

May 1, 2024  
File No. 04224030.18

Mr. Andrew Smith  
Toxics Cleanup Manager  
Washington State Department of Ecology  
Southwest Regional Office  
Toxics Cleanup Program  
300 Desmond Drive  
Lacey, Washington 98503

**Subject:** Installation of Replacement Wells and New Landfill Gas Probes following Construction of the NE 99<sup>th</sup> Street Extension Closed Leichner Landfill, Vancouver, Washington

Dear Andrew,

This report, prepared by SCS Engineers (SCS) on behalf of Clark County Public Health (CCPH), describes the installation and development of groundwater monitoring wells LB-09SR2 and LB-22SR, and landfill gas (LFG) probes GP-40 through GP-42 at the Closed Leichner Landfill in Vancouver, Washington (Figure 1). Former wells LB-09SR and LB-22S were decommissioned in August 2021 as documented in a report dated September 22, 2021 (SCS, 2021)<sup>1</sup> to accommodate construction of the 99<sup>th</sup> Street extension through the northern portion of the site. The replacement wells were installed close to the original locations of the former (decommissioned) well (see Figure 2). GP-40, GP-41, and GP-42 are new LFG perimeter compliance probes installed between the northern end of the landfill footprint and 99<sup>th</sup> Street (see Figure 3). The replacement wells and new LFG probes were installed from January 4 to 8, 2024 in accordance with the *Work Plan for Groundwater and Landfill Gas Monitoring Network Modifications*, submitted to the Washington State Department of Ecology (Ecology) and CCPH, dated May 19, 2021. Ecology approved the work plan in an email dated May 26, 2021.

## **DRILLING AND WELL/GAS PROBE INSTALLATION**

Monitoring wells LB-09SR2 and LB-22SR are located in the northwest and northeast portion of the site, respectively (Figure 2). Both wells are hydraulically upgradient of the landfill. Both groundwater wells were screened in the shallow alluvial water-bearing zone (WBZ). This section discusses drilling activities, well design, and construction methods.

### **Drilling and Logging**

Field activities were performed in accordance with Oregon Water Resources Department (OWRD) regulations, Oregon Administrative Rule (OAR) 690-240 (Construction, Maintenance, Alteration, Conversion and Abandonment of Monitoring Wells, Geotechnical Holes, and Other Holes in Oregon).

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<sup>1</sup> The decommissioning for LB-09SR and LB-22S was described in the 2021 Report of Decommissioning of Monitoring Wells and Landfill Gas Monitoring Probes Closed Leichner Landfill.



The drilling and well construction activities were performed by an Oregon-licensed drilling contractor, Holt Services Inc, based in Vancouver, Washington, under the direct supervision of an SCS representative. Drilling was completed using a truck mounted, B-58 drilling rig. The borings were drilled using an 8-inch outer diameter hollow stem auger. Soil samples were collected for soil classification at 5-foot intervals using an 18-inch split spoon sampler. Field boring logs were completed with lithologic descriptions from the soil samples and visual observations made during drilling. Logs for the monitoring well and gas probe borings showing the type, distribution and characteristics of the lithologic units encountered during drilling are provided in Attachment 1.

## Well Design and Construction

During drilling, heaving sands were encountered at about 36.5 feet in LB-9SR2. Clean tap water was added inside the augers while drilling to prevent the sands from coming inside the auger, allowing for installation of the monitoring well. At LB-22SR, heaving sands were encountered at approximately 28 feet below ground surface (bgs), at which point split spoon sampling was discontinued and the augers were filled with clean tap water during drilling to keep the sands outside the augers. The drillers estimate approximately 150 to 200 gallons of water was added to the boring of LB-9SR2, and a large amount of water was added to LB-22SR during drilling.

Monitoring wells LB-9SR2 and LB-22SR were constructed with 2-inch-diameter, Schedule 40, polyvinyl chloride (PVC), flush threaded solid and slotted (screened) casing. The screened casings (0.010-inch machine-cut slots) were installed from approximately 34 to 49 feet bgs in LB-9SR2 and 30 to 40 feet bgs in LB-22SR. The bottom of the screened section was fitted with a threaded 0.4-foot long flat-bottomed end cap.

The sand pack and bentonite seal materials were poured in the annular space around the PVC well casing. The 12/20 silica sand pack was placed from the bottom of the boring to 2-to-3 feet above the top of the well screen. After the sand pack was constructed, bentonite chips were poured into the annular space to within 2-to-4 feet of the surface. An above-ground, lockable, steel protective monument was secured with concrete at the top of the well casing, and three steel protective posts were installed around the monument. LB-9SR2 was installed with a steel flush-mount well box.

Well construction information for monitoring wells LB-9SR2 and LB-22SR is included in the boring logs provided in Attachment 1 and summarized in Table 1.

## Gas Probe Design and Construction

GP-40, GP-41 and GP-42 were constructed with 0.5-inch-diameter, Schedule 40, polyvinyl chloride (PVC), flush threaded solid and slotted (screened) casing. The screened casings (0.010-inch machine-cut slots) were installed from approximately 10 to 15 feet bgs in GP-40, 10 to 20 feet bgs in GP-41, and 10 to 25 feet bgs in GP-42. The bottom of the screened section was fitted with a threaded flat end cap.

The sand pack and bentonite seal materials were poured in the annular space around the PVC well casing. The 6/9 silica sand pack was placed from the bottom of the boring to 2 feet above the top of the well screen. After the sand pack was constructed, bentonite chips were poured into the annular space to within 2 feet of the surface. An above-ground, lockable, steel protective monument was secured with concrete at the top of the probe casing, and three steel protective posts were installed around the monument.

Probe construction information for the new LFG compliance probes is included in the boring logs provided in Attachment 1 and summarized in Table 1. In accordance with OAR 690-240-0395, monitoring well reports were submitted by the drilling contractor to the OWRD. Copies of the reports are provided in Attachment 2.

## Surveying

The groundwater monitoring wells and gas probes described in this report were surveyed on March 29, 2024 by a Washington-registered land surveyor with MacKay Sposito. The location and elevation information obtained through the survey is shown on Table 1.

## MONITORING WELL DEVELOPMENT

### Well Development

LB-22SR and LB-9SR2 were developed January 26, 29, and 30, 2024, by a combination of surging and pumping groundwater from each of the wells, until sediment and drilling fluids were removed from the well. Development activities included using a surge block, an electrical submersible pump, and a bailer. The pumping rate was generally 0.5 gallon per minute or less, since the aquifer could not sustain higher rates. LB-22SR had a very low recovery rate, and even at very low pumping rates, could not sustain flow for more than 10 minutes before drying up. Field water-quality parameters (specific conductance, pH, temperature, and turbidity) were measured and recorded on a well development field form (provided in Attachment 1). Well development was complete when water-quality parameters stabilized for at least three successive measurements and the purged water was visibly free of sediment. Total water removed during development was 278 gallons from LB-9SR2 and 20 gallons from LB-22SR.

Water levels measured in replacement wells LB-22SR and LB-9SR2 will be used for future interpretations of groundwater flow in the shallow WBZ. New LFG probes GP-40, GP-41 and GP-42 will be incorporated into the perimeter LFG probe compliance network and monitored quarterly.

Mr. Andrew Smith  
May 1, 2024  
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If you have any questions or comments regarding this letter-report, please contact Ms. Barb Lary at (971) 284-1297 or by email at blary@scsengineers.com.

Sincerely,



Brandon Rapozo, G.I.T.  
Staff Professional  
SCS Engineers



Barbara E. Lary, L.G.  
Senior Project Professional  
SCS Engineers



BARBARA E. LARY

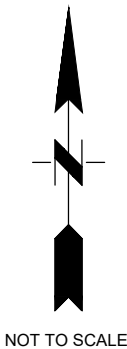
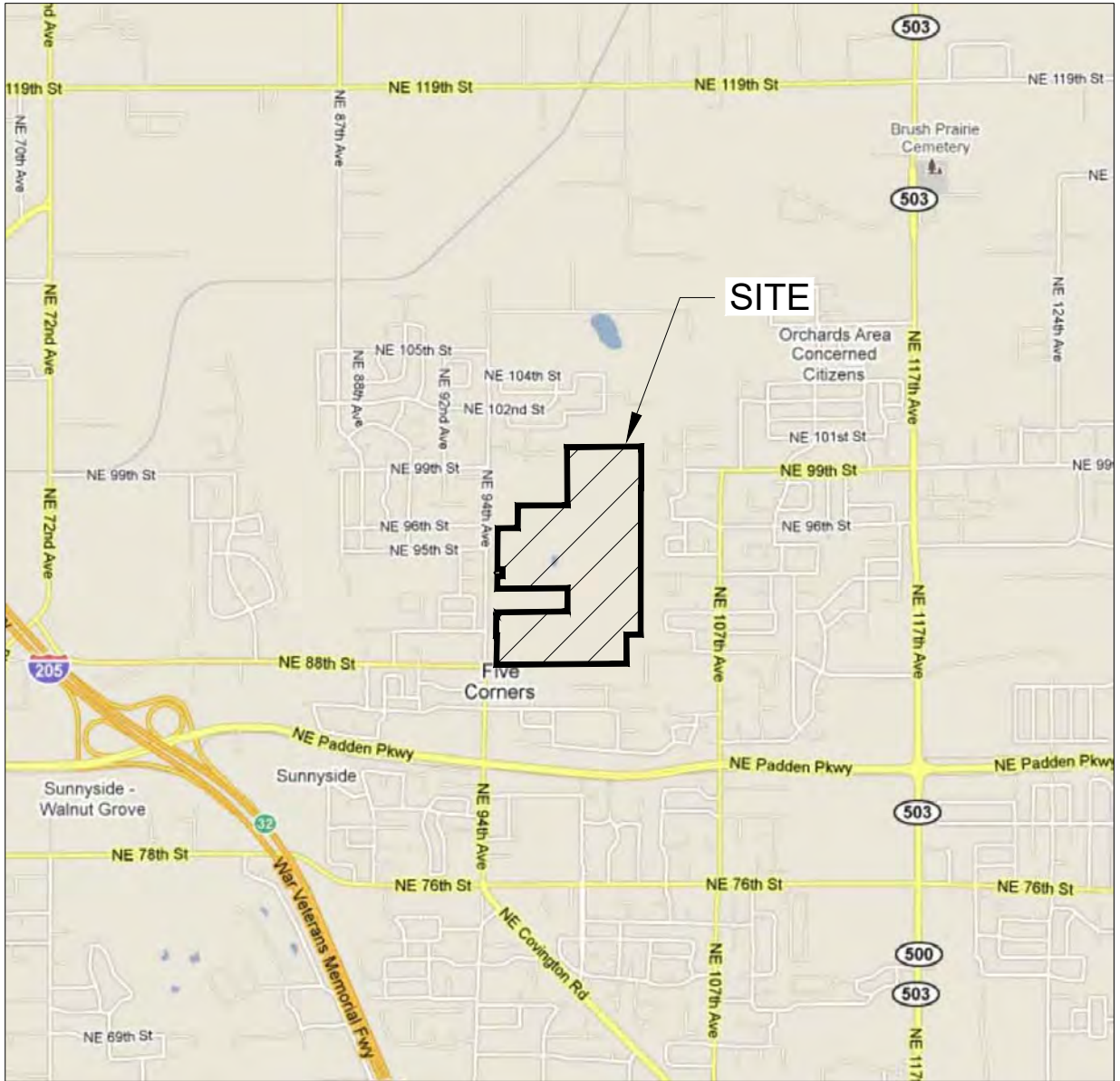


Louis Caruso, LG, LHG  
Project Director/Vice President  
SCS Engineers

cc: Danielle Gibson, Ecology  
Mike Davis and Tina Kendall, CCPH  
Alan Melnick, Joelle Loescher, Melissa Sutton, J Kimberly Walker-Norton, CCPH  
Chris Malone, City of Vancouver

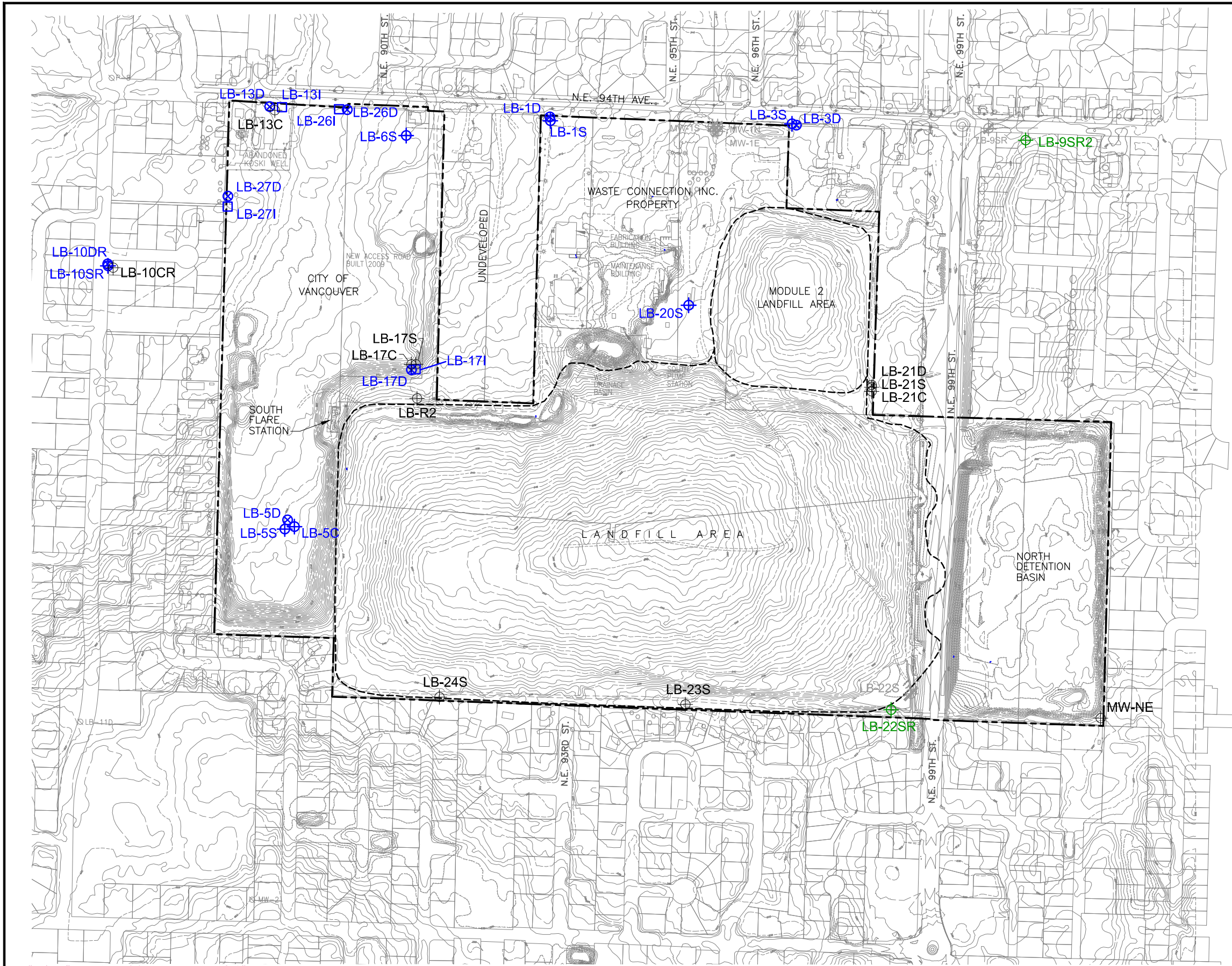
Encl: Figure 1 - Site Location Map  
Figure 2 - Groundwater Monitoring Well Location Map  
Figure 3 - Landfill Gas Probe and Extraction Well Map  
Table 1 - Monitoring Well and Gas Probe Construction Information  
Attachment 1 - Boring Logs and Well Development Forms  
Attachment 2 - Resource Protection Well Report Submitted to Ecology WRD

## FIGURES



SOURCE: GOOGLE MAPS

<b>SCS ENGINEERS</b> Environmental Consultants and Contractors 15940 S.W. 72nd Avenue Portland, Oregon 97224 (503) 639-9201 FAX: (503) 684-6948	PROJECT NO. 04224030.18	DES BY B.R.	<b>SITE LOCATION MAP</b>  LEICHER LANDFILL CLARK COUNTY, WASHINGTON	DATE MARCH 2024
	SCALE AS SHOWN	CHK BY B.L.		FIGURE 1
	CAD FILE FIGURE 1	APP BY L.C.		

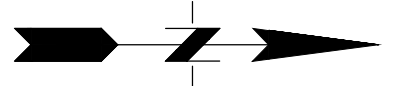


**LEGEND:**

- LB-9SR2 ⊕ New Monitoring Well Location, Alluvial Water-Bearing Zone
- LB-5S ⊕ Monitoring Well Location, Alluvial Water-Bearing Zone (Sampled Wells)
- LB-24S ⊕ Monitoring Well Location, Alluvial Water-Bearing Zone (Depth to Water Only)
- LB-5D ⊗ Monitoring Well Location, Troutdale Aquifer (Sampled Wells)
- LB-21D ⊗ Monitoring Well Location, Troutdale Aquifer (Depth to Water Only)
- LB-17I □ Monitoring Well Location, Middle of Alluvial Water-Bearing Zone (Sampled Wells)
- LB-22S # Decommissioned Monitoring Well Location
- Property Boundary
- - - - - Limit of Landfill Cover and Approximate Edge of Waste

**NOTES:**

1. Monitoring wells designated by blue color are compliance monitoring wells.
2. Topography taken from Clark County GIS, December 2023.



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PROJECT NO.	04224030.18	DES BY	B.R.
SCALE	AS SHOWN	CHK BY	B.L.
CAD FILE	FIGURE 2	APP BY	L.C.

**GROUNDWATER MONITORING WELL LOCATIONS**  
 LEICHER LANDFILL  
 VANCOUVER, WASHINGTON

DATE  
APRIL 2024  
 FIGURE  
**2**

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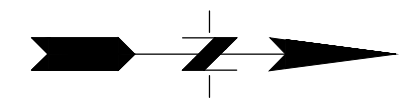


**LEGEND:**

- ⊕ GP-42 New Landfill Gas Monitoring Probe Location
- ⊕ GP-30 Compliance Landfill Gas Monitoring Probe Location
- ⊗ GP-31 Decommission Landfill Gas Monitoring Probe Location
- — — — — Property Boundary
- - - - - Limit of Landfill Cover and Approximate Edge of Waste

**NOTE:**

Topography taken from Clark County GIS, December 2023.



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PROJECT NO.	04224030.18	DES BY	B.R.
SCALE	AS SHOWN	CHK BY	B.L.
CAD FILE	FIGURE 3	APP BY	L.C.

LANDFILL GAS PROBE LOCATIONS  
 LEICHER LANDFILL  
 VANCOUVER, WASHINGTON

DATE	APRIL 2024
FIGURE	3

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## TABLE

**Table 1**  
**Monitoring Well and Gas Probe Construction Information**  
 Lechner Landfill, Vancouver, WA

Well ID	Northing	Easting	Top of Casing Elevation (feet)	Total Boring Depth (feet bgs)	Total Well Depth (feet bgs)	Well Casing Diameter (inches)	Boring Diameter (inches)	Screen Interval (feet bgs)	Stick-up PVC (inches)	Well Tag	Notes
LB-9SR2	138597.003	1110091.601	219.23	50	47.9	2	8	37.5-47.5	N/A	BPL-259	Flush monument
LB-22SR	138597.29	1110091.823	225.46	45	42.5	2	8	32-42	25	BPL-260	Above ground monument
GP-40	138089.862	1112320.414	N/A	15	15	0.5	8	10-15	29.9	BPL-261	Above ground monument
GP-41	138090.259	1112320.063	N/A	20	20	0.5	8	10-20	39	BPL-262	Above ground monument
GP-42	138090.161	1112320.075	N/A	25	25	0.5	8	10-25	30	BPL-263	Above ground monument

bgs = below ground surface

Wells were surveyed on March 29, 2024 by MacKay Sposito using horizontal datum of Washington Sate Plane, South Zone based on WSRN. Vertical Datum is Clark County Datum.

## **ATTACHMENT 1**

**Boring Logs and Well Development Forms**

15940 SW 72nd Ave,  
Portland, OR 97224

**BORING NUMBER: LB-9SR2**

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**Leichner Well Reinstallations  
Leichner Landfill  
Vancouver, WA 98662**

**JOB NUMBER: 04224030.18**

REMARKS:  
Well Tag ID: BPL-259.  
Notice of Intent No. RE25540

Depth		Sample Information					Graphic Log	Description	Completion Detail
meters	feet	Sample Location	Sample Number	Blow Counts	Recovery	USCS Soil Class.			
0	0					FILL			
1	5		1	5 5 6		SW			
2	10		2	4 6 8	10"				
3	15		3	8 8 11	10"	SP			
4	20		4	4 4 6	10"				
5	25						Harder drilling.		

STANDARD\_LOG\_LEICHNER\_04223030.19.GPJ STD\_LOG.GDT 5/3/24

Drilling Company: **Holt**  
 Drilling Method: **Hollow Stem Auger**  
 Logged By: **B. Rapozo**

Date Started: **1/3/24**  
 Date Ended: **1/3/24**  
 Boring Diameter: **8 in**  
 Well Diameter: **2 in**  
 Total Depth: **50.0 ft.**

**Leichner Well Reinstallations**

**JOB NUMBER: 04224030.18**

Depth		Sample Information					Graphic Log	Description	Completion Detail
meters	feet	Sample Location	Sample Number	Blow Counts	Recovery	USCS Soil Class.			
8	25		5	3 5 8	15.5"		SAND, fine to medium, brown to light gray, dense, dry.	<p>25</p> <p>30</p> <p>35</p> <p>40</p> <p>45</p> <p>50</p> <p>← Silica sand (12/20) (10-50lb bags used)</p> <p>← 2-inch diameter, 0.010-inch slotted Sch 40 PVC screen</p> <p>← Threaded, flat PVC end cap</p>	
9	30		6	8 10 11	15"		SAND, fine to medium, light gray, medium dense, dry. Trace fine gravel.		
11	35		7	1 5 6	18"		SAND, fine to medium, light gray, dense, moist. Encountered groundwater at approx. 36.5' and became flowing sand.		
12	40						No further sampling due to flowing sands. Added approximately 400 gallons of tap water to prevent sand heaving into the augers.		
14	45								
15	50						End of boring at 50 feet bgs. Installed groundwater monitoring well.		
16	55								

STANDARD\_LOG LEICHTNER\_04223030.18.GPJ STD\_LOG.GDT 5/3/24

15940 SW 72nd Ave,  
Portland, OR 97224

**BORING NUMBER: LB-22SR**

Page 1 of 2

**Leichner Well Reinstallations  
Leichner Landfill  
Vancouver, WA 98662**

**JOB NUMBER: 04224030.18**

REMARKS:  
Well Tag ID: BPL-260.  
Notice of Intent No. RE25539

Depth		Sample Information					Graphic Log	Description	Completion Detail
meters	feet	Sample Location	Sample Number	Blow Counts	Recovery	USCS Soil Class.			
0	0					FILL	SANDY GRAVEL, well graded, brown, loose, dry.	<p>8-inch diameter locking monument</p> <p>Concrete</p> <p>Bentonite chips, 3/8", hydrated (8-50lb bags used)</p> <p>2-inch diameter Sch 40 PVC casing</p>	
1	5		1	3 3 5	18"	SP	SAND, fine to medium, dark gray, medium dense, slightly moist.		
2	10		2	3 4 6	12"		SAND, fine to medium, gray and light brown, subangular, medium dense, slightly moist.		
3	15		3	3 3 5	13"	SW	SAND, well graded, light to dark gray, loose, moist. Encountered groundwater at approx. 15'.		
4	20		4	2 3 3	13.5"				
5	25								

STANDARD\_LOG\_LEICHNER\_04223030.19.GPJ STD\_LOG.GDT 5/3/24

Drilling Company: **Holt**  
 Drilling Method: **Hollow Stem Auger**  
 Logged By: **B. Rapozo**

Date Started: **1/4/24**  
 Date Ended: **1/8/24**  
 Boring Diameter: **8 in**  
 Well Diameter: **2 in**  
 Total Depth: **45.0 ft.**

14945 SW Sequoia Parkway, Suite 180  
Portland, OR 97224

**BORING NUMBER: LB-22SR**

Page 2 of 2

**Leichner Well Reinstallations**

**JOB NUMBER: 04224030.18**

Depth		Sample Information					Graphic Log	Description	Completion Detail
meters	feet	Sample Location	Sample Number	Blow Counts	Recovery	USCS Soil Class.			
8	25						<p>SAND, well graded, dark gray, loose, moist.</p> <p>No further sampling due to flowing sand at 28'.</p>	<p>Silica sand (12/20) (4-50lb bags used)</p> <p>2-inch diameter, 0.010-inch slotted Sch 40 PVC screen</p> <p>Threaded, flat PVC end cap</p>	
11	30								
12	40						<p>End of boring at 45 feet bgs. Installed a groundwater monitoring well.</p>		
14	45								
15	50								
16	55								

STANDARD\_LOG LEICHER\_04223030.18.GPJ STD\_LOG.GDT 5/3/24

15940 SW 72nd Ave,  
Portland, OR 97224

**BORING NUMBER: GP-40**

Page 1 of 1

**Leichner Well Reinstallations  
Leichner Landfill  
Vancouver, WA 98662**

**JOB NUMBER: 04224030.18**

REMARKS:  
Well Tag ID: BPL-261.  
Notice of Intent No. RE25539

Depth		Sample Information					Graphic Log	Description	Completion Detail
meters	feet	Sample Location	Sample Number	Blow Counts	Recovery	USCS Soil Class.			
0	0					FILL	SANDY GRAVEL, well graded, brown, loose, dry.		
1	5					SM	SILTY SAND, subangular, dark brown and gray, loose, moist.		
2	10					ML	SILT, brown to gray, moist to wet.		
4	15						Encountered dark plastic sheeting at 14.5'.		
5	20						End of boring at 15 feet bgs. Installed a gas probe.		
6	25						No samples were collected. Lithologic information was collected from soil cuttings on the auger.		

STANDARD\_LOG LEICHTNER\_04223030.18.GPJ STD\_LOG.GDT 5/3/24

Drilling Company: **Holt**  
 Drilling Method: **Hollow Stem Auger**  
 Logged By: **B. Rapozo**

Date Started: **1/5/24**  
 Date Ended: **1/8/24**  
 Boring Diameter: **8 in**  
 Well Diameter: **0.5**  
 Total Depth: **15.0 ft.**



15940 SW 72nd Ave,  
Portland, OR 97224


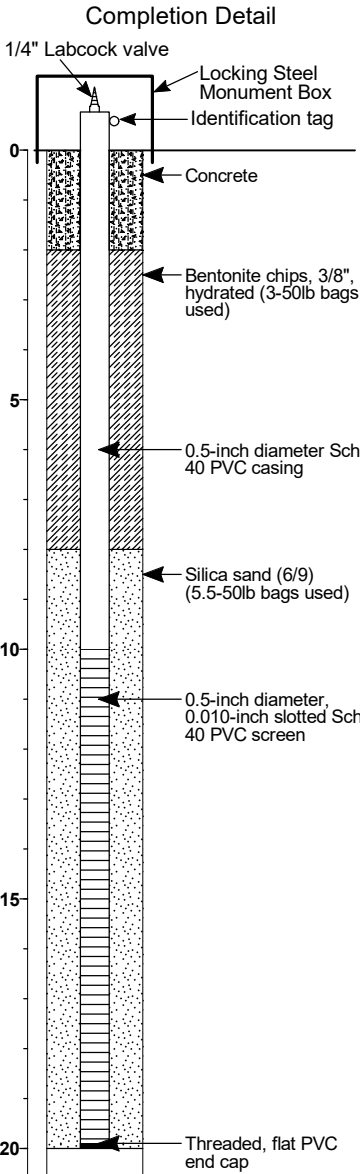










**BORING NUMBER: GP-41**

Page 1 of 1

**Leichner Well Reinstallations  
Leichner Landfill  
Vancouver, WA 98662**

**JOB NUMBER: 04224030.18**

REMARKS:  
Well Tag ID: BPL-262.  
Notice of Intent No. RE25539

Depth		Sample Information					Graphic Log	Description	Completion Detail
meters	feet	Sample Location	Sample Number	Blow Counts	Recovery	USCS Soil Class.			
0	0					FILL		SANDY GRAVEL, well graded, brown, loose, dry.	
						SM		SILTY SAND, brown to gray, moist.	
1								SILTY SAND, gray.	
5								SILTY SAND, gray.	
2								Encountered some dark plastic sheeting and a bent metal rod at 9'.	
3	10								
4									
5									
6	20							End of boring at 20 feet bgs. Installed a gas probe.	
7								No samples were collected. Lithologic information was collected from soil cuttings on auger.	
25									

STANDARD\_LOG LEICHTNER\_04223030.19.GPJ STD\_LOG.GDT 5/3/24

Drilling Company: **Holt**  
 Drilling Method: **Hollow Stem Auger**  
 Logged By: **B. Rapozo**

Date Started: **1/5/24**  
 Date Ended: **1/8/24**  
 Boring Diameter: **8 in**  
 Well Diameter: **0.5**  
 Total Depth: **20.0 ft.**

15940 SW 72nd Ave,  
Portland, OR 97224

**BORING NUMBER: GP-42**

Page 1 of 1

**Leichner Well Reinstallations  
Leichner Landfill  
Vancouver, WA 98662**

**JOB NUMBER: 04224030.18**

REMARKS:  
Well Tag ID: BPL-263  
Notice of Intent No. RE25539

Depth		Sample Information					Graphic Log	Description	Completion Detail
meters	feet	Sample Location	Sample Number	Blow Counts	Recovery	USCS Soil Class.			
0	0					FILL	SANDY GRAVEL, well graded, brown, loose, dry.		
1	5					SM	SILTY SAND, brown, moist.		
2							Driller noted hard drilling, possibly cobbles.		
3	10								
4									
5	15					SP	SAND, medium to coarse, trace silt, brown, slightly moist.		
6	20								
7									
8	25					SM	Grades to a SILTY SAND, brown, loose, dry.		
9	30						End of boring at 25 feet bgs. Installed a gas probe.  No samples were collected. Lithologic information was collected from soil cuttings on auger.		

STANDARD\_LOG LEICHTNER\_04223030.19.GPJ STD\_LOG.GDT 5/3/24

Drilling Company: **Holt**  
 Drilling Method: **Hollow Stem Auger**  
 Logged By: **B. Rapozo**

Date Started: **1/5/24**  
 Date Ended: **1/8/24**  
 Boring Diameter: **8 in**  
 Well Diameter: **0.5**  
 Total Depth: **25.0 ft.**

# SCS ENGINEERS

## Field Report Form

Page 1 of 1

Client:		Weather:	
Project: Lechner Landfill 04223030.19		42°F cloudy	
Event: Well development		Date: 1-26-24	
Prepared By: J. MALK	Address: Vancouver, WA	Arrival: 700	Departure: <del>10</del> 1510
- Left from apartment straight for site.			
- Met Brandon there to go over purging well 22SR			
- Started purging well @ <del>1130</del> 800 at a rate of 1 Gallon a minute.			
- Well wasn't pumping water consistently so called Ian.			
- Left for Lowes at 1015			
- Returned to 22SR with valve parts but after talking with Barb moved to well 9SR2 @ 1130			
- Started purging 9SR2 @ 1220 at a rate of 0.5 G/min.			
- Took water level reading every 10 min to make sure water didn't drop too fast.			
- Water pumped out from 1220 - 1500 ~ 75 G			
- Left site @ 1510			
- Got to office, unpacked, and left at 1645			

Signed: J. Malk

# SCS ENGINEERS

## Field Report Form

Client:		Weather: 42° F cloudy	
Project: Leithner Landfill 04223030.19		Date: 1-29-24	
Event: Well development		Arrival: 730	
Prepared By: J Mack	Address: Vancouver, WA	Departure: 1610	

- Got to office and started loading up
- Departed for Leithner @ 645
- Arrived at well 9SR2 and set up equipment
- Took a DTW and resumed purging @ 810
- Had to leave after conversation with Barb @ 830
- Picked up Surge pump with Barb @ 1300
- Returned to 9SR2 and started pumping @ 1344
- Pumped well until 1600 and then packed up
- Left at 1610

Signed: 

# SCS ENGINEERS

## Field Report Form

Page 1 of 1

Client:		Weather:
Project: Lechner Landfill 04223030.19		46°F cloudy
Event: well development		Date: 1/30/24
Prepared By: J. Mack	Address: Vancouver Battle Ground, WA	Arrival: 715
		Departure: 1545
- Arrived at 9SR2 at 0715		
- Checked water level then setup pump		
- Pumped for an hour and a half at 0.56/45 sec		
- Bailed 10 case volumes		
- Switched back to pump and after started to record parameters and		
- <del>was</del> necessary Packed up and left for 22 at 1230		
- Started surging at 1300 for one hour		
- Took out one case volume with disposable bailer		
- Started pumping at 1445 but noticed water dropping quickly so I stopped it		
- After talking with Ian and Barb I pumped it dry and departed at 1545		

Signed:



# SCS ENGINEERS

## Field Report Form

0422 3030.19

Page 1 of 1

Client:		Weather:	
Project: Lechner Landfill		55°f Sunny	
Event: Well development		Date: 2/1/24	
Prepared By: J. Mack	Address: Vancouver Burrton Road, WA		Arrival: 1040
			Departure: 1305
- Calibrated YSI at office at 0910			
- Packed up truck and departed for Lechner			
- Arrived at 22 SR# at 1040			
- Took water level and TD			
- Surged for 15 min then set up pump			
- Started pumping at ~ 300 mL / 30 sec			
- Pumped for 25 min before water pressure decreased in tubes.			
- Dewatered well and then packed up.			
- Took final DTW and departed at 1305			

Signed: John Mack

Field Calibration Log  
SCS Engineers

Equipment:			Serial Number:		Field Staff:				
Pro Quattro			23C106864		JMack				
Location/ Project Number	Date	Time	Temperature (°C)	Dissolved Oxygen (mg/L)	pH 4.0 Buffer (S.U.)	pH 7.0 Buffer (S.U.)	Conductivity 1413 µS/cm standard (µS/cm)	ORP 220 mV standard (mV)	
Lechner	1-26-24	0800	11.9	10.82	4.0	7.0	1413	220	
Lechner	<del>1-29-24</del> 1-30-24	0808	<del>11.8</del> 11.7	10.47	4.0	7.0	1413	220	
Notes: 760.6 mm Hg - 1-26-24									
<del>1-29-24</del> ; 1-30-24 755.7 mmHg									

245

# WELL DEVELOPMENT FORM

## SCS ENGINEERS

15940 SW 72nd Ave, Portland, OR 97224  
Ph: (503) 639-9201, Fax: (503) 684-6948

Client:	Date: 1-26-24 1-29-24
Project #: 0422303019	Well ID: 9SR2
Site Name: Lechner Landfill	Initial DTW: 29.85 Final DTW: 30.05
Site Location: <del>Butte Grand</del> <sup>vancouver</sup> <del>WA</del> <sup>WA</sup>	Initial DTB: 48.04 Final DTB: 48.09
Development Method: surge block, DC pump	Casing Diameter: 2-inch
Total Water Removed: 278 G	Casing Volume: 2.97
Water Contained?	WL Meter #: 200606
Field Personnel: J. Mack	

Time	Cumulative Gallons Removed	pH (SU)	Temperature (degrees C)	Specific Conductivity (us/cm)	Dissolved Oxygen (mg/L)	DTW TOC ft-bgs	Turbidity (NTU)	Comments
1145	245	6.54	14.8	385.7	5.97	34.08		
1149	248	6.60	14.6	273.2	6.72	34.17		
1152	251	6.71	14.4	394	7.24	34.20		
1155	254	6.66	14.5	378.2	6.90	34.19	141	
1159	260	6.70	14.7	374.4	7.11	34.29		
1203	263	6.67	14.5	375	6.83	34.42	120	
1207	266	6.66	14.3	279.5	6.81	34.61	110	
1211	269	6.70	14.2	398.4	6.57	34.60	91.4	
1215	272	6.74	14.0	371.1	6.90	34.70	86.8	
1219	275	6.64	14.1	364	6.57	34.47	77.9	
1223	278	6.68	13.9	372.1	6.56	34.21	65.4	

Development - please pump out 5 to 10 casing volumes as needed to "clean" out well.  
2 inch well conversion = 0.167 gal/ft.

Signed: 



# WELL DEVELOPMENT FORM

## SCS ENGINEERS

15940 SW 72nd Ave, Portland, OR 97224  
 Ph: (503) 639-9201, Fax: (503) 684-6948

Client:	Date: <u>2-1-24</u> & <u>1-30-24</u>		
Project #: <u>04223030.19</u>	Well ID: <u>22SR</u>		
Site Name: <u>Lechner Landfill</u>	Initial DTW: <u>20.58</u>	Final DTW: <u>31.80</u>	
Site Location: <u>Battle Ground near VANCOUVER WA</u>	Initial DTB: <u>40.65</u>	Final DTB: <u>42.52</u>	
Development Method: <u>Surge block, DC pump</u>	Casing Diameter: <u>2-inch</u>		
Total Water Removed: <u>20 G</u>	Casing Volume: <u>3.22</u>		
Water Contained?	WL Meter #: <u>200606</u>		
Field Personnel: <u>J. Mack</u>			

Time	Cumulative Gallons Removed	pH (SU)	Temperature (degrees C)	Specific Conductivity (us/cm)	Dissolved Oxygen (mg/L)	DTW TOC ft-bgs	Turbidity (NTU)	Comments
<u>12:10</u>	<u>20</u>	<u>6.70</u>	<u>16.5</u>	<u>362.1</u>	<u>4.52</u>	<u>31.80</u>	<u>NT</u>	<u>water too dark for Turbidity</u>

Development - please pump out 5 to 10 casing volumes as needed to "clean" out well.  
 2 inch well conversion = 0.167 gal/ft.

Signed: 

## **ATTACHMENT 2**

**Resource Protection Well Report Submitted to Ecology WRD**

# Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

**Type of Work:**

- Construction  
 Decommission ⇒ Original NOI No. \_\_\_\_\_

Ecology Well ID Tag No. BPL 259

Site Well Name 9S

Consulting Firm SCS

Was a variance approved for this well/boring?  Yes  No

If yes, what was the variance for? \_\_\_\_\_

**WELL CONSTRUCTION CERTIFICATION:** I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

Driller  Trainee  Engineer

Name (Print Last, First Name) SMITH PAUL

Driller/Engineer/Trainee Signature [Signature]

License No. 2984

Company Name HOLT

If trainee box is checked, sponsor's license number: \_\_\_\_\_

Sponsor's signature \_\_\_\_\_

Notice of Intent No. RE 25540

**Type of Well:**

- Resource Protection Well  Injection Point  
 Remediation Well  Grounding Well  
 Geotechnical Soil Boring  Ground Source Heat Pump  
 Environmental Boring  Other \_\_\_\_\_

↳  Soil-  Vapor-  Water-sampling

Property Owner CLACK COUNTY

Well Street Address ROW AT END OF NE 100<sup>th</sup> WAY

City VAWCOUVE County CLACK

Tax Parcel No. ROW IN SAGEWALK

Location (see instructions): WWM  or EWM

SW 1/4-1/4 SW 1/4, Section 37 Town 3N Range 3E

Latitude (Example: 47.12345) 45.69427

Longitude (Example: -120.12345) -122.57557

(WGS 84 Coordinate System)

Borehole diameter 8 inches Casing diameter 2 inches

Static water level 20' ft below top of casing Date 1/3/24

Above-ground completion with bollards  Flush monument

↳ Stick-up of top of well casing \_\_\_\_\_ ft above ground surface

Start Date 1/3/24 Completed Date 1/5/24

Construction Design	Well Data	Driller's Log
	<p>0-1' CONCRETE            1'-32' BENTONITE            CHIPS            32'-50' SILICA SAND            12/20</p>	<p>0-6" CONCRETE            6"-1' GRAVEL            1-50' SILT/SAND            COBBLES</p>

# Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

**Type of Work:**

- Construction  
 Decommission ⇒ Original NOI No. \_\_\_\_\_

Ecology Well ID Tag No. BPL 260

Site Well Name LB22SR

Consulting Firm SCS

Was a variance approved for this well/boring?  Yes  No

If yes, what was the variance for? \_\_\_\_\_

**WELL CONSTRUCTION CERTIFICATION:** I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

Driller  Trainee  Engineer  
 Name (Print Last, First Name) Smith Paul  
 Driller/Engineer/Trainee Signature [Signature]  
 License No. 2984  
 Company Name HOLT

If trainee box is checked, sponsor's license number: \_\_\_\_\_  
 Sponsor's signature \_\_\_\_\_

Notice of Intent No. 25539

**Type of Well:**

- Resource Protection Well  Injection Point  
 Remediation Well  Grounding Well  
 Geotechnical Soil Boring  Ground Source Heat Pump  
 Environmental Boring  Other \_\_\_\_\_  
 ↳  Soil-  Vapor-  Water-sampling

Property Owner CLALLAM COUNTY

Well Street Address NE 99th ST & NE 105th AVE

City VAN Couver County CLALLAM

Tax Parcel No. \_\_\_\_\_

Location (see instructions): WWM  or EWM

NE 1/4-1/4 NE 1/4, Section 59 Town 2W Range 2E

Latitude (Example: 47.12345) 45.69205

Longitude (Example: -120.12345) -122.56670

(WGS 84 Coordinate System)

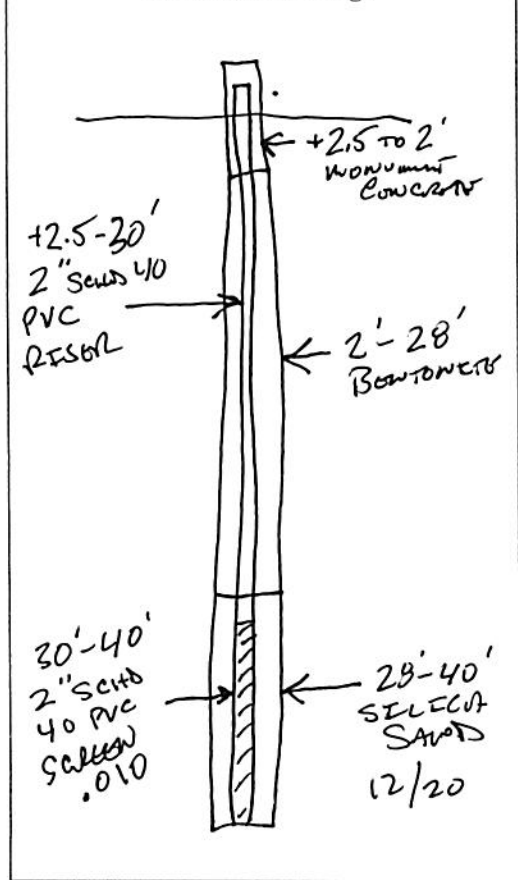
Borehole diameter 8 inches Casing diameter 2 inches

Static water level 21 ft below top of casing Date \_\_\_\_\_

Above-ground completion with bollards  Flush monument

↳ Stick-up of top of well casing 2.5 ft above ground surface

Start Date 1/4/24 Completed Date 1/5/24

Construction Design	Well Data	Driller's Log
	<p>0-2' MONUMENT CONCRETE</p> <p>2'-28' BENTONITE CHIPS</p> <p>28'-40' SILICA SAND 12/20</p>	<p>0-5' GRAVEL</p> <p>5'-40' SILT SAND</p>

# Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

**Type of Work:**

- Construction  
 Decommission ⇒ Original NOI No. \_\_\_\_\_

Ecology Well ID Tag No. BPL 261

Site Well Name GP40

Consulting Firm SCS

Was a variance approved for this well/boring?  Yes  No

If yes, what was the variance for? \_\_\_\_\_

**WELL CONSTRUCTION CERTIFICATION:** I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

Driller  Trainee  Engineer  
 Name (Print Last, First Name) SMITH PAUL  
 Driller/Engineer/Trainee Signature [Signature]  
 License No. 2984  
 Company Name Holt

If trainee box is checked, sponsor's license number: \_\_\_\_\_

Sponsor's signature \_\_\_\_\_

Notice of Intent No. 25539

**Type of Well:**

- Resource Protection Well  Injection Point  
 Remediation Well  Grounding Well  
 Geotechnical Soil Boring  Ground Source Heat Pump  
 Environmental Boring  Other \_\_\_\_\_

↳  Soil-  Vapor-  Water-sampling

Property Owner CLARK COUNTY

Well Street Address NE 99<sup>th</sup> ST & NE 105<sup>th</sup> AVE

City VANCOUVER County CLARK

Tax Parcel No. 6000

Location (see instructions): WWM  or EWM

NE 1/4-1/4 NE 1/4, Section 59 Town 2N Range 2E

Latitude (Example: 47.12345) 45.69310

Longitude (Example: -120.12345) -122.56767

(WGS 84 Coordinate System)

Borehole diameter 8 inches Casing diameter 1/2 inches

Static water level \_\_\_\_\_ ft below top of casing Date \_\_\_\_\_

Above-ground completion with bollards  Flush monument

↳ Stick-up of top of well casing 2 ft above ground surface

Start Date 1/5/24 Completed Date 1/5/24

Construction Design	Well Data	Driller's Log
	<p>0-2' CONCRETE MONUMENT                  2'-8' BENTONITE                  8'-15' SILICA SAND 6/9</p>	<p>0-6" GRAVEL                  6"-15' SILT/SAND</p>

# Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

**Type of Work:**

- Construction  
 Decommission  $\Rightarrow$  Original NOI No. \_\_\_\_\_

Ecology Well ID Tag No. 39L 262

Site Well Name GP41

Consulting Firm SCS

Was a variance approved for this well/boring?  Yes  No

If yes, what was the variance for? \_\_\_\_\_

**WELL CONSTRUCTION CERTIFICATION:** I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

Driller  Trainee  Engineer  
 Name (Print Last, First Name) SMITH PAUL  
 Driller/Engineer/Trainee Signature [Signature]  
 License No. 2984  
 Company Name Holt

If trainee box is checked, sponsor's license number: \_\_\_\_\_  
 Sponsor's signature \_\_\_\_\_

Notice of Intent No. 25539

**Type of Well:**

- Resource Protection Well  Injection Point  
 Remediation Well  Grounding Well  
 Geotechnical Soil Boring  Ground Source Heat Pump  
 Environmental Boring  Other \_\_\_\_\_

$\hookrightarrow$   Soil-  Vapor-  Water-sampling  
 Property Owner CLARK COUNTY

Well Street Address NE 99<sup>th</sup> ST & NE 105<sup>th</sup> AVE

City VANCOUVER County CLARK

Tax Parcel No. 6000

Location (see instructions): WWM  or EWM

NE 1/4-1/4 NE 1/4, Section 59 Town 2N Range 2E

Latitude (Example: 47.12345) \_\_\_\_\_

Longitude (Example: -120.12345) \_\_\_\_\_

(WGS 84 Coordinate System)

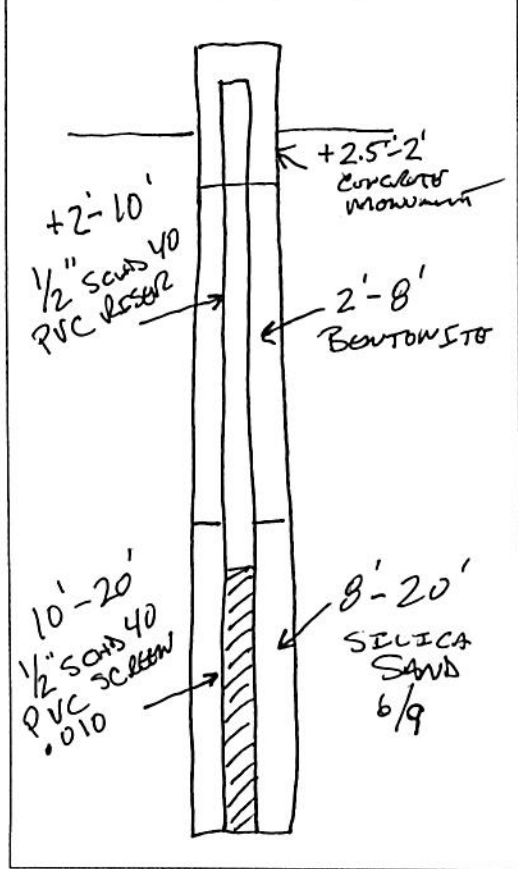
Borehole diameter 8 inches Casing diameter 1/2" inches

Static water level \_\_\_\_\_ ft below top of casing Date \_\_\_\_\_

Above-ground completion with bollards  Flush monument

$\hookrightarrow$  Stick-up of top of well casing 2 ft above ground surface

Start Date 1/5/24 Completed Date 1/5/24

Construction Design	Well Data	Driller's Log
	<p>0-2' CONCRETE MONUMENT                  2'-8' BENTONITE                  8'-20' SILICA SAND 6/9</p>	<p>0-5' GRAVEL                  5'-20' SILT/SAND</p>

# Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

**Type of Work:**

- Construction  
 Decommission ⇒ Original NOI No. \_\_\_\_\_

Ecology Well ID Tag No. BPL 263

Site Well Name GP42

Consulting Firm SCS

Was a variance approved for this well/boring?  Yes  No

If yes, what was the variance for? \_\_\_\_\_

**WELL CONSTRUCTION CERTIFICATION:** I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

Driller  Trainee  Engineer  
 Name (Print Last, First Name) SMITH PAUL  
 Driller/Engineer/Trainee Signature [Signature]  
 License No. 2984  
 Company Name Holt

If trainee box is checked, sponsor's license number: \_\_\_\_\_  
 Sponsor's signature \_\_\_\_\_

Notice of Intent No. 25539

**Type of Well:**

- Resource Protection Well  Injection Point  
 Remediation Well  Grounding Well  
 Geotechnical Soil Boring  Ground Source Heat Pump  
 Environmental Boring  Other \_\_\_\_\_

↳  Soil-  Vapor-  Water-sampling

Property Owner CLARK COUNTY

Well Street Address NE 99<sup>th</sup> ST & NE 105<sup>th</sup> AVE

City VANCOUVER County CLARK

Tax Parcel No. 6000

Location (see instructions): WWM  or EWM

NE 1/4-1/4 NE 1/4, Section 59 Town 2N Range 2E

Latitude (Example: 47.12345) 45.69309

Longitude (Example: -120.12345) -122.57122

(WGS 84 Coordinate System)

Borehole diameter 8 inches Casing diameter 1/2 inches

Static water level \_\_\_\_\_ ft below top of casing Date \_\_\_\_\_

Above-ground completion with bollards  Flush monument

↳ Stick-up of top of well casing 2 ft above ground surface

Start Date 1/5/24 Completed Date 1/5/24

Construction Design	Well Data	Driller's Log
	<p>0-2' CONCRETE &amp; MONUMENT                  2'-8' BENTONITE                  8'-25' SILICA SAND                  6/9</p>	<p>0-25' SILT/SAND</p>