Figure A-8

LOCATION See Figure 2 DATUM 394.02 ft. MSL

DATE 3/25/86

Page 2 of 4

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

	SOIL PROFILE		SA	MPL	ES		STANDARD PENETRATION TEST
ELEVN. DEPTH	DESCRIPTION	USCS SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	WATER CONTENT, PERCENT WP Wn W1 20 40 60 80  PIEZOMETER INST.
	For lithology, see log of boring P-1					40 = 40 = 50 = 65	Pea gravel  1" Schedule 40 flush threaded PVC casing  Bentonite slurry

REMARKS:

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL

Figure A-8

LOCATION See Figure 2 DATUM 394.02 ft. MSL

DATE 3/25/86

Page 3 of 4

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

	SOIL PROFILE		SAI	MPL	ES		STANDARD PENETRATION TEST
LEVN EPTH	DESCRIPTION	USCS SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	WATER CONTENT, PERCENT WP Wn WI 20 40 60 80  PIEZOMETE INST.
	For lithology, see log of boring P-1	n				75 - - 75 - - 80 - - 90 - - 95 - - 100	Bentonite slurry  1" Schedule 40 flush threaded PVC casing

VERTICAL SCALE 1 IN. TO 5 FT.

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VASHON LANDFILL

Figure A-8

LOCATION See Figure 2

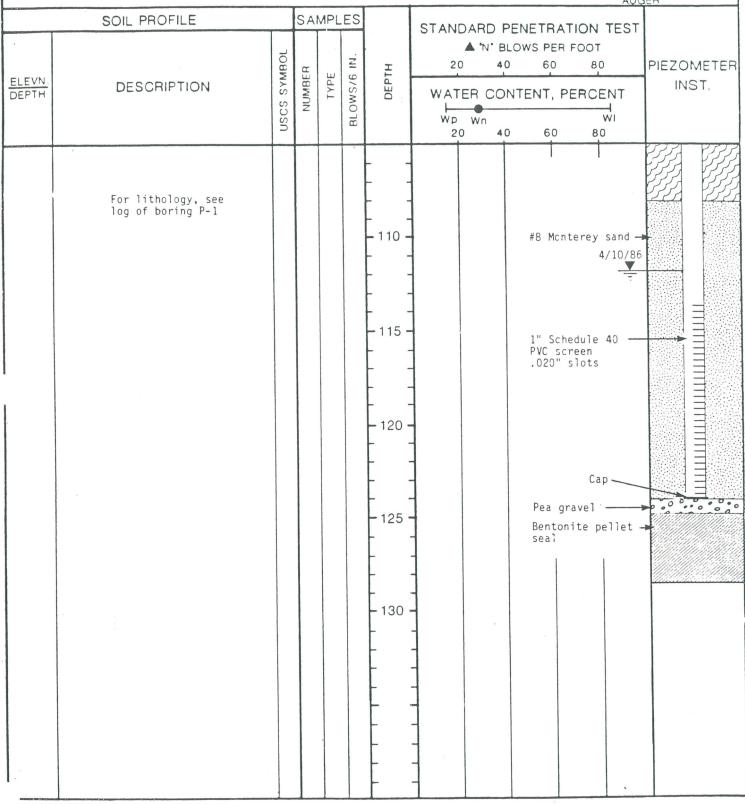
DATUM 394.02 ft. MSL

DATE 3/25/86

Page 4 of 4

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM



REMARKS:

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL

Figure A-9

LOCATION See Figure 2

DATUM 393.08 ft. MSL

DATE 3/29/86

Page 1 of 4

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

	SOIL PROFILE		SA	MPL	ES		STANDARD PENETRATION TEST
LEVN	DESCRIPTION	USCS SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	WATER CONTENT, PERCENT  WP Wn 20 40 60 80  PIEZOMETE  INST.
	For lithology, see log of boring P-1					5 -	6" Locking steel surface casing Cement grout  Pea gravel
						- 15	1" Schedule 40 flush threaded PVC casing  Bentonite slurry
						- 25	

VERTICAL SCALE
1 IN. TO 5 FT.

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VASHON LANDFILL

Figure A-9

Page 2 of 4

LOCATION See Figure 2 DATUM 393.08 ft. MSL

DATE 3/29/86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

7.65	SOIL PROFILE		SAI	MPL	ES		STANDARD PENETRATION TEST
ELEVN DEPTH	DESCRIPTION	USCS SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	WATER CONTENT, PERCENT WP Wn 20 40 60 80  PIEZOMETER INST.
	For lithology, see log of boring P-1					- 40 - 45 - 60 - 65 - 65	1" Schedule 40 flush threaded PVC casing  Bentonite slurry

REMARKS:

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL

Figure A-9

Page 3 of 4

VASHON LANDFILL

JOB# 853-1047/30

LOCATION See Figure 2

VERTICAL SCALE

1 IN. TO 5 FT.

DATUM 393.08 ft. MSL

DATE 3/29/86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

	SOIL PROFILE		SA	MPL	ES		STANDARD PENETRATION TEST	
×		SYMBOL	ER	E	5 IN.	TH	▲ 'N' BLOWS PER FOOT 20 40 60 80	PIEZOMETE
PTH	DESCRIPTION	USCS SY	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	WATER CONTENT, PERCENT	INST.
		Sn			В		20 40 60 80	
-	For lithology, see log of boring P-1					  - 75 -	Bentonite	
						- 80 <b>-</b>	slurry	
						- 85 - 	1" Schedule 40 - flush threaded PVC casing	
						- 90 ·	10x20 Silica — sand	
						-100	1" Schedule 40 PVC screen .020" slots  4/10/86	
	· ·					-	Pea gravel —	0000

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Figure A-9

Page 4 of 4

LOCATION See Figure 2

DATUM 393.08 ft. MSL

DATE 3/29/86

BORING METHOD - HOLLOW STEM SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. SAMPLES SOIL PROFILE STANDARD PENETRATION TEST ▲ 'N' BLOWS PER FOOT USCS SYMBOL ż PIEZOMETER 20 40 60 BLOWS/6 ELEVN. INST. DESCRIPTION WATER CONTENT, PERCENT DEPTH ŴΙ Wp Wn 60 80 20 40 Bentonite peilet seal For lithology, see log of boring P-1 - 110

RE	M	AF	RK	S	:
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Figure A-10
Page 1 of 4

LOCATION See Figure 2

DATUM 373.73 ft. MSL

DATE 3-19-86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

	SOIL PROFILE	_	SAI	MPL	ES		STANDARD PENETRATION TEST
LEVN EPTH	DESCRIPTION	USCS SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	WATER CONTENT, PERCENT WP Wn 20 40 60 80 PIEZOMETER INST.
0.0	Dense to very dense, grayish- brown, silty, gravelly, fine coarse SAND (Till)	GM SM	1	DO	33 22 19		6" Locking steel surface casing  Bentonite/ cement grout  3/4" PVC gas monitoring probe  Pea gravel
			2	DO	36 50 4	- 10 -	
			3	DO	50/6	_ 15	
			4	DO	50	20	
			5	DO	50	- 25	1.25" Schedule 40 flush threaded PVC
341.2				5 D(	50	30	casing
32.5		3 1/	SP	7 0	3 5 9	6	

REMARKS: DO = Drive Open

VERTICAL SCALE
1 IN. TO 5 FT.

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VASHON LANDFILL

Figure A-10 Page 2 of 4

LOCATION See Figure 2 DATUM 373.73 ft. MSL

DATE 3-19-86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

	SOIL PROFILE		SAN	<b>JPL</b>	ES		STANDARD PENETRATION TEST
ELEVN DEPTH	DESCRIPTION	USCS SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	WATER CONTENT, PERCENT WP Wn WI 20 40 60 80  PIEZOMETER INST.
	Very dense, grayish-brown, fine to coarse SAND, trace to little GRAVEL and SILT (Proglacial sand)	SP	8	DO	50/6"		Pea gravel
			9	DO	50 6"	- 45 <b>-</b>	
			10	DO	50 6	- - 50	1.25" Schedule 40 flush threaded PVC casing
			11	DO	50/6	- - 55	
			12	DO	31 50 3	60	
			13	DO	50	65	
			14	- DC	50	3 -	

REMARKS:

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL

Figure **A-10**Page 3 of 4

VASHON LANDFILL

JOB# 853-1047.08

LOCATION See Figure 2

VERTICAL SCALE

1 IN. TO 5 FT.

DATUM 373.73 ft. MSL

DATE 3-19-86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD- HOLLOW STEM

SOIL PROFILE SAMPLES STANDARD PENETRATION TEST ▲ 'N' BLOWS PER FOOT SYMBOL Z 40 60 PIEZOMETER 20 80 BLOWS/6 ELEVN INST. DESCRIPTION WATER CONTENT, PERCENT DEPTH USCS WI Wp Wn 20 40 60 80 SP 00. 0 0 301.7 Pea gravel 72.5 Very dense, medium to coarse SAND 34 SP 75 15 DO 50 50 80 16 DO 0 1.25" Schedule 40 flush threaded PVC casing 50 85 DO 17 00. 28 90 50 18 DO 282.7 Bentonite pellet seal 91.0 Very hard, dark gray, SILT, little to trace fine sand, (Upper lacustrine silt) 34 50 19 DO 4 21 10/86 95 20 DO 30 43 275.7 #8 Aqua sand 98.0 Very hard, dark grayish brown, sandy SILT, (Upper lacustrine silt) SM 100 50 21 DO 1.25" Schedule 40 PVC screen 0.020" 270.7 slots 103.0 Very dense, dark gray, fine to medium silty SAND REMARKS:

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' Figure **A-10**Page **4** of 4

LOCATION See Figure 2

DATUM 373.73 ft. MSL

DATE 3-19-86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD-HOLLOW STEM

	SOIL PROFILE		SA	MPL	ES		STANDARD PENETRATION TEST
		_					▲ 'N' BLOWS PER FOOT
		SYMBOL	Œ	tat	Z	H	. 20 40 60 80 PIEZOMETER
DEPTH	DESCRIPTION	SYA	NUMBER	TYPE	9/SMO	ОЕРТН	WATER CONTENT, PERCENT INST.
DEFIN		uscs	S S		NOT		
		ns			BL		Wp Wn WI 20 40 60 80
	Variable and fine to	-	22	DO	33		
	Very dense, dark gray, fine to medium silty SAND	SM			50		#8 Aqua sand
	Ì						
						-	1.25" Schedule 40 ===================================
			23	DO	25 50 4	-110 -	slot size ►
			1	-	4'	-	
261.2		4/				-	
112.5	Very hard, grayish brown, SILT, iittle to trace fine sand (Lower	//					Cap
	lacustrine silt)	ML	-	-	40	-115-	
			24	DO	50		Pea gravel
						-	Bentonite pellet
•	·					-	seal seal
1	Grades to silty fine SAND (Lower lacastrine silt)				29	-	
			25	DO	- 29 39	120	<b>j</b>
				+	50/3	"[	
						-	_
					47	-	
247.7			2	5 DC	750	125	<b>†</b>
126.0		+	+	+	1	1	
	End of hole at 126.0 feet						]
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		÷				-	
						-	4
						-	1
						-	1
							]
						_	
-						-	4
	ARKS:						

REMARKS:

VERTICAL SCALE 1 IN. TO 5 FT.

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VASHON LANDFILL

Figure A-11

Page 1 of 3

LOCATION See Figure 2

DATUM 373.6 ft. MSL DATE 3/24/86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

	SOIL PROFILE		SAI	MPL	ES		STANDARD PENETRATION TEST
ELEVN.	DESCRIPTION	USCS SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	WATER CONTENT, PERCENT WP Wn 20 40 60 80 PIEZOMETER INST.
	For lithology, see log of boring P-2					10 - 15 - 20 - 25 - 30	Bentonite slurry

REMARKS:

VERTICAL SCALE 1 IN. TO 5 FT.

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VASHON LANDFILL

Figure A-11

Page 2 of 3

LOCATION See Figure 2 DATUM 373.6 ft. MSL

DATE 3/24/86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD - HOLLOW STEM

	SOIL PROFILE		SAI	MPL	ES		STANDARD PENETRATION TEST
ELEVN. DEPTH	DESCRIPTION	S SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	ОЕРТН	20 40 60 80 PIEZOMETER WATER CONTENT, PERCENT
		nscs			BLC		Wp Wn WI 20 40 60 80
	For lithology, see log of boring P-2					- 40 -	Bentonite slurry
						- 45 · - - - - 50	2" Schedule 40 flush threaded PVC casing
						<b>-</b> 55	
						65	

REMARKS:

VERTICAL SCALE 1 IN. TO 5 FT.

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VASHON LANDFILL

Figure A-11

Page 3 of 3

LOCATION See Figure 2 DATUM 373.6 ft. MSL

DATE 3/24/86

BORING METHOD - HOLLOW STEM

ED HAMMED WEIGHT 140 I B DDOD 30 IN

SAN	MPLER HAMMER WEIGHT 140	LB.,	DRC	OP 3	30 1	N.	BORING METHOD - HOLLOW STEM
	SOIL PROFILE		SA	MPL	ES		STANDARD PENETRATION TEST
		ا ي					▲ 'N' BLOWS PER FOOT
		MBC	EB	ш	NI 9	DEPTH	20 40 60 80 PIEZOMETE
DEPTH	DESCRIPTION	USCS SYMBOL	NUMBER	TYPE	BLOWS/6 IN.	DEF	WATER CONTENT, PERCENT INST.
		SCS	Z		BLO		Wp Wn WI
		1-	_				20 40 60 80
						-	
	For lithology son					-	
	For lithology, see log of boring P-2		-				
						- 75 -	
						-	
						- 80 -	1
						-	1
	ı						
						85	#8 Aqua sand ——
						-	
							4/10/86
						-	
						90	2" Schedule 40 PVC screen
						-	.020 slots
	,						Pea gravel
				1		-	Bentonite pellet seal
			1			95	
						-	1   1   1   1
							]
						-	4
						100	
						-	1
							]
	ARKS:						

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL





REPORT TO HARPER OWES

RESULTS OF GEOTECHNICAL INVESTIGATION
PROPOSED SURFACE DRAINAGE DESIGN
VASHON LANDFILL PROJECT

#### Distribution:

5 copies - Harper Owes Seattle, Washington

3 copies - Golder Associates Redmond (Seattle), Washington

June 1986

853-1047.2

## TABLE 1: TEST PIT LOGS

STRATUM
Medium dense brown Sandy SILT, some
Gravel, some Cobbles, little trasm
debris (FILL) Dense brown Silty Sand, some Gravel
(FILL) Misc. TRASH, wood, plastic, fabric,
sawdust, etc. (GARBAGE)
No seepage on 3/31/86
No seepage on 3/31/00
STRATUM
Medium dense brown Sandy SILT, some
Gravel (TILL) Medium dense orange-brown Sandy SILT,
POOTS (WEATHERED TILL)
Very dense brown Silty SAND, some Gravel (TILL)
seepage at -5.5 feet on 3/31/86
STRATUM
Medium dense orange brown Silty SAND,
some Gravel, occasional roots
Vary dance grey brown Silty SAND, some
Gravel, little Cobbles (TILL)
No seepage on 3/31/86
STRATUM
Medium dense reddish brown Silty SAND, some Gravel (WEATHERED TILL)
. Leave Cilty Sand Boile
Gravel, little Cobbles, a 24" boulder encountered (TILL)
Seepage at -2.5 feet and -4.5 feet on
3/31/86

```
TABLE 1: TEST PIT LOGS (Continued)
TEST PIT TP-5
DEPTH
····
(FT)
0 TO 1 Medium dense orange brown Silty SAND,
                  some Gravel (WEATHERED TILL)
                 Very dense grey brown Silty SAND, some Gravel, sandy zones at -7.5' and -8.5'
1 TO 9.5
                  (TILL)
                 Seepage at -7.5 feet on 3/31/86
TEST PIT TP-6
 DEPTH
                               STRATUM
 W.R.C. #1.
                Medium dense grey brown Silty fine to
                  coarse SAND, little to some Gravel,
 0 to 3
                  little to some Trash (FILL AND TRASH)
                  Misc. TRASH, wood, plastic, fabric, sawdust, rubber tires, etc. (GARBAGE)
 3 to 7.5
                  No seepage on 3/31/86
 TEST PIT TP-7
  DEPTH
                                 STRATUM
                 Medium dense grey brown Silty fine to
                   coarse SAND, little to some Gravel,
  0 to 3
                    little to some Trash (FILL AND TRASH)
                   Misc. TRASH, wood, plastic, fabric, sawdust, rubber tires, etc. (GARBAGE)
  3 to 9
                   No seepage on 3/31/86
  TEST PIT TP-8
   DEPTH
                                  STRATUM
   ......
                  Medium dense orange brown Sandy SILT,
                    little Gravel, some organics (FILL)
   0 to 1
                   Medium dense orange brown Silty SAND,
                    some Gravel, little Cobbles (WEATHERED
   1 to 4.5
                     TILL)
                    Very dense grey brown Gravelly SAND,
                    some cobbles, little Silt (SANDY
   4.5 to 11
                     TILL)
```

No seepage on 3/31/86

## TABLE 2 - MAND PROBE

	P - E P		 H	-																					_																					
	FT	)						_	_													T																		•	•					
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## TABLE 2 - HAND PROBE (CONTINUED) HP-6 . . . . . . . . . DEPTH STRATUM VIII 0 to 1 Light grey SAND, little silt 1 to 4 Orange brown Silty SAND, little gravel (DENSE SAND) HP - 7 DEPTH STRATUM ..... O to 4 Brown f/m SAND, little to some Gravel, trace SILT, metal debris fragment at -4: (RECENT ALLUVIUM) HP - 8 . . . . . . . . . DEPTH STRATUM OINDING. 0 to 2 Brown Gravelly f/c SAND, trace Cobbles (RECENT ALLUVIUM) NP - 9 . . . . . . . . DEPTH STRATUM O to 4 Brown f/c SAND, little Gravel, trace Silt (RECENT ALLUVIUM) HP-10

STRATUM

0 to 3 Brown Gravelly f/c SAND (RECENT ALLUVIUM)

DEPTH



REPORT TO HARPER OWES

# SUPPLEMENTARY GEOTECHNICAL INVESTIGATION FOR VASHON LANDFILL CLOSURE AND EXPANSION DESIGN

#### Distribution:

1 copy - Harper Owes

Seattle, Washington

5 copies - Golder Associates

Seattle (Redmond), Washington

October 1987

873-1174

#### TABLE 1 TEST PIT LOGS\*

1	
0 to 1.5 ft	Loose, brown-gray, silty SAND, little gravel (FILL)
1.5 to 3.0 ft	Soft, brown, organic SILT, little sand, roots, and grass (TOPSOIL/ORGINAL GROUND SURFACE)
3.0 to 7.5 ft	Compact to dense, gray-brown to gray, massive, silty, fine to medium SAND, little to trace gravel; becomes sandier with depth to medium SAND, little to trace
	silt and gravel, moist (TILL)
	Test pit was terminated at 7.5 ft depth. No water was encountered in the test pit.
2	
0 to 0.5 ft	Loose, brown, fine to medium SAND, little gravel
0.5 to 7.5 ft	Loose, dark brown to gray, silty SAND, little garbage to GARBAGE in layers
	Test pit was terminated at 7.5 ft depth. No water was encountered in the test pit.
<u>3</u>	
0 to 1.5 ft	Loose, brown, fine sandy SILT, little trace gravel
1.5 to 5.0 ft	Dense, gray, silty, fine to medium SAND, trace gravel (TILL)
	Test pit was terminated at 5.0 ft depth. No water was encountered in the test pit.

<sup>\*</sup> Test pits were excavated and logged on February 25 and 26, 1987. Test locations are shown in Figure 1.

O to 0.5 ft Loose, gray, silty, fine SAND (FILL)

0.5 to 2.5 ft GARBAGE

Test pit was terminated at 2.5 ft depth. No water was encountered in the test pit.

5

0 to 2.0 ft Loose, brown, silty, fine SAND (FILL)

2.0 to 6.0 ft GARBAGE with silty, fine sand

Test pit was terminated at 6.0 ft depth. No water was encountered in the test pit.

<u>6</u>

O to 0.5 ft Loose, brown, fine to medium SAND, little to trace roots

0.5 to 6.0 ft Compact, brown, weakly bedded, fine to medium SAND, trace gravel

Test pit was terminated at  $6.0\ \text{ft}$  depth. No water was encountered in the test pit.

7

O to 3.0 ft Loose, brown-gray, silty fine SAND, little to trace gravel (FILL)

3.0 to 5.5 ft GARBAGE

Test pit was terminated at  $5.5\ \text{ft}$  depth. No water was encountered in the test pit.

8
0 to 1.5 ft Loose, brown, sandy GRAVEL (ROAD FILL)
1.5 to 6.0 ft Loose to compact, gray, fine, sandy SILT, little to trace gravel (WEATHERED TILL)
6.0 to 9.5 ft Dense, brown, massive, fine, sandy SILT, little to trace gravel (TILL)

Test pit was terminated at 9.5 ft depth. No water was encountered in the test pit.

10
0 to 1.5 ft Compact, brown, silty, fine to medium SAND (FILL)
1.5 to 3.5 ft Very dense, brown, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 3.5 ft depth. No water was encountered in the test pit.

O to 1.0 ft Loose, gray, fine sandy SILT, little to trace gravel (FILL)

1.0 to 3.0 ft

GARBAGE

Test pit was terminated at 3.0 ft depth. No water was encountered in the test pit. Dense to very dense till was encountered in the far western edge of the test pit.

13

O to 5.5 ft Loose to compact, brown, fine sandy SILT, little gravel and garbage (FILL)

5.5 to 8.5 ft Loose to compact, dark brown, fine sandy SILT, little roots and organics (FOREST TOPSOIL)

8.5 to 9.0 ft Very dense, light brown, fine to medium sandy SILT, little gravel (TILL)

Test pit was terminated at  $9.0\ \text{ft}$  depth. No water was encountered in the test pit.

14

O to 3.0 ft

Loose to compact, brown-gray, fine to medium sandy SILT, little gravel (FILL)

3.0 to 6.5 ft Loose, dark brown, fine sandy SILT, little large roots and organics (FOREST TOPSOIL)

Test pit was terminated at 6.5 ft depth. Water was encountered in the test pit at 6.0 ft depth.

O to 4.5 ft Compact, brown, massive, silty, fine to medium SAND, little gravel (TILL)

4.5 to 5.0 ft Very dense, brown, massive, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 5.0 ft depth. No water was encountered in the test pit.

16

O to 3.0 ft Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

3.0 to 9.5 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 9.5 ft depth. No water was encountered in the test pit.

<u>17</u>

O to 3.0 ft Loose to compact, brown, fine sandy SILT, little gravel and debris/garbage (FILL)

3.0 to 4.0 ft Loose, dark brown, silty, organic SAND, many roots (TOPSOIL)

4.0 to 6.5 ft Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

6.5 to 9.5 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel, moist below 9.2 ft (TILL)

Test pit was terminated at 9.5 ft depth. No water was encountered in the test pit.

<u>18</u>	
0 to 5.0 ft	Loose to compact, brown, massive, fine to medium sandy SILT, little gravel and debris/garbage (FILL)
5.0 to 6.0 ft	Loose, dark brown, organic, silty SAND, many large roots (FOREST TOPSOIL)
6.0 to 9.0 ft	Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)
9.0 to 10.7 ft	Very dense, gray, fissile, silty, fine to medium SAND, little gravel (TILL)
	Test pit was terminated at 10.7 ft depth. No water was encountered in the test pit.
<u>19</u>	
0 to 0.2 ft	Loose, dark brown, organic, silty SAND (TOPSOIL)
0.2 to 4.0 ft	Compact to dense, brown, massive, silty, fine to

4.0 to 8.0 ft

Very dense, gray, fissile, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 8.0 ft depth. No water was encountered in the test pit.

TILL)

medium SAND, little gravel, trace roots (WEATHERED

20

O to 1.0 ft

Loose, brown, silty, fine SAND, little gravel (FILL)

1.0 to 4.0 ft

Loose, dark brown, fine sandy SILT, little roots and organics (TOPSOIL)

4.0 to 6.0 ft

Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

6.0 to 9.5 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 9.5 ft depth. No water was encountered in the test pit.

2	٦
4	1

0 to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

O.5 to 5.0 ft Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

5.0 to 9.5 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 9.5 ft depth. No water was encountered in the test pit.

22

O to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

O.5 to 2.0 ft Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

2.0 to 8.5 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 8.5 ft depth. No water was encountered in the test pit.

23

O to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

O.5 to 3.0 ft Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

3.0 to 8.0 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel to fine to medium SAND, little silt and gravel (TILL)

Test pit was terminated at 9.5 ft depth. No water was rencountered in the test pit.

0 to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

O.5 to 2.5 ft Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

2.5 to 9.0 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 9.0 ft depth. No water was encountered in the test pit.

25

O to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

O.5 to 2.5 ft Compact to dense, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

2.5 to 3.5 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 3.5 ft depth. No water was encountered in the test pit.

26

O to 2.0 ft Compact, brown, massive, silty, fine to medium SAND, little gravel, trace roots (WEATHERED TILL)

2.0 to 7.5 ft

Dense to very dense, gray, fissile, silty, fine to medium SAND, little gravel to fine to medium SAND, little gravel and silt (TILL)

Test pit was terminated at 9.5 ft depth. No water was encountered in the test pit.

O to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

0.5 to 4.5 ft Compact to dense, fine to medium SAND, little silt and gravel (TILL)

Test pit was terminated at 5.5 ft depth. No water was encountered in the test pit.

28

0 to 3.0 ft Compact, brown, fine SAND, little silt (FILL)

3.0 to 9.0 ft Dense, gray, massive, fine to medium SAND, little silt and gravel (TILL)

Test pit was terminated at 9.0 ft depth. No water was encountered in the test pit.

29

O to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

O.5 to 2.0 ft Compact to dense, brown, massive, silty, fine to medium sand, little gravel, trace roots (WEATHERED TILL)

2.0 to 6.0 Very dense, gray, fissile, fine to medium SAND, little silt and gravel to silty, fine to medium SAND, little gravel (TILL)

Test pit was terminated at 6.0 ft depth. No water was encountered in the test pit.

O to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

O.5 to 1.5 ft Compact to dense, brown, massive, silty, fine to medium sand, little gravel, trace roots (WEATHERED TILL)

1.5 to 5.0 ft Very dense, gray, fissile, silty, fine to medium SAND, little gravel, occassional boulders >18 inches (TILL)

Test pit was terminated at 5.0 ft depth. No water was encountered in the test pit.

31

O to 1.0 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

1.0 to 2.0 ft Compact to dense, brown, massive, silty, fine to medium sand, little gravel, trace roots (WEATHERED TILL)

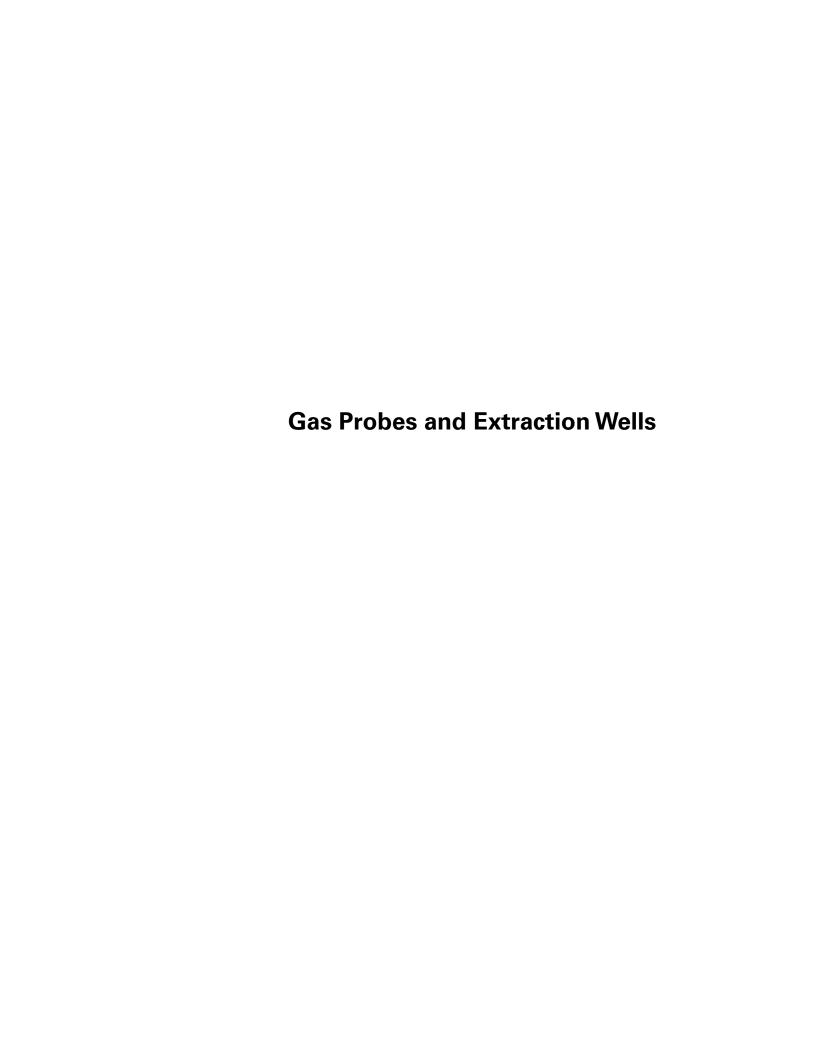
Test pit was terminated at 4.0 ft depth. No water was encountered in the test pit.

<u>32</u>

O to 0.5 ft Loose, dark brown, organic, silty SAND (TOPSOIL)

O.5 to 2.0 ft Compact to dense, brown, massive, silty, fine to medium sand, little gravel, trace roots (WEATHERED TILL)

Test pit was terminated at 6.0 ft depth. No water was encountered in the test pit.



		Δsı	)ec	King C	Count	ty Va	shon Isl	and Landfi Specific Location	II - 09	0057	Monitoring \ Coordinates (SPN NAD83 ft)	Well Log Exploration Nun	nhor
	8	CON	SULTIN	■   G				th of main gate			E:1227778 N:163363 (est)	VTP-1	
		Conti	actor		iipment			Sampling Metho	d		Ground Surface (GS) Elev.	VIP-I	ט
	Но	olt Serv Ope	rices, Inc	Rotar Exploration	y drill ri		14	Rotary core Vork Start/Completion			NA (est)  Top of Casing Elev.	Depth to Water (Bei	low CCI
		Da			onic	J(S)	V	8/3/2016	i Dales		NA (est)	No Water Encou	
De (fe	epth E	lev.	Exploration	on Completion d Notes	Sample Type/ID	Samp	nalytical le Number & lb Test(s)	Field Tests	Material Type		Description	110 11000	Depth (ft)
			Valv	ved hose barb									
	2+												2
	1+												+-1 0
	0 +		Con	crete surface seal									0 1
	2 +							PID= 0.0		Overdril samples	led section of VTP-1S to 10' by collected. Installed VTP-1D	ogs, no soil at same location.	_ 2
	3 +												- 3
	4 +		3/4-	inch SCH 40 PVC I ft bgs				PID= 0.0					+ 4
	5 +		0-31	1 ft bgs	S1			DID- 0.0					- 5
	6 +		3/8-	inch Bentonite chip kfill 2-30 ft bgs				PID= 0.0					- 6
	7 +		Daci	Killi 2-30 it bgs									<b>-</b> 7
	8 +							PID= 0.0					- 8
	9 +	X	XXX										- 9
2016	0+				$\blacksquare$						Vashon Till/A Unit		-10
ember 26,	1+							PID= 0.0		(SM); fir	nse, slightly moist, brown, gra ne to medium sand, fine to co diamict fabric, no odor.	avelly, silty SAND arse subrounded	-11
GPJ Sept	2+		$\stackrel{\wedge}{\otimes}$							g. a s.,	, , , , , , , , , , , , , , , , , , , ,		-12
ND LATER	3	X						PID= 0.0					13
ST 2016 A	4												-14
ON_AUGU	5				S2			PID= 0.0					-15
IKC VASH	6		XX										-16
ROJECTS	7							PID= 0.0					-17
1/GINTW/F	8												-18
APLATE F	9+	X											<del>-</del> 19
1 LOG TEN	20+	X	XXX										-20
LORATION	21+	X			S3								-21
DARD EXP	Г	Legen	<b>d</b> ntinuous	core 7"			No Wate	r Encountered	114 (* 14 )		oration Log Key for on of symbols	Explorati	
ASPECT STANDARD EXPLORATION LOG TEMPLATE PYGINTW/PROJECTSIKC VASHON AUGUST 2016 AND LATER.GPJ September 26, 2016	Method					Water				Logged to Approve	by: MML	log VTP-1D Sheet 1 of	

	Λ.	nost	King C	ount	y Vash	on Isl	and Landf	ill - 09	90057	Mon	itoring V	Vell Log	
	X./;	pect		,			Specific Location			Coordinates (SP	,	Exploration Nu	
		nTSULTING ontractor	Fau	ipment	vasnon isia	and, Nor	th of main gate Sampling Metho	nd		E:1227778 N:1 Ground Surface		VTP-1	D
		ervices, Inc		/ drill rig	,		Rotary core			NA (e			
		perator	Exploration	_		И	/ork Start/Completio			Top of Casir		Depth to Water (B	elow GS)
	[	Dave		onic			8/3/2016			NA (e	st)	No Water Enco	untered
Depti (feet	Elev. (feet)	Exploration C and No		Sample Type/ID	Analyti Sample Nu Lab Tes	mber &	Field Tests	Material Type		Des	scription		Depth (ft)
ASPECT STANDARD EXPLORATION LOG TEMPLATE P./GINITW/PROJECTSIKC VASHON, AUGUST 2016 AND LATER. GpJ September 26, 2016  Sample  Sample  ASPECT STANDARD EXPLORATION LOG TEMPLATE P./GINITW/PROJECTSIKC VASHON, AUGUST 2016 AND LATER. GpJ September 26, 2016  Sample  Sa		Gravel fit bgs 3/4-inch SCH 40	ilter pack 30-34 0.020 slot screen ft bgs	S4 S3	Lab Tes	nto)	PID= 0.0  PID= 0.0  PID= 0.0  PID= 0.0		(SP-SM subroun odor Moist, b subangu medium	Vashon Advar moist to moist, br); trace silt, trace ded gravel, pred rown SAND (SP); ular to subrounder sand, no odor	rown, slightly fine subanguominantly me; trace silt, trad gravel, pres	silty SAND ular to edium sand, no ace fine	-23 -24 -25 -26 -27 -28 -29 -31 -32 -33 -34 -35 -36 -37 -38 -39 -40 -41 -42 -43 -44 -45 -46
ASPECT STANDARD I		Continuous co	re 7"		Water Level	No Wate	r Encountered				or	Explorat log VTP-1I Sheet 2 of	D



# SOIL BORING AND MONITORING PROBE CONSTRUCTION RECORD

Probe / Boring ID VTP1S

Total depth: 23'

Sheet 1 of 2

Project name: Vashon LF
Project number: 09-04304-000

Client: KCSWD Location: 123' N and 12' W of EF-2 West side of landfill

HEC rep.: Bruce Carpenter
Installation Date: 04/30/2013

Drilling Contractor: Cascade

Drilling method: GeoProbe

Sampling method: 5' sampler w/ liner

Air monitoring (y/n): Y

Instrument(s): GEM

0₂ 20.9 sample 85 7  8  9  ✓ Static water level 8.9' 5/1/2013  #2/12 sand filter pack, 10'-15'  CH₄ 0 5-ft 11  CO₂ 0 core 0₂ 20.8 sample 12  100  13  14  15  (Second boring drilled to 15'	GEM (% volume)	Sample Type, Interval	% Recovery	Depth (feet, BGS)	Soil Group	Water Level (feet)	Soil Description	Probe / Boring Detail		
Concrete seal.   O'.12   O'.12   O'.13   O'.14   O'.15   O'.				3			stickup 2.7'	_		
1				2						
CH <sub>4</sub> 0 5-ft 1 Light brown - tan silty   SAND, damp (till)   CD <sub>2</sub> 0 core   SM   gravelly, SAND, damp (till)   CD <sub>3</sub> 0 core   SM   gravelly, SAND, damp (till)   CD <sub>4</sub> 0 5-ft   SM   Grayish brown, damp   CD <sub>4</sub> 0 5-ft   SM   Static water level 8.9' 5/1/2013   CD <sub>4</sub> 0 5-ft   SM   Static water level 8.9' 5/1/2013   CD <sub>4</sub> 0 5-ft   SM   STATIC water level 8.9' 5/1/2013   CD <sub>4</sub> 0 5-ft   SM   STATIC water level 8.9' 5/1/2013   CD <sub>4</sub> 0 5-ft   SM   STATIC water level 8.9' 5/1/2013   CD <sub>4</sub> 0 5-ft   SM   STATIC water level 8.9' 5/1/2013   CD <sub>4</sub> 0 5-ft   SM   SM   SM   SM   SM   SM   SM   S				11				0'-1'		
CH <sub>4</sub> 0 5-ft   SM   SM   gravelly, SAND, damp (till)   SM   Grayish brown, tan sitty gravelly sample   SO   Sampl				0			Cycoo /Toposil down	_		
CO2 0   core   SM   gravelly, SAND, damp (till)   wet @ 2' (water perched near top of till)	CH. O	5-ft		<u>-</u>						
0 2 20.8 sample 80 2   wet @ 2' (water perched near top of till)	CO, 0				SM					
Hydrated bentonite chips.   CH4 0 5-ft 6   Grayish brown, damp   CH4 0 5-ft 6   Grayish brown, damp   CH4 0 5-ft 6   Static water level 8.9' 5/1/2013   #2/12 sand filter pack, 10'-15'   CH4 0 5-ft 11   CH4 0 5-ft 12   CH4 0 5-ft 14   CH4 0 5-ft 15   CH4 0 5-ft 16   CH4 0 5-ft 16   CH4 0 5-ft 17   CH4 0 5-ft 18   CH4 0 5-ft 19   CH	0,20.8	sample	80	2						
CH <sub>4</sub> 0				3						
CH <sub>4</sub> 0				<u>-</u>						
CH <sub>4</sub> 0 5-ft 6 CO <sub>2</sub> 0 core O <sub>2</sub> 20.9 sample 85 7										
CH <sub>4</sub> 0 5-ft				5			Cycyrials bysource downs			
CO2 0 core O2 20.9 sample 85 7 8 8	CH, O	5-ft		6			Grayish brown, damp	-		
Static water level 8.9' 5/1/2013   #2/12 sand filter pack, 10'-15'	$CO_2$ 0	core								
9	0 <sub>2</sub> 20.9	sample	85	7				_		
10				8						
CH <sub>4</sub> 0 5-ft 11						- V	Static water level 8.9' 5/1/2013	_		
CH <sub>4</sub> 0 5-ft 11				10				#2/12 sand		
CO <sub>2</sub> 0   Core   CO <sub>2</sub> 20.8   Sample   12     3/4-inch dia.   Schedule 40   PVC 10 -slot   prepacked   Screen   12.5'-15'   15   (Second boring drilled to 15'   and probe constructed)   PVC endcap   PVC endcap								filter pack,		
02 20.8 sample       12         100       13         14       PVC 10 -slot prepacked screen 12.5'-15'         15       (Second boring drilled to 15' and probe constructed)         CH4 0 5-ft CO2 0 core 100 02 21.0 sample       17         Bentonite       Bentonite         19 SM Grayish-brown silty gravelly SAND, damp (till)				11				10-15		
13   Schedule 40   PVC 10 - slot   prepacked   screen   12.5'-15'     Second boring drilled to 15'   and probe constructed)   PVC endcap-   PVC endcap-   Bentonite   18   SAND, damp (till)	0,20.8			12						
14  14  15  CH <sub>4</sub> 0 5-ft 16 (Second boring drilled to 15' and probe constructed)  PVC endcap  SAND, damp (till)			100					l '		
Screen 12.5'-15'  15  CH <sub>4</sub> 0 5-ft 16 and probe constructed)  CO <sub>2</sub> 0 core 100  O <sub>2</sub> 21.0 sample 17  19 SM Grayish-brown silty gravelly SAND, damp (till)				13				PVC 10 -slot		
CH <sub>4</sub> 0 5-ft 16 (Second boring drilled to 15' and probe constructed)  CO <sub>2</sub> 0 core 100  O <sub>2</sub> 21.0 sample 17  Bentonite—  19 SM Grayish-brown silty gravelly SAND, damp (till)				14				screen		
CH <sub>4</sub> 0 5-ft 16 and probe constructed)  CO <sub>2</sub> 0 core 100  O <sub>2</sub> 21.0 sample 17  Bentonite—  19 SM Grayish-brown silty gravelly SAND, damp (till)				15				12.5'-15'		
CH <sub>4</sub> 0 5-ft 16 and probe constructed)  PVC endcap  O <sub>2</sub> 21.0 sample 17  Bentonite  19 SM Grayish-brown silty gravelly SAND, damp (till)							(Second boring drilled to 15'			
0 <sub>2</sub> 21.0 sample 17  18  19 SM Grayish-brown silty gravelly SAND, damp (till)	CH₄ 0		100	16				PVC endcap-		
18  19 SM Grayish-brown silty gravelly SAND, damp (till)  Bentonite— Bentonit	υυ <sub>2</sub> 0 0 21 0			17						
19 SM Grayish-brown silty gravelly SAND, damp (till)	<b>□</b> <sub>2</sub> ∠⊥.0	sample		Τ1				Bentonite-		
SAND, damp (till)				18						
SAND, damp (till)				19	SM		Grayish-brown silty gravelly			
									<b>\</b> ////////////////////////////////////	



#### SOIL BORING AND MONITORING PROBE CONSTRUCTION RECORD

Probe / Boring	ID VTP1S
Total depth:	
Sheet 2 of	

MERKERA	Oncot
Project name: _ Vashon LF	Drilling Contractor: Cascade
Project number:	Drilling method: <u>GeoProbe</u>
Client: KCSWD	Sampling method: <u>5' core w/ liner</u>
ocation: 123' N and 12' W of EF-23 West side of landfill	Air monitoring (y/n): Y
HEC rep.: Bruce Carpenter	Instrument(s): GEM
nstallation Date: 04/30/2013	., -

GEM (% volume)	Sample Type, Interval	% Recovery	Depth (feet, BGS)	Soil Group	Water Level (feet)	Soil Description	Probe / Boring Detail
CH <sub>4</sub> 0 CO <sub>2</sub> 0 O <sub>2</sub> 21	3-ft core sample	100	21				
			23			Probe unable to penetrate beyond 23'	
						Pressure grouted (with first boring) with bentonite slurry, left two 5' sections of pipe and cutting shoe in hole.	
						Soil vapors were measured in bore hole using GEM 2000 gas analyzer.	



# SOIL BORING AND MONITORING PROBE CONSTRUCTION RECORD

Probe / Boring ID VTP2D

Total depth: 25'

Sheet 1 of 2

Project name: vasion LF
Project number: <u>09-04304-000</u>
Client: KCSWD
Location: South side LF (50' E and 100' S of condensate trap)

Drilling Contractor: Cascade

Drilling method: GeoProbe

Sampling method: 5' core w/ liner

Air monitoring (y/n): Y

Instrument(s): GEM

HEC rep.: Bruce Carpenter
Installation Date: 04/30/2013

GEM (% volume)	Sample Type, Interval	% Recovery	Depth (feet, BGS)	Soil Group	Water Level (feet)	Soil Description	Pro	Probe / Boring Detail		
	<u> </u>		4			Stickup 3.5'				
			3							
			2				Concrete seal,			
			1				0'-1'	<b>N</b>		
	†							355		
	1		0			Grass/Topsoil, damp				
			1			Brown silty SAND, tr, gravel, damp				
CH <sub>4</sub> 0	5-ft		2	SM						
$CO_2^{\dagger}$ 0	core					Brown gravelly silty SAND, damp				
U <sub>2</sub> 21	sample	80	3			dense	Hydrated-			
	<del> </del>		4				bentonite chips,			
			-			Geotextile liner Brown sandy	0'-15'			
		. – – – –	5	GW		GRAVEL, tr, silt, damp				
	+		6			Gray gravelly, sandy SILT,				
CH₄ 0	5-ft					tr, clay, damp				
CO <sub>2</sub> 0			7	ML						
U <sub>2</sub> 21	sample	60								
	+		8			Gray, gravelly silty SAND				
			9	SM		tr, clay, damp				
			10							
			11							
CH₄ 0	- E 4+									
$CO_2$ 0	5-ft core	60	12							
0, 21	sample	. – – – –	13							
			14							
			15							
	<u> </u>						#2/12 sand			
CH₄ 0	5-ft		16				filter pack, 15'-25'	\		
$CO_2$ 0	core	70	17				10-20			
0, 21	sample			SM		Gray silty SAND, damp-wet, fuel odor	1			
	1		18							
		1		1	1		I	1 1 L		



Installation Date: 04/30/2013

# SOIL BORING AND MONITORING PROBE CONSTRUCTION RECORD

Probe / Boring ID VTP2D
Total depth: 25'
Sheet 2 of 2

Project name: Vashon LF	_ Drilling Contractor: <u>Ca</u>
Project number:09-04304-000	_ Drilling method: <u>Geol</u>
Client: KCSWD	_ Sampling method: <u>5'</u>
Location: South side LF (50' E and 100' S of condensate trap)	Air monitoring (y/n):
HEC rep.: Bruce Carpenter	Instrument(s): GEM

Orilling Contractor: Cascade
Orilling method: GeoProbe
Sampling method: 5' core w/ liner
Air monitoring (y/n): Y

GEM (% volume)	Sample Type, Interval	% Recovery	Depth (feet, BGS)	Soil Group	Water Level (feet)	Soil Description	Probe / Boring Detail
	+		20	MSW		Refuse, shredded paper, cloth, fiberglass, plastic, damp-wet	#2/12 sand filter pack, 15'-25'
$\begin{array}{ccc} H_4 & 0 \\ 0_2 & 0 \\ 0_2 & 21 \end{array}$	5-ft core sample	50	21		7	Static water level 21.92' 5/1/2013	3/4-inch dia. schedule 40 PVC 10 - slot prepacked
			24			Silty SAND mixed with refuse, sawdust, plastic, fiberglass, damp	screen 21.5'-24'
			<u>25</u>			Soil vapors were measured in borehole using GEM 2000 gas analyzer.	PVC endcap
	+						



# SOIL BORING AND MONITORING PROBE CONSTRUCTION RECORD

Project name: _	Vashon LF	
	09-04304-000	
,		

Drilling Contractor: <u>Cascade</u>
Drilling method: <u>GeoProbe</u>

Client: KCSWD

Sampling method: <u>5' core w/ liner</u>

Location: South side LF (50' E and 100' S of condensate trap)
HEC rep.: Bruce Carpenter

Air monitoring (y/n): Y
Instrument(s): GEM

Installation Date: 04/30/2013

GEM (% volume)	Sample Type, Interval	% Recovery	Depth (feet, BGS)	Soil Group	Water Level (feet)	Soil Description	Prol	pe / Boring Detail
		. – – – –	3					
			2			Stickup 3'	Concrete seal, $7$	
			1					
			0			Grass/Topsoil, damp	Hydrated ¬	775
		. – – – –	1			Brown silty SAND, tr, gravel, damp	bentonite chips, 0'-4'	<b>&gt;</b>
CH <sub>4</sub> 0	5-ft						0-4	
CO <sub>2</sub> 0	core		2	SM		Donor donor the city CAND donor		
0 <sub>2</sub> 21	sample	80	3			Brown gravelly silty SAND, damp dense		
		- 50				delise		
			4				#2/12 sand	
						Geotextile liner, Brown sandy	filter pack, 4'-7'	
-			5	GW		GRAVEL, tr, silt, damp	_	
CH₄ O	3-ft	. – – – –	6			Gray gravelly, sandy SILT,	3/4-inch dia. ¬ schedule 40	
$CO_2^4$ 0	core					tr, clay, damp	PVC 10 -slot	
	sample	60	7	ML			prepacked	
						Soil vapors were measured in borehole	screen 4.5'-7'	
			8			using GEM 2000 gas analyzer.	4.5-1	
			9				PVC endcap~	
							-	
			10					
		. – – – –	11					
							_	
			12					
			42				_	
			13				-	
			14					
							-	
			15					
			16					
			17					
			18					
			19					
							-	
Last Modified: 0			20					

1	<b>As</b>	pect	Tang C	Journe	y Vashon Is Project Address & Site	Specific Location	03	,0001	Monitoring Coordinates (SPN NAD83 ft)	Exploration Nui	mber
	CON	SULTING		Vas	hon Island, East s		ре		E:1228037 N:162717	1 '	
	Con	tractor	Equ	iipment		Sampling Metho	od		Ground Surface (GS) Elev. (NAVD88	VTP-3	
Н	lolt Ser	rvices, Inc	Rotar	y drill rig		Rotary core	9		361.58'	Ecology Well T BJX-258	ag
	Ор	erator	Exploration	on Method(	(s)	Work Start/Completion Dates			Top of Casing Elev. (NAVD88)	Depth to Water (Below G	
	P	ete	S	onic		8/5/2016 to 8/8/	2016		365.08'	No Water Enco	unte
epth eet)	Elev. (feet)	Exploration C and No		Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type		Description		
	364	Valved	hose barb								
-2 -	-										+
,	363										1
-1 -	362										
0 -	- 552	d ka		H			11 11 1		FILL		$\dashv$
	361	Concret	te surface seal					Dry to s	lightly moist, brown, slightly g	ravelly SAND	
1 -	- (							gravel, t	ace silt, fine to medium sand, race organics (root mass, gra	iss)	t
2 -	360					DID- 0.0					+
	359					PID= 0.0					
3 -	- 🕃										†
4 -	358 ×	3/4-inch	n SCH 40 PVC						ile fabric at 4 ft bgs		
	357	0-36 ft t	bgs			PID= 0.0		Moist, g	ray brown, gravelly, silty SAN sand, fine to coarse subrour	D (SM); fine to ded gravel, rare	
5 -	- 🗟			S S				organics	s (roots, twigs).	<b>3</b> · · · · ·	ł
6 -	356 🔀	3/8 inch	n Bentonite chip								
٥	355	backfill	2-34 ft bgs			PID= 0.0					
7 -	- 🛚 🔀										+
_	354										
8 -	~ ×					PID= 0.0					Ť
9 -	<sup>353</sup> ×										+
	352										
10-	- 🖹							]			t
11-	351 ×										-
	350							]			
12-	- 🔀					PID= 0.0					+
13-	349 😞							Some b	rown mottling at 12.5 ft bgs		-
	348										
14-	- 🔀					PID= 0.0		6-inch ro	ounded cobble		+
15-	347			S2							
15	346							Moist a	LANDFILL DEBRIS ray to black, gravelly, sandy f		
16-	- ×					PID= 0.0		paper, g	lass, metal wires, textiles, pla	estic	+
,	345										
17-	344										t
18-	- 🏋 🔀					PID= 0.0		}			+
	343							}			
19-	- (×					PID= 0.0		}			t
20 -	342 ×										+
	341										
21-	- 🕃			S3							+
	340										
	Lege	nd ontinuous co	ro 7"		No Moto	er Encountered		See Expl	oration Log Key for	Evalera4	i -
od o		onunuous col	ic /			51 Encountered			on of symbols	Exploration log	iOl
Sample					Water Level			Logged b	by: MML	VTP-3	)
	1							Approved	a by. JJO	Sheet 1 of	2

	Δ	sp		c+	King C	ò	unt	y Vashor	Isla	and Landf	iII - 09	0057	Monitoring \		,
7		SNS					\/	-		Specific Location			Coordinates (SPN NAD83 ft)	Exploration Num	
_		Contra		NG	Equ	inm		snon Island, E	ast sid	de of South Slop Sampling Metho			E:1228037 N:162717 Ground Surface (GS) Elev. (NAVD88	VTP-3	D
														Ecology Well Ta	ag N
F		Servio Opera		IIC	Rotar Exploration		_		IA/	Rotary core fork Start/Completion			361.58' Top of Casing Elev. (NAVD88)	BJX-258 Depth to Water (Belo	
	,	Pete				oni oni		(5)		3/5/2016 to 8/8/2			365.08'	No Water Encou	
enth	Elev.			ration Co	ompletion	Τ	ample	Analytical			Material			140 Water Enoug	De
eet)	(feet)	)	I A	and No	tes		pe/ID	Sample Numbe Lab Test(s)	er &	Field Tests PID= 170	Type		Description		
	339									116-170					
23-	-											Debris	includes fiberglass, plastic sh	avings and scraps	s †:
24 -	338														1
- 7	337									PID= 289					
25-	-											}			+
	336											1			
26-	-						S3			PID= 87					+
27 -	335											<b>&gt;</b>			1
۱ ک	334											<b>)</b>			
28 -	-									PID= 170		<b>x</b>			+
	333											Debris	includes lumber, insulation, ca	ardboard with	
29-	_									PID= 150		~5% org	ganics (roots, twigs)	araboara, war	+
	332														1
30 -	224											}			T
31-	331									PID= 84					+
	330			10-inch	conductor et at 35 ft bgs					PID= 84					
32-	-		M	and seal	led with 3 ft of bentonite						XXXX		Vashon Advance Outwasl	h/B Unit	+
	329			chips			8					Moist, b	prown SAND (SP); trace fine s		
33 -										PID= 35		predom	inantly medium sand		t
34 -	328			Gravel fi	ilter pack 34-40										1
	327			ft bgs											
35-	-					H									+
	326														
36-	-														t
37 -	325			3/4-inch	0.020 slot										ļ
"	324		∄::	SCH 40 36-38.5	0.020 slot screen ft bgs					PID= 70					
38-	-		∄∷									]			+
	323			Endcap											
39-	-						SS			PID= 26.8					t
40 -	322											]			
+0	321		$\boxtimes$												
41-	-			3/8-inch	Bentonite chip 10-43.5 ft bgs					PID= 72		1			+
	320			Dacktill 4	∙u-43.5 π bgs					110-12					
12-	-											-			t
43-	319														1
٠٠ ]	318					$oldsymbol{\mu}$				PID= 23.1		D. "	-f		_
14-												Bottom	of exploration at 43.5 ft. bgs.		+
	317														
45-	-														+
46-	316														1
<del>-</del> U -	315														T
		gend	1												
11 -				us cor	e 7"			No '	Water	Encountered			loration Log Key for	Exploration	or
Sample								Water					ion of symbols	log	
Sa Ne								الد ﴿				Logged b	by: MML d by: JJS	VTP-3D	
	1							I					y · • • • • • • • • • • • • • • • • • •	Sheet 2 of 2	2

	A	sr	ect	King C	oun	ty Vas	shon Isl	and Landf	ill - 09	90057	Monitoring \ Coordinates (SPN NAD83 ft)	Well Log  Exploration Nu.	ımher
			ULTING		Va	•		de of South Slop	oe		E:1228042 N:162717	1 '	
		Contra			ipment	1011011101	aria, East of	Sampling Metho			Ground Surface (GS) Elev. (NAVD88	VTP-3	
Н	lolt S	Servi	ces, Inc		, , drill r	ig		Rotary core			362.15'	Ecology Well 7 BJX-255	Tag N
•		Opera		Exploration		_	И	ork Start/Completion			Top of Casing Elev. (NAVD88)	Depth to Water (Be	
		Dav	е		onic			8/5/2016			365.9'	No Water Enco	
epth eet)	Elev. (feet)		and	n Completion Notes	Sample Type/II	Sampl	nalytical e Number & b Test(s)	Field Tests	Material Type		Description		De (
-2 -	365		Valve	ed hose barb									
-1 -	364												
0 -	363		V /1										
1 -	362		Conc	rete surface seal						Dry to s	FILL lightly moist, brown, slightly gace silt, fine to medium sand,	ravelly SAND fine subrounded	
2 -	361									gravel, t	trace organics (root mass, gra	iss)	
- 3 -	360							PID= .4					
4 -	359			nch SCH 40 PVC				DID CC	7777		ile fabric at 4 ft bgs	D (01) 5	$\perp$
5 -	358			ft bgs	S.			PID= 2.8		medium	ray brown, gravelly, silty SAN sand, fine to coarse subroun (roots, twigs).	ບ (SM); fine to ded gravel, rare	
6 -	357	XXX	3/8-ir	nch Bentonite chip				DID- 4.0			· · · · · · · · · · · · · · · · · · ·		_
7 -	355		backf	fill 2-23 ft bgs				PID= 1.9					-
3 -	354	XXX						PID= 0.6					+
9 -	353							11D- 0.0					+
0-	352												-
1-	351	XXX											+
2-	350							PID= 17.3					+
3-	349									Some b	rown mottling at 12.5 ft bgs		+
4-	348							PID= 31.1		6-inch r	ounded cobble		+
5-	347				S2					· ·			+
6-	346							PID= 63.5		Moist, g	LANDFILL DEBRIS	ill: trash bags.	_
7-	345									paper, (	glass, metal wires, textiles, pla	เอแบ	+
8-	344							PID= 85					+
9-	343							PID= 41.1					+
:0-	342	XXX								<b>&gt;</b>			+
1-1	341				S3								-
		gend Con	tinuous c	core 7"		e e	No Water	Encountered	<u>                                      </u>		loration Log Key for ion of symbols	Explorat log	ior
Method						Water				Logged b	by: MML d by: JJS	VTP-3	

	Δ	spe	<b>C</b> +	King	Co	unty	y Vashon	Isla	and Landf	iII - 09	0057	Monitoring \		
		SPE					Project Address		•			Coordinates (SPN NAD83 ft)	Exploration Num	
_		Contractor	ING	F	quipm		non Island, Ea	ast sic	le of South Slop Sampling Metho			E:1228042 N:162717 Ground Surface (GS) Elev. (NAVD88	<b>VTP-3</b>	S
_		Services,	Inc			Irill rig			Rotary core			362.15'	Ecology Well Ta BJX-255	ag N
		Operator	IIIC	Explora	-	_		W	ork Start/Completion			Top of Casing Elev. (NAVD88)	Depth to Water (Belo	
		Dave			Soni	,	1-7		8/5/2016			365.9'	No Water Encou	
	Elev.	Expl	loration Co	ompletion tes	Sa	ample	Analytical Sample Number	. &	Field Tests	Material Type		Description		De (f
23 - 24 - 25 - 26 - 27 - 28 - 29 - 31 - 32 - 33 - 34 - 35 - 36 - 37 - 38 - 39 - 40 - 40 - 40 - 40 - 40 - 40 - 40 - 4	Elev. (feet) 340  339  338  337  336  333  333  332  331  332  331  329  328  327  326  327  326  327  326  327		Gravel fil ft bgs  3/4-inch SCH 40 25-27.5 t	ompletion tes	S.S. T.Y.		Analytical Sample Number Lab Test(s)	8	Field Tests  PID= 670  PID= 415  PID= 518  PID= 650  PID= 822  PID= 960  PID= 431  PID= 250  PID= 30	Material Type	Debris ~5% org	includes fiberglass, plastic sh includes lumber, insulation, caganics (roots, twigs)  Vashon Advance Outwasi rown SAND (SP); trace fine sinantly medium sand  of exploration at 40 ft. bgs.	avings and scraps ardboard, with	-2 -2 -2 -2 -3 -3 -3 -3 -3
41- 42-	321													
+2 - 43 -	320													
	319													
4 -	318													
15- 16-	317													† ·
·o -	316													
Method		<b>gend</b> Continuo	ous cor	e 7"			Water Level	Vater	Encountered		explanat Logged I	loration Log Key for ion of symbols by: MML d by: JJS	Exploration log VTP-3S	i

	Δcr	nact	King C	ount	y Vashon Isl	and Landf	ill - 09	0057	Monitoring V		
	CON	ULTING		Vas	Project Address & Site shon Island, West s	•	pe		Coordinates (SPN NAD83 ft) E:1227935 N:162743	Exploration Num	
	Contra		Equip	oment	mon island, west s	Sampling Metho	<u>.                                      </u>		Ground Surface (GS) Elev. (NAVD88)	VTP-4	
	Holt Serv	ices, Inc	Rotary	drill rig	9	Rotary core	)		358.08'	Ecology Well Ta BJX-256	ag No.
	Oper	ator	Exploration	Method	d(s) V	Vork Start/Completio	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (Bel	ow GS)
	Pe	te	So	nic		8/8/2016 to 8/9/	2016		361.86'	No Water Encou	intered
	h Elev. (feet)	Exploration C and No	ites	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type		Description		Depth (ft)
-2	360	Valved I	hose barb								2
-1	359										<del> </del> -1
0	358			T					FILL		0
1	357	Concret	e surface seal					(SP); tra	slightly moist, brown, slightly grace silt, fine to medium sand, f trace organics (root mass, gras	ine subrounded	<del> </del> 1
2	356					PID= 0.0					- 2
3	355							Contax	tile fabric at 4 ft bgs		- 3
4	354	3/4-inch 0-51.5 f	SCH 40 PVC t bgs			PID= 0.0	7000	Slightly	moist, gray brown, sandy, silty	GRAVEL (GM);	+ 4
5	353			S S				gravel,	medium sand, fine to coarse, s with rare root organics		5
6	352	3/8-inch backfill 2	Bentonite chip 2-50 ft bgs			PID= 0.0		(SM); fi	moist to moist, gray brown, gr ne to medium sand, fine to coa with rare root organics	avelly, silty SAND arse, subrounded	6
7	351										7
8	350					PID= 0.0					- 8
9	349										<del>-</del> 9
optember 26, 2016											<del>-10</del>
											+11 +12
LATER.GP.						PID= 0.0					-13
14 14						PID= 2.8			LANDFILL DEBRIS		— ——14
AUGUST.	343			S2		F1D= 2.0		Moist, b	plack to gray, sandy, gravelly F metal cans, plastic scraps, et	ill; clothing, c.	<del>-</del> 15
NASHON 16	342					PID= 8.9					<del>-</del> 16
JECTS/KC	341							Become	es brown		17
18	340					PID= 14.2					-18
ATE P:\GI	339										19
20 TEMPS	338		-					Include	s scattered thinly bedded sand		-20
ORATION FO	337			S3							-21
OARD EXPL	Legen	d ntinuous co	re 7"	11		r Encountered	KXXX		loration Log Key for ion of symbols	Explorati	on
ASPECT STANDARD EXPLORATION LOG TEMPLATE P./GINTWIPROJECTSIKC VASHON_AUGUST 2016 AND LATER.GPJ Se	Metho				Water			Logged I	•	log VTP-4D Sheet 1 of 3	

	Qς	pect	Killy	County	y Vashon Is Project Address & Site	Specific Location			Monitoring V Coordinates (SPN NAD83 ft)	Exploration Nu	ımher
4	CO	NSULTING			non Island, West s		ne		E:1227935 N:162743		
		ntractor	E	quipment		Sampling Metho			Ground Surface (GS) Elev. (NAVD88)	VTP-4	
Н	olt Se	ervices, Inc	Rota	ary drill rig		Rotary core	<b>:</b>		358.08'	Ecology Well BJX-256	Tag N 6
	O <sub>i</sub>	oerator	Explora	ation Method(	s) I	Work Start/Completion	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (B	
	ا	Pete		Sonic		8/8/2016 to 8/9/	2016		361.86'	No Water Enco	ounter
epth	Elev.	Exploration Co	ompletion tes	Sample Type/ID	Analytical Sample Number &	Field Tests	Material Type		Description		De (f
23 - 24 - 25 - 26 - 27 - 28 - 29 - 30 - 31 - 33 - 35 - 36 - 37 - 38 - 40 - 40 - 40 - 40 - 40 - 40 - 40 - 4	(feet)	Exploration Co and No	mpletion tes	Sample Type/ID	Sample Mumber & Lab Test(s)	PID= 7.6  PID= 7.6  PID= 7.3  PID= 14.8  PID= 22	Material Type	Debris i	ncludes lumber and wood ncludes steel up to 1/4" thick	twigs and	-2 -2 -2 -2 -2 -3 -3 -3 -3 -3 -3 -4 -4 -4
41 <del>-</del> 42 <del>-</del>	317					PID= 52					-4
43-	315			SS		PID= 31.2					-2
14 <del> </del> 15 <del> </del>	314	<b>₹</b>									
46 –	313					PID= 28.3					-2
<u>`</u>	Lege	end Continuous cor	e 7"			er Encountered	<u> </u>	See Explexel	oration Log Key for on of symbols	Explorat	tion
Sample Method					Water Level			Logged b	-	log VTP-4	D
౫⋞					<b>≶</b>			Loggea t	by: MML d by: JJS	v i P-4	U

	Δ·	spect	King	Count	y Vashon Is Project Address & Site	Iand Landt	III - U9	0005/	Monitoring V Coordinates (SPN NAD83 ft)	Vell Log  Exploration Num	nher
	CO	NSULTING		Vas	hon Island, West s	•	pe		E:1227935 N:162743	,	
		ontractor	Ed	quipment		Sampling Metho	•		Ground Surface (GS) Elev. (NAVD88)	VTP-4	
Н	lolt S	ervices, Inc	Rota	ary drill rig		Rotary core	)		358.08'	Ecology Well Ta BJX-256	ag l
	(	Operator	Explora	tion Method	(s)	Work Start/Completio	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (Belo	
		Pete	:	Sonic		8/8/2016 to 8/9/	2016	Г	361.86'	No Water Encou	nte
epth eet)	Elev. (feet)	Exploration and N		Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type		Description		[
									Verban Adams Octorel	/D 11-24	_
18-	310	Condu	ctor casing set and sealed wit	th H		PID= 9.1		Moist, b	Vashon Advance Outwash rown SAND (SP); trace fine su		
10		3 feet of benton	of hydrated ite chips before	SS S				predomi	nantly medium sand		
49-	309	advano	Jiig								
50-	308										+
51-	- 00-										
٠ ·	307					PID= 8.7					t
52-	306	Gravel ft bgs	filter pack 50-5	66							+
53-	305		h 0.020 slot								1
	305	[: SCH 4 51.5-5	h 0.020 slot 0 screen 4 ft bgs								
54-	304	Endca	р			PID= 6.3					+
55-	303			98							-
56-	302										†
57-	301	3/8-inc	h Bentonite chi 56-60 ft bgs	p							+
		Dackfill	50-00 It มgs								
58-	300					PID= 4.1					†
59-	299										+
30 -	- 200										
,,	298							Bottom	of exploration at 60 ft. bgs.		
31-	297										+
62-	<sup>-</sup> 296										-
	295										
34-	294										Ī
	293										†
66-	292										†
67 -	291										+
8-	290										+
59 -	289										+
70-	288										+
71 -	287										
		gend Continuous co	ara 7"		NI- 38/ *	on Enganyate and		See Expl	oration Log Key for	Escala	_
Sample		COMMINUOUS CO	ne i		S S S S S S S S S S S S S S S S S S S	er Encountered		explanati	on of symbols	Exploration log	U
Met					Water			Logged b	by: MML	VTP-4D	
	I				<u> </u>			, approved	a by. 000	Sheet 3 of 3	3

	Δcr	<b>nect</b>	King Co	ount	y Vashon Isl	and Landf	ill - 09	90057	Monitoring V	Vell Log	nho-
	CONS	ULTING		Vas	Project Address & Site shon Island, West s	•	ре		Coordinates (SPN NAD83 ft) E:1227927 N:162741	Exploration Nun	
	Contra	actor	Equip			Sampling Metho	•		Ground Surface (GS) Elev. (NAVD88)	VTP-4	
I	Holt Serv	ices, Inc	Rotary	-		Rotary core			358.58'	Ecology Well T BJX-254	ag No.
	Oper	ator	Exploration	Method	d(s) V	Vork Start/Completio	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (Be	,
	Dav	ve	So	nic		8/4/2016			362.58'	No Water Encou	untered
	Elev. (feet)	Exploration C and No	otes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type		Description		Depth (ft)
-2	361	Valved	hose barb								2
-1 -	360										1
0 -	359	Concret	e surface seal						FILL		0
1 -	358	Concret	e suriace sear					(SP); tra	lightly moist, brown, slightly grace silt, fine to medium sand, f trace organics (root mass, gras	ine subrounded	- 1
2 -	356					PID= 0.0					- 2
3 -	355							Geotex	ille fabric at 4 ft bgs		- 3
4 -	354	3/4-inch 0-22.5 f	SCH 40 PVC t bgs			PID= 0.0		Moist, g	ray brown, gravelly, silty SANI sand, fine to coarse subround	O (SM); fine to ded gravel, rare	4
6	353	3/8-inch	Bentonite chip	S				organic	s (roots, twigs).		+ 5 + 6
7	352	backfill	2-21 ft bgs			PID= 0.0					- 7
8 -	351					PID= 0.0					- 8
9 -	350										- 9
9 10-	Ы							· ·			-10
ptember 26, 2016	348										-11
න් ල්වූ 12	346					PID= 0.0					-12
13 <sup>-</sup>	345										-13
14.	344					PID= 2.2					-14
ле 15 <sup>-</sup>	343			S2							+15 16
10. 10. 17.	342					PID= 1.6		Moist, g	LANDFILL DEBRIS gray to black, gravelly, sandy F glass, metal wires, textiles, plan	ill; trash bags, stic	-17
18 ·	341					PID= 4.7			.,		-18
MTE P:\GIN	340										-19
20 -	339		-			PID= 6.6					-20
21 ·	338			S3							-21
ARDEXPLO	Legen	d ntinuous co	re 7"		No Wate	r Encountered		See Exp	loration Log Key for	Explorati	ion
ASPECT STANDARD EXPLORATION LOG TEMPLATE PIGINTWIPROJECTSIKC VASHON_AUGUST 2018 AND LATER GPJ Se  Sample 1	- Internal				Water			Logged I	ion of symbols by: MML d by: JJS	log VTP-4S Sheet 1 of	<b>5</b>

	Aspect	King C	ounty	Vashon Isl Project Address & Site	Specific Location	ıı - U9	UU3/	Monitoring V Coordinates (SPN NAD83 ft)	Exploration Num	nber
4	CONSULTING			on Island, West s		ре		E:1227927 N:162741		
	Contractor	Equ	iipment		Sampling Metho	d		Ground Surface (GS) Elev. (NAVD88)	VTP-4	
Н	olt Services, Inc		y drill rig		Rotary core			358.58'	Ecology Well Ta BJX-254	
	Operator	Exploration	on Method(	s) V	Vork Start/Completion	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (Bel	
	Dave	S	onic		8/4/2016	<del></del>		362.58'	No Water Encou	ınteı
	Elev. (feet) Exploration Countries and No		Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type		Description		D
	336 Gravel fi	ilter pack 21-27		200 1001(0)	PID= 15					Ť
23-	ft bgs						Debris i	ncludes fiberglass, plastic sha	vings and scraps	, <del> </del>
24 -	335 0 3/4 inch	0.020 slot	NS					•		+:
4	334 334 334 334 334 334 334 334 334 334	0.020 slot screen ft bgs			PID= 34					'
25-			$\mathbf{H}$							+
26-	333									1
20	332		88		PID= 4.9					
27										+
28 –	331				PID= 3.1					1
_0 _	330						Dob-i-	naludaa lumban insulation	rdboord with	
29			SS S2				~5% org	ncludes lumber, insulation, ca anics (roots, twigs)	ruboard, WITN	+
30 -	329 3/8-inch	Rentonite chin								1
55	328 S76-IIICII	Bentonite chip 27-45ft bgs								
31					PID= 1.2					ł
32-	327									1
JZ -	326		98							
33					PID= 0.6					+
34 -	325									1
J <del>-1</del> -	324									
35							Debris i	ncludes glass, plastic, animal	fur	ł
36	323							J ,,,		1
50	322				PID= 0.5					
37										+
38	321		S7							1
J0 <sup>-</sup>	320									
39-					PID= 0.5					+
40 -	319									1
.5	318									
41					PID= 0.4					+
42 <del>-</del>	317									-
-	316		88							
43					PID= 0.1			Vashon Advance Outwash		+
44 -	315						Moist, b	rown SAND (SP); trace fine sun nantly medium sand	ıbrounded gravel,	,
	314							, <del></del>		
45							Bottom	of exploration at 45 ft. bgs.		$\dagger$
46 -	313							-		1
.5	312									
	Legend					1	See Evol	oration Log Key for		
od be	■ Continuous cor	e 7"			r Encountered		explanati	on of symbols	Exploration log	or
Sample Method			;	Water Level		ı	Logged b	y: MML	VTP-4S	;
<u>ے رں</u>			•			,	Approved	l by: JJS	Sheet 2 of 2	

	Λ	c is	oct	King C	Coun	ty V	ashon Isl	and Landf	iII - 09	0057	Monitoring V		
	7		ect			-		Specific Location			Coordinates (SPN NAD83 ft)	Exploration Nun	
•		ONS Contrac	ULTING	Fau	v vipment	ashon	Island, West s	ide of South Slop Sampling Metho			E:1227860 N:162780 Ground Surface (GS) Elev. (NAVD88	VTP-5	D
						_						Ecology Well Ta	ag No.
	HOIL	Opera	es, Inc	Exploration	y drill ri	_	И	Rotary core /ork Start/Completion			359.6925' Top of Casing Elev. (NAVD88)	BKY-334 Depth to Water (Bel	
		Pete			onic	)u(0)	,	1/9/2017	n Datos		363.0922'	No Water Encou	
Depth			Exploration (	Completion	Sample	e   e o m	Analytical ple Number &	Field Tests	Material		Description	140 Water Ericou	Depth
(feet)	(feet	)	and N	hose barb	Type/IE		Lab Test(s)	11010 10010	Туре		2000., p. 10.		(ft)
-	-												+
-	+		6-inch Monum	SCH 80 PVC nent									+
0 -	360		Concre	ete surface seal					\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Topsoil	; fine to medium sand, abundan	t root mass.	0
-	†									Moist, b	FILL rown, gravelly, silty SAND (SM)	fine to medium	†
-	Ť							PID= 0.7		sand, fir	ne subangular gravel.		†
			3/4-inc	h SCH 40 PVC									
5 -	355		0-24 ft	bgs	N			PID= 4.6		Geotext	ile at 4 ft bgs and becomes gray	brown.	<del>-</del> 5
-	<u> </u>		3/8-inc	h Bentonite				PID= 2.0					+
-	+		bgs	"									+
-	†							PID= 2.0			rown, slightly gravelly SAND (SR	P); fine to medium	+
-	350										ne subrounded gravel.  LANDFILL DEBRIS		1,
10-											ray, sandy, gravelly Fill; fine to m trash bags, plastic)	ledium sand,	10
-	-							DID- 45 4					1
-	+							PID= 45.1					+
-	ļ 	$\Rightarrow$						PID= 162.3					+
15-	345				S2								15
-	t							PID= 816					†
										Debris i	ncludes paper and plastic shavir	ngs.	Ī
-	_							PID= 25.5					1
20-	340		Condu	ctor casing set							Vachen Advance Outweek	/D Hait	
-	+		with 3 the benton advance	ctor casing set and sealed feet of hydrated ite chips before							Vashon Advance Outwash ray brown, slightly gravelly SAN sand, fine subrounded gravel.		+
-	+	$\Rightarrow$	KX	filter pack t bgs	S3			PID= 15.1			ounte, inio outrounted graven		+
-	Ť			. 290									†
25-	335		3/4-inc SCH 4/ 24-26.5	h 0.020 slot 0 screen 5 ft bas				PID= 34.5					-25
20	-							DID- 65.4		1			23
-	+							PID= 35.1					+
-	1		3/8-inc	h Bentonite	S 8			PID= 7.7					+
-	330		bgs bgs	ckfill 28-30 ft						1			+
30-			×I D							Bottom	of exploration at 30 ft. bgs.		30
		gend	Soil Sample	Recovery			No Water	Encountered			oration Log Key for explanation	Explorati	or
Sample		Cont	tinuous cor tinuous cor	e 4" ID		Water Level	ino vvaler	LITCOUTTETEU		of symbo	ols	Log VTP-5D	
Sample 25 O	<u> </u>					> -				Approved		Sheet 1 of 2	

	Λ	en/	ect	King (	Cou			and Landf	iII - 09	0057	Monitoring V		
	_					-		Specific Location			Coordinates (SPN NAD83 ft)	Exploration Num	
<u> </u>			TING				Island, West s	ide of South Slop			E:1227865 N:162778	VTP-5	S
		Contracto			ipmen			Sampling Metho			Ground Surface (GS) Elev. (NAVD88	/	
		Services	, Inc	Rotar	•	•		Rotary core			360.0117'	Ecology Well Ta BKY-333	
	(	Operator		Exploration	on Meti	iod(s)	V	Vork Start/Completio	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (Bel	
		Pete		S	onic		A 1 5 1	1/9/2017			363.3776'	No Water Encou	ntered
Depth (feet)	Elev. (feet)	Ex	ploration C and No	completion	Samp Type/	in I Gaii	Analytical nple Number & Lab Test(s)	Field Tests	Materia Type		Description		Dept (ft)
0 -	- 360		6-inch s Monum	hose barb SCH 80 PVC ent te surface seal					74 1× . 74	Topsoil	; fine to medium sand, abundan	t root mass.	0
-	- -		**************************************					PID= 0.0		Moist, b	FILL rown, gravelly, silty SAND (SM); ne subangular gravel.	fine to medium	]  -  -
5 -	355		$\geqslant$	n SCH 40 PVC	3	5		PID= 0.0		· · ·	ile at 4 ft bgs and becomes gray		- - 5
-	-		chip ba	n Bentonite ckfill 2-13 ft				PID= 0.0	XXX		rown, slightly gravelly SAND (SF ne subrounded gravel.	P); fine to medium	<del></del>
-	_		XXXXXXX XXXXXXX					PID= 1.5			ray, sandy, gravelly Fill; fine to m trash bags, cardboard, plastic)	edium sand,	+
10-	- 350 -							PID= 124		Debris i	ncludes aluminum cans, copper	rope, cloth,	-10 -
I	- - 345		3/4-incl	filter pack bgs 0.020 slot screen	C	75		PID= 57.3 PID= 12.5					- - -15
-	<del>-</del>		15-17.5	ft bgs				PID= 399		Debris i	ncludes rubber gloves, paper, pl	astic shavings.	
			∬ chip ba	n Bentonite ckfill 19-30 ft				PID= 206		}			
20-	- 340 -		bgs					PID= 14.8			Vashon Advance Outwash ray brown, slightly gravelly SAN sand, fine subrounded gravel.		— 20 —
-								PID= 7.9					
25-	335				G	3		PID= 10.9					-25 -
-	_							PID= 9.0					
30-	- 330							PID= 11.4			el below 28 ft bgs of exploration at 30 ft. bgs.		30
ē ž				Recovery				r Encountered		See Expl of symbo	oration Log Key for explanation	Explorati	+ on
Sample 20-		Contini	uous cor	e 4" ID		Water Level				Logged b	oy: MML	Log VTP-5S Sheet 1 of 1	

	Λ		261	King C	ò	unt	y Va	shon Is	land Landfi	iII - 09	0057	Monitoring V	Vell Log	
			ect				•		e Specific Location			Coordinates (SPN NAD83 ft)	Exploration Num	nber
_		ontracto	LTING	Equ	inn		shon Is	land, South	end of South Slop Sampling Metho			E:1227887 N:162558 Ground Surface (GS) Elev. (NAVD88	VTP-6	D
١.													Ecology Well Ta BKY-331	
		Services		Rotar					Rotary core			324.8379'	BKY-331	001
		Operator		Exploration			1(S)	,	Work Start/Completion	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (Belo	
		Pete		S	oni	С			1/10/2017		1	328.3087'	No Water Encour	ntered
Depth (feet)	Elev. (feet)	E:	φloration C and No	completion otes	Sa Ty	ample /pe/ID	Samp	nalytical le Number & lb Test(s)	Field Tests	Materia Type		Description		Depth (ft)
- -	-			hose barb										+
0 -	325		<b>*</b>	te surface seal		-				<u> </u>	Topsoil	; fine to medium sand, abundant	root mass.	0
-   -	-				W)	2					(SM); fir	oist to wet, brown, slightly gravell ne to medium sand, fine subrour	y, silty SAND nded gravel. land dug to 3 ft bgs	+
-	-	3/4-inch SCH 40 PVC 0-18.5 ft bgs							PID= 0.0			LANDFILL DEBRIS		
5 -	320	XXXXXXX	3/4-inch SCH 40 PVC 0-18.5 ft bgs						PID= 0.9			ay, sandy, gravelly Fill; fine to molastic shavings, bags)	edium sand,	- 5
_	_		3/8-inch Bentonite chip backfill 2-17 ft bgs			81			PID= 4.5					+
-	315		<b>^</b>						PID= 1.2		Become	s wet.		- - 10
Sample 10-	-		<del>}</del>						PID= 2.3		Woody	debris between 10 and 14 ft bgs		- 10 - -
-	-	XXXXXXXXX							PID= 2.8					+
15-	310		Conduc	ctor casing set		S2			PID= 0.7			Vashon Advance Outwash	/R I Init	-15 -
-	-		⊲ I advanci	filter pack					PID= 0.6		Moist, b medium	rown SAND (SP); trace fine roui		, <u> </u>
-		jend	3 18.5-21	n 0.020 slot 0 screen ft bgs					PID= 0.4		Soo First	oration Log Kov for orglanation		
Sample			Sample uous core	e 4" ID			Water	No Wate	er Encountered		of symbo Logged b Approved	y: MML	Exploration Log VTP-6D Sheet 1 of 2	)

	Δ	snec	King (	Со		y Vashon Isl Project Address & Site		ill - 09	0057	Monitoring V Coordinates (SPN NAD83 ft)	Vell Log  Exploration Num	nho-
	CC	NSULTIN	■ G			Project Address & Site shon Island, South 6	•	e e		Coordinates (SPN NAD83 π) E:1227887 N:162558		
		Contractor		uipm		SHOIT ISIANA, GOULT	Sampling Metho			Ground Surface (GS) Elev. (NAVD88	VTP-6	
	Holt S	Services, Inc	Rota	rv dr	ill ria		Rotary core			324.8379'	Ecology Well Ta BKY-331	ag No.
	(	Operator	Explorati	-	_	(s) V	Vork Start/Completio			Top of Casing Elev. (NAVD88)	Depth to Water (Beld	ow GS)
		Pete	9	Soni	С		1/10/2017			328.3087'	No Water Encour	ntered
Depth (feet)	Elev. (feet)	Exploration	on Completion d Notes	Sa Ty	mple pe/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type		Description		Depth (ft)
20 -	305			1	S3 S2	223 (154,6)	PID= 1.1		medium	Vashon Advance Outwash rown SAND (SP); trace fine rour sand. (continued) pecomes fine to coarse.		D - 20 -
25 -	300	3/8 chir bgs	inch Bentonite backfill 23-40 ft				PID= 1.9			The CANADA COLOR S		_ _ _ 25
-					S4		PID= 0.8		Frequer and 27	ray, silty SAND (SM); fine mass nt very thin laminae of light gray s ft bgs. ray brown SAND (SP); fine to m	silt between 26	+
-							PID= 1.0		edges.	ens of gray silty sand and red ora		+
30 -	295				_				Moist, g	ray, silty SAND (SM); fine sand	w/ trace red	- 30 - -
T 2016 AND LATER.GPJ March 14, 52	290				SS		PID= 0.2			ecomes fine to coarse.	antly fine sand.	
JECTSIKC VASHON_AUGUS:	 						PID= 2.1		Moist, g	rown, silty SAND (SM); fine san ray brown SAND (SP); predomiring with depth.		<u>+</u> + - +
ASPECT STANDARD EXPLORATION LOG TEMPLATE P./GINTWPROJECTS/KC VASHON_AUGUST 2016 AND LATER.GPJ March  Sample  MAHDA	285						PID= 17.9		Bottom	of exploration at 40 ft. bgs.		40
SPECT STANDARD EXPLORATION Sample	(0)	gend Grab Sample Continuous				No Water Povel	r Encountered		See Expl of symbol Logged by Approved	by: MML	Exploration Log VTP-6D Sheet 2 of 2	)

	Λ.	cnoct	King (	Count	ty Vashor	ılslan	d Landfi	II - 09	0057	Monitoring V		
		spect		.,	Project Address	•				Coordinates (SPN NAD83 ft)	Exploration Num	nber
_		ON SULTING Contractor		Va iipment	shon Island, So		of South Slop Sampling Metho			E:1227892 N:162560 Ground Surface (GS) Elev. (NAVD88	<b>∀ VTP-6</b>	S
						,		u		324.5111'	Ecology Well Ta	g No.
		Services, Inc	Exploration	y drill rig		Work :	Rotary core Start/Completion	n Dates		Top of Casing Elev. (NAVD88)	BKY-330 Depth to Water (Belo	
	`	Pete		onic	2(9)	, , ,	1/10/2017	, Datoo		328.2467'	No Water Encour	
Depth	Elev.	Exploration	Completion	Sample Type/ID	Analytical Sample Numbe	er &	Field Tests	Material Type		Description		Depth (ft)
-	(leet)	Valved	d hose barb	Турель	Lab Test(s)			Туре				- (11)
0 -	325		ete surface seal					. <u></u>	Topsoil	; fine to medium sand, abundant	root mass.	0
-	† † †		ch Bentonite ackfill 2-4 ft bgs						(SM); fii		y, silty SAND nded gravel. land dug to 3 ft bgs	-
5 -	320	3/4-in	I filter pack 4-10 ch SCH 40 PVC ft bgs ch 0.020 slot				PID= 1.1		Moist gr debris (p	LANDFILL DEBRIS ray, sandy, gravelly Fill; fine to m plastic shavings, bags)	edium sand,	- 5 -
-	†	SCH <sup>2</sup>	40 screen 6.5-9	S S			PID= 7.1					†
10-	315	chip b	ch Bentonite ackfill 10-20 ft				PID= 13.8		Become	es wet.		10
-	†	bgs		Φ			PID= 7.3		Pagama	no mojet with weedy debrie between	oon 12 F and 14 ft	†
-	310						PID= 14.8		bgs.	es moist with woody debris betwe	en 12.5 and 14 ft	†
15	† †			S2			PID= 2.0		Debris i	ncludes plastic bags and glass.		+ 15 -
-	+						PID= 2.5		Moist, b	Vashon Advance Outwash rown SAND (SP); trace fine sub nedium sand.		1
20-	305						. 13 2.0					20
-	_								Bottom	of exploration at 20 ft. bgs.		
- ADHORA	<u> </u>											-
25	300											- -25
-	†											†
-	205											+
30-	295											-30 -
aldr		gend No Soil Sampl Grab Sample	e Recovery	- '		Water End	countered	•	See Explored of symbol	oration Log Key for explanation ols	Exploration Log	on
Sample 2 2 3 Method 1.00 Low Lond 1.00 Low Later, de J. C.		Continuous co	ore 4" ID		Water Level				Logged b Approved		VTP-6S Sheet 1 of 1	

0	A.	cna	\		King C	ounty Vashon Isla		90057		Monitoring V	Vell Log	
		spe	<b>7</b>			Project Address & Site	•			Coordinates (SPN NAD83 ft)	Exploration Nun	nber
	Dcc	NSUL	TING		Va	shon Island, West s	ide of South Slop	е		E:1227762 N:162804	VTP-7	7
	C	Contractor		Equ	ipment		Sampling Meth	od		Ground Surface (GS) Elev. (NAVD88,	/	
ŀ	Holt S	Services,	Inc	Rotar	y drill rig		Rotary core	<b>!</b>		359.775'	Ecology Well Ta BKX-135	ag N
		Operator	-		on Method	(s) V	Vork Start/Completic			Top of Casing Elev. (NAVD88)	Depth to Water (Bei	low (
	Ì	•		,		`						
		Pete		S	onic	<u> </u>	4/3/2018			359.199'	No Water Encou	ınte
epth	Elev. (feet)	Exp	loration Co and Not		Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type		Description		
	,	1		steel flush		Lau Test(S)		74 1× . 7/1		ightly moist, brown, Topsoil; fine		+
			Valved h	nose barb				17. 31.17	fine sub	rounded gravel, numerous organ		
-	-						PID= 39.6		grass)	FIII		-/+
			Concrete	e surface seal					Moist h	Fill rown, gravelly, silty SAND (SM);	predominantly	
-	-		\$							nedium sand, fine subrounded to		+
			1						gravel.		-	
_			3/8-inch	Bentonite			PID= 69					1
			chip bac	Bentonite ckfill 2-8 ft bgs					1			
_												
			\$						]			Γ
_	355		<b>.</b>	1011 40 51 15			DID C::					
5 -			2-inch S 0-9 ft bg	SCH 40 PVC IS	S S		PID= 24.0					†
			<b>1</b>						1			
-	-		1									+
									Become	s gray brown.		
-	-		\$				PID= 162		25001116	Landfill Debris		+
			<b>§</b>					$\bowtie$	Very mo	ist, black to gray, silty, sandy, gr	avelly Fill; plastic	
_	-		*						scraps,	thin aluminum sheets, paper, ca	rdboard, garbage	+
				ilter pack 8-15				$\qquad \qquad \bigotimes \qquad \qquad \bigotimes$	bags, et Become			
_			ft bgs				PID= 414	$\otimes \otimes \otimes$	Decome	o moist.		1
			2-inch 0	020 slot SCH								
10	350		40 scree	.020 slot SCH en 9-14 ft bgs				$\times\!\!\times\!\!\times$	}			
10-			4				CH4= 1.6%		\$			Ť
			9						1			
-	<u> </u>		9					$\bowtie$	}			+
			9						3			
-	-		3				PID= 70.0	$\bowtie$	<b>†</b>			+
			٩		S2				}			
-	-		}						3			+
			}					$\bowtie$	EibaI-	oo fiboro		
-	-		١				PID= 66.7		ribergia	ss fibers		+
									DI	at battom of deletie		
15-	345						CH4= 0%		Piywood	at bottom of debris contact.		4
-			3/8-inch	Bentonite			PID= 345		Moiet a	Vashon Advance Outwash ray brown, SAND (SP); fine to m		
_			chip bac	Bentonite ckfill 15-20 ft			1.2 040			ray brown, SAND (SP); fine to fr ded to subangular gravel.	iculum sand, ime	
			<b>3</b>						1	J J		ſ
	Ĺ						DID- 07.0					
_			3				PID= 27.3					Ť
			3		S3							
-	Ī		<u> </u>						1			†
			3						.]			
-			3				PID= 13.6					+
	340		3						1			
20 -	1		Ŋ		┞┻┤		CH4= 0%		Bottom /	of exploration at 20 ft. bgs.		$\dashv$
									בטננטווו	or expresaulos at 20 st. bys.		
_	-											+
_	-											1
		gend							See Evol	pration Log Key for explanation		
<u>v</u>	,  00	Continu	ous core	e 4" ID			Encountered		of symbo		Explorati	OI
Sample	?					Water			•		Log	
Sa Za	<b>:</b>					ات ۶			Logged b		VTP-7	
	- 1								~hhi oveo	by. JJO	Sheet 1 of 1	1

	A	cna	<b>1</b>		King C	ounty Vashon Isla		90057		Monitoring V	Vell Log	
		spe	<b>701</b>			Project Address & Site	•	_		Coordinates (SPN NAD83 ft)	Exploration Num	nber
	Dcc	N SUL	TING		Vas	shon Island, East sid	•			E:1227838 N:162641	VTP-8	2
	С	Contractor		Equ	iipment		Sampling Meth	od		Ground Surface (GS) Elev. (NAVD88,	/	
F	Holt S	Services,	Inc	Rotar	y drill rig		Rotary core	<b>:</b>		359.315'	Ecology Well Ta BKX-134	ag N
		Operator			on Method		Vork Start/Completic			Top of Casing Elev. (NAVD88)	Depth to Water (Bel	low C
	,	'				177		Daios				
		Pete		S	onic		4/3/2018		T	358.892'	No Water Encou	nter
	Elev. (feet)		loration Co		Sample Type/ID	Analytical Sample Number &	Field Tests	Material Type		Description		D
,	()	1 _ 1		steel flush	1,50,10	Lab Test(s)		13/2	Topsoil	; fine to medium sand, rare root	fibers.	+
			Valved h	nose barb						Fill		1
,	_		Concret	e surface seal			PID= 280		Slightly fine to n	moist, brown, slightly gravelly, si nedium sand, fine subrounded gr	lty SAND (SM); ravel.	Ī
_	_		3/8-inch chip bac bgs	Bentonite ckfill 2-14 ft			PID= 713					+
5 -	355		2-inch S 0-15 ft b	GCH 40 PVC ogs	15		PID= 455		Become	es gray brown.		<u> </u>
_	-											+
-	350						PID= 304		Become and sub	es dark gray brown with coarse so rounded cobbles. silty SAND (SN	ubrounded gravel M)	+
10-	-						CH4= 0% PID= 134		1	es brown. es gray and siltier.		+
-	-		<b>V</b>				PID= 280		Become	es brown.		
_	_						PID= 207					+
- 15-	345		Gravel fi	ilter pack bgs			CH4= 0%		Root fib	er organics.		1
. •	_			.020 slot SCH en 15-20 ft bgs			PID= 513		Very mo plastic s fibers, g	Landfill Debris oist, black to gray, sandy, gravelly ccraps, paper, cardboard, garbagilass.	/ Fill; red and blue e bags, white	+
-	<u>-</u>				83		PID= 570					+
_	340						PID= 5073		Become	ss siity.		+
20-	_	% % % % % % % % % % % % % % % % % % %					CH4= 0% PID= 2877					_
-	-		3/8-inch chip bac bgs	Bentonite ckfill 21-25 ft	84				Moist, b	rown, gravelly, silty SAND (SM); ne to coarse subrounded to suba	fine to medium ngular gravel.	
-	335		***				PID= 1312		Moist, g	Vashon Advance Outwash, ray brown, SAND (SP); trace silt ne subrounded to subangular gra	, fine to medium	+
25 - -	<u>-</u>		Ŋ				CH4= 0%		Bottom	of exploration at 25 ft. bgs.		+
		gend Continu	ous core	e 4" ID			r Encountered		See Explored See Explored Symbol	oration Log Key for explanation	Exploration	OI
Sample Method						Water			Logged b		Log VTP-8 Sheet 1 of 1	1

	Δ	spec	•	King C	-		and Landfill - 0	90057		Monitoring V	Vell Log	
7		NSULTING		,	•		Specific Location Perimeter Road	I		Coordinates (SPN NAD83 ft) E:1227987 N:162784	Exploration Numb	
_		ontractor		ipment	vasiioii	isianu, soutin	Sampling Meth			Ground Surface (GS) Elev. (NAVD88)	VTP-9	
ŀ	Holt S	ervices, Inc		y drill rig	,		Rotary core			373.646'	Ecology Well Tag BKX-132	ıg No
		perator	Exploration	-		N	ork Start/Completic			Top of Casing Elev. (NAVD88)	Depth to Water (Belo	ow GS
		Pete	s	onic			4/2/2018			373.223'	No Water Encoun	ntered
epth feet)	Elev. (feet)	Exploration and	n Completion Notes	Sample Type/ID	Samp	nalytical le Number & lb Test(s)	Field Tests	Material Type		Description		Dep (ft)
	-	N mon	ich steel flush ument ed hose barb						14-inch	thick Asphalt.		-
-	- - 370 -	3/8-i	crete surface seal nch Bentonite backfill 2-7 ft bgs						Moist, g medium gravel.	rill ray brown, gravelly, silty SAND ( sand, fine to coarse subrounded	SM); fine to t to subangular	_
5 -	-	2-inc 0-7.5	h SCH 40 PVC ift bgs	Т			CH4= 0.1% PID= 204		Moist, g	ile at 6 ft. ray brown, gravelly, silty SAND (	SM); fine to	- 5 -
_	-	Grav ft bg:	el filter pack 7-10 s						coarse s gravel.	sand, fine to coarse subrounded	to subangular	+
-	365	2-inc 40 s	h 0.020 slot SCH creen 7.5-10 ft	S1			PID= 506					
10-	-						CH4= 0% PID= 405		Bottom	of exploration at 10 ft. bgs.		10
-	-								Note: Va	accumed down to 6 ft bgs		
_	-											+
_	360											+
15-	-											- 15
-	-											
-	-											+
-	355											_
Sample Method	Leg	end Continuous c	ore 4" ID		Water Level	No Water	Encountered		See Expl of symbol Logged b		Exploration Log	⊥ on

	Δ	spe	ct		King	-		and Landfill - 0	90057		Monitoring V		
7		NSULTI				-		Specific Location  perimeter road			Coordinates (SPN NAD83 ft) E:1227882 N:162832	Exploration Num	
_		ontractor		Equ	ipment	Vasilo	Ti isiana, ooda	Sampling Metho	od		Ground Surface (GS) Elev. (NAVD88)	VTP-1	
H	Holt S	Services, I	nc	Rotar	y drill r	ig		Rotary core			376.139'	Ecology Well Ta BKX-133	ag No.
	C	Operator		Exploration	on Meth	od(s)	И	ork Start/Completion	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (Beld	low GS
		Pete		S	onic			4/2/2018			375.311'	No Water Encou	interec
epth eet)	Elev. (feet)	Explo	and No		Sampl Type/II	e Sam	Analytical uple Number & Lab Test(s)	Field Tests	Material Type		Description		Dept (ft)
			monume	steel flush ent nose barb						7-inch t	hick Asphalt.		
-	375			e surface seal						(SP-SM	moist, brown, gravelly, slightly si l); fine to medium sand, fine to congular gravel.	lty SAND parse subrounded	
-	-			Bentonite skfill 2-6.75 ft						(SM); fir	Fill moist to dry, gray brown, gravelly ne to medium sand, fine to coars ular gravel.	/, silty SAND e subrounded to	_
5 -	370		2-inch S 0-7.5 ft I	GCH 40 PVC bgs				CH4= 0%					- 5 -
											ile at 6.75 ft.	O (CD CM); fine to	
-	-		Gravel fi 6.75-10	ilter pack ft bgs				PID= 213		medium	rown, gravelly, slightly silty SANI n sand, fine subrounded gravel.		
_	-		2-inch 0	.020 slot SCH	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					Moist, g	ray brown, gravelly, silty SAND ( a sand, fine to coarse subrounded	SM); fine to	1
			40 scree bgs	en 7.5-10 ft						gravel.	ecomes predominantly fine.	J	
-	-												+
								DID - 70.4		-			
10-	-							PID= 72.4 CH4= 0%	1111111	Bottom	of exploration at 10 ft. bgs.		10
_	365									Note: V	accumed down to 6 ft bgs		+
	000												
_	-												Ī
-	-												+
_	_												
15-													15
_	360												+
	000												
-	-												†
-	-												+
-	-												+
	Loc	lond											
<u>a</u> 5		<b>jend</b> Continuo	us core	e 4" ID		[	No Water	Encountered		See Expl of symbo	oration Log Key for explanation	Exploration	on
Sample Method						Water				Logged b	by: MML	Log VTP-10 Sheet 1 of 1	

•	Δ	cne	<u>~</u>		King C	-		and Landfill - 0	90057		Monitoring V		
7		SPE			17.	-		Specific Location est perimeter roa	ad.		Coordinates (SPN NAD83 ft) E:1227950 N:163802	Exploration Nur	
_		Contractor	ING	Eau	ipment	asnon i	siand, Northw	Sampling Meth			Ground Surface (GS) Elev. (NAVD88)	VTP-1′	<b>1</b> S
ŀ	Holt S	Services,	Inc		, y drill rig	1		Rotary core			401.479'	Ecology Well Ta BKX-137	ag No.
		Operator		Exploration	_		И	Vork Start/Completic			Top of Casing Elev. (NAVD88)	Depth to Water (Be	
		Pete		S	onic			4/6/2018			400.832'	No Water Encou	ıntered
epth	Elev. (feet)	Expl	loration C and No	completion	Sample Type/ID	Sam	Analytical ple Number & .ab Test(s)	Field Tests	Materia Type		Description		Depti
			monum	steel flush ent					74 1× 1/1	Moist, b	rown, silty, sandy Topsoil; fine to	medium sand,	
			valveu	hose barb						abundai	nt root mass.		-1
	400		Concret	te surface seal						Moist, b	rown, slightly gravelly, slightly sil nedium sand, fine subrounded gr	ty SAND (SP-SM) ravel.	);
_								PID= 23.9					_
										predomi	moist, gray brown, gravelly, silty nantly fine to medium sand, fine	SAND (SM); to coarse	
_	-		3/8-inch	n Bentonite ckfill 2-5 ft bgs						subrour	ided to subangular gravel.		+
			CHIP Dat	CKIIII 2-5 IL DGS									
-	-		2-inch 5 0-6 ft bo	SCH 40 PVC gs									+
-	-				S.			PID= 60.5					- 5
			Gravel f ft bgs	filter pack 5-12									
-	395		2 inch (	0.000 alot SCH						Become	es slightly silty SAND (SP-SM).		
	- 393		40 scre	0.020 slot SCH en 6-11 ft bgs				PID= 33.9		Slightly	Vashon Till/Unit A moist, gray brown, gravelly, silty	SAND (SM):	
								1 15- 55.5		predomi	nantly fine to medium sand, fine	to coarse	
_	_									. Subrour	ded to subangular gravel.		1
										-			
_	-							PID= 66.9		-			+
) -	-							CH4= 0%					10
										-			
-	-							PID= 14.1					+
	390												
-	-												Ť
	_		3/8-inch	n Bentonite	S2								
			chip bad	ckfill 12-15 ft				PID= 31.4		-			
_	-									-			1
5-	-		1		₽			PID= 38.5 CH4= 0%		Bottom	of exploration at 15 ft. bgs.		15
										2500111	pro- a.c. r ac r a r a byo.		
-	-												+
	385												
-	-												†
	_												
_	-												1
		gend								00-5	analian I an Karafara a la co		
בַּ עַ		Continuo	ous core	e 4" ID		¥ =	No Water	Encountered		See Expl of symbo	oration Log Key for explanation lls	Explorati	ion
Sample						Water Level				Logged b	y: MML	Log VTP-11:	S
2 رر						-				Approved	by: JJS	Sheet 1 of	

	<u> </u>					Ki	ng C	-			d Landfill - 09	9005	7				toring V			
	•		ec	- 1				-			pecific Location					ates (SPN	NAD83 ft)		oration Num	ber
$\vdash$			ULTIN	IG	F	iin		shon Is	land, Nort	thwes	st perimeter roa					27938 N:		, VT	P-11	D
		Contra			Equ	•					Sampling Metho	а			Grouna Suria		lev. (NAVD88	/	gy Well Ta	
			ces, Inc	:	Rotar	-	_			14/-	Rotary core	. D-4			T (O.	402.145			BKX-136	
	(	Opera			Exploration			(s)		VVOI	rk Start/Completion	n Date	es		l op of Ca		(NAVD88)		Water (Belo	
		Pet	е		S	oni	С				4/5/2018	_				401.479	9'	No Wa	ter Encour	ntered
	Elev. (feet)			nd Note	es	Sa Ty	ample /pe/ID	Samp	nalytical le Number & lb Test(s)	k	Field Tests	Mat Ty	terial ype			Desc	ription			Depth (ft)
			N mo	onumer	teel flush nt ose barb						DID- 25 5	217,	: .ÿ.	Moist, b ∖abundar	rown, silty, s nt root mass	S	psoil; fine to	medium	n sand,	/
-	400		3/8 ch	3-inch E ip back	surface seal  Bentonite fill 2-30 ft						PID= 35.5	П		fine to m	nedium sand	ly gravell d, fine su	Fill y, slightly sil brounded g ravelly, silty	ravel.		;  -  -
5 -	_	XXXXXXXXXXXXXXXXX	2-i	S	CH 40 PVC		S1				PID= 54.3			predomi		to mediui	m sand, fine			- - 5
	395										PID= 50.8			Become	s slightly sil	ty SAND	(SP-SM).			-
-	-	***************************************									PID= 107			predomi	moist, gray	brown, g to mediui	Till/Unit A ravelly, silty m sand, fine ravel.	SAND (S	SM); ee	_
10-																				10
10											CH4= 0%			-						
-	390										PID= 201									_
-	_						S2				PID= 463									<u></u>
15 <sup>-</sup>	- -										PID= 579									-15 -
-	385	XXXXXXXX									PID= 820									
-	+					Ħ	_				CH4= 0%			Become	s slightly sil	ty SAND	(SP-SM).			†
Sample 20-	† -	XXXXXXXXXXXXXX				S3				PID= 15,000			predomi	ray brown, q nantly fine t ded to suba	to coarse	silty SAND ( sand, fine travel.	SM); o coarse		-20	
-	380	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	***************************************				S4				PID= 326			GubiOull	aca to subs	angulai g	i uvol.			_
Sample		<b>gend</b> Con	tinuous	core	4" ID			Water	No Wa	ater E	Encountered	17.1		See Explo of symbo		Key for 6	explanation	_	oloratio Log TP-11E	
ω̈́Σ	≦							> -						Approved					neet 1 of 2	

	cnact		_	ounty Vashon Isla		90057		Monitoring V	Vell Log	
7	spect			Project Address & Site				Coordinates (SPN NAD83 ft)	Exploration Num	ber
<b>●</b> cc	ONSULTING			shon Island, Northw	<u> </u>			E:1227938 N:163804	VTP-11	n
C	Contractor	Eq.	iipment		Sampling Metho	od		Ground Surface (GS) Elev. (NAVD88	'/	
Holt S	Services, Inc	Rotar	y drill rig		Rotary core	!		402.145'	Ecology Well Ta BKX-136	ig inc
(	Operator	Exploration	on Method(	(s) N	ork Start/Completio	n Dates		Top of Casing Elev. (NAVD88)	Depth to Water (Beld	ow G
	Pete		onic		4/5/2018			401.479'	No Water Encour	
				Analytical		1.		101.110	Liloodi	
epth Elev. eet) (feet)		ompletion otes	Sample Type/ID	Sample Number & Lab Test(s)	Field Tests	Material Type		Description		De <sub>l</sub>
+				Lub Tool(o)			Moist, q	ray brown, gravelly, silty SAND (	(SM);	$\dagger$
375	Gravel fi	ilter pack bgs .0.20 slot SCH en 31-41 ft bgs	\$00 \$400		PID= 2420 PID= 140 CH4= 0.1%		Moist, befine to mesubangu	Vashon Advance Outwash rown, gravelly SAND (SP); trace ledium sand, fine to coarse subsilar gravel.	/Unit B e silt, predominantly rounded to 33.5 ft bgs.	-2
40 - 360		ı Bentonite ckfill 42-45 ft	S		CH4= 0%		Gravely	silty sand (SM) lens.		+ + + + + + + + + + + + + + + + + + + +
45 - 355	gend							of exploration at 45 ft. bgs. evated PID readings due to hot o	drilling conditions.	+
	gend   Continuous core	e 4" ID		Mater Level	Encountered		See Explo of symbo Logged b Approved	y: MML	Exploration Log VTP-11L Sheet 2 of 2	)

	Λ.	200	<u></u>	King C	oun	ty Va	ashon Is	land Landfi	iII - 09	90057	Monitoring \		
		spe	CT			-		e Specific Location			Coordinates (SPN NAD83 ft)	Exploration Nun	
<b>⊢</b> '		ontractor	ING	East	ipment	ashon/	Island, Cent	er of South Slope Sampling Metho			E:1227986 N:162728 Ground Surface (GS) Elev. (NAVD88	GW-9	•
Ι.			l			-						Ecology Well T BJX-257	
		ervices, Operator	inc	Exploration	y drill r	•		Rotary core Work Start/Completion			358.19' Top of Casing Elev. (NAVD88)	BJX-257 Depth to Water (Be	
		Pete		1	onic	u(0)		8/9/2016 to 8/10/			362.28'	No Water Encou	,
	Elev.			completion	Sample	! San	Analytical  pple Number &	Field Tests	Material		Description	No Water Energy	Depth
(feet)	(feet) 361	<del>-</del>	and No	op flange with	Type/IE		ab Test(s)		Туре				(ft)
-2	360		viton ga	isket									2
-1 -	359		HDPE T	F inint									1
0 -	358			te surface seal							FILL	It. OAND	<del> </del> 0
1 -	357		00110101							(SP-SM	lightly moist, brown, slightly si l); trace silt, fine to medium sanded gravel, trace organics (ro	nd, fine	- 1
2 -	356												- 2
3 -	355							PID= 0.0					- 3
4 -	354		4-inch S 0-17 ft b	SDR 11 HDPE ogs						Moist, o	tile fabric at 4 ft bgs ray brown, gravelly, silty SAN n sand, fine to coarse subroun	D (SM); fine to	<del> </del> 4
5 -	353				S1			PID= 0.0			s (roots, twigs).	aca gravoi, raio	- 5
6 -	352		3/8-inch backfill 2	Bentonite chip 2-15 ft bgs									- 6
7 -	351							PID= 68					7
8 -	350												- 8
9 -	349							PID= 90					- 9
10 demper 56, 2016	348												-10
	347												-11
S 12-	346							PID= 117		Moist. b	LANDFILL DEBRIS black to gray, sandy, gravelly F		12
AND LAT	345									textiles,	metal cans, plastic scraps, pagarbage bags, etc.		-13
14 ·	344												-14
15-	343				S2					<b>&gt;</b>			-15
16	342							PID= 155					-16
17-	341												-17
18-	340												-18
19-	339							PID= 40					-19
20 EM	338									<b>&gt;</b>			-20
NOTATION 21	337				S3								-21
OARD EXPL		lend Continuo	ous cor	re 7"	<u>                                      </u>		No Wate	er Encountered			loration Log Key for ion of symbols	Explorati	ion
ASPECT STANDARD EXPLORATION LOG TEMPLATE P./GINTW/PROJECTS/KC VASHON_AUGUST 2016 AND LATER, GPJ Sep  Sample 1						Water Level				Logged I	·	log GW-9 Sheet 1 of	2

	Δ	spe	<b>~</b> +	King C	ount	y Vasho	n Island	l Landf	ill - 09	0057	Monitoring		
7		she				Project Addres					Coordinates (SPN NAD83 ft)	Exploration Nur	
_		NSUL1 ontractor	ING	Fau	ipment	ashon Island		ampling Metho			E:1227986 N:162728	GW-9	9
			ln-								Ground Surface (GS) Elev. (NAVD	Ecology Well T	ag N
Н		ervices,	ınc		y drill rig			Rotary core			358.19' Top of Casing Elev. (NAVD88)	BJX-257 Depth to Water (Be	
		Operator Pete		Exploration	on Metnod onic	1(0)		an/Completio )16 to 8/10			362.28'	No Water Encou	
				1		Analytica		710 10 6/10			302.20	ino water Encou	
	Elev. (feet)	Exp	loration C and No	Completion otes	Sample Type/ID	Sample Num Lab Test(	ber & I	Field Tests	Material Type		Description		De
	336												
23	335							PID= 162					+:
	333							1 ID- 102	$\bowtie$				
24 +	334		Gravel f	filter pack 17-35									+:
۱			Ŭ										
25 –	333		4-inch S	SDR 11 HDPE									+
26			screen	with 1/2-inch tions 17-35 ft	83								1
	332		bgs					PID= 124					
27	331												+
28 +	330												+
29													+
	329							PID= 28					
30 +	328				H								+
31 +	327							PID= 12.1					t
32-													1
,_	326												
33	325												+
	020												
34 +	324		:					PID= 9.7					+
35 -			Mahla/W	I endcap	8								1
55	323		Weided	Спасар									
36	322												+
	022												
37 -	321		3/8-inch backfill	Bentonite chip 36-40 ft bgs				PID= 8.1					t
38	_		,										_
30	320		•							Moiet h	Vashon Advance Outwas rown SAND (SP); trace fine		
39	319		,					PID= 3.2		predom	inantly medium sand	Sabiodilued glavel	''
	018							. 10 - 0.2					
40 +	318		1		-					Bottom	of exploration at 40 ft. bgs.		+
11 <del>-</del>													1
	317												
12	316												t
13													1
٠,٥	315												
14	314												+
	U 1-4												
45	313												t
46													1
٠.٥	312												
1		end								Soc Fyr	loration Log Koy for		
ğ ğ		Continu	ous co	re 7"		No	Water End	ountered		explanat	loration Log Key for ion of symbols	Explorati	ior
Sample Method						Water				Logged I	ov. MMI	log GW-9	
യ⊸	1					<i>&gt;</i>				-vyycu i	d by: JJS	J11-3	

	Λ.	cna	<b>~</b> ‡	King C	ount	ty Vashon Is	sland Landf	iII - 09	0057	Monitoring V	
	_	spe		18900 W	estsidę	Project Address & S Highway SW, Vas	ite Specific Location shon, WA 98070, N FP-4S and VTP-5S.	lorth of le	eachate	Coordinates (SPN NAD83 ft)	Exploration Number
,		ONSULT Contractor	ING	Faui	pment	agoon, between V	P-4S and VTP-5S. Sampling Methor	nd		E:-122.500 N:47.4340 Ground Surface (GS) Elev. (NAVD88)	GW-10
Ι,		Services, I	nc	·	drill rig		Rotary core			359.9499'	Ecology Well Tag No. BKX482
- '		Operator	110.	Exploratio		' I	Work Start/Completion			Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
		Pete			onic	( )	6/25/2018 to 6/26			363.7966'	No Water Encountered
	Elev.	Explo	oration C and No	ompletion tes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type		Description	Depth (ft)
-	-		Sealed gasket	top flange		200 100(0)					-
-	_		HDPE T	ee-joint							_
0 -	360		Concrete surface seal, 0 to 2 feet bgs  4-inch Sch 80 HDPE, +3.85 to 15.5 feet bgs						medium	FILL SAND WITH GRAVEL (SM); Mo to coarse gravels, fine to coarse lesive material.	
-	_						PID = 5.7		Geote	dile fabric observed at 3.5 feet bo	gs
5 -	355		4-inch Sch 80 HDPE, +3.85 to 15.5 feet bgs 3/8-inch bentonite chip backfill, 2 to 14.5 feet bgs				PID = 20.8			Y SILT WITH GRAVEL (ML); Mo e sands, medium to coarse grav e.	
-	<del>-</del>						PID = 8.0			SAND WITH GRAVEL (SM); More gravels with cobbles, fine to co	
10-	350						PID = 20.2 CH4 = 0.0			- J	-10
-	<del>-</del>						PID = 57.8		\coarse s	WITH SILT (SP-SM); Moist, ligh sand.  LANDFILL DEBRIS SAND WITH GRAVEL (SM); Mo lastic bags, plastic, glass, metal s	ist, dark gray to
15-	_ 345						PID = 112.5		· · · ·		-15
-	_		to 29.5				PID = 29.0			includes red plastic, red painted lebris, metal scraps.	lumber, plywood,
20-	340		screen v perforat 28.5 fee	sch 80 HDPE with 1/2-inch ions, 15.5 to it bgs					Debris newspa	includes glass, plastic bags, text per	illes, woody debris,
							PID = 33.9 CH4 = 0.0				
Sample 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		<b>gend</b> Continuo	us core			Water Level	ter Encountered		of symbo		Exploration Log
Sar	2					F			Logged I Approve	by: ACO d by: MVA/PSB	<b>GW-10</b> Sheet 1 of 2

	\		King (	Count	ty Vashon I	sland Landf	ill <u>-</u> 09	0057	Monitoring V		
X	<b>4</b> spe				Project Address & S	ite Specific Location			Coordinates (SPN NAD83 ft)	Exploration Num	ber
	CONSULT	ING			agoon, between V	shon, WA 98070, N TP-4S and VTP-5S		Jacriato	E:-122.500 N:47.4340	GW-10	0
	Contractor			uipment		Sampling Meth			Ground Surface (GS) Elev. (NAVD88,	Ecology Well Ta	
Holt	t Services, I	nc.		ry drill rig		Rotary core			359.9499'	BKX482	
	Operator		•	ion Method	J(S)	Work Start/Completion			Top of Casing Elev. (NAVD88)	Depth to Water (Belo	
	Pete			Sonic	A = -1.4° ·	6/25/2018 to 6/26	0/2018	1	363.7966'	No Water Encour	ntered
epth Ele eet) (fe	ev. Explo	oration Co and Not	ompletion tes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Materia Type	I	Description		Dep (ft)
† †						PID = 59.6		black; plack; pl	LANDFILL DEBRIS SAND WITH GRAVEL (SM); Molastic bags, plastic, glass, metal sed) includes blue plastic jugs, glass, egg cartons, concrete	scraps.	+ + +
25 - 33	35					PID = 85.5			includes charcoal, ash debris, g paper (appears visibly burnt)	lass, metal,	- 25 -
+		Welded	endcap			PID = 37.1		Debris	includes blue plastic, glass, woo	d debris	+
30 - 33	30	Backfille bentonite feet bgs	ed with e chips to 35			PID = 14.4 CH4 = 0.0					<u>+</u> 3
+						PID = 8.8		trace lur	SAND (SM); Moist, light brown; mber debris Vashon Advance Outwash	/B unit	_
1								SAND (	(SP); Moist, light brown; trace sil ace fine to coarse gravels, no vis	t, fine to coarse ible landfill debris.	
35 + 32	25 🐱 🐱 🐱					PID = 4.1	-	Bottom	of exploration at 35 ft. bgs.		+3
_											+
1											<u></u>
40 - 32	20										- 4
+											+
+											+
+											+
45 — 31											- 4
	egend Continuo	us core	: 7" ID	, ,	Water Level	ter Encountered	,	of symbo		Exploration Log GW-10 Sheet 2 of 2	

	<u> </u>	coc	<u></u>	King C	oun	ty Va	shon Is	land Landfi	II - 09	0057	Monitoring V	Vell Log	
		spe	CT	18900 Wes	tside H	Project a	Address & Site SW, Vashon	e Specific Location , WA 98070, Nort P-7 and VTP-5D.	hwest of	leachate	Coordinates (SPN NAD83 ft)	Exploration Num	
<b>—</b>		ONSULT Contractor	ING	Fau	pment	lăgooń, l	between VTI	P-7 and VTP-5D.  Sampling Methor	nd .		E:-122.501 N:47.4341 Ground Surface (GS) Elev. (NAVD88	GW-11	1
Ι.				· '	•			, ,	u		, , , ,	Ecology Well Tag	g No.
<u> </u>		Services, I	nc.	Exploration	/ drill rig	_	<u> </u>	Rotary core Vork Start/Completion	n Dates		360.1557' Top of Casing Elev. (NAVD88)	BKX483  Depth to Water (Belo	
		Pete		· '	onic	u(3)		6/25/2018 to 6/26			363.6807'	No Water Encour	,
Depth	Elev.		oration C	ompletion	Sample		nalytical le Number &	Field Tests	Material		Description	1.10 1.1010. 2.1000.	Depth
	(feet)		and No	otes	Type/ID	Jailipi	b Test(s)	Tielu Tests	Туре		Description		(ft)
-	†		Sealed gasket	top flange									+
-			HDPE 1	Tee-joint									
0 -	360		Concret 0 to 2 fe	te surface seal,					\(\frac{1}{2\ldot 1_\text{y}} \cdot \frac{1}{2\ldot 1_\text{y}} \cdot \fra	TOPSO	DIL; Dry, light brown; root mass,	non-cohesive	+ 0
-			0 10 2 10	oct age				PID = 3.2			FILL WITH SILT AND GRAVEL (SWine to coarse sand, fine to coarse		
-	_		4-inch 5 +3.53 to	Sch 80 HDPE, o 10.5 feet bgs						orange s	saming.		_
5 -	355		backfill,	bentonite chip 2 to 9.5 feet				PID = 3.2		-			+ 5 -
-			bgs					PID = 11.1		Geotex	tile fabric at 6.5 feet bgs		_
-	-							FID - 11.1		black; de	LANDFILL DEBRIS SAND WITH GRAVEL (SM); Mo ebris includes plastic, metal, gla- ish gloves.	oist, dark brown to ss shards, brick,	
10-	350							PID = 7.0 CH4 = 1.1		, plactic d	on gove.		-10
-			gravel fi to 18 fe	i to 1-inch Iter pack, 9.5 et bgs				PID = 35.0					-
-			screen	Sch 80 HDPE with 1/2-inch ions, 10.5 to bgs				PID = 35.0		Debris	includes wood debris, plastic, m	etal	
15 - -	345							PID = 290.0		Debris	includes fiberglass, shredded pa	aper, metal wires	- 15 -
NEW STANDARD LOG FORM P:GINTWPROJECTS/2018_090057-310_17.6_VASHONLF.GPJ_JJJy 18, 2018  Sample	_		Welded	endcap				PID = 132.1		Debris	includes plastic, plastic bags, ca	ardboard, lumber	+
NASHONLF	340		Backfille bentoni	ed with te chips to 25				PID = 202.7 CH4 = 0.0		SAND plastic d	(SP); Moist, dark blue-gray; tracebris.  Vashon Advance Outwash		+ +20
0057-310.1.7.6			feet bgs	·				CH4 = 0.0			SW); Moist, dark gray; trace grass observed, noticeable refuse of	avel and trace silt,	
ECTS/2018_09	_							PID = 19.3					_
- 25   25	335							PID = 11.9	*****	Detterre	f and action at 05 th has		+ +25
RM P:\G										DOLLOTTI (	of exploration at 25 ft. bgs.		+
STANDARD LOG FOR Sample		gend Continuo	ous core	e 7" ID	<u> </u>	Water	No Wate	r Encountered		See Explo	oration Log Key for explanation	Exploration Log	on
Sar	2					Le				Logged b Approved	oy: ACO d by: MVA/PSB	<b>GW-11</b> Sheet 1 of 1	

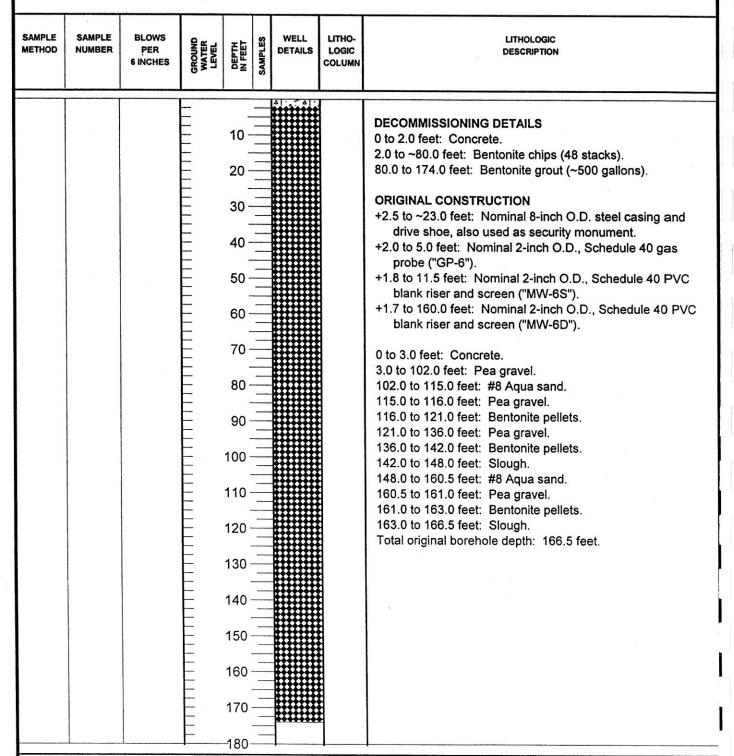


		Aspec			N	Monit	oring Well Constructio		
		CONSULTIN	ı 📗		ct Numb	oer	Well Number MW-1	Sheet 1 of 2	
Project Name: King County Closed Landfills  Location: Vashon Island Landfill			dfills	0.0	00001		Ground Surface Elev	403.64	
				Top of Casing Elev. Approx 404					
Driller/Method:	Holt Services / S						Depth to Water (ft BGS)		
Sampling Method:	Continuous Core	)					Start/Finish Date	4/3/2015	
	ehole Completion	Sample Type/ID	Laboratory	PID (ppm)	Unit	Material Type	Description		De
(feet)		Турель	Tests	(ррііі)		Туре			- (
5 + 400 5 + 400 5 + 395 10 + 395 115 + 390 15 + 380 25 + 380 25 + 380 25 + 380 45 + 365 40 +							Decommissioning Monitoring well decommissioned is rotosonic drilling methods 0 to 2 feet: Soil backfill 2 to 131 feet: Bentonite chips (66) Well monument had been damag was sitting on top of the PVC. An approximately 1-foot diameter the well from ground surface to appelow ground surface. The void whentonite as part of the decommiss.  Original Well Constant of the decommission of the	bags)  ed previously, and  void existed around proximately 50 feet as backfilled with ssioning process.  truction  h O.D., Schedule 80	
‡ <sub>20</sub>									ŧ
+ 305 Sampler Typ	) o		DID D	oto!e:-!-	tion D	to etc :	Logged by:	AHP	土
Sampler Typ	JC.		PID - Ph			etector	Logged by:	ALIF.	
M INO RECOVERY				tic Wate			Approved by:	John Strunk	
			<del>∸</del> Wa	ter Level	(ATD)		Figure No.	C - 2	

		<b>A</b>	.al		N	<b>Monitor</b> i	ing Well Constructio	n Log	
		ASPE	ING		ct Numb 90057	per	Well Number MW-1	Sheet 2 of 2	
Project Name:	King County	/ Closed La	andfills			I	Ground Surface Elev	403.64	
Location: Vashon Island Landfill							Top of Casing Elev.	Approx 404	
Oriller/Method:	Holt Services /						Depth to Water (ft BGS)		
Sampling Method:							Start/Finish Date	4/3/2015	
Depth / Elevation Bor	ehole Completion	Sample	Laboratory	PID	Unit	Material Type	Description		D
(feet)		Sample Type/ID	Laboratory Tests	(ppm)	Unit	Туре	Description		D
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Sampler Ty	 oe:		PIN - P	hotoioniza	ation Do	tector	Logged by:	AHP	
No Recovery			_			100101			
			_	atic Wate			Approved by:	John Strunk	
			<del>≚</del> W	ater Level	(ATD)				

#### LOG OF EXPLORATORY BORING

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy BORING NO. MW-6
PAGE 1 of 1
REFERENCE ELEV. 392.4
TOTAL DEPTH 174.0'
DATE COMPLETED 8/15/03



#### REMARKS

Existing nominal 8-inch casing and drive shoe were removed, then existing well assemblies and backfill were overdrilled using nominal 8-inch-diameter casing to below the original installation depth. Backfill was placed concurrent with casing removal.

#### LOG OF EXPLORATORY BORING

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY Vashon Island Landfill Closure
Vashon Island, Washington
Tacoma Pump & Drilling
Dual Rotary
Udaloy

BORING NO.
PAGE
REFERENCE ELEV.
TOTAL DEPTH
DATE COMPLETED

MW-11 1 of 1 404.3 375.0' 7/29/03

SAMPLE SAMPL METHOD NUMBE	GROUND WATER LEVEL	DEPTH IN FEET SAMPLES	WELL DETAILS	LITHO- LOGIC COLUMN	LITHOLOGIC DESCRIPTION
	10 11 12 12 12 12 12 12 12 12 12 12 12 12	20			DECOMMISSIONING DETAILS 0 to 2.0 feet: Concrete. 2.0 to 254.0 feet: Bentonite grout pumped into well screen and casing using the tremie method.  ORIGINAL CONSTRUCTION Depth of boring = 375.0 feet.  ~2.5 to 242.0 feet: Nominal 2" PVC casing. 242.0 to 254.0 feet: Nominal 2" PVC screen and end plug. 0 to 2.0 feet: Concrete. 2.0 to 235.0 feet: Bentonite grout. 235.0 to 240.0 feet: Bentonite chips. 240.0 to 254.0 feet: 20 x 40 CSSI sand. 254.0 to 260.0 feet: Pea gravel. 260.0 to 375.0 feet: Bentonite grout.

REMARKS

Original N: 1471.91 E: 3023.75.

**UDALOY ENVIRONMENTAL SERVICES** 

VAS-MW11.gds:3.9/29/03.VAS-MW11...A25-003.01 T5

		Mene	ct 📙	Droio	ct Num	VIOIIL	oring Well Constructi Well Number	Sheet	
		CONSULT	ING		90057		MW-14	1 of 2	
Duningt Names	King County	Closed La	ndfillo	U.	90037			373.62	
Project Name:			iiuiiis				Ground Surface Elev		
ocation:	Vashon Island L						Top of Casing Elev.	Approx. 376	
Oriller/Method:	Holt Services / S						Depth to Water (ft BGS)		
	Continuous Core	<del> </del>				1	Start/Finish Date	4/7/2015-4/9/2015	_
Depth / Elevation (feet)  370 5 - 365 10 - 365 15 - 355 20 - 345 30 - 345 345	ehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Decommissionin Monitoring well decommissioner rotosonic drilling methods 0 to 2 feet: Soil backfill 2 to 60 feet: Bentonite chips 60 to 150 feet: Bentonite grout 150 to 180 feet: Bentonite chips  Original Well Cor +2 feet to 172 feet: Nominal 2-ir PVC blank riser and 10-slot scre 0 to 2 feet: Concrete 2 to 150 feet: Bentonite grout 150 to 154 feet: Bentonite chips 154 to 172 feet: No. 20-40 Colo 172 to 180 feet: Bentonite chips	ng Details d by overdrilling using enstruction ench O.D., Schedule 40 een erado Silica Sand	
35 - 340 40 - 335 40 - 335 45 - 320 55 - 320 55 - 315 60 - 315 60 - 315 60 - 305 70 - 305									
295 80									
280 95 275 Sampler Typ	pe:		_	hotoioniza atic Wate		etector	Logged by:	AHP y: John Strunk	
			Ā M	ater Leve	(ATD)		Figure No.	C - 3	

						Monitori	ng Well Construction	on Log	
		CONSUL	CT ING		ct Num 90057	ber	Well Number MW-14	Sheet 2 of 2	
Project Name:	King Count	y Closed La	andfills				Ground Surface Elev	373.62	
ocation:	Vashon Island						Top of Casing Elev.	Approx. 376	
Oriller/Method:	Holt Services						Depth to Water (ft BGS)		
Sampling Method:							Start/Finish Date	4/7/2015-4/9/2015	
Depth / Elevation (feet)	orehole Completion Sample Type/ID Laboratory Tests		PID (ppm)	Unit	Material Type	Description		Dep (ft	
±									Ŧ
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05+									10
265									Ŧ
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± ± 250									‡
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220									‡.
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1210									Ē
65									10
205									‡

Sampler Type:

O No Recovery

KCSWD\_SONIC LOG KC VASHON\_DECOMMISSIONED.GPJ June 30, 2015

190

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

 $\underline{\blacktriangledown}$ 

Logged by: AHP

Approved by: John Strunk

<u>-</u>175

180

185

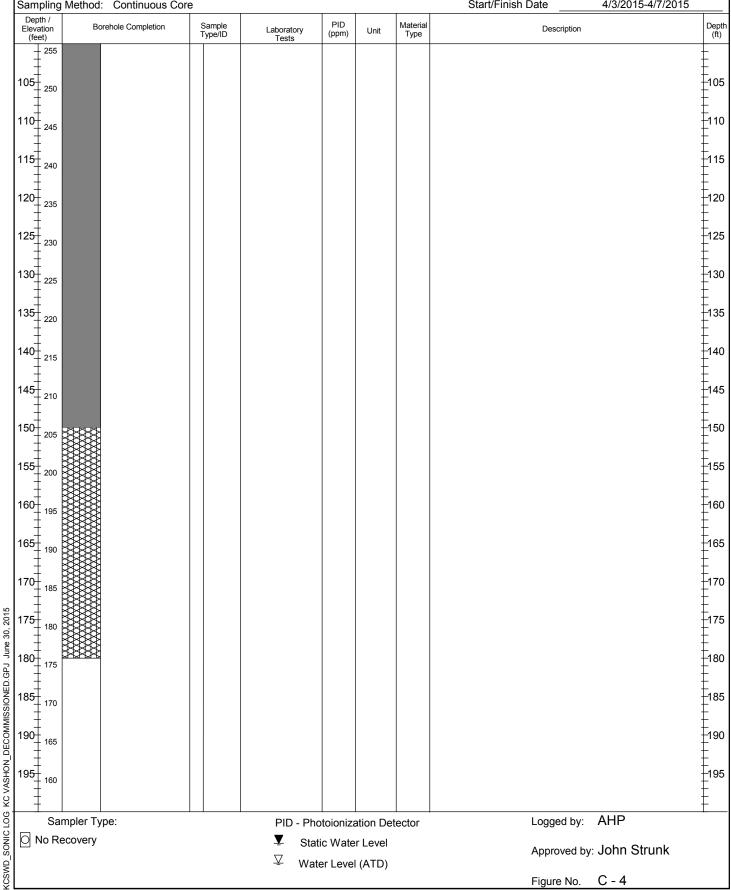
190

195

Figure No. C - 3

		Meno	_+		<u> </u>	<b>Monit</b>	oring Well Construction		
	`	CONSULTI	CT NG		ct Numb 90057	oer	Well Number MW-5	Sheet 1 of 2	
Project Name:	King County	Closed Lar	ndfills	08	90037		Ground Surface Elev	355.86	
ocation:	Vashon Island L		- Tarinio				Top of Casing Elev.	Approx. 358	
Priller/Method:	Holt Services / S						Depth to Water (ft BGS)		
Sampling Method:	Continuous Core	;					Start/Finish Date	4/3/2015-4/7/2015	
	hole Completion	Sample	Laboratory	PID (ppm)	Unit	Material	Description		De
(feet)		Type/ID	Tests	(ррііі)		Туре			$\pm$
5 - 350 5 - 350 10 - 345 15 - 340 20 - 335 25 - 330 30 - 325 35 - 320 40 - 315 45 - 310 50 - 305 55 - 300 60 - 295 65 - 290 70 - 285 75 - 280 80 - 275 80 - 275 80 - 275 80 - 275 80 - 265 90 - 265 90 - 265 90 - 265							Decommissioning Monitoring well decommissioned rotosonic drilling methods 0 to 2 feet: Soil backfill 2 to 152 feet: Bentonite chips (84  Original Well Cons +2 feet to 5 feet: Nominal 3/4-inc monitoring probe +2 feet to 84 feet: Nominal 2-inch PVC blank riser and 20-slot scree +2 feet to 126 feet: Nominal 2-inch PVC blank riser and 20-slot scree 0 to 3 feet: Concrete 3 to 69 feet: Pea gravel 69 to 84 feet: #8 Monterey sand 84 to 84.5 feet: Pea gravel 84.5 to 89 feet: Bentonite pellets 89 to 101 feet: Pea gravel 101 to 106 feet: Bentonite pellets 106 to 113 feet: Pea gravel 113 to 126 feet: #8 Monterey san 126 to 132 feet: Bentonite pellets 132 to 151 feet: Pea gravel	struction h O.D. PVC gas n O.D., Schedule 40 en ("MW-5S") ch O.D., Schedule 40 en ("MW-5D")	
Sampler Typ	e:		PID - P	hotoioniza	ation De	tector	Logged by:	AHP	
No Recovery			<b>▼</b> St	atic Wate	r Level		المالية من محمد من المالية	. John Strunk	
			∑ w	ater Level			Approved by	: John Strunk	

**Monitoring Well Construction Log** Project Number Well Number Sheet MW-5 090057 2 of 2 King County Closed Landfills Project Name: **Ground Surface Elev** 355.86 Approx. 358 Location: Vashon Island Landfill Top of Casing Elev. Depth to Water (ft BGS) Driller/Method: Holt Services / Sonic Start/Finish Date 4/3/2015-4/7/2015 Sampling Method: Continuous Core Depth / PID (ppm) Material Type Sample Type/ID Borehole Completion Elevation (feet) Laboratory Tests Description



O No Recovery

**T** Static Water Level

Approved by: John Strunk

 $\nabla$ Water Level (ATD)

C - 4 Figure No.

# MW-27 Decommissioning Summary Memo



# **Solid Waste Division**

# Memo

August 22, 2016 Aspect Project No.: 090057

**To:** Isabel McClure – King County Solid Waste Division (KCSWD)

Anne Holmes, Tom Theno, Dan Swope – KCSWD

Henry Haselton, Adam Griffin - Aspect Consulting LLC

From: Aaron Pruitt, LG – Aspect Consulting LLC

John Strunk, LHG - Aspect Consulting LLC

Re: Vashon Island Closed Landfill - Task 310.1.10 - Contract No. E000102E08

**MW-27 Decommissioning Summary Memo** 

Field investigations performed in the Spring of 2015 at the Vashon Island Closed Landfill included the installation of four new wells (MW-33 through MW-36). One of the new wells, MW-34, was installed in close proximity to existing well MW-27. Evaluations of stratigraphic and water level data from both MW-27 and MW-34 indicate that MW-27 was completed in a way that may allow interconnection of the Cc3 and D hydrogeologic units. Evaluation of MW-27 well completion details, stratigraphic information obtained from sonic drilling and core samples at MW-34 and groundwater hydrographs provided information to support a recommendation to decommission MW-27. KCSWD approved the recommendation in May 2016 to decommission MW-27.

The decommissioning of MW-27 occurred between July 5<sup>th</sup> and July 12<sup>th</sup>, 2016. The well was decommissioned by overdrilling using a rotosonic drill rig operated by Holt Services, Inc. (Holt), a subcontractor to Aspect Consulting, LLC (Aspect). The well was overdrilled with a 9-inch inner diameter barrel to 90 feet below ground surface (ft bgs), and a 7-inch inner diameter drill barrel from 90 ft bgs to the total depth of 237 ft bgs (see Decommissioning Log, Attachment A). During overdrilling, it was noted that the well deviated from plumb to the southeast at 37 ft bgs, and well casing was not extracted below the deviation. Soil cuttings from 90 ft bgs to 100 ft bgs included a small amount of hydrated bentonite, likely from MW-27 completion.

After overdrilling to total depth, the boring was backfilled with bentonite pellets from 237 ft bgs to 210.5 ft bgs, and bentonite chips from 210.5 ft bgs to 2 ft bgs. Ten bags of bentonite chips were required to backfill 7 feet of boring at a depth starting at 176 ft bgs, when only 3.5 bags of bentonite chips would be expected to fill that amount of borehole volume. It is likely that a void (possibly the bottom section of well casing) was filled at the 176 ft depth. The well casing below the deviation at 37 ft bgs was also backfilled with bentonite chips, taking an additional sixteen bags of bentonite

chips. The ground surface was patched with black-dyed concrete. Daily field reports are provided in Attachment B.

During the decommissioning of MW-27, a transducer was deployed in the nearby well MW-34 to monitor water levels in the D-unit aquifer (Figure 1). Water levels increased by over a foot when drilling advanced between 200 ft bgs and 210 ft bgs. This suggests that the low-transmissivity Cf unit between the Cc3 and D unit aquifers is interconnected between 200 ft bgs and 210 ft bgs. This depth is below the former screen depth interval in MW-27, but within the original gravel pack interval in MW-27. This water level response supports the observation that the extended gravel pack interval in MW-27 was serving as a conduit cross-connecting the Cc3 and D units. Water levels fluctuated as drilling continued to total depth, and stabilized as the boring was backfilled with bentonite.

#### Limitations

Work for this project was performed for the King County Solid Waste Division (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

\biserver1.aspect.local\projects\King Co Closed Landfills\Phase I\Vashon Is\Task 310.1.10 Infrastructure Improvements\MW-27\MW-27 Decom Memo.docx

#### **Attachments:**

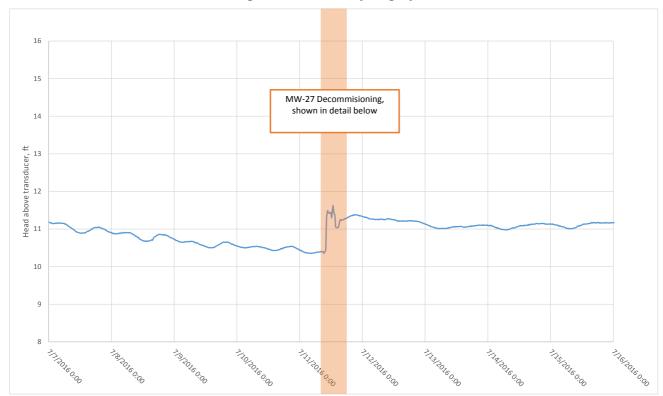
Figure 1 – MW-34 Hydrograph

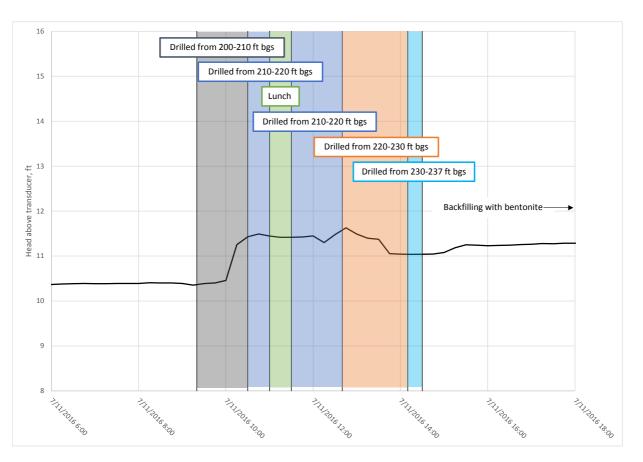
Attachment A – MW-27 Decommissioning Log

Attachment B - Daily Field Reports

Figure 1 – MW-34 Hydrograph

Figure 1- MW-34 Hydrograph





Attachment A – MW-27 Decommissioning Log



# Monitoring Well Construction Log mber Well Number

Project Number 090057

MW-27

Sheet 1 of 2

388.63

Project Name: King County Closed Landfills

Location: Vashon Island Landfill

Top of Casing Elev. (NGVD 88)

Ground Surface Elev (NGVD 88) 386.34

Figure No.

A - 2

Location:v	asnon isiano L	andilli					10p of Casing Elev. (NGVD 66) 366.63	
Driller/Method: Ho	olt Services / S	onic					Depth to Water (ft BGS)	
Sampling Method:							Start/Finish Date 7/5/2016-7/12/2016	
Denth /	Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
5 380 Conc 10 Bento	rete surface patch  ponite chips 2 -  of th bgs		Tests			, jpc	Decommissioning Details  Monitoring well decommissioned by overdrilling using rotosonic drilling methods: 9-inch ID barrel to 90 feet, 7-inch ID barrel 90 to 237 feet.  0 to 2 feet: Concrete surface patch (dyed black) 2 to 210.5 feet: Bentonite chips 210.5 to 237 feet: Bentonite pellets  Additional Notes:Well casing deviates from plumb to the SE at 37 ft bgs (observed)Well casing below the deviation not extractedRemaining well casing below deviation at 37 ft bgs backfilled with bentonite chips (16 bags)  Original Well Construction +2.3 to 186.5 feet: 4-inch OD, Sch 80 PVC blank riser 186.5 to 190.6 feet: 4-inch OD, Sch 80 PVC 20-slot screen 190.6 to 191.4 feet: 4-inch OD, Sch 80 PVC blank casing joint 191.4 to 200.7 feet: 4-inch OD, Sch 80 PVC 20-slot screen 200.7 to 201.3 feet: 4-inch OD, Sch 80 PVC blank casing and end plug 0 to 2 feet: Concrete, steel monument, bollards 2.0 to 134.0 feet: 3/4-inch bentonite chips 134.0 to 141.0 feet: Slough 141.0 to 183.5 feet: 3/4-inch bentonite chips 183.5 to 203.5 feet: Norton 16 x 30 silica sand 203.5 to 237.0 feet: Pea gravel	5 10 15 20 25 30 40 45 55 60 65 70 75 80 95 100 105 110 115
Sampler Type:			PID - Pho	otoioniza	tion De	tector	Logged by: MML	
No Recovery			▼ Stat	ic Mata	r I evel			
Montecovery			± Stat	ic Wate	r Level		Approved by: John Strunk	

Water Level (ATD)

KCSWD\_SONIC LOG KC VASHON\_DECOMMISSIONED.GPJ August 16, 2016



# Monitoring Well Construction Log

Project Number 090057

MW-27

Sheet 2 of 2

Project Name:

Location:

King County Closed Landfills

Vashon Island Landfill

Top of Casing Elev. (NGVD 88) 388.63

Ground Surface Elev (NGVD 88) 386.34

Driller/Me		Sonic			Depth to Water (ft BGS)				
Sampling	Method:	T T				T T	Start/Finish Date7/	5/2016-7/12/2016	
Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	De (	
265								<u> </u>	
125	Bentonite chips 2 -							<u>‡</u> 1:	
± 260 ±	210.5 ft bgs							<u> </u>	
130								<del>-1</del> 13 E	
135 <u>+</u>								<u> </u>	
250								\frac{\frac{1}{2}}{2}	
140								<u>-</u> 14	
‡ 245 ‡								‡	
145 240								<u></u> 1₁	
150 <del>-</del>								Ę,	
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= 230 = 230								‡	
160 225								<del>-</del> 10	
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170								1 <sub>1</sub>	
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175								-2 -2 -2	
215 170	Bentontite pellets 210.5	5						<u></u> 2	
Ŧ	- 237 ft bgs							Т	
220 165								<del>-2</del> 2.	
225 <del>-</del>								± 2	
T 160								±	
230 155	- 							‡2	
235								-2 -2 -2 -2	
235	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\							‡	
<u> </u>	<u> </u>								
	mpler Type:		PID - Ph			etector	Logged by: M	ML	
O No Re	ecovery			tic Wate			Approved by: Jo	ohn Strunk	
			<u>▽</u> Wa	ter Level	(ATD)				
							Figure No. A	- 2	

RESOURCE PROTECTION WELL!	REPORT CURRENT  Notice of Intent No. AE 38181
Construction/Decommission	Type of Well
Construction	Resource Protection
Decommission ORIGINAL INSTALLATION Notice	
of Intent Number	Geotechnical Soil Boring Property Owner  County Annual County
	Site Address 18910 Westside Hury Sw
Consulting Firm Aspect	City Vashon Island County King
Unique Ecology Well [D	Location 14 SW 14 SW Sec 36 Twn 23 R 2 or
Tag No. Mus 27	
WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for	Lat/Long (s,t,r Lat Deg Lat Min/Sec
construction of this well, and its compliance with all Washington well construction standards	still Required) Long Deg Long Min/Sec
Materials used and the information reported above are true to my best knowledge and belief	Tax Parcel No.
Driller/Trainee Signature	S 1/2
Driller/Trainee License No.	Cased or Uncased Diameter Static Level
	Work/Decommision Start Date 7-5-16
If trainee, licesned drillers'	
Signature and License No.	Work/Decommision Completed Date £-12-16
Construction/Design	Well Data Formation Description
CONCRETE SU	Redi Mix Bentonite
	Bentonite Silty Sanol + gravel Chips
DEPTH OF BORING	225 2ts 237  Silt.  Notes:  Drill from Surface to 50 ft overdrilling a well at 50 ft we lost the well during drilling  Aspect P.M. Contacted DOE.  Was told to keep drilling.
cale !" =	hhile backfilling we exposed  the pre-cince again and poured  in bentunte hoter privatively.



# Notice of Intent to **Decommission a Well**

Notification Number

This form and required fees **MUST BE RECEIVED** by the Department of Ecology **72 HOURS BEFORE** you construct a well.

AE38181

Submit one completed form for each job site and required fee (check or money order only) to: Department of Ecology Cashiering Unit, P.O. Box 47611, Olympia, WA 98504-7611

NOTE: Please print. Pro	cessing y	our Notice o	of Intent	may be d	elayed if	all fie	elds	are not fil	led in completely.	
_	County				Phone	Numb				
Mailing Address 18910 Westside Highwa	y SW		City	Vashon I				ate WA	Zip Code 98070	
2. Agent (if different from a	above)				Phone Number					
Mailing Address			City		State			ate	Zip Code	
3. Well Location										
Tax Parcel Number, T	ownship, F	Range, Sect	tion,⅓, ar	nd ¼ ¼ ar	e Requi	red. La	atitud	e and lon	gitude (if available).	
County Name King - 1	7									
Well Site Street Address	18910 W	estside Highv		City	Vashon Is	land		State WA	Zip Code 98070	
Tax Parcel Number	Township	Range	Section	1/4 (within	160 acres	) 1	/ <sub>4</sub> - <sup>1</sup> / <sub>4</sub>	(within 40 a	cres)	
	23N	2E	36	SW			SI	W		
Latitude Degrees		Latitude Ti	me			Horiz	onta	Collection	n Method	
<b>C</b>			min		sec					
Longitude Degrees		Longitude	Time							
			min		sec					
Notice of Intent Number being decomissioned	of well		Ur be	ique Well ing decom	Tag Nur nissioned	nber o (if app	f wel	l ole)		
5. Well Type to Decommis	sion								_	
Resource Protect	ion - \$20.00	each Revise	ed Code: 0	)27-WEL1*	*-02-87-00	00101		How Ma	ny? 1	
6. Estimated Decommission	on Start Da	te 7/5/2016	6	Project N	ame Asp	ect Va	shor	ı Island C	losed Landfill	
7. Professional's License	Number									
8. Well Drilling Company	Name H	olt Services, I	nc.			PI	hone	Number	(253) 604-4878	
9. Well Driller Name						D	riller	License N	lumber	
10. Send the entire form.	1					<u> </u>				
Please copy the notific this reference number							s) an	d keep in	a safe place. Use	
Water Well : Soil Sampling, Dewaterin		50.00		Thi	s notificati	on nun	nber r	nust be pro	ovided to your driller:	
Environmental investigati All other wells: Amount Enclosed \$	on wells: N	lo Fee 20.00 each 00	AE38181							

#### Instructions

- Item 1: Property owner's name, daytime phone number and mailing address.
- Item 2: Agent If the driller, consultant or other person is acting as your agent and is submitting the notification fee, please provide their name, mailing address and daytime phone number
- Item 3: Complete county name and code number from drop down list. If the site street address is available, please fill in the complete address here. Include city and zip code. Please enter the tax parcel number if available. NOTE: Include all dashes and zeros. Please provide the Township, Range, Section, where the well is located. This information can be found in your property legal description or the County Assessor's Office
- Item 4: Please enter the original construction notice of intent number if available.
- Item 5: Type of well to decommission. Please note those wells that require a fee and those that do not.
- Item 6: Enter the approximate decommissioning start date.
- Item 7-11: This information should be available from your well driller.

#### For Assistance

Contact the Department of Ecology Regional Office where the well is located.

Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima counties contact:

Central Regional Office (CRO) (509) 575-2490 TTY 711 and 1-800-833-6388

Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman counties contact:

Eastern Regional Office (ERO) (509) 329-3400 TTY 711 and 1-800-833-6388

Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom counties contact:

Northwest Regional Office (NWRO) (425) 649-7000 TTY 711 and 1-800-833-6388

Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum counties contact:

Southwest Regional Office (SWRO) (360) 407-6300 TTY 711 and 1-800-833-6388

ECY 040- 24 To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy

BORING NO.
PAGE
REFERENCE ELEV.
TOTAL DEPTH
DATE COMPLETED

MW-27 1 of 13 380.8 237.0' 8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET		VELL ETAILS	LITHO- LOGIC COLUMN	LITHOLOGIC DESCRIPTION
			-		41	41.41.41.41.41.41.41.41.41.41.41.41.41.4		0 to 0.4 foot: ASPHALT  0.4 to 2.5 feet: SILTY GRAVEL (GW-GM), brown fines, subrounded to subangular, some fine to medium sand, few fines, moist. (ROAD SUBGRADE)
G	4		- - - - -	5 -				2.5 to 7.0 feet: SILTY GRAVEL (GP-GM), brown fines, medium to coarse, subrounded to subangular, some fine to coarse sand, few fines, few cobbles, trace boulders, dry to moist. Trace wood debris, broken glass and plastic debris at 3.0 to 3.5 feet. (FILL)
G	8	8	- 1 - 1 - 1 - 1 - 1 - 1 - 1	10 -				7.0 to 11.0 feet: SILTY GRAVEL (GM), olive gray fines, fine to coarse, subrounded to subangular, some fines, little fine to medium sand, trace cobbles, moist. Gravel content decreases downhole, gradational basal contact. (TILL)
G	12		- - - - - -	-				11.0 to 27.0 feet: SILTY SAND (SM), olive gray fines, fine to medium, trace to few coarse, some nonplastic fines, some fine to medium gravel, trace coarse gravel, trace cobbles, moist. (TILL)
G	15			15 -				
			-	20				

#### REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

**UDALOY ENVIRONMENTAL SERVICES** 

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy BORING NO.
PAGE
REFERENCE ELEV.
TOTAL DEPTH
DATE COMPLETED

MW-27 2 of 13 380.8 237.0' 8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO- LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	20		-					11.0 to 27.0 feet: SILTY SAND (SM), continued.
			-		_			@ 23.0 feet: gravelly.
G	25		-	25 -				@ 25.0 to 28.0 feet: slight increase in moisture content.
			- - - -					27.0 to 39.0 feet: SILTY SAND (SP-SM), yellow brown fines, fine to medium, subrounded to subangular, trace to few subrounded coarse sand and fine gravel, few fines, moist. Transitional to SP. Basal contact defined as where silt occurs disseminated within matrix. (FLUVIAL DEPOSITS)
G	30		- - -	30 -				
	25		-	35 -				<ul> <li>@ 33.0 feet: smoother drilling.</li> <li>@ 33.0 to 39.0 feet: trace to few fine subrounded to subangular gravel, drilling action suggests gravel occurs in beds, occasional thin (&lt;5 mm) brown sandy silt (ML) as beds, silt also occurs as thin coatings on gravels.</li> </ul>
G	35		-	-				as beus, siit also occurs as triiri coatings on gravels.
			-	- 40-				39.0 to 45.0 feet: SILTY SAND (SM), see description on next page.

#### **REMARKS**

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy BORING NO.
PAGE
REFERENCE ELEV.
TOTAL DEPTH
DATE COMPLETED

MW-27 3 of 13 380.8 237.0' 8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	/ELL LITHO- TAILS LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	40		- - - - - -	-		39.0 to 45.0 feet: SILTY SAND (SM), yellow brown fines, fine to medium, trace coarse, some fines, some subrounded to subangular fine gravel, damp to moist. Gradational basal contact. (FLUVIAL DEPOSITS)  @ 42.0 to 44.0 feet: few fine gravel.
G	45		-	45 -		45.0 to 74.0 feet: SILTY SAND (SP-SM), yellow brown to grayish brown fines, fine to medium, trace coarse, trace to few fines (gradational to SP), little to some rounded, subrounded and subangular fine gravel at 45.0 feet, trace to few fine gravel below. Uncertain basal contact due to discharge hose failure. (FLUVIAL DEPOSITS)
G	50			50 -		
G	55		-	55 -		@ 55.0 feet: remove standard tri-cone drill bit, install sample-through bit.
			-	- 60-		@ 59.0 feet: cobbles.

#### **REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES** 

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy BORING NO.
PAGE
REFERENCE ELEV.
TOTAL DEPTH
DATE COMPLETED

MW-27 4 of 13 380.8 237.0' 8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	ELL TAILS	LITHO- LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	60		-				45.0 to 74.0 feet: SILTY SAND (SP-SM), continued. © 60.0 to 76.0 feet: very easy drilling, very easy to drive casing, transitional to SP-SM, sand is fine with trace medium, trace fine to coarse subrounded to subangular gravel.
G	65		- - - - -	65 -			
G	70			70 -			74.0 to 77.5 feet: SAND (SP), yellow brown fines, fine,
G	76		-	75 -			trace fines, damp. (FLUVIAL DEPOSITS)
			-  -  -  -	- 80			77.5 to 87.0 feet: SAND (SP), yellow brown fines, fine with common interbeds of thin (<3 mm) gray silt (ML) beds, damp to moist, silt beds are soft, moderate plasticity, damp to moist. (FLUVIAL DEPOSITS)

#### **REMARKS**

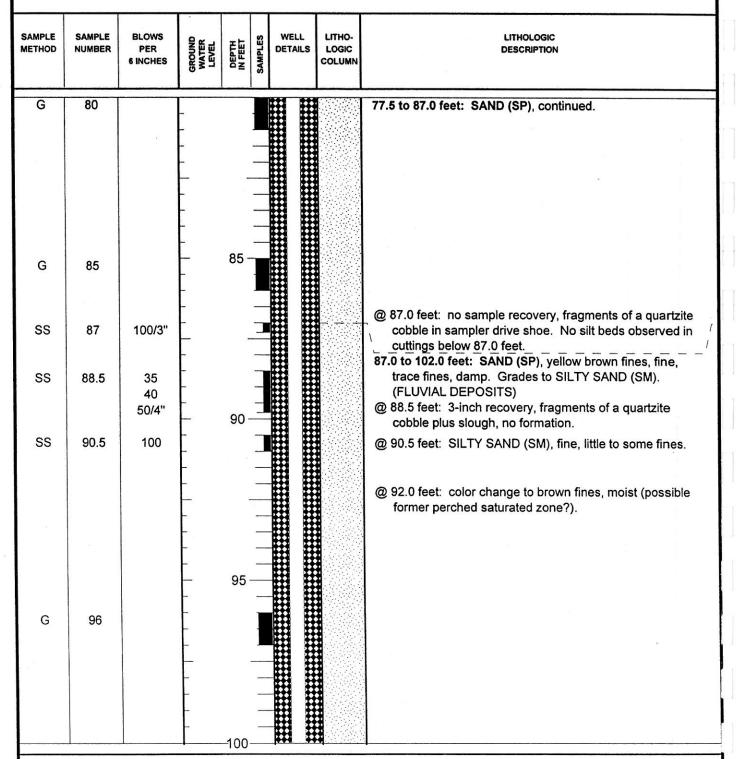
(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

UDALOY ENVIRONMENTAL SERVICES

VASHON.gds:2.12/17/03.VASHON...A25-003.01 T5

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY

Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy BORING NO. MW-27
PAGE 5 of 13
REFERENCE ELEV. 380.8
TOTAL DEPTH 237.0'
DATE COMPLETED 8/15/03



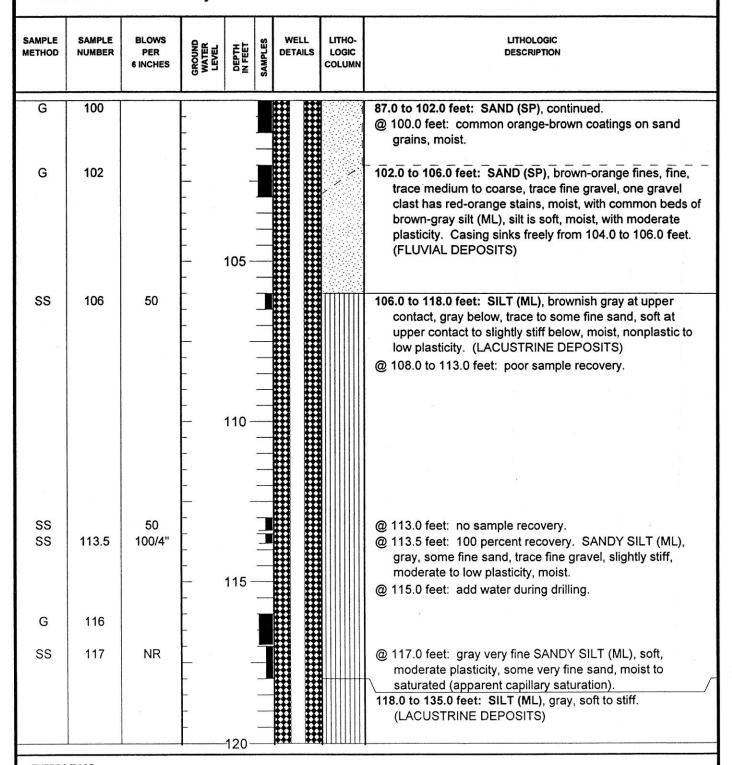
#### REMARKS

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UDALOY ENVIRONMENTAL SERVICES

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udalov BORING NO.
PAGE
REFERENCE ELEV.
TOTAL DEPTH
DATE COMPLETED

MW-27 6 of 13 380.8 237.0' 8/15/03



#### REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

**UDALOY ENVIRONMENTAL SERVICES** 

VASHON.gds:2.12/17/03.VASHON...A25-003.01 T5

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy BORING NO. PAGE REFERENCE ELEV. TOTAL DEPTH DATE COMPLETED

MW-27 7 of 13 380.8 237.0' 8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO- LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	120		-					118.0 to 135.0 feet: SILT (ML), continued.
G	122		- - -	-				
G	124		- - -	125 -				@ 124.0 feet: trace subangular black (basalt) fine gravel, trace brown laminated silt (ML).
SS	126	100	- - - - -	420				@ 126.0 feet: no sample recovery. Install secondary air compressor to facilitate sample recovery.
SS	130.5	99/18"	- Ā - -	130 -				
G	134	~	-8/14/03  	135	-			@ 132.7 feet: depth to water measured during placement of annular backfill with 8-inch steel casing drive shoe at 134.1 below grade, 08/14/03. Borehole caved to 0.3 feet below drive shoe.
		*	-	133				135.0 to 140.0 feet: SAND (SP), gray fines, fine, few fines. (FLUVIAL/LACUSTRINE DEPOSITS)
SS	137	10 30 50/5"	-		] 			@ 137.0 feet: 3-inch recovery, SAND (SP), gray fines, fine, trace to few fines. No apparent bedding structures. Based on water levels measured during annular fill placement, sample was likely disturbed by heaving.

#### REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY

Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy

BORING NO. PAGE REFERENCE ELEV. TOTAL DEPTH DATE COMPLETED

MW-27 8 of 13 380.8 237.0' 8/15/03

					_			BATE OOMFEETED 8/15/03
SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO- LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	140		-	_				140.0 to 150.0 feet: SILT (ML), gray, very stiff to hard. Trace organic material at 140.0 feet, absent below. (LACUSTRINE DEPOSITS)
G	145		- - - -	145 –				
G	148	  -  -  -	- - - - 1	50 —		ē		
G	152	-		-				150.0 to 156.0 feet: SILTY GRAVEL (GM), yellow-brown fines, fine to medium, subrounded to subangular, matrix-supported, matrix is laminated gray clayey silt (CL) with yellow-brown staining adjacent to gravels. (FLUVIAL/LACUSTRINE DEPOSITS)
G	156	-	- 1:	55 — - - - - -				156.0 to 164.0 feet: SILT (ML), gray, trace clay, very stiff to hard. (LACUSTRINE DEPOSITS)

#### REMARKS

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**UDALOY ENVIRONMENTAL SERVICES** 

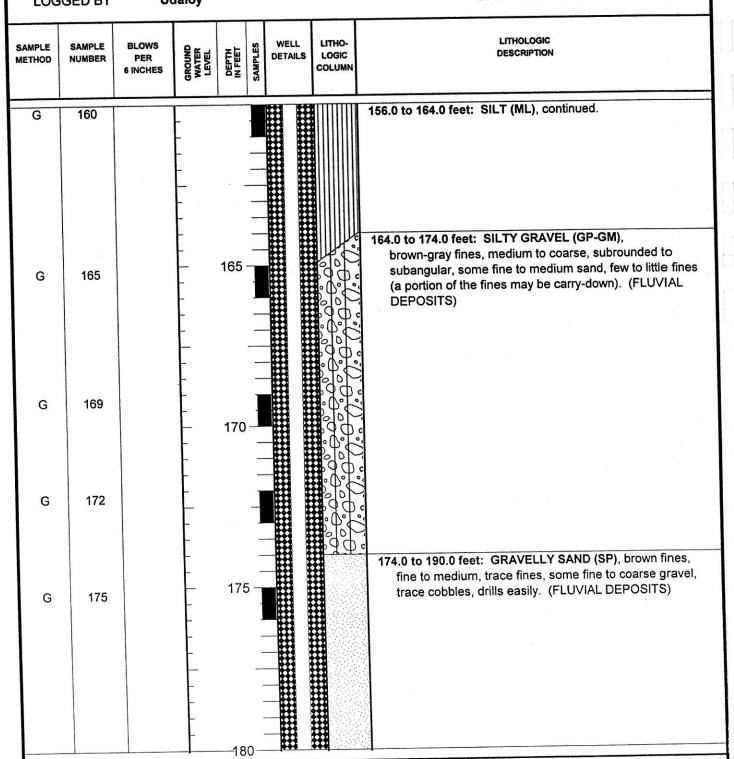
VASHON.gds:2.12/17/03.VASHON...A25-003.01 T5

**PROJECT NAME** LOCATION **DRILLED BY DRILL METHOD** LOGGED BY

Vashon Island Landfill Closure Vashon Island, Washington **Tacoma Pump & Drilling Dual Rotary, Foremost DR24** Udaloy

**BORING NO. PAGE** REFERENCE ELEV. TOTAL DEPTH DATE COMPLETED

MW-27 9 of 13 380.8 237.0" 8/15/03



#### REMARKS

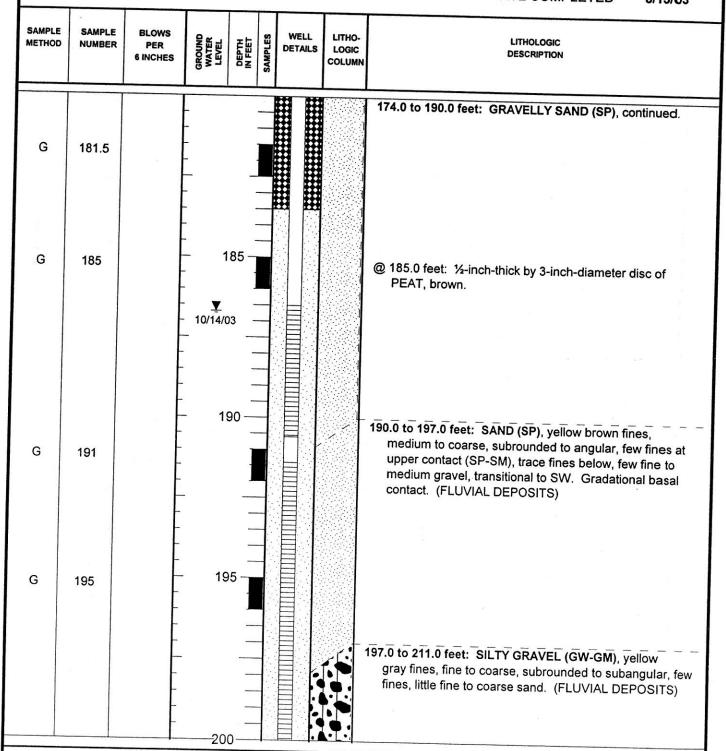
(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY

Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy

BORING NO.
PAGE
REFERENCE ELEV.
TOTAL DEPTH
DATE COMPLETED

MW-27 10 of 13 380.8 237.0' 8/15/03



#### REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003.

**UDALOY ENVIRONMENTAL SERVICES** 

7 70=237 Televation 132.7 ftb

PROJECT NAME LOCATION **DRILLED BY** DRILL METHOD LOGGED BY

Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24

BORING NO. PAGE REFERENCE ELEV. TOTAL DEPTH DATE COMPLETED MW-27 11 of 13 380.8 237.0" 8/15/03

GED B1							
SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO- LOGIC COLUMN	LITHOLOGIC DESCRIPTION
200		- - - - -		] 			197.0 to 211.0 feet: SILTY GRAVEL (GW-GM), continued.
205		-	205	- -			
209			210	- - [ -			211.0 to 214.0 feet: SILTY GRAVEL (GM), yellow brown
213		-  -  -  -		-			fines, medium to coarse, subrounded to subangular, some fines, continuous with and basal unit of overlying GP-GM. (FLUVIAL DEPOSITS)
215				-			214.0 to 217.0 feet: SILTY SAND (SM), gray fines with black sand grains, very fine to fine, some fines, smooth drilling, uncertain basal contact. (FLUVIAL DEPOSITS)  @ 217.0 feet: with drive shoe at 217.0 feet, static water depth is 190.2 feet after 30 minutes.  217.0 to 227.0 feet: GRAVEL (GP), gray brown fines (fine to medium, rounded to subrounded, some fine to medium sand, trace fines. Transitional to GP-GM. (FLUVIAL DEPOSITS)
	200 205 209	200 205 209	200	200   -	200   PER 6 INCHES   NOW S   S   S   S   S   S   S   S   S   S	200 PER 6 INCHES P	200  200  201  202  205  207  207  208  209  210  211  215

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

PROJECT NAME LOCATION DRILLED BY DRILL METHOD LOGGED BY

Vashon Island Landfill Closure Vashon Island, Washington Tacoma Pump & Drilling Dual Rotary, Foremost DR24 Udaloy BORING NO. PAGE REFERENCE ELEV. TOTAL DEPTH DATE COMPLETED

MW-27 12 of 13 380.8 237.0' 8/15/03

SAMPLE	SAMPLE	BLOWS			S	WELL	LITHO-	LITHOLOGIC
METHOD	NUMBER	PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	DETAILS	LOGIC	DESCRIPTION
G	221		-	27				217.0 to 227.0 feet: GRAVEL (GP), continued.
G	224			225 -				12 = 227-217 = 1.50
G	228		- 2	- 230 -				@ 227.0 feet: with drive shoe at 227.0 feet, depth to water is 205.8 feet after 30 minutes, rising very slowly after 30 minutes.  227.0 to 237.0 feet: SILTY GRAVEL (GM), gray fines, medium to coarse, subrounded to subangular, some fines, few to little fine to medium sand, trace cobbles. Easy drilling. (FLUVIAL DEPOSITS)
G	232			-				
G	236		- - - - -	235 —				Total depth drilled and sampled = 237.0 feet.
		-	-					Total depth unlied and sampled = 237.0 feet.
			- 2	40-				See Page 13 for Well Completion Details.

#### REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

**UDALOY ENVIRONMENTAL SERVICES** 

VASHON.gds:2.12/17/03.VASHON...A25-003.01 T5

**PROJECT NAME** LOCATION DRILLED BY DRILL METHOD LOGGED BY

**Vashon Island Landfill Closure** Vashon Island, Washington **Tacoma Pump & Drilling Dual Rotary, Foremost DR24** Udaloy

BORING NO. MW-27 PAGE 13 of 13 REFERENCE ELEV. 380.8 TOTAL DEPTH 237.0" 8/15/03 DATE COMPLETED

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO- LOGIC COLUMN	LITHOLOGIC DESCRIPTION
				245 250 255				WELL COMPLETION DETAILS  +2.3 to 186.5 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank riser pipe.  186.5 to 190.6 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.  190.6 to 191.4 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing at joint between screen sections.  191.4 to 200.7 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.  200.7 to 201.3 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing and end plug.  185.0 to 186.0 feet: Stainless steel centralizer.  192.0 to 193.0 feet: Stainless steel centralizer.  200.0 to 201.0 feet: Stainless steel centralizer.  0 to 2.0 feet: Concrete.  2.0 to 134.0 feet: Baroid® 3/4-inch bentonite chips.  134.0 to 141.0 feet: Blough.  141.0 to 183.5 feet: Baroid® 3/4-inch bentonite chips.  183.5 to 203.5 feet: Norton™ 16 x 30 silica sand.  203.5 to 237.0 feet: Pea gravel.

#### REMARKS

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Attachment B - Daily Field Reports



350 Madison Avenue North Bainbridge Island, Washington 98110 (206) 780-9370 401 Second Avenue S, Suite 201 Seattle, Washington 98104 (206) 328-7443

 DATE: 7/05/16
 PROJECT NO. 090057 TASK 310.1.10
 WEATHER: PARTLY CLOUDY, HIGH 60'S

 PROJECT NAME: Vashon Landfill
 CLIENT: KCSWD

 EQUIPMENT USED: WATER LEVEL IND,
 PROJECT LOCATION: VASHON ISLAND, WA

THE FOLLOWING WAS NOTED:

Arrival Time: 0901

Activities: Ensure access, direct equipment drop off Personnel/Visitors: Matthew Lewis (Aspect)

**Departure Time: 1300** 

Field Forms Used: Field Notebook

#### **Summary of Activities:**

Matthew arrived on site, unlocked the south gate, and identified the well to be decommissioned (MW-27 with Ecology Tag AHM-855). At 0910, received a call from driller with Holt Services that there is a problem with the brake system of the truck hauling the drill rig and it is temporarily parked at the Vashon ferry terminal dock until it can be moved to the landfill. A mechanic from Holt was been dispatched to make repairs. At 1000, the roll-off box for soil cuttings is delivered and staged on the side of the perimeter road at the SE corner of the landfill. Driller informs me that repairs will take the rest of the day. I instruct them to leave the rigs near MW-27 after the repairs are made, but not to block access to the perimeter road.

Aspect off site at 1300 after locking the south gate.

**Problems Encountered:** Lost time equipment failure (Holt), no other problems.

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350 Madison Avenue North Bainbridge Island, Washington 98110 (206) 780-9370 401 Second Avenue S, Suite 201 Seattle, Washington 98104 (206) 328-7443

<b>DATE</b> : 7/06/16	<b>PROJECT NO.</b> 090057 TASK 310.1.10		WEATHER: PARTLY CLOUDY, MID 60'S		
PROJECT NAME: Vashon Lar	CLIENT: KCSWD				
<b>EQUIPMENT USED:</b> WATER L COMPUTER, DIVERS	EVEL IND, FIELD	PROJECT L	OCATION:	VASHON ISLAND, WA	

#### THE FOLLOWING WAS NOTED:

**Arrival Time: 0720** 

Activities: Safety mtg., install divers, remove monument, start overdrilling

Personnel/Visitors: Matthew Lewis - Aspect, David (Holt driller) and helpers (Ben, Grady)

**Departure Time: 1645** 

Field Forms Used: Field Notebook

#### **Summary of Activities:**

Matthew arrived on site, met driller, have safety meeting. Matthew removes the pump and tubing from MW-27, installs a diver and barometric diver in MW-34 while drillers prep equipment and remove bollards. At 0850, Holt's vac-truck arrives with a jackhammer to remove the concrete monument and leaves at 0930. At 1000 Holt levels rig, preps equipment, and begins over drilling MW-27.

At 1100 Holt's mechanic arrives to make further repairs on truck. He is on and off the site throughout the day, buying parts as necessary.

The soil cuttings returned for depth interval 40 to 50 ft bgs contains no bentonite or PVC well casing from MW-27. I call Bob to report, he recommends drilling to 106 ft bgs to reacquire the well. Well borehole is likely not plumb and vertically aligned between 30 and 40 ft bgs. Review of the MW-27 drill log indicate that the tri-cone bit was replaced with a sample-through bit at 55 ft bgs which could account for a non-plumb borehole.

I go to the hardware store to buy plastic sheeting so that samples can now be laid out and observed for signs of the well materials (bentonite, PVC, filter pack, etc.)

Holt advances to 90 ft bgs with no indication of the well below 40 ft bgs. Samples are covered, gates are locked, roll-box is closed before leaving.

Personnel off site at 1645.

Problems Encountered: Well was installed at an angle, not being returned in soil cuttings. No other problems.

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<b>DATE</b> : 7/07/16	<b>PROJECT NO.</b> 090057 TASK 310.1.10		WEATHER:	CLOUDY/LT RAIN, MID 60'S
PROJECT NAME: Vashon Lar	ndfill	CLIENT: K	CSWD	
EQUIPMENT USED: NONE		PROJECT L	OCATION:	VASHON ISLAND, WA

#### THE FOLLOWING WAS NOTED:

Arrival Time: 0730

Activities: Continue drilling, scout future boring locations

Personnel/Visitors: Matthew Lewis, Bob Hanford & John Strunk (Aspect), David (Holt driller) and helpers (Ben, Grady),

Dan Swope (KCSWD) **Departure Time:** 1550

Field Forms Used: Field Notebook

#### **Summary of Activities:**

Matthew arrives on site at 0730, Bob and John S. arrive at 0840. Holt is running late, arrives at 0900 and resumes drilling. Bob, John, and Matthew scout locations for future drilling work for gas extraction well and probes on South Slope. After discussion with KCSWD, John recommends drilling to the total depth (237 ft bgs) and backfilling as planned. Holt switched from 9-inch casing to 7-inch casing at 90 ft bgs. Soil cuttings from 90-100 ft bgs contain a very small amount (handful) of bentonite chips. No bentonite was observed below this depth.

Bob and John leave at 1120. Holt advances casing to 150 ft bgs by end of the day.

At 1550, Holt and Aspect leave site.

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<b>DATE</b> : 7/08/16	<b>PROJECT NO.</b> 090057 TASK 310.1.10		WEATHER:	RAINY TO SUNNY, MID 60'S
PROJECT NAME: Vashon Lar	ndfill	CLIENT: K	CSWD	
EQUIPMENT USED: NONE		PROJECT LO	OCATION:	VASHON ISLAND, WA

#### THE FOLLOWING WAS NOTED:

Arrival Time: 0800

Activities: Continue drilling

Personnel/Visitors: Matthew Lewis (Aspect), David (Holt driller) and helpers (Ben, Grady)

**Departure Time:** 1610

Field Forms Used: Field Notebook

#### **Summary of Activities:**

Arrive at 0800. Holt resumes drilling for the day. No indications of well in cuttings. Drilled to 200 ft bgs by end of day.

At 1610 Holt and Aspect leave site after closing roll-off box, locking gates, and covering samples.

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<b>DATE:</b> 7/11/16	<b>PROJECT NO.</b> 090057 TASK 310.1.10		WEATHER: CLOUDY, MID 60'S		
PROJECT NAME: Vashon Lar	ndfill	CLIENT: K	CSWD		
EQUIPMENT USED: NONE		PROJECT LO	OCATION: VASHON ISLAND, V	VA	

#### THE FOLLOWING WAS NOTED:

Arrival Time: 0730

**Activities:** Continue drilling

Personnel/Visitors: Matthew Lewis (Aspect), David (Holt driller) and helpers (Ben, Grady)

**Departure Time: 1615** 

Field Forms Used: Field Notebook

#### **Summary of Activities:**

Arrive at 0730. Holt continues drilling for the day. No indications of well in cuttings. Drilled to 237 ft bgs by end of day. Boring terminates in slightly moist, hard, gravelly SILT.

At 1430 Holt begins backfilling the boring with bentonite pellets (12 buckets, 50 lbs each). Top of pellets sounded at 210.5 ft bgs. Begin backfilling with 3/8" bentonite chips.

At 1605 Holt reports that it took 10 bags of chips to backfill 7 ft of hole at 176 ft bgs (instead of the expected ~3 ½ bags). Likely a void at that depth has been filled in. I reexamined samples from that interval, and confirm there is no indication of MW-27. The boring is backfilled to 170 ft by end of day.

At 1615 Aspect leave site after closing roll-off box, locking gates, and covering samples. Holt leaves at 1630 after putting some equipment away.

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<b>DATE</b> : 7/12/16	<b>PROJECT NO.</b> 090057 TASK 310.1.10		WEATHER: CLOUDY, MID 60'S	
PROJECT NAME: Vashon Lar	ndfill	CLIENT: KCSWD		
EQUIPMENT USED: NONE		PROJECT L	OCATION: VASHON ISLAND, W	/A

#### THE FOLLOWING WAS NOTED:

Arrival Time: 0730

**Activities:** Complete decommissioning

Personnel/Visitors: Matthew Lewis (Aspect), David (Holt driller) and helpers (Ben, Grady)

**Departure Time: 1615** 

Field Forms Used: Field Notebook

#### **Summary of Activities:**

Arrive at 0730 and unlock the south gate. Holt arrives at 0800 and resumes backfilling with bentonite chips.

At 1150, Holt reports another void at 37 ft bgs. We attach a flashlight to drop tape and can see the opening to MW-27 at the SE edge of the boring (the conductor casing is at 30 ft bgs leaving 7 ft of open hole). I call Bob, and talk to John S and Erick Miller, they recommend continue filling the void as much as possible, keeping track of how much goes down the well. The total amount of bentonite chips that go down the PVC casing is 16 bags. Holt calls the shop to request more bentonite chips. Holt begins decontaminating the casing removed from the boring, and disposing of samples.

At 1410, a driver from Holt arrives with a pallet of bentonite chips, and they resume backfilling to surface. Holt patches the surface with black-dyed concrete.

- Total materials used for backfilling MW-27
  - 162 bags (50 lbs each) of bentonite chips
  - o 12 buckets (50 lbs each) of bentonite pellets
  - o 7 bags of concrete
- The roll-off box is about ½ full and closed
- There are 3 drums of decon water are marked and next to the roll-off box

Holt and Aspect leave the site by 1615 after closing the roll-off box, and locking the south gate.

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