-2021	1:15 PM					Water Level - 64.30' bg	js	



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Monitoring \	Nell Insta	llation F	Report	(Co	onti	inued)	Well	Number		
Program Plan Name		cation Descriptio		Site [Broi	ELF00		
			n	one Ir			,	Project Manager		
ELLWF Water Table Monitor Station Type (Monitoring Well, F		E Area			ING /	N3 / W2		Virginia Rigsby		
Monitoring Well	reconnect, etc./									
Monitoring Well		Drillir	ig and Samplir							
Drilling Start Date	Dr	rilling Completion		9		Total Drilled Dept	h			
6-01-2021		•	01-2021				97,	3'		
	ampling Method	-	Top Depth			Bottom Depth		<u> </u>	Diameter	
	and a second			-						
Rotosonic Drill			0,0)'		66.0'			6"	
				-				-	-	
Core / Rotosonic Drill			66.	0'		97.3'			6"	
				-				+	_	
Over-Ream			0,0)'		97,3			8"	
								+		
								1		
								1		
								1		
Drilling and Sampling Comment	s (lost circulation zone	es, drilling proble	ms, etc.)							
Hand-augered from 0.0' - 6.	0' to ensure there v	vere no underg	round obstru	ctions	. No p	problems were e	ncount	tered.		
Soil plug samples were colle	ected every 2 ft beg	ginning at 67' (6	7' – 97'),							
The screen interval was pre	determined based	on CPT/DPT re	eulte							
The screen interval was pre	determined based	on CF1/DF11e	suits.							
Ground Surface Elevation:	288.15' ms									
-			physical Loggin	g						
	ogging Top Depth	Logging I	Bottom Depth		Loggir	ng Contractor	L L	.ogging T	ruck Operator	
NA	NA		NA			NA			NA	
Geophysical Logs										
Caliper Natur	al Neut	ron	Resistivity		Single	Pt. Resis- 🗌 L a	& S Nor	mal	Spontaneous	
Gamr	ma Dens	sity	-		tivity		esistivity		Potentia	
Other (List)										
	ackfill Bottom Depth	Backfill N	faterial (Includ	е Туре	e, Quar	ntity)				
NA	NA	-	NA							
Depths measured from around s	urface to nearest 0.1	0								

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Monitori	ng W	ell Ins	stallation Re	eport (Contir	nued)	Well Num		
	Тор	Depth	Bottom Depth	Material/Schedule	Diameter	Slot S		F007D Slot Type
Casing	_3	.2	77.0'	PVC / Schedule 40	4"			
Casing	-0		11.0	1 VO / Gonedale 40	4			
	77	.0'	97.0'	PVC / Schedule 40	4"	10 s	ot	Slotted
Screen								
Sump	N	A	NA	NA	NA			
Sump Cap	97	.0'	97.3	PVC / Schedule 40	4"			
	Тор	Depth	Bottom Depth	Amount (sacks and size)		Trade N	lame	
	73	3.1'	97.3	12 bags (50 lbs/bag)	Sout	hern Proc	iucts (GP-1A
Filter Pack								
	Тор	Depth	Bottom Depth	Amo	ount/Size (sack	, bucket, e	etc.)	
	68	.8'	73.1'	2 buckets / Be	ntonite Pellets	(3/8"), 5	gallon	bucket
Bentonite Seal								
	Тор	Depth	Bottom Depth	Amount (sacks and size)	Grout Da	ite	G	rout Weight
	0.	.0'	68.8'	24 bags / 46.2lbs/bag	6-02-202	21	14.0	- 15,0 bs/ga
Grout								
Neat Cement								
Bentonite Cement								
High Solids								
Bentonite Well Installation Commer		at a later de						
A bladder pump will be	a installed a	at a jater da	ne,					
Pump Installation Informa	ation			Pump Not Installed				
Installation Date		Installer/Co	mpany	Model/Manufacturer		Dian	neter	
Single Spee	d		Variable Speed	Depth from Top of Casing	to Top of Pump)		
Report Prepared By	Bill	Joyce		1		Date		6-2021
Depths measured from as			0.4.8					

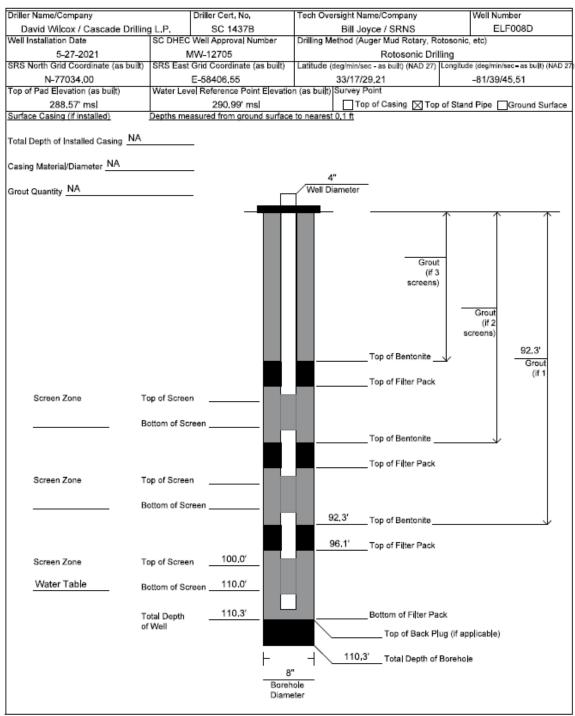
Depths measured from ground surface to nearest 0.1 ft.

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Vell Developed	2		nt Oversight		nent Method	ELF007D Final Yield (gpm
Cascade Drillir	-	Bill Joyce		Air Lift /		1/2 gpm
Date	Time	pН	Conductivity	Turbidity	Temperature	Comments (additives, problems, etc.)
6-08-2021	10:22 AM		uS	NTUs	Celsius	Water Level - 75.46' bgs (below ground surface)
	10:48 AM					Air Lift for 49 minutes
7-06-2021	2:07 PM					Water Level - 76.50' bgs
	2:28 PM					Pump wide open
	2:36 PM					Pumped 10 gallons - not going dry, Tur turning clear
	2:55 PM					Swab / Surge (S/S)
	3:05 PM					Pumping at 1 1/4 gpm. Knock it down t 3/4 gpn. S/S with pump every 15 minut
	4:03 PM					Pumping at 1/2 gpm, Water Level - 88, bgs
	4:15 PM	6.14	97.34	30.0	24.6	
	4:25 PM	6,12	98.44	14.5	22,9	
	4:35 PM	6.11	95.14	7.03	22.9	
	4:36 PM					Stop pumping
7-07-2021	8:35 AM					Water Level - 76.45' bgs. Trip in and S/ with pump
	8:48 AM					Start pumping, Adjust flow to 1/2 gpm
	9:00 AM	6.00	90.75	25.4	22.2	
	9:15 AM	6,01	79,25	10,3	22,4	
	9:30 AM	5.97	73.08	6.91	22.6	
	9:40 AM	5.92	66.94	4.32	22.8	
	9:50 AM	5,93	69,16	1,90	22.7	
	9:55 AM					Water Level - 78,30' bgs
	10:00 AM	5,95	64.01	2.84	22.7	Collect Sample ELLWF-NEW0002 at 10
	10:18 AM					Sampling completed. Turn off the pump
7-08-2021	1:05 PM					Water Level - 76,46' bgs

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Monitoring Well Installation Report



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Monitoring W	ell Installat	tion Re	port (Cont	inued)	Well Numi	ber 008D	
Program Plan Name	Location	Description	S	ite ID		Project Ma		
ELLWF Water Table Monitoring		E Area			/ W2	,	-	
Station Type (Monitoring Well, Piez		E Area		143	/ ///2	Virginia Rigsby		
Monitoring Well	oniotor, otor,							
Monitoring well		Drilling a	nd Sampling					
Drilling Start Date	Drilling	Completion Dat			Total Drilled Depth			
*	Drining				Total Drilled Depth	110,3'		
5-26-2021 Drilling Samp	ling Mating	0-20-	26–2021 Top Depth		Bottom Depth		Diameter	
Drilling Samp	aing metrica		TOP De	pun	Bottom Dept		Diameter	
Rotosonic Drill			0.0'		76.0'		6"	
Core / Rotosonic Drill			76.0		110.3'		6"	
Over-Ream			0.0'		110.3'		8"	
Drilling and Sampling Comments (lo	st circulation zones, dri	illing problems,	etc,)		1			
Hand-augered from 0.0' - 6.0' to	o ensure there were	no undergrou	nd obstruct	ions. No	problems were en	countered.		
Soil plug samples were collecte	ed every 2 ft beginnin	ig at 77' (77' -	109'),					
The screen interval was predet	ermined based on Cl	PT/DPT resul	ts.					
Ground Surface Elevation: 288	3.07' msl							
			sical Logging					
	ing Top Depth	Logging Bott		Logg	ing Contractor	Loggin	g Truck Operator	
NA	NA	N	A		NA		NA	
Geophysical Logs Caliper Natural Gamma Other (List)	Neutron Density	Res	istivity	Singl Singl	e Pt. Resis- 🗌 L & Res	S Normal istivity	Spontaneous Potential	
Backfill Top Depth Back	fill Bottom Depth	Backfill Mate	rial (Include)	Type Oue	intity)			
		Data in Male	,	, ype, odda	(10.37)			
NA Depths measured from ground surfa	NA Ice to pearent 0.1.8		NA					

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WORLD	ng wei	11150		eport (Contin	ueu)	Well Number	ELF008D
	Top Dep	th	Bottom Depth	Materia//Schedule	Diameter	Slot Size	
Casing	-2.9		100.0'	PVC / Schedule 40	4"		
-							
Screen	100.0'		110.0'	PVC / Schedule 40	4"	10 slot	Slotted
-							
Sump	NA		NA	NA	NA		
Sump Cap	110.0'		110.3'	PVC / Schedule 40	4"		
	Top Dep	th	Bottom Depth	Amount (sacks and size)		Trade Nam	18
	96.1'		110.3'	7.5 bags (50 lbs/bag)	Sout	hern Produc	ts GP-1A
Filter Pack							
-	Top Dep	th	Bottom Depth	Amo	ount/Size (sack	, bucket, etc.)	
Bentonite Seal	92.3		96.1	1.5 buckets / Be	entonite Pellete	s (3/8"), 5 ga	llon bucket
Dentointe Geur							
	Top Dep	th	Bottom Depth	Amount (sacks and size)	Grout Da	te	Grout Weight
-	0,0'		92,3'	32 bags / 46,2 bs/bag	5-27-202		1,0 - 15,0 lbs/gal
Grout	0,0		02,0	or bugos notribuibug	0 27 20		io iolo iongui
Neat Cement							
Bentonite Cement							
High Solids Bentonite							
Well Installation Commen A bladder pump will be		ater date.				·	
Pump Installation Information	tion			Pump Not Installed			
Installation Date	Ins	taller/Compa	any	Model/Manufacturer		Diamete	r
Single Speed	đ		ariable Speed	Depth from Top of Casing	to Top of Pump)	
Report Prepared By	Bill Jo			·		Date	7-16-2021

Depths measured from ground surface to nearest 0.1 ft.

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Time 12:43 PM 1:07 PM 11:20 AM 12:06 PM 12:13 PM 12:17 PM 12:42 PM 12:45 PM 1:00 PM	6.24	Conductivity uS	Air Lift / Turbidity NTUs	Pump Temperature Celsius	1/2 gpm Comments (additives, problems, etc.) Water Level - 74.95' bgs (below ground surface) Air Lift for 39 minutes Water Level - 75.30' bgs Begin to pump wide open. Very turbid bu clears some. Pumped 10 gallons, Clear Swab / Surge (S/S) with swab Begin to pump - set at 3/4 gpm
12:43 PM 1:07 PM 11:20 AM 12:06 PM 12:13 PM 12:17 PM 12:42 PM 12:45 PM					Water Level - 74.95' bgs (below ground surface) Air Lift for 39 minutes Water Level - 75.30' bgs Begin to pump wide open. Very turbid bu clears some. Pumped 10 gallons, Clear Swab / Surge (S/S) with swab
1:07 PM 11:20 AM 12:06 PM 12:13 PM 12:17 PM 12:42 PM 12:45 PM	6.24	uS	NTUs	Celsius	surface) Air Lift for 39 minutes Water Level - 75,30' bgs Begin to pump wide open. Very turbid bu clears some. Pumped 10 gallons, Clear Swab / Surge (S/S) with swab
11:20 AM 12:06 PM 12:13 PM 12:17 PM 12:42 PM 12:45 PM	6.24				Water Level - 75.30' bgs Begin to pump wide open. Very turbid bu clears some. Pumped 10 gallons, Clear Swab / Surge (S/S) with swab
12:06 PM 12:13 PM 12:17 PM 12:42 PM 12:45 PM	6.24				Begin to pump wide open. Very turbid bu clears some. Pumped 10 gallons, Clear Swab / Surge (S/S) with swab
12:13 PM 12:17 PM 12:42 PM 12:45 PM	6.24				clears some. Pumped 10 gallons, Clear Swab / Surge (S/S) with swab
12:17 PM 12:42 PM 12:45 PM	6.24				Swab / Surge (S/S) with swab
12:42 PM 12:45 PM	6.24				
12:45 PM	6.24				Regin to nump - set at 2/4 gpm
	6.24	1 1			begin to pump - set at 3/4 gpm
1:00 PM		118.8	77,9	22.2	
					S/S with pump. Very turbid. Pump wide open to clear. Set at 3/4 gpm
1:10 PM					S/S with pump. Turbid but clears faster
1:20 PM					S/S with pump, Pump wide open, Clears Set at 3/4 gpm
1:30 PM	6.24	100.9	46.7	22.0	
1:45 PM	6,13	97.05	22,0	22.0	
1:50 PM					Water Level - 102,1' bgs, Lower pump ra to 1/2 gpm
2:00 PM	6.20	106.5	14.6	22.4	
2:10 PM	6,18	98,42	5,71	22,3	
2:20 PM	6.16	92.15	3.14	22.2	
2:30 PM	6.12	91.03	3.56	22.3	Collect Sample ELLWF-NEW0005 at 143
2:46 PM					Sampling completed. Turn off the pump.
1:30 PM					Water Level - 75,08' bgs
	1:20 PM 1:30 PM 1:45 PM 1:50 PM 2:00 PM 2:10 PM 2:20 PM 2:30 PM 2:46 PM	1:20 PM 1:30 PM 6.24 1:45 PM 6.13 1:50 PM 2:00 PM 6.20 2:10 PM 6.18 2:20 PM 6.16 2:30 PM 6.12 2:46 PM	1:20 PM 6.24 100.9 1:30 PM 6.24 100.9 1:45 PM 6.13 97.05 1:50 PM 2:00 PM 6.20 2:00 PM 6.20 106.5 2:10 PM 6.18 98.42 2:20 PM 6.16 92.15 2:30 PM 6.12 91.03 2:46 PM 91.03 91.03	1:20 PM 6.24 100.9 46.7 1:30 PM 6.13 97.05 22,0 1:45 PM 6.13 97.05 22,0 1:50 PM	1:20 PM 6.24 100.9 46.7 22.0 1:30 PM 6.13 97.05 22,0 22,0 1:45 PM 6.13 97.05 22,0 22,0 1:50 PM

Appendix D. Final Layout of ELF Monitoring Wells

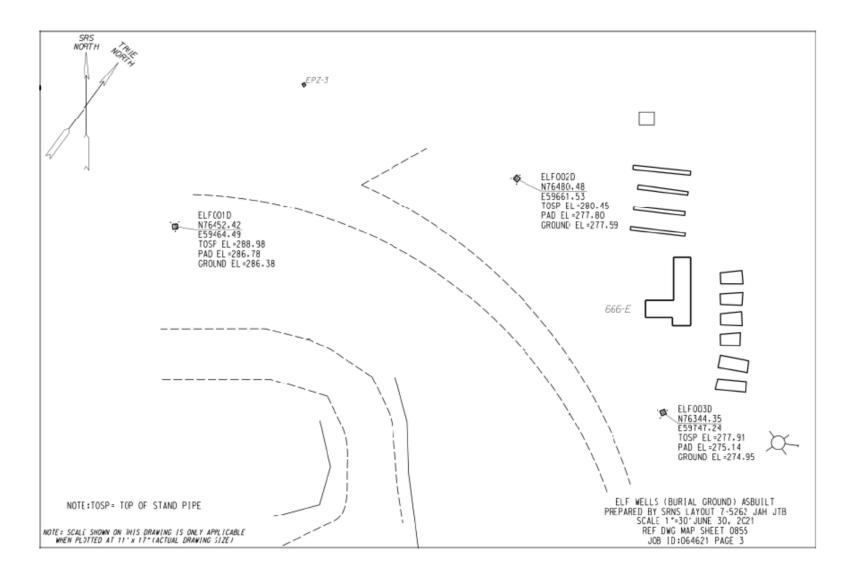


Figure D-1. Final Layout of ELF001D, ELF002D, and ELF003D.

D-1

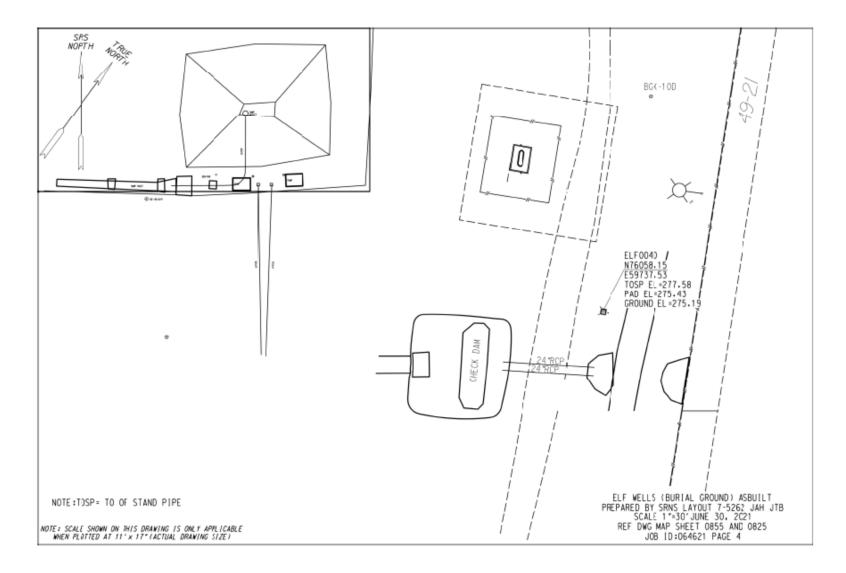


Figure D-2. Final Layout of ELF004D.

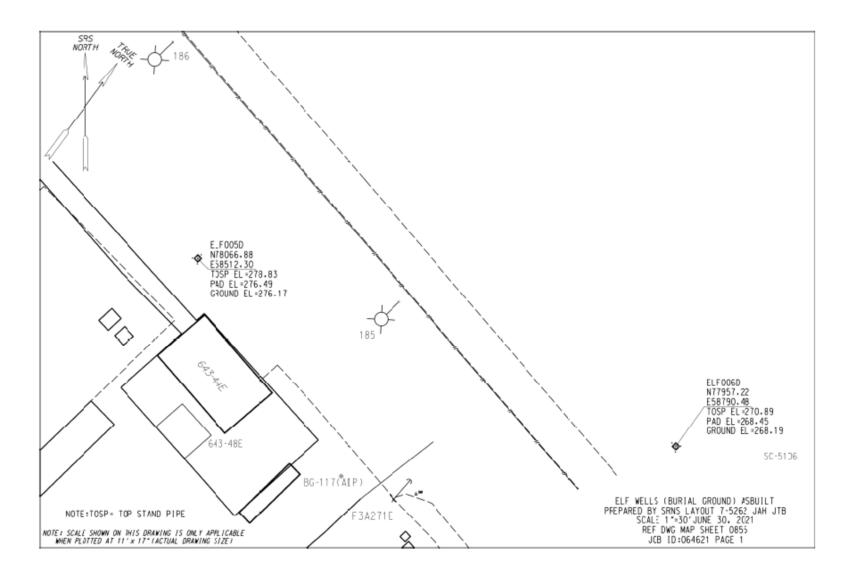


Figure D-3. Final Layout of ELF005D and ELF006D.

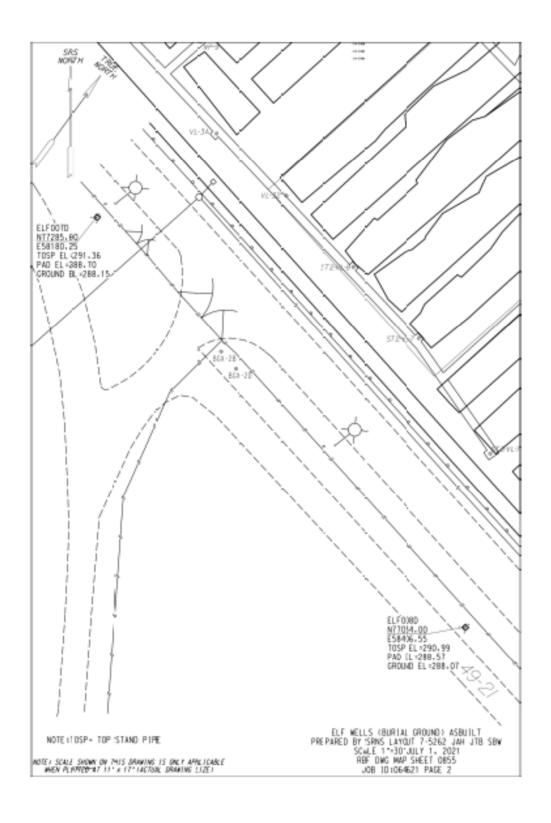


Figure D-4. Final Layout of ELF007D and ELF008D

Distribution:

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Records Administration (EDWS)