APPENDIX C

Select Site Investigation Reports (Provided on CD)

Appendix C

Field Activity Forms

C-1 Resource Protection Well Report (sent to WA Department of Ecology)
C-2 Field Activty Sheets
C-3 Detailed Borehole and Well Construction Logs
C-4 Well Development Forms
C-5 Well Sampling Forms

Copy
Append C-1

C-1

Resource Protection Well Report
(sent to WA Department of Ecology)

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. RE04051

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm King County

Unique Ecology Well IDTag No. APS 048 / MW-32

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

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Haradon, Don

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2914

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner King County Water & Waste Management

Site Address 18910 Westside Hwy SW

City Vashon Island

County King

Location SW1/4-1/4 SW1/4 Sec 36 Twn 23 R 02

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

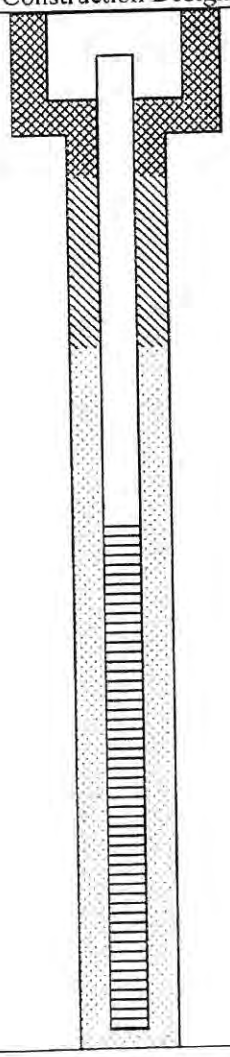
Tax Parcel No. 3623029009

Cased or Uncased Diameter 2" Static Level ~19' bgs

Work/Decommission Start Date 12-14-09

Work/Decommission Completed Date 12-14-09

Construction Design



Well Data

MONUMENT TYPE: N/A - Variance

CONCRETE SURFACE SEAL: N/A - Variance

ANNULAR SPACE: N/A

BACKFILL: 0-8'

TYPE: No. 8 Bentonite Chips

PVC BLANK: +2 - 10' bgs

SCREEN: 10-20'

SLOT SIZE: .010

TYPE: 2" Sched 40 PVC Prepack

SAND PACK: 8-20'

MATERIAL: 10/20 Silica Sand

DRILLING METHOD: Hand Auger

WELL DEPTH: 20'

BORING DIAMETER: 3.25"

Formation Description

0-2' SW/SP Fill - brownish Tan

2-5' SM/SC med-coarse Sand w/ Silty Sand. Some fine gravel @ 5'. Wet @ 5'

5-10' SM/SC Silty Sand w/ silt Coarse gravel @ 9'. Iron stain @ 5-10'

10-16.5 SM - med Sand w/ some Silt. Fine Sand @ 13 Iron Stain @ 16. Damp to wet Zones 10-15'

16.5-20' SM - med - coarse Sand Well sorted w/ tr. Pebbles Damp 16-18, moist 18-18½ wet 19-20

20' Bottom of boring.

SCALE: 1"= N/A PAGE 1 OF 3

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. RE04051

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner King County Water & Waste Management

Site Address 18910 Westside Hwy SW

City Vashon Island

County King

Consulting Firm King County

Unique Ecology Well IDTag No. APJ049 / MW-30

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

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Herndon Don

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2914

If trainee, licensed driller's Signature and License Number:

Location SW1/4-1/4 SW1/4 Sec 36 Twn 23 R 02

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

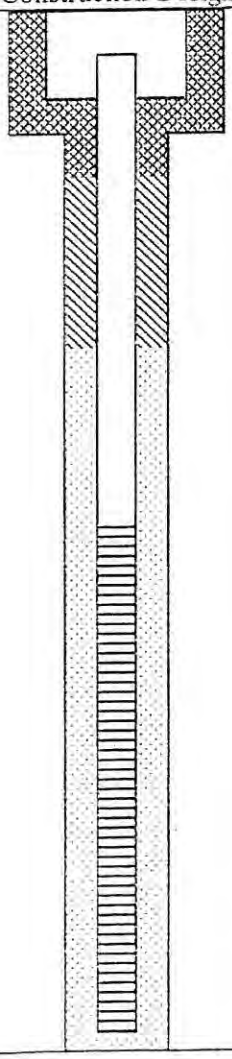
Tax Parcel No. 3623029009

Cased or Uncased Diameter 2" Static Level 4.65' bgs

Work/Decommission Start Date 12-14-09

Work/Decommission Completed Date 12-14-09

Construction Design



Well Data

MONUMENT TYPE: N/A - Variance

CONCRETE SURFACE SEAL: N/A - Variance

ANNULAR SPACE: N/A

BACKFILL: 0-3

TYPE: No 8. Bentonite Chips

PVC BLANK: +1.2' - 4.02 bgs

SCREEN: 4.02 - 9.02' bgs

SLOT SIZE: .010

TYPE: 2", Sched 40 PVC Prepack

SAND PACK: 3' - 9.02'

MATERIAL: 10/20 Silica

DRILLING METHOD: Hand Auger

WELL DEPTH: 9.02' bgs

BORING DIAMETER: 3.25'

Formation Description

0-2' SW/SP Fill/Tan

2-5' SM/SC med-coarse sand w/silty sand. Fine gravel @ 5'/wet @ 5'

5'-10' SM/SC silty sand w/silt Coarse Gravel @ 9'. Iron staining 6.5-10

Bottom of boring 11' bgs

SCALE: 1"= N/A PAGE 2 OF 3

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. RE07051

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm King County

Unique Ecology Well IDTag No. APS 050 / MW-31

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

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Harden, Don

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2914

If trainee, licensed driller's Signature and License Number:

Type of Well ("x in box)

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner King County Water & Waste Management

Site Address 18910 Westside Hwy SW

City Vashon Island

County King

Location SW1/4-1/4 SW1/4 Sec 36 Twn 23 R 02

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

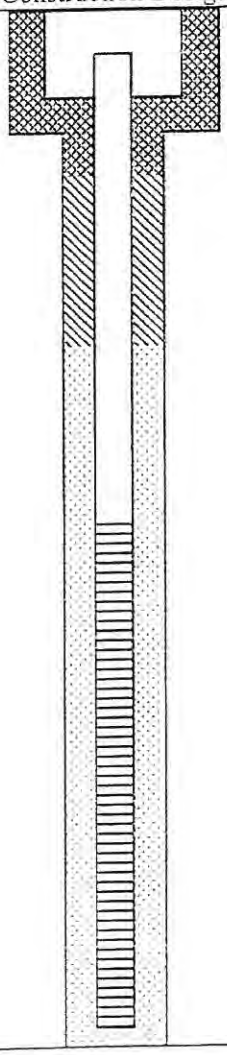
Tax Parcel No. 3623029009

Cased or Uncased Diameter 2" Static Level ~9.02' bgs

Work/Decommission Start Date 12-15-09

Work/Decommission Completed Date 12-15-09

Construction Design



Well Data

MONUMENT TYPE: N/A - Variance

CONCRETE SURFACE SEAL: N/A - Variance

ANNULAR SPACE: N/A

BACKFILL: 0-4

TYPE: #0 8 Bentonite Chips

PVC BLANK: +2-5' BGS

SCREEN: 5-10'

SLOT SIZE: .010

TYPE: 2" sched 40 PVC (Prepack)

SAND PACK: 4-10

MATERIAL: 10/20 silica

DRILLING METHOD: Hand Auger

WELL DEPTH: 10.2' bgs

BORING DIAMETER: 3.25"

Formation Description

0-3 SM/SC silty Sand & Sandy silt

3-6.5 SM silty Sand some med gravel starting @ 5'

6.5-9' SM Med - Course Sand w/ some fine sand lenses wet

9-11' SC Very fine Sand & silt moist

SCALE: 1"= N/A PAGE 3 OF 3

C-2

Field Activity Sheets

FIELD ACTIVITY SHEET

Project KC Vashon LF West hillslope
Site BH-32, BH-30
Arrival Time 0730
Departure Time 1545

Planned Activity INSTALL MW's

Contractor ESN NW

Date 12/14/09
Weather Rain, Overcast
Site Supervisor/Logger BILIR
Personnel present BILIR
SWOPE
KEATING
HARNDON

Health & Safety Talk? (Y) N Time 0800

Equipment Calibration notes AIR by Keating

TIME	ACTIVITY
0730	Arrive @ site
	Begin mobe equipment to BH-32
0745	Driller arrive early.
0800	SAfety talk.
0815	Mobe equipment to BH-32
	Prep Site (wait on Keating for AIR Sampling)
0930	Begin air quality Sampling
1200	BHTD @ 20' bgs
1230	WTD @ 20' bgs
	Instal slipcap (replaced by Snaplock cap)
1245	Mobe to BH-30
1300	Setup @ BH-30
1320	Begin air Sample : Auger @ BH-30
1430	BHTD @ 11.5' bgs
1500	WTD @ 8.8' bgs
	install screwcap (replaced w snaplock cap)
	cleanup Site
	Stop work
1520	driller leaves
1545	Leave site

FIELD ACTIVITY SHEET

Project: KC Vashon West Hillslope
Site: BH-31/MW-31/APJ-050
Arrival Time: 0845
Departure Time: 1220

Planned Activity: INSTALL MW-31

Contractor: ESN NW

Date: 12/15/09
Weather: Light rain/overcast
Site Supervisor/Logger: BILIR
Personnel present: BILIR
KEATING
HARNDON

Health & Safety Talk? (Y) N Time 0900

Equipment Calibration notes: By KEATING (AIR)

TIME	ACTIVITY
0845	Arive site
0900	H+S talk. No issues.
0910	MOBE + PREP TO/AT BH-31
0945	Setup at BH-31
0950	Begin Air Sample + Auger
1040	EHTD @ 10.5' bgs
1130	WTD @ 10' bgs
	Install Cap (replace 4" snap lock cap)
	Cleanup site
	Driller attach State ID tags to all wells
1200	Stop work - driller leaves
1220	Leave site

C-3

Borehole and Well Construction Logs

Department of Natural Resources & Parks
Water & Land Resources Division
Science & Technical Support Section

King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104

King County

Boring and Well Installation Log

Project name/Location: West KC Vashon Landfill Hillslope	Elevation: ✓	Drilling Method: Stainless Steel AMS Hand Auger	BH-30 MW-30 APJ-049
		Sampling Method:	
Contractor: ESN NW		Hammer Wt: ~15 lb	
Driller: Don Harndon #2914		Date: 12/14/09	Page
Start Time 1300	Stop time: 1530	Logger: BILIR	1 of 1

Time	Moisture	Core Sample Recovery	Blows	Air Sampling	Depth In Feet	USCS Code	Notes	Well Construction Details
1320	Damp		Auger	20.6 O² 0 methane @BZ	1	SW/SP	FILL/SOIL; multi/varicolored, very loose, fine with medium sand	0
					2	SM/SC	MEDIUM-COARSE SAND with SILTY SAND, varicolored browns, rooting, red iron oxide stains	
1328			14	20.50² @BH 0 methane	3			2.8
			Auger		4		fine gravel @ 5'	3.8
	Moist			20.5 O² @BZ 0 methane	5	SM/SC	very fine-FINE SAND with SILT brownish/gray; black organics, very dense	ATD
1339	Wet			20.70² @BH 0 methane	6			0.0
				20.60² @BZ 0 methane (sample)	7		reddish brown organics & stains (6.5-8.5)	
1400				20.60² 0 methane (sample)	9	SM	MEDIUM-COARSE SAND; grayish-brownish-multicolored; very dense; reddish stains (8.5'-10')	8.8
				20.70² 0 methane (sample)	11			
1430					12		BHTD = 11.5' bgs	
1600					13		- snap lock well cap - Stick up = 1.2' ags - Bentonite pellets = 0-2.8' bgs - pre packed screen = 3.8'-8.8' bgs - 2" diameter PVC casing - flat bottom screw cap - borehole caved in = 8.8'-11.5' bgs - supplemented 10/20 CO. Si; Sand - water level ATD = 5.85 BTOC - well depth ATD = 10.21' BTOC (on 12/22/09 DTW = 5.81' BTOC) (on 1/26/10 DTW = 5.76' BTOC) TOC = mark on snap cap GS = wooden platform (top)	
					14			
					15			
					16			
					17			
					18			
					19			
					20			

Department of Natural Resources & Parks
Water & Land Resources Division
Science & Technical Support Section

King County

King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104

Boring and Well Installation Log

Project name/Location: Wash KC Vashon Landfill Hillslope	Elevation: ✓	Drilling Method: Stainless Steel AMS Hand Auger	BH-31 MW-31 APJ-050
Contractor: ESN NW		Sampling Method:	
		Hammer Wt: ~15 lb	
Driller: Don Harndon #2914		Date: 12/15/09	Page 1 of 1
Start Time 0945	Stop time: 1200	Logger: BILIR	

Time	Moisture	Core Recovery	Blows	Air Sampling	Depth In Feet	USCS Code	Notes	Well Construction Details
0950	Damp ↓		Auger ↓	20.7 O_2 0 methane @BH		SM/SC	SILTY SAND? SANDY SILT:	
					1		2.5Y 4/2 tanish/orangeish; light mica flecks, rooting, loose, med. dense, trace	
							black oxide stains	
					2			
					3	- - -	— — —	
			14					
	↓		Auger ↓		4	SM	MEDIUM SAND w/ some fine sand	
							variecolored, 2.5Y 7/2 light gray,	
	Moist ↓				5		mica flecks; fining [illegible], red	
							iron oxide stain (5'–6.5')	
					6			
	▼ ↓		↓					
1000	Wet ↓		27	20.7 O_2 0 methane @BH	7		trace gravels at 6.5'	
			Auger ↓			SM	FINE SAND w/ Medium/coarse	
					8		SAND: bluish gray, coarse down,	
							pebbles up to 1 cm (black 5Y 3/1);	
					9		silty lens (<1 cm w/ white	
							quartz), red stains (6.5'–7.5')	
						SC	Very fine SAND - SILT	
1040	↓		↓	20.8 O_2 0 methane	10			
1130								
					11		BHTD = 10.5' bgs	
					12		- snaplock well cap	
							- stick up = 2.08' ags	
					13		- Bentonite pellets = 0'–4' bgs	
							- prepacked screen = 5'–10' bgs	
					14		- 2" diameter PVC casing	
							- flat bottom screw cap	
					15		- supplemented 10/20 CO. SI Sand	
							- water level ATD = 11.02' BTOC	
					16		- well depth ATD = 12.275' BTOC	
					17		(on 12/22/09 DTW = 7.78 BTOC)	
							(on 1/26/10 DTW = 7.91 BTOC)	
					18			
					19		TOC = mark on snap cap	
					20		GS = top of wood platform	

Department of Natural Resources & Parks
Water & Land Resources Division
Science & Technical Support Section

King County

King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104

Boring and Well Installation Log

Project name/Location: KC Vashon Landfill West Hillslope	Elevation: ✓	Drilling Method: Stainless Steel AMS Hand Auger	BH-32 MW-32 APJ-048
Contractor: ESN NW		Sampling Method:	
Driller: Don Harndon #2914		Hammer Wt: ~15lb	
Start Time: 0930	Stop time: 1245	Date: 12/14/09	Page 1 of 2
		Logger: BILIR	

Time	Moisture	Core Recovery	Blows	Air Sampling	Depth In Feet	USCS Code	Notes	Well Construction Details
0930	DAMP		Auger	20.7 O² @BH 0 Methane	0	SW/GP	SOIL/FILL; brownish tan, VERY loose	
	↓		↓		1			
	↓		↓		2	SM/SC	Medium-Coarse Sand with silty Sand; 10 YR 4/3 to 2.5 Y 5/4 brown to light olive brown; very loose	
	DRY		7		3			
			Auger		4			
0945	WET			21.0 O² @BH 0 Methane	5		fine gravels @ 5	
	DAMP		↓			SM/SC	Silty SAND w/ SILT; light brownish gray 2.5 Y 6/2, medium dense, loose; Rust iron oxide stains (6.5-10'), roofing (7.5-10')	
	↓		+50/4		6			
	↓		Auger		7			
1002	↓		↓	20.7 O² @BH 0 Methane	8		- dark grayish brown fine sand (7.5-8')	8
	↓		↓		9		coarse gravel at 9'	
1015	MOIST		↓	20.7 O² @BH 0 Methane	10	SM	MEDIUM SAND with some SILT, 2.5 Y 5/1 - 5/2 (gray - grayish brn) light gray MICA (9.5-12)	10
	DAMP		+50		11			
	WET		Auger					
1035	DAMP WET		↓	20.0 O² @BH 0 Methane	12			
	DAMP		↓		13		V. FINE Sand @ 13' dense; 2.5 Y 5/2 grayish brown	0.010
1050	WET		↓		14			
1115	DAMP		↓		15		red iron oxide stain	
	↓		↓		16		↓	
	↓		+50		17	SM	Med-Coarse Sand; multicolored V. dense, loose with SILT; trace pebbles	
1120	MOIST		Auger	20.7 O² @BH 0 Methane @Sample @ Bit: 17	18			
	WET		↓		19			
1200	WET		+50	20.7 O² @BH 0 Methane @9.75 @Sample	20			20

1230

BHTD = 20' bgs

Department of Natural Resources & Parks
Water & Land Resources Division
Science & Technical Support Section

King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104

King County

Boring and Well Installation Log

Project name/Location: Vashon Landfill KC West hillslope	Elevation: ~	Drilling Method: SS AMS Hand AugeR	BH-32 MW-32 APJ-048
Contractor: ESN NW		Sampling Method:	
Driller: DON HACNDON #2914		Hammer Wt: ~15 lb	
Start Time: 0930	Stop time: 1245	Date: 12/14/09	Page 2 of 2
		Logger: BILIR	

Time	Moisture	Core Recovery	Blows	Air Sampling	Depth In Feet	USCS Code	Notes	Well Construction Details
					1		Notes:	
					2		- Snap lock wellcap - Stick up = 1.9' ags - Bentonite Pellets 0-8' bgs - prepacked screen = 10-20' bgs - 2" diameter PVC casing - flat bottom screw cap - supplemented 10/20 Co. Sil sand - water level ATD: dRY (moist tip) - well depth ATD = 21.89' TOC (on 12/22/09 DTW = DRY) (on 1/ 1/10 DTW =)	
					3			
					4			
					5			
					6			
					7			
					8			
					9			
					10			
					11			
					12			
					13			
					14			
					15			
					16			
					17			
					18			
					19		TOC = mark on snapCAP GS = top of wood platform	
					20			

C-4

Well Development Forms

1st Well Development

King County
Department of Natural Resources and Park

Hydrologic Services Group- WLRD
Field Data Sheet

Project: Vashon West Hill Slope
Well Name: MW-30 / APJ-049
Site Id: MW-30
Sampling Method: peristaltic pump w/ clean tubing
Sampling Team Members: Sevin Bilir
Purge Method:

Well Specifications

Hole Diameter d_h = 3.25"
Well Casing Inside Diam d_wID = 2"
Water Level H = 6.0' BTOC
Depth of Well TD = 10.21' BTOC
TD-H = 4.21'

Purge Volume Calculations

Well Volume (ft3)= Vc= p(dwID/2)2(TD-H)= —
Vt = Vc * 7.482 gal/ft3 or Vt = (TD-H) * wcgf
4.21 * 0.163 = 0.69 gal
Minimum Purge Volume (gallons)=
Vp = Vt x 3 = 2 1.37 gal
Holding Tank Volume = N/A

Comments:
Water was cloudy with tan colored sediments.

BTOC (below top of casing)

Flow Rate:
1/4 - 1/2 total of pump

2009 Date	Time	Water Purged (gal)	Cumulative Water Purged (gal)	Cumulative Water Purged Well Vol	Water Characteristics pH	Conductivity (µ mhos/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (° Celsius)	Eh	Removed FT
12/30	1346	0	0	0	—	—	—	—	—	—	0
	1348	0.25	0.25	0.36	6.62	384	3.64	2.46	9.2	+17.7	—
	1352	0.25	0.5	0.72	6.6	282	51.4	2.52	9.6	+13.8	—
	1355	0.1	0.6	0.87	wait to	RISE /		2+ (DRY)			3.7
	1405	1 FT		RISE							
	1416	2 FT		RISE							
	1427	3 FT		RISE							
	1428	0.2	0.73	1.06	7.08	396	27.8	3.85	8.5	-11.1	4.5
	1433	0.2	0.89	1.29	6.86	299	29.8	4.26	8.9	+0.5	5.5
	1440	0.2	1.05	1.53	6.82	278	45.5	5.13	9.0	+2.6	6.5
	1441	0.1	1.14	1.65							7
↓	DONE			1.74		(DRY)					7.35

Sampling Date:
Sample Number: N/A
Number of Sample Containers:
Preserve:
Analytical Laboratory: ~~King County Environmental Labs~~
Date Shipped:
Carrier: N/A

Atm Blank Y or N Sample Number: X
Field Rep Y or N Sample Number: X

WQ Equipment calibration
1040 am
DO 99.7% @ 300'
Turb 5.81/5.36
Cond 1.23 @ 1920/1416
pH ✓

well casing diameter to gallons per foot of head: wcgf =
8 " = 2.637 6" = 1.468 4" = 0.653 3" = 0.367 2" = 0.163

1st Well Development

King County
Department of Natural Resources and Park

Hydrologic Services Group- WLRD
Field Data Sheet

Project: VASHON WEST HILLSCOPE	Well Name: MW-31 / APT-050
Site Id: MW-31	Sampling Method: Peristaltic pump w/ clean tubing
Sampling Team Members: Sevin Bilir	Purge Method:

Well Specifications		**Purge Volume Calculations**
Hole Diameter	d_h = 3.25"	Well Volume (ft3)= Vc= p(dwID/2)2(TD-H)= ———
Well Casing Inside Diam	d_wID = 2"	Vt = Vc * 7.482 gal/ft3 or Vt = (TD-H) * wcgf 4.21 * 0.163 = 0.68 gal
Water Level	H = 8.07' bTOC	Minimum Purge Volume (gallons)= Vp = Vt x 2 = 1.37 gal
Depth of Well	TD = 12.275' bTOC	Holding Tank Volume = N/A
	TD-H = 12.275 - 8.07 = 4.21'	

Comments:
Water was cloudy with tan colored sediments until last few minutes/foot of water removed, bTOC (below Top of Casing)

Flow Rate:
1/4 - 1/2 total of pump

2009 Date	Time	Water Purged (gal)	Cumulative Water Purged (gal)	Cumulative Water Purged Well Vol	Water Characteristics pH	Conductivity (µ mhos/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (° Celsius)	Eh	Removal FT
12/30	1134	0	0	0	—	—	—	—	—	—	0
	1139	0.16	0.2	0.3	7.43	477	56.6	8.82	—	-15.6	1
	1145	0.4	0.6	0.9	6.95	377	370	5.66	—	-3.8	3.5
	1146	wait on water to rise 1 ft					(DRY)				
	1207	0.2	0.7	1.0	7.04	382	679	7.66	—	-57.9	4.5
	1211	wait on water to rise 1 ft					(DRY)				
	1238	0.2	0.9	1.3	7.17	370	298	8.57	8.6	-15.6	5.5
	1241	wait on water to rise 1 ft					(DRY)				
	1311	0.2	1.0	1.5	7.15	230	146	7.44	7.7	-14.5	6.5
	1313	DONE		1.7			(DRY)				7.2

Sampling Date:	Atm Blank Y or N X Sample Number:
Sample Number: N/A	Field Rep Y or N X Sample Number:
Number of Sample Containers:	
Preserve:	
Analytical Laboratory: *King County Environmental Labs*	WQ equipment calibrated 1040am DO 99.7% @ 300' Turb 5.81/5.36 Cond 1.23x@1420/1416
Date Shipped: N/A	pH ✓
Carrier:	

well casing diameter to gallons per foot of head: wcgf =
8 " = 2.637 6" = 1.468 4" = 0.653 3" = 0.367 2" = 0.163

1st Well Development

King County
Department of Natural Resources and Park

Hydrologic Services Group- WLRD
Field Data Sheet

Project:	VASHON West Hillslope	Well Name:	MW-32 / APS-048
Site Id:	MW-32	Sampling Method:	Peristaltic pump clean tubing
Sampling Team Members	Sevin Bilir	Purge Method:	

Well Specifications			**Purge Volume Calculations**	
Hole Diameter	d_h =	3.25"	Well Volume (ft3)= Vc= p(dwID/2)2(TD-H)= Vt = Vc * 7.482 gal/ft3 or Vt = (TD-H) * wcgf	N/A
Well Casing Inside Diam	d_wID =	2"	Minimum Purge Volume (gallons)= Vp = Vt x 3 =	N/A
Water Level	H =	N/A	Holding Tank Volume =	N/A
Depth of Well	TD =	21.39' bTOC (below Top of Casing)		
Comments: Well (dry) no Reading on sounder. Moisture beads on wall.			**Flow Rate:** N/A	

2009 Date	Time	Water Purged (gal)	Cumulative Water Purged (gal)	Cumulative Water Purged Well Vol	Water Characteristics pH	Conductivity (µ mhos/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (° Celsius)	Eh	FT Removed
12/30	1410	0	0	0	NO	WATER		(DRY)			0

Sampling Date:		Atm Blank Y or N Sample Number:	X
Sample Number:	N/A	Field Rep Y or N Sample Number:	X
Number of Sample Containers:			
Preserve:			
Analytical Laboratory:	King County Environmental Labs		
Date Shipped:	N/A		
Carrier:			

well casing diameter to gallons per foot of head: wcgf =
8 " = 2.637 6" = 1.468 4" = 0.653 3" = 0.367 2" = 0.163

C-5

Well Sampling Forms

KING COUNTY
SOLID WASTE DIVISION

VAGW (12)

used for MW-30, -31, and -32 on West Hillslope

VASHON GROUNDWATER SAMPLING FIELD RECORD

FIELD SAMPLING DATA

Well: VMW#30 / APJ-049
Casing Size: 2 inches
Screened Interva 5.2-10.2' below top of casing (BTOC)
Total Depth: 10.21' BTOC (marked)
Pore Volume: PV=(BotScrnTD-DTW=HtW)x0.163)

Date/Time: 01/26/10 0910
Weather: Overcast
Location: West Hillslope
Field Observations:
Stick up = 1.24" ags

=(10.2-5.76=4.44)*0.163=0.73 g/pore vol (0.73g * 3.78 l/g ⇒ 2.7l

HYDROLOGY MEASUREMENTS

DEPTH TO H_2O (FT)	ELEVATION	TOP PVC	TIME	DATE	METHOD USED
5.76' BTOC	n/a	n/a	0930	01/26/10	WLRD sounder

WELL EVACUATION

GALLONS	PORE VOLUMES	METHOD USED	DATE	TIME
~2.1	3	Peristaltic pump	01/26/10	1058

SAMPLE ID # WMV30100126 -

SAMPLE TYPE	DATE TIME	METHOD	VOLUME (mL)	CONTAINER TYPE	DEPTH TAKEN (FEET)	FIELD FILTERED (YES,NO)	PRE-SERVATIVE	ICED YES/NO
TSS	01/		✓1000	WM HDPE	✓10 BTOC	NO	NONE	YES
COND/ALK	26/		✓ 500	WM HDPE		NO	NONE	YES
TDS/TOTS	2010	Peristaltic pump w/ clean tubing	✓ 500	WM HDPE		NO	NONE	YES
NH_3/NO_3			✓ 250	WM HDPE		NO	NONE	YES
CL/SO_4	11:15		✓ 125	NM HDPE		NO	NONE	YES
TOC			✓2,40	AMBER GLASS		NO	H_3PO_4	YES
METALS, d			✓ 500	Acid Washed HDPE		✓ YES	NONE	YES
VOA			✓4,40	GLASS		NO	HCl	YES

LABEL THE DISSOLVED METALS BOTTLE "FIELD FILTERED" ✓

CONTROL BOX SETTINGS 4 / A

FIELD WATER QUALITY PARAMETERS

INSTR. #		1562	3140044	1562	WLRD sounder	
~~Diters~~ SB	PORE VOLUMES CUM. gals	SPEC. COND. (µmhos/cm)	pH VALUE	TEMP DEG. C	DEPTH TO WATER (feet)	TIME
	0	started pump	--	--	5.76	0950
2.7 / 0.7	1	398	6.59	8.6	9.02	1003
2.7 / 1.4	2	378	6.65	7.9	10.02	1024
2.7 / 2.1	3	370	6.72	8.5	10.02	1055
8.1l /	4	BEGIN SAMPLE				
/	5	FINISH SAMPLE				
/	6					

KCSWD VASHON LF
ID VTRP100126R
Date 01/26/2010
Sampler SB

KCSWD VASHON LF
ID WV30100126-
Date 01/26/2010
Sampler SB

NOTES: INSTRUMENTS CALIBRATED TODAY PRIOR TO USE? YES ☒ TIME: 0915 (4,7) BUFFERS:
VTRPs TURNED IN? YES ☒ NO ☐. VTRP1001 26 R VTRP DATE 01/22/10
VTRP BUBBLES? YES ☒ NO ☐. BUBBLE DIAMETERS: 3 @ 3-4mm
NO QC BOTTLES

CUSTODY RECORD:

PERSONNEL	SIGNATURE	DATE/TIME
BILR	SB	01/26/10 11:45

Number of bottles in this set 12+3

Time it took to sample well: 2:35 hrs SB

KING COUNTY
SOLID WASTE DIVISION

VAGW (12)

used for MW-30, -31, and -32 on West Hillslope

VASHON GROUNDWATER SAMPLING FIELD RECORD

FIELD SAMPLING DATA

Well: VMW#31 / APJ-050
Casing Size: 2 inches
Screened Interval 7.08 - 12.08 below top of casing (BTOC)
Total Depth: 12.27 BTOC (marked)
Pore Volume: PV=(BotScrnTD-DTW=HtW)x0.163)=gal *3.78=L

Date/Time: 01/28/10 1240
Weather: overcast
Location: West Hillslope
Field Observations:
Stick up= 25" =2.08' ags

[(12.08-7.91) * 0.163] = 0.68 gal = 2.56 L

HYDROLOGY MEASUREMENTS

DEPTH TO H_2O (FT)	ELEVATION	TOP PVC	TIME	DATE	METHOD USED
7.91 BTOC	n/a	n/a	1300	01/28/10	WLRD sounder

WELL EVACUATION

GALLONS	PORE VOLUMES	METHOD USED	DATE	TIME
2 / ~9.2 / ~2.43	~3.6	Peristaltic pump	01/28/10	1655

SAMPLE ID # WMV311001 28 -

SAMPLE TYPE	DATE TIME	METHOD	VOLUME (mL)	CONTAINER TYPE	DEPTH TAKEN (FEET)	FIELD FILTERED (YES,NO)	PRE-SERVATIVE	ICED YES/NO
TSS	01/		✓ 1000	WM HDPE	12' BTOC	NO	NONE	YES
COND/ALK	28 /		300/ 500	WM HDPE		NO	NONE	YES
TDS/TOTS	2010	Peristaltic pump w/ clean tubing	300/ 500	WM HDPE		NO	NONE	YES
NH_3/NO_3			✓ 250	WM HDPE		NO	NONE	YES
CL/SO_4	15:30		✓ 125	NM HDPE		NO	NONE	YES
TOC			✓ 2,40	AMBER GLASS		NO	H_3PO_4	YES
METALS, d			✓ 500	Acid Washed HDPE		✓ YES	NONE	YES
VOA			✓ 4,40	GLASS		NO	HCl	YES

✓ LABEL THE DISSOLVED METALS BOTTLE "FIELD FILTERED"

FIELD WATER QUALITY PARAMETERS

CONTROL BOX SETTINGS

INSTR. #		1562	3140044	1562	WLRD sounder		
liters / ~~gals~~	PORE VOLUMES	SPEC. COND. (umhos/cm)	pH ±0.1 VALUE	TEMP DEG. C	DEPTH TO WATER (feet)	TIME	
0	0	started pump	--	--	7.91	1305	KCSWD VASHON LF ID VTRP100128T Date 01/28/2010 Sampler SB
~2.5	1	215	6.45	9.3	11.5	1315	...mp stroke (mL)
~2.5	2	233	7.02	9.3	dry	1404	
~1.5	3	245	7.0	9.0	dry	1455	KCSWD VASHON LF ID WV31100128- Date 01/28/2010 Sampler SB
	4	BEGIN SAMPLE				1515	
~2.7	5	FINISH SAMPLE			dry	1700	
	6						

NOTES: INSTRUMENTS CALIBRATED TODAY PRIOR TO USE? YES ✓ NO o. TIME: 1250 BUFFERS: (4.7) 10
VTRPs TURNED IN? YES ✓ NO o. VTRP1001 28T VTRP DATE: 01/26/10
VTRP BUBBLES? YES ☐ NO ☒ BUBBLE DIAMETERS: N/A
NO QC BOTTLES

CUSTODY RECORD:

PERSONNEL	SIGNATURE	DATE/TIME
BILIR	[signature]	01/28/10 17:30

Number of bottles in this set 12 +3

Time it took to sample well: ~5 hrs

Chain of Custody Record

Environmental Monitoring Program Date 01/26/10

King County Department of Natural Resources and Parks — Solid Waste Division

No. 09680

Name: King County Solid Waste Division
Address: 201 South Jackson Street, Suite 701, Seattle, WA 98104-3855
Attention: Sendy P. Jimenez 206-296-4411
Authorization: KCEL Lab Services to KCSWD
Project Test Site: VAGW (12) West Hillslope

Lab No.	Sample I.D.	Date	Time	Project Site Test Reference	Remarks
	WV30100126-	01/26/2010	1115	VAGW (12)	12
	VTRP100126R	01/22/2010	—		3

Project Site Test Reference columns:

GROUNDWATER: CHGW Cedar Hills GW Qlty (2); CHGW-V C. Hills GW VOAs Only (3); CHGW-NP Cedar Hills GW-NonPotable (37); CHGW-OS C. Hills GW Offsite (38); CHGW-E Cedar Hills GW Eqpt Blank (41); CHGW-O Cedar Hills GW-OrthoP Blank (50); CFGW Cedar Falls GW Qlty (5); DUGW Duvall GW Qlty (6); ENGW Enumclaw GW Qlty (7); HOGW Hobart GW Qlty (8); HTGW Houghton GW Qlty (9); PUGW Puyallup GW Qlty (10); VAGW Vashon GW Qlty (12) — X

SURFACE WATER: CHSW-Q Cedar Hills SW Quarterly (14); CHSW-M Cedar Hills SW Monthly (15); CHSW-P Cedar Hills SW Permit (16); CHSW-P2 Cedar Hills SW South Lagoon (46); CHSW-A5 Cedar Hills Area 5 Top Deck (42); CFSW Cedar Falls SW Qlty (17); DUSW Duvall SW Qlty (18); VASW Vashon SW Qlty (21); HILL: VASW-1 Vashon Hillslope SW Qlty (43); VASW-2 Vashon Hillslope SW Qlty (44); VASW-3 Vashon Hillslope SW Qlty (45)

LEACHATE/WASTEWATER: CHLS-M Cedar Hills Leachate Mthly (23); CHTW Cedar Hills Truckwash (24); PERMIT: CHLS-P Cedar Hills Lchate Permit (25); ALLS Algona WW Permit (26); ENLS Enumclaw WW Permit (27); FALS Facioria WW Permit (28); SRTS Shoreline WW Permit (29); HTLS Houghton WW Permit (30); RELS Renton WW Permit (31); VALS-P Vashon Leachate Permit (32); VALS-O/M Vashon Leachate Othr/Mthly (34); CHSW-E Cedar Hills Emergency Spill (49); Number of Containers

Relinquished By Sampler	Date 1/26	Received By	Date
Sampler Signature: Sevin BILIR	2010	Signature	
Sampler Printed Name: KCSWD	Time 1345	Printed Name	Time
Company		Company	
Relinquished By	Date	Received By: Lynne Cox	Date 1/26/10
Signature		Signature: Lynne Cox	
Printed Name	Time	Printed Name: KCEL	Time 1345
Company		Company	

Observations/Comments/Special Instructions:

Total # of Bottles: 15

Instructions:
1. Complete in ballpoint pen. Draw one line through errors and initial.
2. Receiving lab is to sign in the shaded box.
3. Check off pre-printed Project Site Test Reference to be performed for each sample, or provide specific instruction if not listed.
4. KCSWD personnel are to retain white and canary pages, receiving lab is to keep pink and goldenrod pages.
5. If KCSWD personnel request, please provide a name and telephone number of your contact person.

0498 (Rev. 3/

Distribution: White and Canary – KCSW Pink and Goldenrod – Receiving Laboratory

Chain of Custody Record

Environmental Monitoring Program Date 01|29|10

King County — Department of Natural Resources and Parks, Solid Waste Division

Nº 09679

Name: King County Solid Waste Division
Address: 201 South Jackson Street, Suite 701, Seattle, WA 98104-3855
Attention: Sendy P. Jimenez 206-296-4411
Authorization: KCEL Lab Services to KCSWD
Project Test Site: VAGW (12) West Hillslope

Project Site Test Reference — GROUNDWATER (columns 2–12); SURFACE WATER (columns 14–45, including HILL: 43, 44, 45); LEACHATE/WASTEWATER (columns 23–49, including PERMIT: 25–32)

Lab No.	Sample I.D.	Date	Time	2 CHGW Cedar Hills GW Qtly	3 CHGW-V C. Hills GW VOAs Only	37 CHGW-NP Cedar Hills GW-NonPotable	38 CHGW-OS C. Hills GW Offsite	41 CHGW-E Cedar Hills GW Eqpt Blank	50 CHGW-O Cedar Hills GW OrthoP Blank	5 CFGW Cedar Falls GW Qtly	6 DUGW Duvall GW Qtly	7 ENGW Enumclaw GW Qtly	8 HOGW Hobart GW Qtly	9 HTGW Houghton GW Qtly	10 PUGW Puyallup GW Qtly	12 VAGW Vashon GW Qtly	14 CHSW-Q Cedar Hills SW Quarterly	15 CHSW-M Cedar Hills SW Monthly	16 CHSW-P Cedar Hills SW Permit	46 CHSW-P2 Cedar Hills SW South Lagoon	42 CHSW-A5 Cedar Hills Area 5 Top Deck	17 CFSW Cedar Falls SW Qtly	18 DUSW Duvall SW Qtly	21 VASW Vashon SW Qtly	43 VASW-1 Vashon Hillslope SW Qtly	44 VASW-2 Vashon Hillslope SW Qtly	45 VASW-3 Vashon Hillslope SW Qtly	23 CHLS-M Cedar Hills Leachate Mtly	24 CHTW Cedar Hills Truckwash	25 CHLS-P Cedar Hills L'chate Permit	26 ALLS Algona WW Permit	27 ENLS Enumclaw WW Permit	28 FALS Factoria WW Permit	29 SRTS Shoreline WW Permit	30 HTLS Houghton WW Permit	31 RELS Renton WW Permit	32 VALS-P Vashon Leachate Permit	34 VALS-Q/M Vashon Leachate Qtly/Mthly	49 CHSW-E Cedar Hills Emergency Spill	Number of Containers	Remarks
	WV31100128-	01/28 2010	1530													X																								12	
	VTRP100128T	01/26 2010	—																																					3	

Relinquished By Sampler	Date	Received By	Date
[signature]	1/29 2010		
Sampler Signature: Sevin Bilir		Signature:	
Sampler Printed Name: KCSWD (Company)	Time: 0740	Printed Name: (Company)	Time:
Relinquished By:	Date:	Received By: [signature]	Date: 1/29/10
Signature:		Signature: Benjamin Mendoza	
Printed Name: (Company)	Time:	Printed Name: King County Env. Lab (Company)	Time: 0740

Observations/Comments/Special Instructions:

Total # of Bottles: 15

Instructions:
1. Complete in ballpoint pen. Draw one line through errors and initial.
2. Receiving lab is to sign in the shaded box.
3. Check off pre-printed Project Site Test Reference to be performed for each sample, or provide specific instruction if not listed.
4. KCSWD personnel are to retain white and canary pages, receiving lab is to keep pink and goldenrod pages.
5. If KCSWD personnel request, please provide a name and telephone number of your contact person.

0498 (Rev. 3/09)

Distribution: White and Canary – KCSWD Pink and Goldenrod – Receiving Laboratory

Appendix D.3

Well Installation Pictures

(1) Hand augering through platform access hole (2) Removing coring sediments (3) Saturated sediments in auger bit (4) Driller using soil sampler

(1) Pre-packed screen around 0.010-inch slots on 2-inch PVC tubing (2) Placing two five-foot pre-packed screens (and 0.010-slots) into borehole (3) Well locking cap, lock and state well tag.

(1) Well MW-30 ; DOE Well tag # APJ-049 (2) Well MW-31; DOE Well tag # APJ-050. Both pictures show augering platforms, wastewater discharge bucket, and auger sediment cuttings in plastic wrapping. Wells are locked with locking caps and locks.

(1 & 2) Well MW-32 ; DOE Well tag # APJ-048. Pictures show augering platforms, wastewater discharge bucket, and auger sediment cuttings in plastic wrapping. Well is locked with locking caps and locks.