Cathcart Landfill Environmental Monitoring Report

Second Semiannual and Annual Summary

2021

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1.0 INTRODUCTION

The following report presents the results of groundwater, surface water, landfill gas, and associated infrastructure monitoring for the second semiannual monitoring period (*July through December*) of 2021 and the annual 2021 summary environmental monitoring report for the Cathcart Sanitary Landfill (*Landfill, site*). The site is located at 8915 Cathcart Way, just west of the intersection of Cathcart Way and State Route 9 in south-central Snohomish County, Washington. The location of the site relative to existing municipal improvements is shown on the **Vicinity Map** (***Figure 1***).

1.1 BACKGROUND

The Cathcart Landfill was designed and permitted in the late 1970s and was operated as a solid waste landfill for 12 years and ceased accepting any new solid waste in June 1992.

The closed landfill is approximately 60 acres in area and is part of a larger County parcel. The Cathcart Landfill is bounded by private residential property to the northwest, north and east and by other Snohomish County facilities to the south and west. Existing site improvements and the site layout are shown on the **Site Map** (***Figure 2***), and existing site topography is shown on the **Site Topographic Map** (***Figure 3***). Surficial geology of the site area is shown on the **Geologic Map** (***Figure 4***).

Leachate is collected and gravity flows to a pretreatment facility, after which it is pumped to the **City of Everett's** Wastewater Treatment Plant for final treatment and discharge. Gas generated by the landfill is collected and extracted through a negatively pressurized system and discharged through an on-site gas flaring facility.

The Landfill is currently permitted for post-closure monitoring by the Snohomish Health District (*SHD*) with a Solid Waste Facility Permit (*SW-011, SHD 2021*). Monitoring results are reviewed by both the SHD and the Department of Ecology.

1.2 MONITORING PROGRAM

The site is currently monitored following the procedures outlined in the current Sampling and Analysis Plan (**SAP**, *Snohomish County, 2020*), which was approved by Ecology and SHD in their letters dated December 11 and 17, 2020, respectively. The SAP includes changes to the monitoring program that were proposed in the County's Application of Variance, which was submitted to the SHD in 2018; the changes were conditionally approved by SHD with input from Ecology in their letter dated December 6, 2018. These changes to the monitoring program are summarized as follows:

- **Groundwater Monitoring:** Sample frequency at all wells (*except for G-09S, G-09D, G-10S, and G-10D*) reduced from quarterly to semiannual; reporting for all wells will be completed on a semiannual basis. Chemical analytical suites will remain unchanged from those specified in the 2006 SAP.
    - Wells G-09S, G-09D, G-10S, and G-10D will continue to be sampled quarterly and will be reported in the semiannual monitoring reports. Due to a gap in the data

for wells G-09S, G-09D, and G-10S between the third quarter 2013 and the third quarter of 2018, eight additional quarters of monitoring will be conducted to determine if a reduction to semiannual sampling frequency is warranted at those wells. Additionally, low vinyl chloride concentrations detected in those wells historically will be further evaluated during the additional quarterly monitoring period.

- **Landfill Gas Monitoring:** Quarterly monitoring at all currently monitored gas probes, barholes, vaults, and lift stations will be maintained, and new soil gas probe GP-6 will be integrated into the gas probe monitoring program to monitor for landfill gas migration on the northern edge of the Cathcart property, near the closest residences. Monitoring results will be included in the semiannual monitoring reports.
- **Surface Water Sampling:** Sample frequency at all monitoring points was reduced to semiannual; two monitoring points (*CC-D1 and CC-J*) were eliminated from the surface water monitoring program based on redundancy/accessibility concerns for those locations. Monitoring results will be included in the semiannual monitoring reports. Chemical analytical suites remain unchanged.

1.2.1 Groundwater Monitoring Network

Currently, a total of 17 groundwater monitoring wells (*eight shallow wells and nine deep wells*), are monitored on a semiannual basis. Of these wells, four-(*4*) are considered upgradient, and 13 are considered to be within the landfill footprint or downgradient site wells. Well locations are shown on the **Monitoring Network Map** (***Figure 5***). Groundwater monitoring results are summarized in **Section 2.0** of this report.

1.2.2 *Surface Water Monitoring Network*

Surface water monitoring stations have been established along Garden Creek and in the site stormwater detention ponds per the **SAP**. The seven surface water sampling locations consist of one sampling location upgradient of the site and six sampling locations within and downgradient of the site. Sampling locations are shown on **Monitoring Network Map** (***Figure 5***). Semiannual surface water monitoring results are summarized in **Section 3.0** of this report.

1.2.3 Landfill Gas Monitoring Network

Per the **SAP**, landfill gas monitoring is conducted quarterly and includes measurement of methane, oxygen, and carbon dioxide. The existing gas monitoring system consists of eight gas probes, six permanently-installed barhole probes, seven vaults, 19 manholes, and two lift stations, which surround the landfill. The gas monitoring locations are shown on the **Monitoring Network Maps** (***Figures 5 and 5a***). Quarterly landfill gas monitoring results are summarized and discussed in **Section 4.0** of this report.

2.0 GROUNDWATER MONITORING

The second semiannual groundwater monitoring events for 2021 were performed by Snohomish County personnel on July 14 and October 19 and 20, 2021.

Depths to water were measured and groundwater samples were collected in accordance with the approved **SAP**. Hydrographs of the historical and current groundwater elevations and precipitation totals are included in ***Appendix A***. The **Second Semiannual 2021 Groundwater Measurements** and comparison with the previous monitoring event elevation data (*delta*) are shown in ***Table 1*** below.

Table 1 – Second Semiannual 2021 Groundwater Measurements

Well Number	Sample Date	Top of Casing Elevation (feet above MSL)	Water Elevation (feet above MSL)	Delta* (feet)
Shallow Wells – Third Quarter 2021				
G-09S	7/14/21	273.08	241.79	-1.39
G-10S	7/14/21	266.94	242.99	-0.61
Shallow Wells – Fourth Quarter 2021				
G-01A	10/19/21	229.00	221.89	3.06
G-04A	10/19/21	286.52	DRY	--
G-08D1	10/19/21	222.02	192.67	-5.63
G-09S	10/20/21	273.08	240.57	-1.22
G-10S	10/20/21	266.94	244.32	1.33
G-11S	10/19/21	250.74	232.19	2.39
G-14S	10/19/21	328.76	311.78	-7.57
G-24S	10/19/21	321.13	306.47	-0.96
Deep Wells – Third Quarter 2021				
G-09D	7/14/21	274.60	220.92	-1.77
G-10D	7/14/21	268.32	236.80	-0.70
Deep Wells – Fourth Quarter 2021				
G-01D	10/19/21	229.96	206.76	1.38
G-02D	10/19/21	242.10	210.77	-2.09
G-06B	10/19/21	246.24	212.21	2.06
G-08D2	10/19/21	221.62	212.15	-3.43
G-09D	10/20/21	274.60	219.80	-1.12
G-10D	10/20/21	268.32	237.92	1.12
G-13D	10/20/21	232.17	221.35	0.22
G-14D	10/19/21	329.58	297.68	-1.27
G-24D	10/19/21	320.51	301.00	-1.41

MSL = Mean sea level

* Delta = Change in groundwater elevation from previous sampling event; wells 09S/09D and 10S/10D are sampled quarterly

Groundwater Contour Maps for the shallow and deep zones during 2021 (*i.e., for the second and fourth quarter monitoring events*) are included as ***Figures 6a through 6d*** of this report.

2.2 GROUNDWATER SAMPLING

Four wells were sampled during the first and third quarters (*G-09S, G-09D, G-10S, and G-10D*); and 16 wells were sampled during the second and fourth quarters in accordance with the procedures outlined in the **SAP** and the modified schedule in the approved Variance. Well sampling field sheets for the second and fourth quarter are included in ***Appendix D***. Well performance was consistent with recent sampling events at all wells.

Samples were transported to Am Test, Inc. of Kirkland, Washington under chain-of-custody for analysis of dissolved metals, volatile organic compounds (*VOCs*), and conventional chemistry parameters. The analytical results are tabulated in ***Appendix B*** of this report and discussed below.

2.3 EVALUATION OF GROUNDWATER ANALYTICAL RESULTS

Each of the groundwater samples collected during 2021 are compared to the applicable groundwater quality standards which are summarized in ***Tables 2 and 3*** below and in ***Appendix B***. Notable observations or deviations from scope are noted below:

2.3.1 Shallow Wells

- The TOC concentration in the second quarter 2021 sample from well G-09S (*13.0 mg/L*) increased significantly from the previous quarter but decreased consistently from the second quarter to the fourth quarter 2021.
- The VOCs detected in shallow wells during the 2021 sampling events include:
  - Cis-1,2-dichloroethene (*cis-1,2-DCE*) – well G-09S (*first and fourth quarters*) and G-10S (*first, third, and fourth quarters*)
  - 1,2-Dichloropropane (*1,2-DCP*) – well G-09S (*fourth quarter*); did not exceed the 1,2-DCP standard of 0.6 µg/L

Table 2 – Summary of Annual 2021 Shallow Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-01A	4/21/21	pH	std units	6.34	6.5-8.5
			Arsenic	mg/L	0.00015	0.00005
		10/19/21	pH	std units	5.58	6.5-8.5
			Arsenic	mg/L	0.000173	0.00005
	G-04A	4/20/21	Insufficient water for sampling			
		10/19/21	Insufficient water for sampling			
	G-08D1	4/20/21	pH	std units	9.59	6.5-8.5
			Sodium	mg/L	103	20
			Arsenic	mg/L	0.00088	0.00005
		10/19/21	pH	std units	9.14	6.5-8.5
			Sodium	mg/L	104	20
			Arsenic	mg/L	0.00161	0.00005
	G-09S	1/12/21	Conductivity	µmhos/cm	980	700
			pH	std units	6.43	6.5-8.5
			Sodium	mg/L	88.5	20
			TDS	mg/L	680	500
			Arsenic	mg/L	0.000607	0.00005
			Manganese	mg/L	0.054	0.05
		4/20/21	Conductivity	µmhos/cm	950	700
			pH	std units	6.42	6.5-8.5
			Sodium	mg/L	79.0	20
			TDS	mg/L	660	500
			Arsenic	mg/L	0.00075	0.00005

Table 2 – Summary of Annual 2021 Shallow Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-09S	7/14/21	Conductivity	µmhos/cm	970	700
			pH	std units	6.15	6.5-8.5
			Sodium	mg/L	90.4	20
			TDS	mg/L	640	500
			Arsenic	mg/L	0.000774	0.00005
			Thallium	mg/L	0.00382	0.002
		10/20/21	Conductivity	µmhos/cm	920	700
			pH	std units	6.06	6.5-8.5
			Sodium	mg/L	94.4	20
			TDS	mg/L	600	500
			Arsenic	mg/L	0.000549	0.00005
	G-10S	1/12/21	Conductivity	µmhos/cm	1400	700
			Sodium	mg/L	181	20
			Sulfate	mg/L	294	250
			TDS	mg/L	970	500
			Arsenic	mg/L	0.00501	0.00005
			Iron	mg/L	9.44	0.3
			Manganese	mg/L	3.22	0.05
		4/20/21	Conductivity	µmhos/cm	1400	700
			Sodium	mg/L	193	20
			Sulfate	mg/L	298	250
			TDS	mg/L	970	500
			Arsenic	mg/L	0.00564	0.00005
			Iron	mg/L	10.3	0.3
			Manganese	mg/L	3.41	0.05
		7/14/21	Conductivity	µmhos/cm	1400	700
			Sodium	mg/L	183	20
			Sulfate	mg/L	271	250
			TDS	mg/L	960	500
			Arsenic	mg/L	0.00573	0.00005
			Iron	mg/L	10.2	0.3
			Manganese	mg/L	3.35	0.05
		10/20/21	Conductivity	µmhos/cm	1300	700
			pH	std units	6.37	6.5-8.5
			Sodium	mg/L	186	20
			Sulfate	mg/L	260	250
			TDS	mg/L	860	500
			Arsenic	mg/L	0.00501	0.00005
			Iron	mg/L	12.2	0.3
			Manganese	mg/L	3.52	0.05
	G-11S	4/20/21	Sodium	mg/L	30.9	20
			Arsenic	mg/L	0.000495	0.00005
		10/19/21	pH	std units	6.26	6.5-8.5
			Sodium	mg/L	42.9	20
			Arsenic	mg/L	0.000319	0.00005
			Manganese	mg/L	0.056	0.05
Upgradient	G-14S	4/20/21	pH	std units	9.25	6.5-8.5
			Sodium	mg/L	83.5	20
			Arsenic	mg/L	0.00352	0.00005

Table 2 – Summary of Annual 2021 Shallow Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Upgradient	G-14S	10/19/21	Sodium Arsenic	mg/L mg/L	107.0 0.00285	20 0.00005
	G-24S	4/20/21	Sodium Arsenic	mg/L mg/L	78.9 0.000624	20 0.00005
		10/19/21	Sodium Arsenic	mg/L mg/L	97.0 0.000552	20 0.00005

2.3.2 Deep Wells

- The VOCs detected in deep wells during the 2021 sampling events include:
  - Cis-1,2-DCE – well G-09D (*first and fourth quarters*) and well G-10D (*fourth quarter*)
  - 1,2-DCP – well G-09D (*first and fourth quarters*); none of the 1,2-DCP concentrations exceeded the groundwater standard of 0.6 µg/L
  - Vinyl chloride – well G-09D (*second, third, and fourth quarters*); all three vinyl chloride detections exceeded the groundwater standard of 0.02 µg/L

Table 3 – Summary of Annual 2021 Deep Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-01D	4/21/21	pH Sodium TDS Arsenic	std units mg/L mg/L mg/L	9.27 205 540 0.00121	6.5-8.5 20 500 0.00005
		10/19/21	pH Sodium Arsenic	std units mg/L mg/L	8.98 140 0.000708	6.5-8.5 20 0.00005
	G-02D	4/21/21	Sodium Arsenic	mg/L mg/L	79.4 0.00373	20 0.00005
		10/19/21	Sodium Arsenic	mg/L mg/L	80.8 0.00364	20 0.00005
	G-06B	4/21/21	Sodium Arsenic	mg/L mg/L	178 0.00415	20 0.00005
		10/19/21	Sodium Arsenic	mg/L mg/L	181 0.00341	20 0.00005
	G-08D2	4/20/21	pH Sodium Arsenic	std units mg/L mg/L	9.90 106 0.00134	6.5-8.5 20 0.00005
		10/19/21	pH Sodium Arsenic	std units mg/L mg/L	9.27 115 0.000519	6.5-8.5 20 0.00005
	G-09D	1/12/21	pH Sodium Arsenic	std units mg/L mg/L	9.35 164 0.00276	6.5-8.5 20 0.00005
		4/20/21	pH Sodium Arsenic Vinyl chloride	std units mg/L mg/L µg/L	8.58 176 0.00349 0.19	6.5-8.5 20 0.00005 0.02

Table 3 – Summary of Annual 2021 Deep Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Downgradient	G-09D	7/14/21	Conductivity	µmhos/cm	710	700
			pH	std units	8.73	6.5-8.5
			Sodium	mg/L	174	20
			Arsenic	mg/L	0.00438	0.00005
			Vinyl chloride	µg/L	0.57	0.02
		10/20/21	pH	std units	8.97	6.5-8.5
			Sodium	mg/L	182	20
			Arsenic	mg/L	0.00268	0.00005
			Vinyl chloride	µg/L	0.12	0.02
	G-10D	1/12/21	Conductivity	µmhos/cm	1500	700
			Sodium	mg/L	364	20
			Sulfate	mg/L	286	250
			TDS	mg/L	1000	500
			Arsenic	mg/L	0.00105	0.00005
			Iron	mg/L	0.499	0.3
			Manganese	mg/L	0.37	0.05
		4/20/21	Conductivity	µmhos/cm	1500	700
			Sodium	mg/L	376	20
			Sulfate	mg/L	289	250
			TDS	mg/L	1000	500
			Arsenic	mg/L	0.00125	0.00005
			Iron	mg/L	0.493	0.3
			Manganese	mg/L	0.367	0.05
		7/14/21	Conductivity	µmhos/cm	1500	700
			Sodium	mg/L	369	20
			Sulfate	mg/L	268	250
			TDS	mg/L	970	500
			Arsenic	mg/L	0.00128	0.00005
			Iron	mg/L	0.499	0.3
			Manganese	mg/L	0.354	0.05
		10/20/21	Conductivity	µmhos/cm	1400	700
			Sodium	mg/L	377	20
			Sulfate	mg/L	252	250
			TDS	mg/L	1000	500
			Arsenic	mg/L	0.000716	0.00005
			Iron	mg/L	0.536	0.3
			Manganese	mg/L	0.354	0.05
	G-13D	4/21/21	pH	std units	9.31	6.5-8.5
			Sodium	mg/L	106	20
			Arsenic	mg/L	0.00019	0.00005
		10/20/21	pH	std units	8.84	6.5-8.5
			Sodium	mg/L	104	20
			Arsenic	mg/L	0.000109	0.00005
Upgradient	G-14D	4/20/21	pH	std units	9.72	6.5-8.5
			Sodium	mg/L	115	20
			Arsenic	mg/L	0.000907	0.00005
		10/19/21	pH	std units	9.11	6.5-8.5
			Sodium	mg/L	123	20
			Arsenic	mg/L	0.000638	0.00005

Table 3 – Summary of Annual 2021 Deep Well Standard Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Groundwater Standard
Upgradient	G-24D	4/20/21	pH	std units	8.64	6.5-8.5
			Sodium	mg/L	111	20
			Arsenic	mg/L	0.00006	0.00005
		10/19/21	Sodium	mg/L	121	20
			Arsenic	mg/L	0.00006	0.00005

2.4 STATISTICAL EVALUATION

Where exceedances to the WAC groundwater standards occur, statistical analysis is performed as specified in the **SAP** using **DUMPStat Statistical Software** (*Version 3.0 by Robert D. Gibbons Ltd., 2018*) to determine the significance of the change.

Details regarding the statistical analyses are found in the SAP and in monitoring reports submitted prior to 2019. Per **Ecology** and **Snohomish Health District** request, the statistical prediction limits for each groundwater zone were previously updated in the first quarter of the year and subsequent data sets were compared against that prediction limit. However, since the first semiannual monitoring event for all wells does not occur until the second quarter, the prediction limits are updated annually following the second quarter sampling event.

2.4.1 Shallow Groundwater Well Statistical Results

Analytes that exceeded the calculated prediction limits in the shallow zone wells and the observed concentration trends are summarized in ***Tables 4 and 5*** below and ***Appendix B***. Plots of the shallow zone groundwater statistical analyses are included in ***Appendix C***.

Table 4 – Summary of Annual 2021 Shallow Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-01A	4/21/21	None	--	--	--
		10/19/21	pH	std units	5.58	6.00-9.39
	G-04A	4/20/21	Not sampled due to insufficient water			
		10/19/21	Not sampled due to insufficient water			
	G-08D1	4/20/21	pH	std units	9.59	6.00-9.39
		10/19/21	Nitrite nitrogen	mg/L	0.035	0.021
	G-09S	1/12/21	Alkalinity	mg/L	360	200
			Bicarbonate	mg/L	360	200
			Calcium	mg/L	79.7	23.8526
			Conductivity	µmhos/cm	980	540
			Potassium	mg/L	4.82	2.7509
			Sulfate	mg/L	187	169
			TDS	mg/L	680	404.5425

Table 4 – Summary of Annual 2021 Shallow Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-09S	4/20/21	Alkalinity	mg/L	340	230
			Bicarbonate	mg/L	340	200
			Calcium	mg/L	63.2	23.7546
			COD	mg/L	24	18
			Conductivity	µmhos/cm	950	546.7776
			Potassium	mg/L	4.51	2.6282
			TDS	mg/L	660	395.6869
		7/14/21	Alkalinity	mg/L	350	230
			Bicarbonate	mg/L	350	200
			Calcium	mg/L	78.4	23.7546
			Conductivity	µmhos/cm	970	546.7776
			Potassium	mg/L	4.96	2.6282
			TDS	mg/L	640	395.6869
			Nickel	mg/L	0.05	0.038
			Thallium	mg/L	0.00382	0.00009
		10/20/21	Alkalinity	mg/L	350	230
			Bicarbonate	mg/L	350	200
			Calcium	mg/L	88.1	23.7546
			Conductivity	µmhos/cm	920	546.7776
			Potassium	mg/L	5.19	2.6282
			TDS	mg/L	600	395.6869
	G-10S	1/12/21	Alkalinity	mg/L	480	200
			Bicarbonate	mg/L	480	200
			Calcium	mg/L	104	23.8526
			Conductivity	µmhos/cm	1400	540
			Potassium	mg/L	3.69	2.7509
			Sodium	mg/L	181	123
			Sulfate	mg/L	294	169
			TDS	mg/L	970	404.5425
			Arsenic	mg/L	0.00501	0.0038
		4/20/21	Alkalinity	mg/L	480	230
			Bicarbonate	mg/L	480	200
			Calcium	mg/L	91.8	23.7546
			Conductivity	µmhos/cm	1400	546.7776
			Potassium	mg/L	3.34	2.6282
			Sodium	mg/L	193	121.1148
			TDS	mg/L	970	395.6869
			Arsenic	mg/L	0.00564	0.004
			Cobalt	mg/L	0.013	0.003
			Iron	mg/L	10.3	9.783

Table 4 – Summary of Annual 2021 Shallow Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-10S	7/14/21	Alkalinity	mg/L	480	230
			Bicarbonate	mg/L	480	200
			Calcium	mg/L	105	23.7546
			Conductivity	µmhos/cm	1400	546.7776
			Nitrite nitrogen	mg/L	0.022	0.021
			Potassium	mg/L	3.64	2.6282
			Sodium	mg/L	183	121.1148
			TDS	mg/L	960	395.6869
			Arsenic	mg/L	0.00573	0.004
			Iron	mg/L	10.2	9.783
		10/20/21	Alkalinity	mg/L	520	230
			Bicarbonate	mg/L	520	200
			Calcium	mg/L	116.0	23.7546
			Conductivity	µmhos/cm	1300	546.7776
			Potassium	mg/L	3.9	2.6282
			Sodium	mg/L	186	121.1148
			TDS	mg/L	860	395.6869
			Arsenic	mg/L	0.00501	0.004
			Iron	mg/L	12.2	9.783
	G-11S	4/20/21	Cobalt	mg/L	0.011	0.003
		10/19/21	None	--	--	--
Upgradient	G-14S	4/20/21	None	--	--	--
		10/19/21	Bicarbonate	mg/L	210	200
			Nitrite nitrogen	mg/L	0.073	0.021
	G-24S	4/20/21	None	--	--	--
		10/19/21	None	--	--	--

Significant increasing and decreasing concentration trends for the second semiannual 2021 monitoring events and for 2021 overall were noted in shallow groundwater, as summarized in ***Table 5*** below.

Table 5 – Significant Trends, Shallow Wells 2021

Well	Date	Significant Trends			
		Second Semiannual 2021		2021 Overall	
		Increasing	Decreasing	Increasing	Decreasing
Downgradient Wells					
G-01A	10/19/21	None	None	pH	None
G-04A	10/19/21	NS	NS	NS	NS
G-08D1	10/19/21	**Iron**	Chloride	Calcium, iron	Chloride

Table 5 – Significant Trends, Shallow Wells 2021

Well	Date	Significant Trends			
		Second Semiannual 2021		2021 Overall	
		Increasing	Decreasing	Increasing	Decreasing
G-09S	7/14/21	Alkalinity, bicarbonate, pH, **TOC**	Calcium, chloride, conductivity, magnesium, potassium, sulfate, TDS	Alkalinity, bicarbonate, pH, TOC	Calcium, chloride, conductivity, magnesium, potassium, sulfate, TDS, selenium
G-09S	10/20/21	Alkalinity, bicarbonate, pH	Calcium, chloride, **conductivity**, magnesium, potassium, sulfate, TDS		
G-10S	7/14/21	Alkalinity, ammonia, bicarbonate	Calcium, chloride, magnesium, sulfate, **TDS**, manganese	Alkalinity, ammonia, bicarbonate	Calcium, chloride, magnesium, sulfate, TDS, manganese
G-10S	10/20/21	Alkalinity, ammonia, bicarbonate	Calcium, chloride, magnesium, sulfate, TDS, manganese		
G-11S	10/19/21	Calcium, magnesium, manganese	Conductivity, sodium, sulfate	Calcium, magnesium, manganese	Alkalinity, bicarbonate, conductivity, sodium, sulfate
Upgradient Wells					
G-14S	10/19/21	pH, arsenic, **manganese**	Chloride, nitrate, **sulfate**	pH, arsenic, manganese	Chloride, nitrate
G-24S	10/19/21	None	Calcium, chloride, magnesium, sulfate	None	Calcium, chloride, magnesium, sulfate

Constituents in **bold** (if any) indicate a new trend noted since the previous monitoring period

Decreasing trends in the shallow wells outnumbered increasing trends during all four 2021 sampling events, including the first quarter sampling event (*13 decreasing/6 increasing*), second quarter sampling event (*22 decreasing/14 increasing*), third quarter sampling event (*13 decreasing/7 increasing*), and fourth quarter sampling event (*24 decreasing/13 increasing*). Three increasing trends were noted in upgradient well G-14S during the fourth quarter event.

2.4.2 Deep Groundwater Well Statistical Results

Analytes that exceeded the calculated prediction limits in the deep zone wells and the observed concentration trends for the second semiannual 2021 events are summarized in ***Tables 6 and 7*** below and in ***Appendix B***. Plots of the deep zone groundwater statistical analyses are included in ***Appendix C***.

Table 6 – Summary of Annual 2021 Deep Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-01D	4/21/21	Alkalinity	mg/L	290	280
			Conductivity	µmhos/cm	650	530
			Sodium	mg/L	205	130.7721
			TDS	mg/L	540	460
			Zinc	mg/L	0.018	0.012
		10/19/21	Conductivity	µmhos/cm	590	530
			Sodium	mg/L	140	130.7721
	G-02D	4/21/21	Nitrate	mg/L	0.32	0.21
			Sulfate	mg/L	70.2	66.05
			Arsenic	mg/L	0.00373	0.0021
		10/19/21	Arsenic	mg/L	0.00364	0.0021
	G-06B	4/21/21	Conductivity	µmhos/cm	650	530
			Sodium	mg/L	178	130.7721
			Sulfate	mg/L	67.6	66.05
			Arsenic	mg/L	0.00415	0.0021
		10/19/21	Conductivity	µmhos/cm	660	530
			Sodium	mg/L	181	130.7721
			Arsenic	mg/L	0.00341	0.0021
	G-08D2	4/20/21	pH	std units	9.90	6.02-9.88
		10/19/21	Nitrite	mg/L	0.067	0.054
	G-09D	1/12/21	Conductivity	µmhos/cm	660	510
			Sodium	mg/L	164	127.8505
		4/20/21	Conductivity	µmhos/cm	680	530
			Sodium	mg/L	176	130.7721
			Sulfate	mg/L	128	66.05
			Arsenic	mg/L	0.00349	0.0021
		7/14/21	Conductivity	µmhos/cm	710	510
			Nitrate	mg/L	0.33	0.21
			Sodium	mg/L	174	130.7721
			Sulfate	mg/L	129	66.05
			Arsenic	mg/L	0.00438	0.0021
		10/20/21	Conductivity	µmhos/cm	660	510
			Sodium	mg/L	182	130.7721
			Sulfate	mg/L	127	66.05
			Arsenic	mg/L	0.00268	0.0021

Table 6 – Summary of Annual 2021 Deep Well Prediction Limit Exceedances

Well Type	Well ID	Sample Date	Parameter	Units	Result	Prediction Limit
Downgradient	G-10D	1/12/21	Alkalinity	mg/L	540	280
			Ammonia	mg/L	0.337	0.2403
			Bicarbonate	mg/L	540	280
			Calcium	mg/L	21.7	6.32
			Chloride	mg/L	16.7	6.86
			Conductivity	µmhos/cm	1500	510
			Potassium	mg/L	1.66	1.6
			Sodium	mg/L	364	127.8505
			Sulfate	mg/L	286	230.291
			TDS	mg/L	1000	460
		4/20/21	Alkalinity	mg/L	540	280
			Bicarbonate	mg/L	540	280
			Calcium	mg/L	18.9	6.32
			Chloride	mg/L	17.1	8.7455
			Conductivity	µmhos/cm	1500	530
			Sodium	mg/L	376	130.7721
			Sulfate	mg/L	289	66.05
			TDS	mg/L	1000	460
		7/14/21	Alkalinity	mg/L	530	280
			Ammonia	mg/L	0.381	0.2927
			Bicarbonate	mg/L	530	280
			Calcium	mg/L	21.0	6.32
			Chloride	mg/L	18.8	8.7455
			Conductivity	µmhos/cm	1500	530
			Sodium	mg/L	369	130.7721
			Sulfate	mg/L	268	66.05
			TDS	mg/L	970	460
			Barium	mg/L	0.0075	0.0046
			Nickel	mg/L	0.04	0.026
		10/20/21	Alkalinity	mg/L	510	280
			Ammonia	mg/L	0.394	0.2927
			Bicarbonate	mg/L	510	280
			Calcium	mg/L	23.1	6.32
			Chloride	mg/L	20.7	8.7455
			Conductivity	µmhos/cm	1400	530
			Sodium	mg/L	377	130.7721
			Sulfate	mg/L	252	66.05
			TDS	mg/L	1000	460
			Vanadium	mg/L	0.012	0.01
	G-13D	4/21/21	Chloride	mg/L	12.2	8.7455
			Cobalt	mg/L	0.01	0.005
		10/20/21	Chloride	mg/L	11.9	8.7455
Upgradient	G-14D	4/20/21	TOC	mg/L	38	26
		10/19/21	Nitrate	mg/L	0.28	0.21
	G-24D	4/20/21	Barium	mg/L	0.104	0.0046
		10/19/21	None	--	--	--

The trends noted during the first semiannual event are summarized in ***Table 7*** below and in ***Appendix B***. Decreasing trends in the deep wells outnumbered increasing trends during all four

2021 sampling events, including the first quarter sampling event (*9 decreasing/1 increasing*), second quarter event (*27 decreasing/10 increasing*), third quarter sampling event (*9 decreasing/1 increasing*), and fourth quarter sampling event (*25 decreasing/9 increasing*). Three of the increasing trends were noted in upgradient wells G-14D and G-24D during the fourth quarter event.

Table 7 – Significant Trends, Deep Wells 2021

Well	Date	Significant Trends			
		Second Semiannual 2021		2021 Overall	
		Increasing	Decreasing	Increasing	Decreasing
Downgradient Wells					
G-01D	10/19/21	**Ammonia**, pH	Bicarbonate, chloride	Ammonia, pH	Bicarbonate, chloride
G-02D	10/19/21	None	Calcium, chloride, conductivity, nitrate, sodium, TDS	Iron	Calcium, chloride, conductivity, nitrate, sodium, TDS
G-06B	10/19/21	Arsenic	Chloride, sulfate	Arsenic	Chloride, sulfate, TDS
G-08D2	10/19/21	**pH**, arsenic	Chloride	pH, sulfate, arsenic	Chloride
G-09D	7/14/21	Ammonia	**Bicarbonate**, calcium, arsenic, lead	Ammonia	Bicarbonate, calcium, nitrate, sulfate, TDS, arsenic, lead
	10/20/21	Ammonia	Bicarbonate, calcium, **sulfate**, **TDS**		
G-10D	7/14/21	None	Calcium, chloride, magnesium, sulfate, manganese	None	Calcium, chloride, magnesium, sulfate, manganese
	10/20/21	None	Calcium, chloride, magnesium, sulfate, manganese		
G-13D	10/20/21	pH	Sulfate	pH, manganese	Ammonia, sulfate
Upgradient Wells					
G-14D	10/19/21	None	Sulfate	Manganese	Chloride, sulfate
G-24D	10/19/21	**Ammonia**, pH	None	Ammonia, pH	Chloride

Constituents in **bold** indicate a new trend noted since the previous monitoring period

3.0 SURFACE WATER MONITORING

Snohomish County performed surface water sampling during the second half of 2021 as required by the landfill permit and consistent with the **SAP** and approved Application of Variance.

3.1 SURFACE WATER SAMPLING

Snohomish County field personnel collected surface water samples from five locations on January 12, 2021 and from one location on July 14, 2021 in accordance with the **SAP** procedures. The 2021 surface water analytical results were compared to applicable criteria in **Chapter 173-201A WAC** as summarized ***Table 8*** below.

Table 8 – Second Semiannual 2021 Surface Water Analytical Results

Parameter	Units	Criteria	CC-A1	CC-B1	CC-D	CC-F	CC-NSDP
Date	--	--	1/12/21	1/12/21	1/12/21	1/12/21	1/12/21
Coliform	(CFU/100 mL)	200	150	61	--	160	12
Conductivity	µmhos/cm	--	87	93	--	93	130
Nitrate N	mg/L	--	2.0	1.7	--	1.8	0.43
pH	std units	5.5-6.5	**6.86**	**6.87**	--	**6.85**	**6.69**
Parameter	**Units**	**Criteria**	**CC-A1**	**CC-B1**	**CC-D**	**CC-F**	**CC-NSDP**
Date	--	--	7/14/21	7/14/21	7/14/21	7/14/21	7/14/21
Coliform	(CFU/100 mL)	200	--	--	--	--	50
Conductivity	µmhos/cm	--	--	--	--	--	300
Nitrate N	mg/L	--	--	--	--	--	ND<0.01
pH	std units	5.5-6.5	--	--	--	--	6.35

NS = Not sampled - location dry; ND = not detected; Values in **bold** exceed the listed water quality criteria

Four of the five pH concentrations detected during the 2021 surface water sampling events slightly exceeded the surface water quality criteria. None of the fecal coliform concentrations exceeded the surface water quality criteria during the 2021 surface water sampling events.

4.0 LANDFILL GAS MONITORING

During the second semiannual sampling events, landfill gas readings were collected from eight gas probes in accordance with the SAP (*Landau 2006*) on August 18 and October 6, 2021. Landfill gas readings were also collected from seven vaults, six barhole probes, and two lift station vaults on those dates. The 2021 landfill gas monitoring results are summarized in separate quarterly letter reports to SHD and on the field sheets in ***Appendix D***.

As shown on the field sheets, no detectable methane concentrations were detected from any of the monitoring points during 2021.

5.0 LEACHATE MONITORING

Cathcart Sanitary Landfill is authorized under City of Everett Industrial Waste Discharge Permit #7701-17 to discharge pretreated industrial wastewater (*landfill leachate and vactor liquid*

wastes) to the City of Everett sewer system via connection through the Silver Lake Water and Sewage District sewer.

As shown on the pretreatment system flow diagram (***Figure 7***), landfill leachate and condensate drains to a pump station (*designated SP-1*), from which the leachate and condensate are pumped to a grit chamber and combined with groundwater from the landfill underdrain system to pump station SP-1. The combined leachate and groundwater is then pumped through a flow meter vault (*designated P-FV-2*), where the total daily flow is measured using an electromagnetic flow meter (*mag meter*). The flow is then discharged into either of two pretreatment lagoons. The lagoons are constructed of concrete equipped with underdrain systems that are connected to leak detection vaults (*designated P-MH-3 and P-MH-4*), which are monitored monthly for the presence of liquid, which could indicate a leak from the lagoons. A total of 16 manholes and vaults within the leachate collection system are monitored monthly for the presence of excess sediment (*or fluid, in the case of leak detection vaults*) and maintenance issues. The completed inspection forms are included in ***Appendix D***. No fluid was observed in either of the leak detection vaults during 2021.

The maximum design capacity of each lagoon is approximately 2.5 million gallons. Combined leachate and vactor liquid is treated in one or both of the leachate collection lagoons by settlement and aeration. Each lagoon has two aerators installed, which operate hourly for 15 minutes. The aerated liquid is then routed via a sampling vault (*P-MH-9*) to a discharge point to the sewer. Liquid samples are collected from P-MH-9 on a monthly basis and the results are summarized in a monthly report, which is submitted to the City of Everett per the IWDP permit.

During 2021, a total of 3,493,100 gallons of landfill leachate were pumped to the pretreatment lagoons for treatment and eventual discharge to the sewer. Leachate was pumped to the pretreatment lagoons at an average rate of 291,092 gallons per month, which varied from 17,100 gallons in August to 1,353,900 gallons in March. Overall, the rate of leachate production and flow correlates with seasonal rainfall totals. The leachate flow totals are included in ***Table 9*** below.

Table 9 – Cathcart Landfill Leachate Flow Totals, 2021

Month	Total (gallons)
January	644,600
February	458,700
March	1,353,900
April	171,200
May	106,900
June	43,400
July	25,500
August	17,100
September	17,800
October	36,800

Table 9 – Cathcart Landfill Leachate Flow Totals, 2021

Month	Total (gallons)
November	272,200
December	345,000
Maximum:	1,353,900
Minimum:	17,100
Monthly Average:	291,092
2021 Total:	**3,493,100**

5.1 LEACHATE SAMPLING

On January 26, 2021, Snohomish County Solid Waste personnel collected annual samples from the leachate pump station vaults designated SP-1 and SP-4 to characterize leachate from above (*SP-1*) and below (*SP-4*) the landfill liner. The leachate samples were analyzed for the following constituents:

- pH by USEPA Method 150.2
- Biological oxygen demand (*BOD*) by Method SM 5210B
- Conductivity by Method SM 2510B
- Total cyanide by USEPA Method 335.4
- Oil and Grease (*HEM*) by USEPA Method 1664 HEM
- Total Petroleum Hydrocarbons (*Polar/Non-Polar*) by USEPA Method 1664 SGT-HEM
- Total Suspended Solids (*TSS*) by Method SM 2540D
- Flashpoint by USEPA Method 1020
- Metals by USEPA Method 200.7/200.8/245.1, including:
    - Arsenic
    - Cadmium
    - Chromium
    - Copper
    - Mercury
    - Lead
    - Nickel
    - Silver
    - Zinc

In addition, the sample from vault SP-1 was analyzed for the standard groundwater constituent suite and priority pollutants, which included:

- Total Cyanide by SM 4500CN-E99
- Total Phenol by EPA Method 420.4
- Metals by USEPA Methods 200.7/200.8, including the above-listed metals and:
    - Antimony
    - Barium

- Beryllium
- Cobalt
- Iron
- Manganese
- Selenium
- Thallium
- Vanadium

- VOCs by USEPA Method 8260/8260 SIM/624
- Semivolatile Organic Compounds (*SVOCs*) by USEPA Method 625/625-SIM
- Polynuclear Aromatic Hydrocarbons (*PAHs*) by USEPA Method 625-SIM
- Organochlorine Pesticides (*OCPs*) by USEPA Method 608
- Polychlorinated Biphenyls (*PCBs*) by USEPA Method 608

Tabulated summaries of the leachate vault sample analytical results are included below as ***Tables 10 through 13***. Only constituents that were detected are shown in the tables; none of the leachate vault samples collected during the current monitoring year contained detectable concentrations of PAHs, OPPs, or PCBs.

Table 10 – Leachate Vault Results – Inorganics

Location ID	Date	pH	BOD	Conductivity	Oil & Grease	TSS
Units		std. units	mg/L	µmhos/cm	mg/L	mg/L
SP-1	1/26/21	6.52	26	1300	5.2	110
SP-4	1/26/21	6.64	6.4	660	ND<5	8.0

ND = Not detected at the indicated detection limit

Table 11 – Leachate Vault Results – Metals

Location ID	Date	Antimony	Arsenic	Barium	Chromium	Iron	Lead	Mercury	Manganese	Zinc
Units		µg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L
SP-1	1/26/21	0.39	0.0044	0.32	0.0103	75.4	0.35	0.00031	0.838	0.0392
SP-4	1/26/21	--	ND<0.005	--	ND<0.01	--	ND<0.01	0.00017	--	0.0179

-- = not analyzed; ND = Not detected at the indicated detection limit

Table 12 – Leachate Vault Results – VOCs

Location ID	Date	1,4-Dichlorobenzene	Acetone	Benzene	Chlorobenzene
Units		µg/L	µg/L	µg/L	µg/L
SP-1	1/26/21	1.9	5.9	1.2	1.65
SP-4	1/26/21	--	--	--	--

-- = not analyzed

Table 13 – Leachate Vault Results – SVOCs

Location ID	Date	bis(2-Ethylhexyl) phthalate	Diethyl phthalate	Di-n-butyl phthalate	2-Methyl naphthalene	Acenaphthene	Fluorine	Naphthalene
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SP-1	1/26/21	0.68	0.31	0.2	0.32	0.17	0.12	0.39
SP-4	1/26/21	--	--	--	--	--	--	--

-- = not analyzed

6.0 SUMMARY AND RECOMMENDATIONS

6.1 SUMMARY

The groundwater, surface water, leachate, and landfill gas monitoring data collected during the 2021 monitoring events indicate the following:

- The groundwater elevations, flow direction, and gradient measured during the 2021 semiannual monitoring events were generally consistent with those measured historically at the site.
- The most common groundwater standard exceedances were pH, sodium, and arsenic, which is consistent with historical site data.
- The majority of statistical limit exceedances in the shallow zone were noted in wells G-09S and G-10S, which is consistent with recent historical data. No statistical exceedances were noted in shallow wells G-01A, G-11S, G-14S, and G-24S during one or more 2021 monitoring events.
- Overall, significantly more decreasing trends were noted in both zones during all four monitoring events (*72 decreasing/40 increasing trends in the shallow zone, and 70 decreasing/21 increasing trends in the deep zone*).
- Most decreasing concentration trends noted in the shallow and deep zones during the second and fourth quarters occurred in downgradient wells – 33 of 46 decreasing trends in shallow downgradient wells and 48 of 52 decreasing trends in deep downgradient wells. Two of the increasing trends noted during the second quarter and fourth quarter occurred in upgradient wells G-14D and G-24D.
- VOC concentrations were limited to the wells located immediately downgradient of the landfill (*G-09S, G-09D, G-10S, and G-10D*). Low concentrations of vinyl chloride were detected in the second, third, and fourth quarter samples from deep well G-09D. Two other VOCs (*cis-1,2-DCE and/or 1,2-DCP*) were also present in one or more of these wells during the first, third, and fourth quarter 2021 monitoring events. These detections are consistent with recent results at these wells.
- Slight exceedances of the surface water quality goals for pH were noted in 4 of the 5 surface water samples collected during 2021. None of the surface water fecal coliform concentrations exceeded the quality goal of 200 CFU/100 mL.
- The monitoring results at the perimeter gas probe locations, vaults, and manholes and did not indicate the presence of detectable concentrations of landfill gas during 2021.
- Landfill settlement surveys were discontinued in 2019 after six years of annual measurements. During the previous six years, no significant settlement was noted across the landfill mass that exceeded tolerance levels established in the Department of Ecology's Uniform Guidance document.

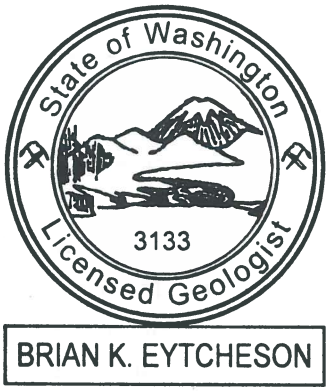
6.2 CONCLUSIONS/RECOMMENDATIONS

- The groundwater elevation data and fluctuations with seasonal rainfall totals (*as shown on the hydrographs in* ***Appendix A***) suggest that the shallow and deep groundwater zones are hydraulically continuous and may in fact represent one complex water-bearing zone.
- There is no indication of groundwater impacts extending beyond the site boundaries of the Cathcart Landfill.
- The analytical data indicate that there is likely a leachate impact in monitoring wells G-09S, G-09D, G-10S, and G-10D.
- In accordance with the SAP and the approved variance, Snohomish County Solid Waste will continue to monitor groundwater and surface water semiannually.
- Landfill gas will continue to be monitored quarterly until the stratigraphy and hydrogeology of the site are evaluated for landfill gas migration potential. The data from probe GP-6 confirms that landfill gas is not migrating near the northwest perimeter of the landfill.
- Leachate production was similar to previous years and corresponded to rainfall totals at the landfill. There was no indication of leachate leakage based on the monthly vault inspections.
- The leachate analytical results for 2021 were similar to previous years and indicated the presence of low concentrations of metals, VOCs, and SVOCs/PAHs.

6.4 SIGNATURES AND LICENSES

Brian K. Eytcheson, LG
SCPW – Solid Waste Division

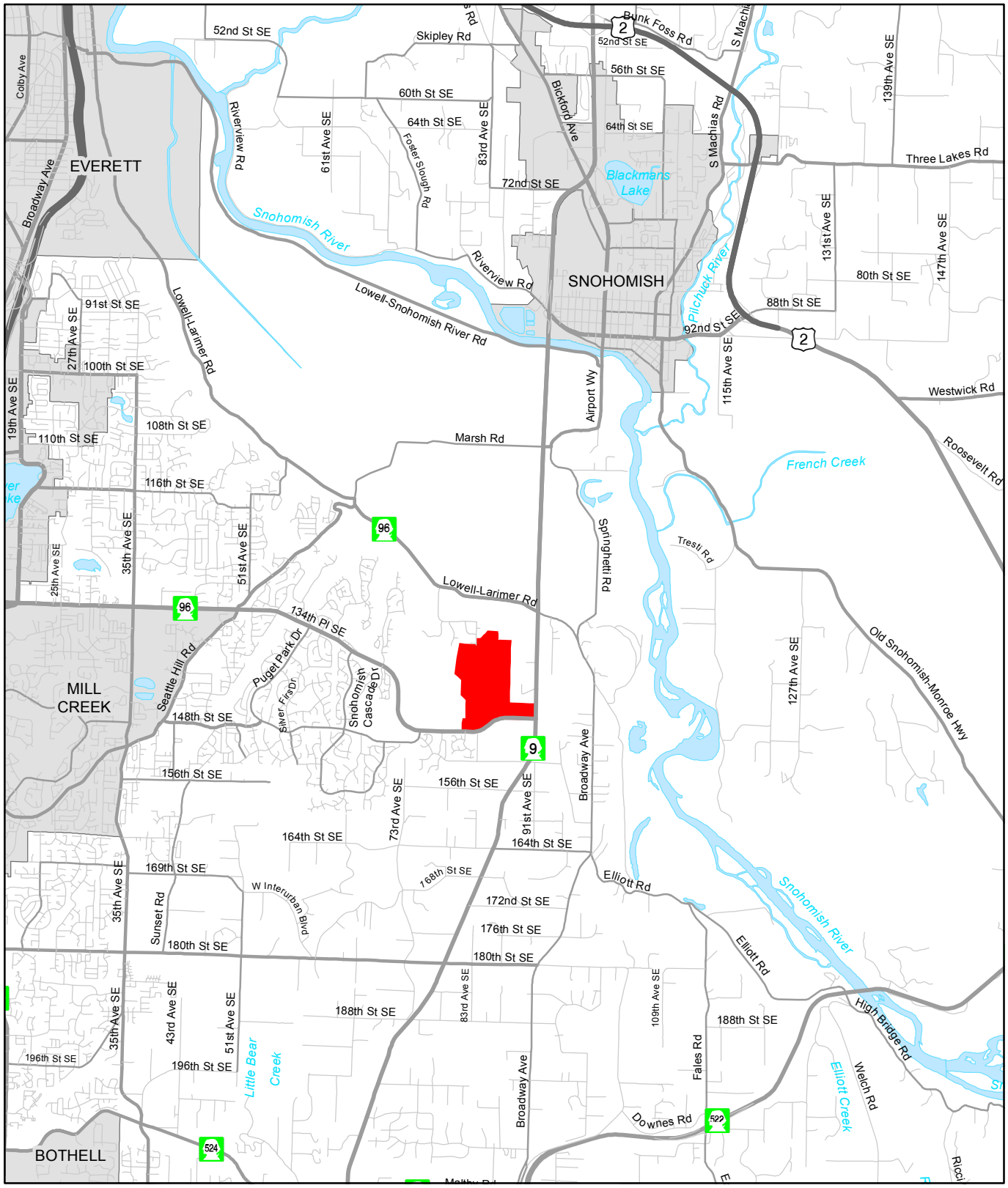
3/10/22
Date



Figures

Figure 1

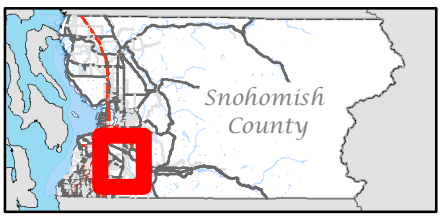
Cathcart Landfill Vicinity Map



0 0.5 1 2 Miles

0 0.5 1 2 3 Kilometers

N W E S



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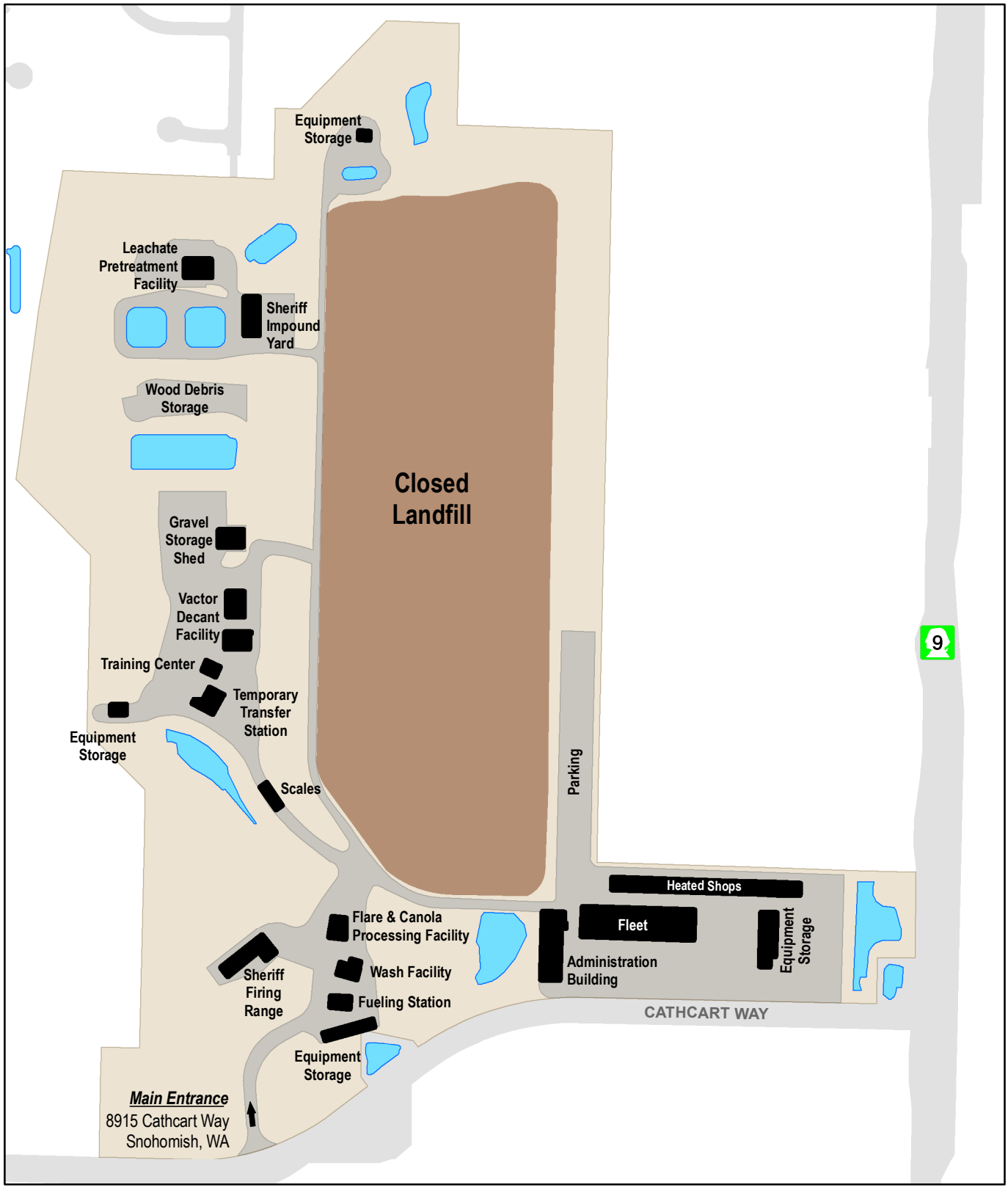
Public Works
Solid Waste Division
March 16, 2010

Figure 2

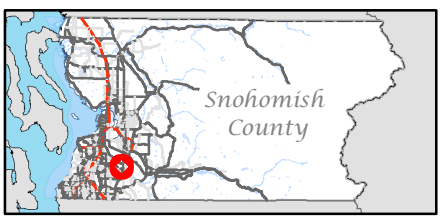
Cathcart Landfill Site Map



0 0.045 0.09 0.18 Miles

0 180 360 720 1,080 Feet

N W E S



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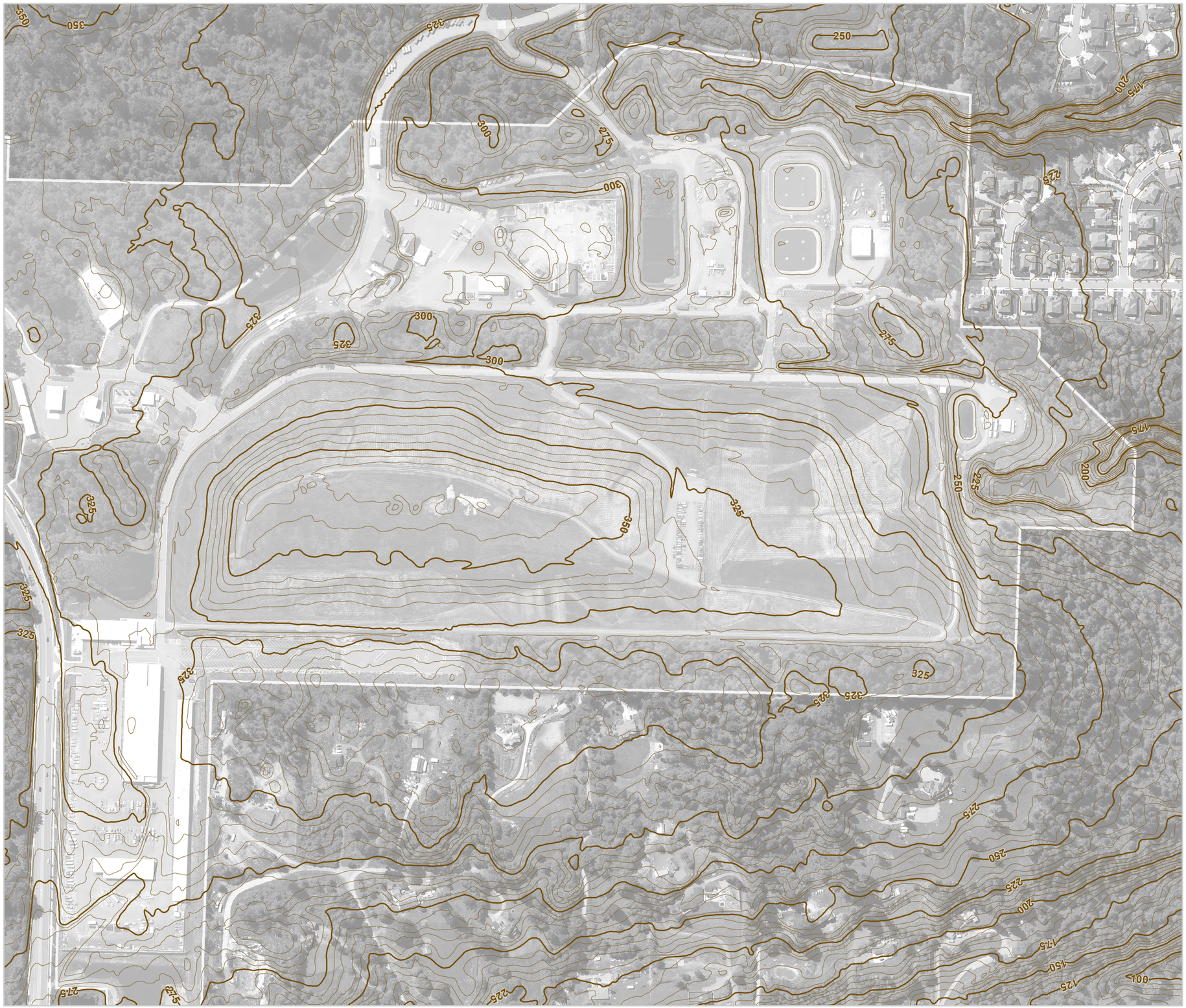
March 16, 2010

Figure 3

Cathcart Landfill

Topography



Map Features

- Parcel Boundary
- Subject Property Boundary
- 5 Foot Contours

N

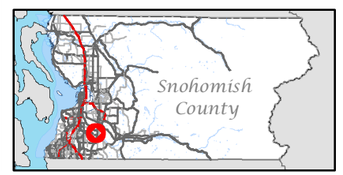
W

E

S

1 inch = 350 feet

0	0.02	0.04	0.08	0.12	0.16	0.2	Miles
0	137.5	275	550	825	1,100		Feet



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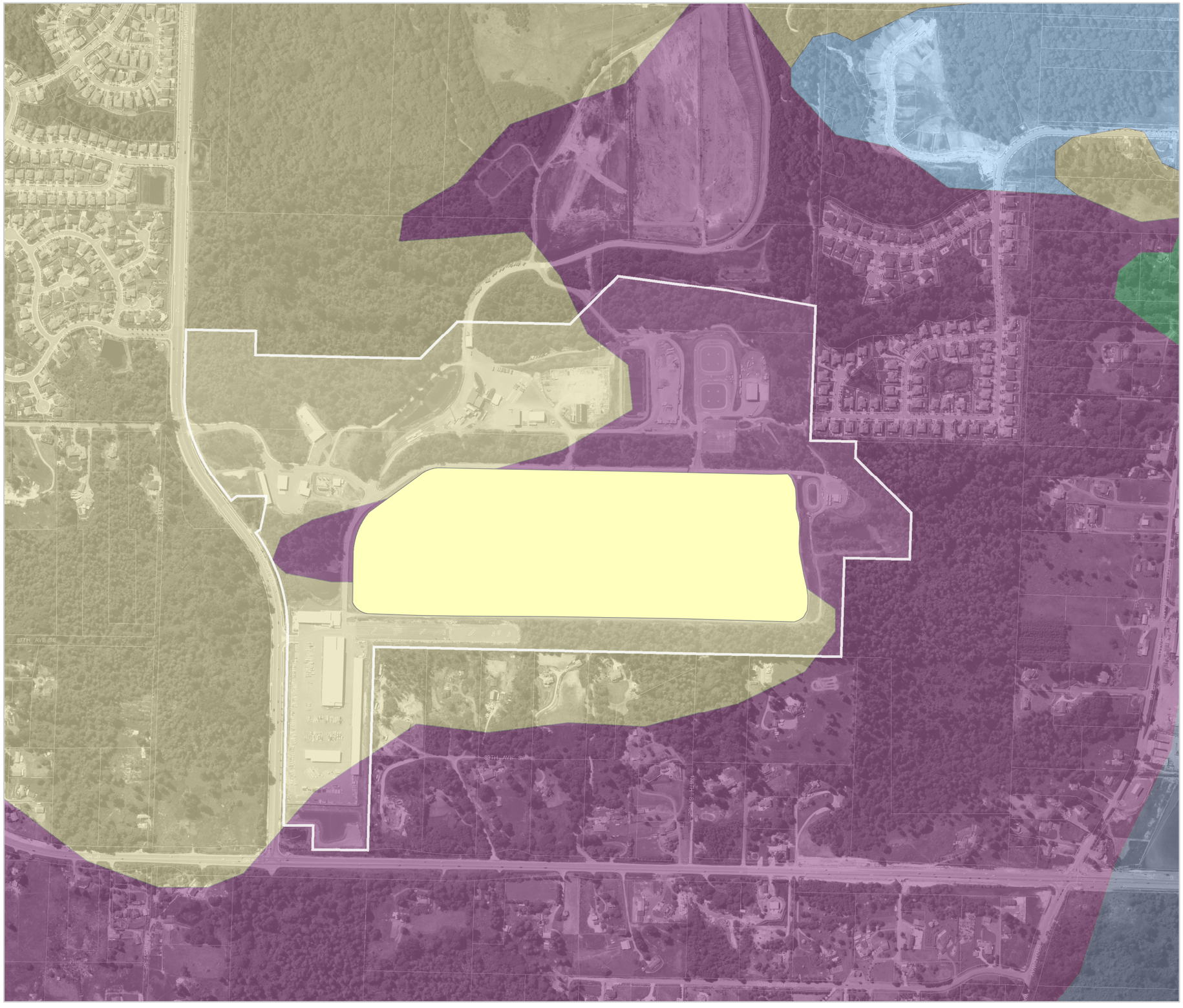
March 24, 2010

Figure 4

Cathcart Landfill

Geologic Map



Map Features

- Parcel Boundary
- Subject Property Boundary

Geologic Description

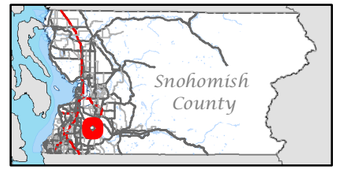
- Recent Alluvium (Qyal)
- Vashon Recessional Outwash (Qvr)
- Vashon Glacial Till (Qvt)
- Vashon Advance Outwash (Qva)
- Transitional Beds (Qtb)
- Modified Land

W S N E

1 inch = 600 feet

0 0.035 0.07 0.14 0.21 0.28 0.35 Miles

0 240 480 960 1,440 1,920 Feet



Snohomish County
Public Works
Solid Waste Division
June 8, 2010

Figure 5

Cathcart Landfill

Monitoring Network

Map Features

- Parcel Boundary
- Subject Property Boundary

Aquifer Unit (Active Wells)

- Deep Aquifer
- Shallow Aquifer

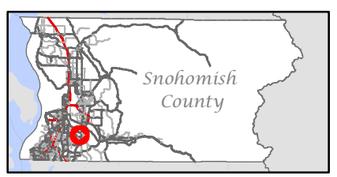
Inactive / Removed Wells

- Abandoned / Decommissioned
- Inactive

Additional Sampling Points

- Gas Probe
- Surface Water Sample Locations

0 125 250 500 750 1,000 Feet



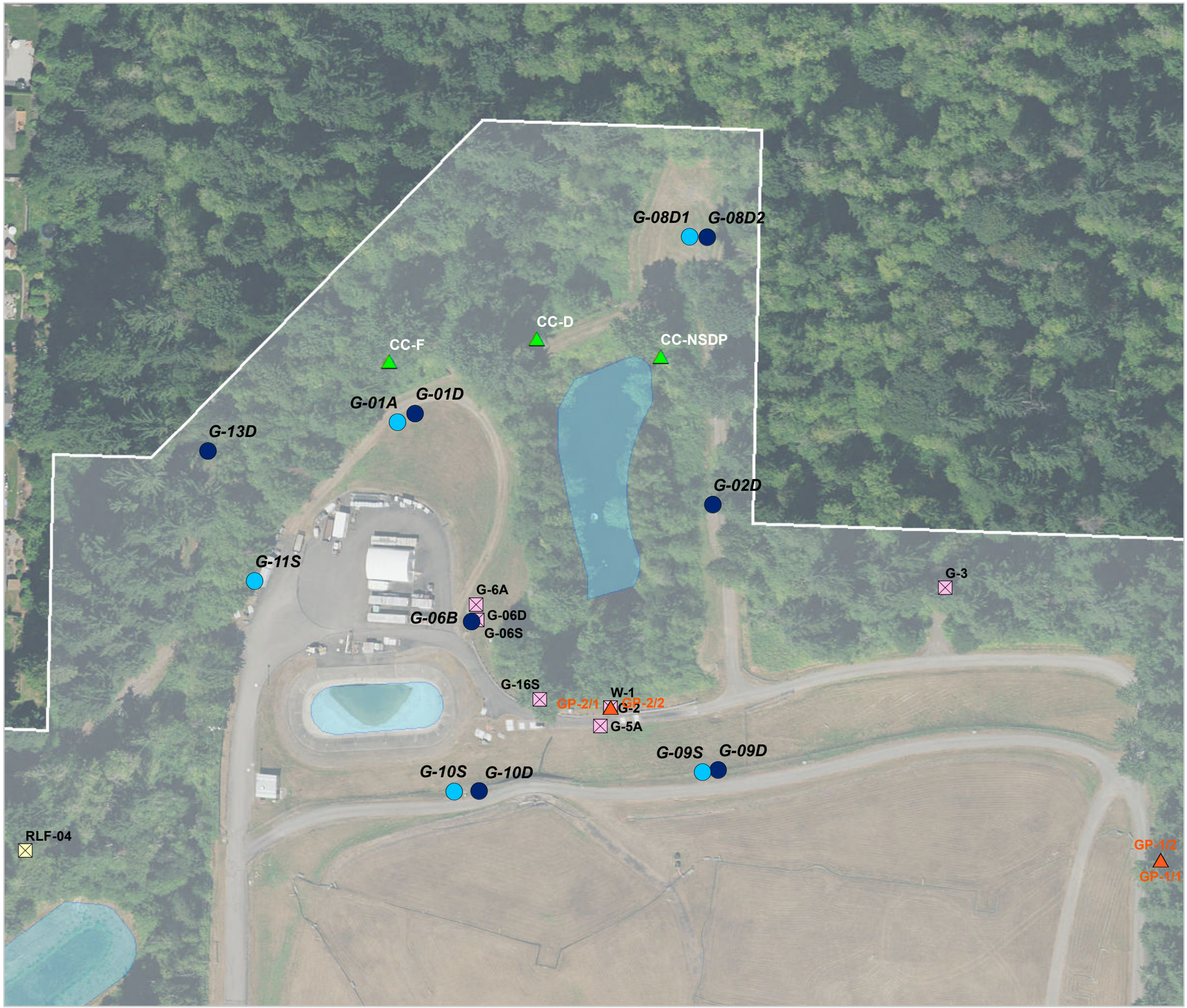
N

Snohomish County
Public Works
Solid Waste Division
November 12, 2019

Figure 5a

Cathcart Landfill

Monitoring Network



Map Features

- Parcel Boundary
- Subject Property Boundary

Aquifer Unit (Active Wells)

- Deep Aquifer
- Shallow Aquifer

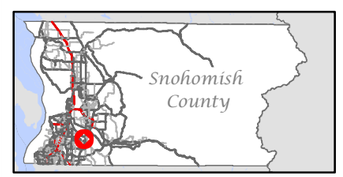
Inactive / Removed Wells

- Abandoned / Decommissioned
- Inactive

Additional Sampling Points

- Gas Probe
- Water Sample Locations

0 37.5 75 150 225 300 Feet



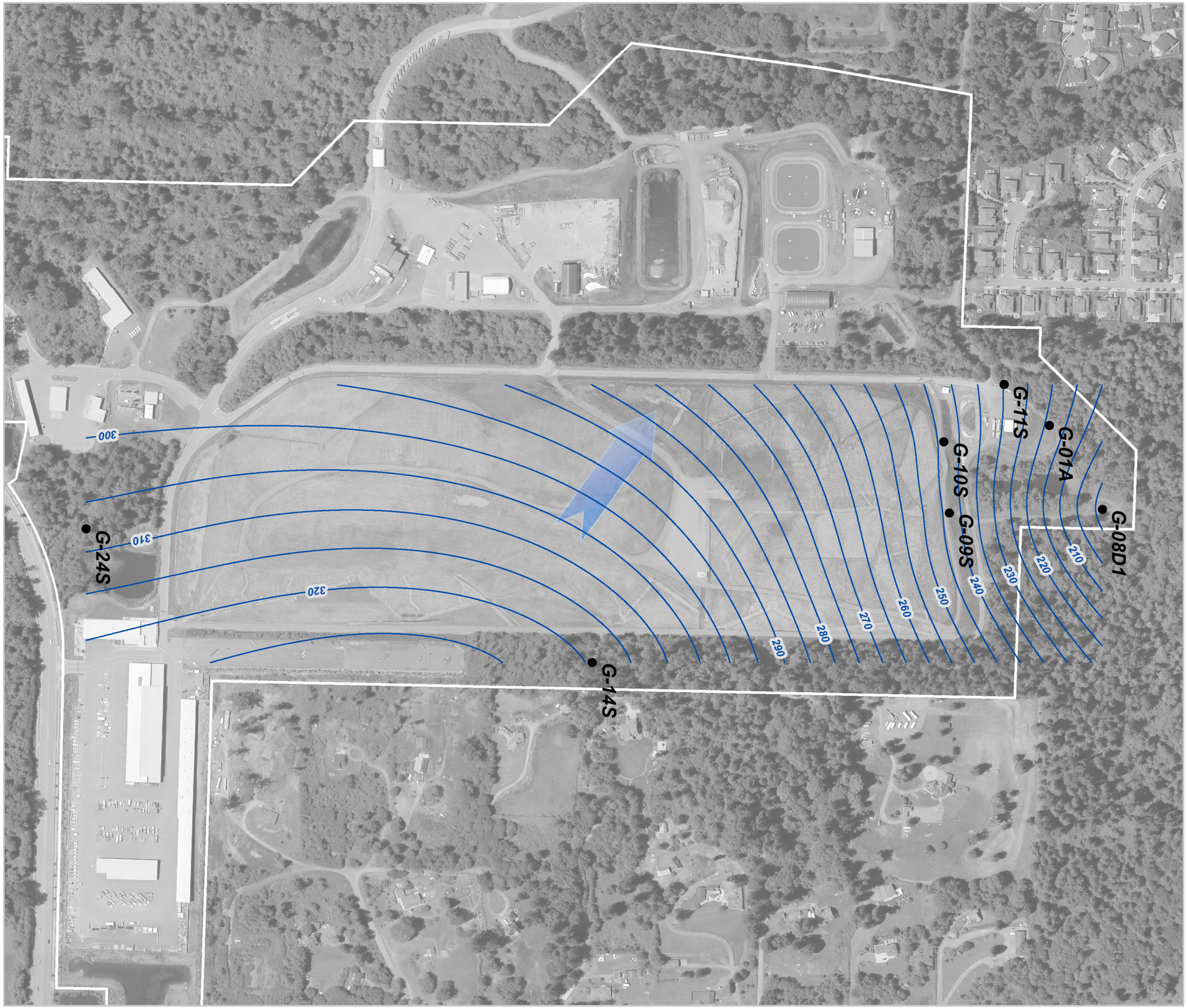
N

Snohomish County
Public Works
Solid Waste Division
November 12, 2019

Figure 6a

Cathcart Landfill

Shallow Aquifer Groundwater Elevation Contours Second Quarter 2021



DIRECTION OF GROUNDWATER FLOW
0.000461 ft / day
0.168 ft / year
143.18 degrees to the positive x - axis

PARCEL BOUNDARY

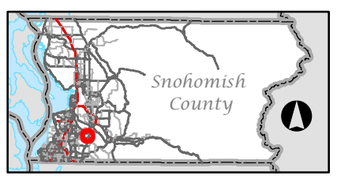
SUBJECT PROPERTY BOUNDARY

5 FT CONTOUR

WELL LOCATION

WELL_ID	SAMP_DATE	MEAS_HEAD
G-01A	4/20/2021	218.83
G-08D1	4/20/2021	198.30
G-09S	4/20/2021	243.18
G-10S	4/20/2021	243.60
G-11S	4/20/2021	229.80
G-14S	4/20/2021	319.35
G-24S	4/20/2021	307.43

0 125 250 500 750 1,000
Feet



N

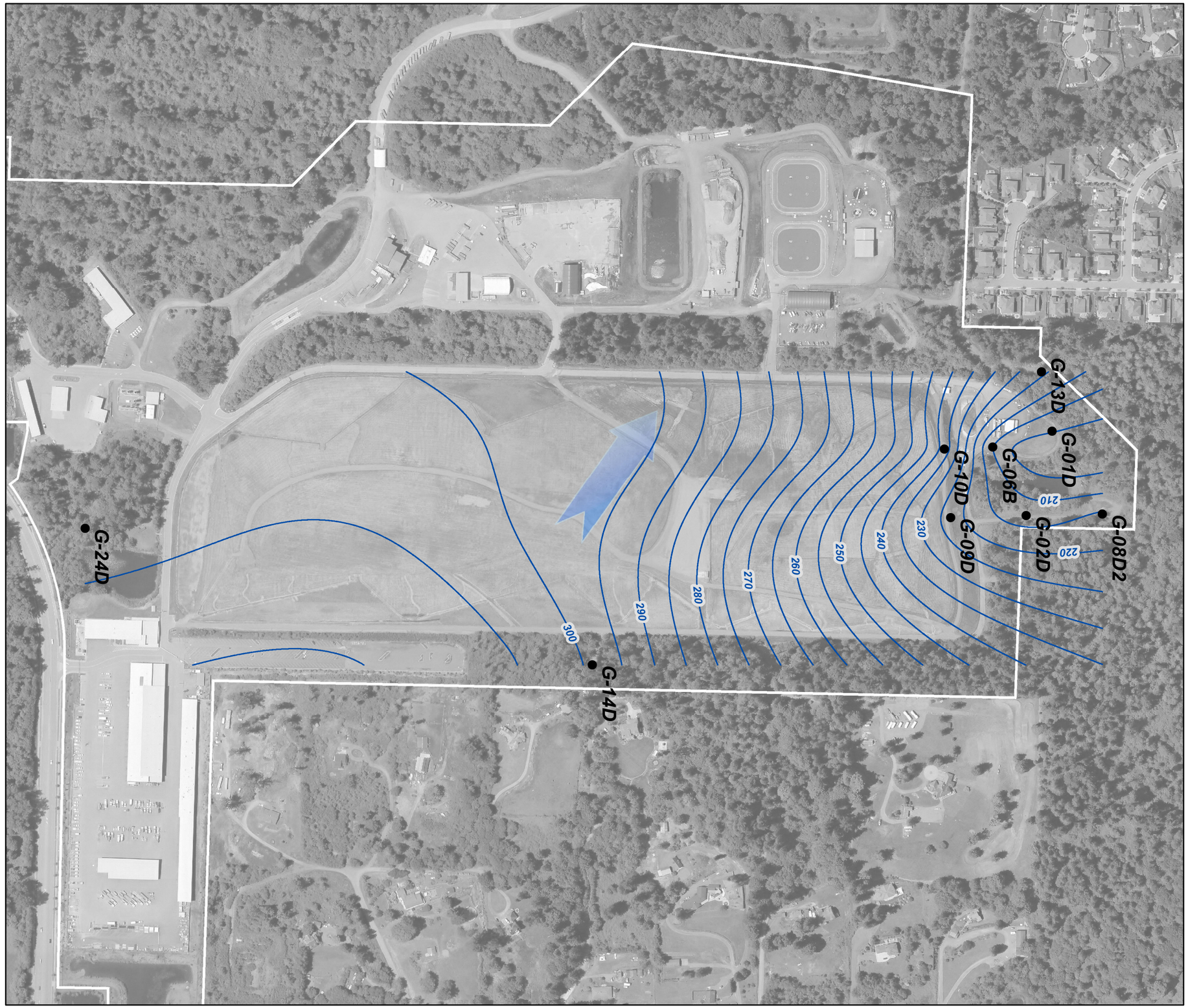
Snohomish County
Public Works
Solid Waste Division
Date: 7/1/2021

Document Path: I:\pw\swaste\projects\GroundwaterContours\ArcMaps\CathcartWaterElevationContours_Shallow.mxd

Figure 6b

Cathcart Landfill

Deep Aquifer Groundwater Elevation Contours Second Quarter 2021



DIRECTION OF GROUNDWATER FLOW
0.0116 ft / day
4.25 ft / year
137.98 degrees to the positive x - axis

PARCEL BOUNDARY

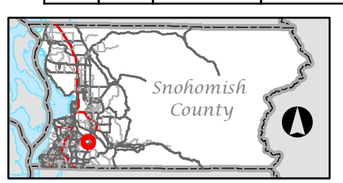
SUBJECT PROPERTY BOUNDARY

5 FT CONTOUR

WELL LOCATION

WELL_ID	SAMP_DATE	MEAS_HEAD
G-01D	4/20/2021	205.38
G-02D	4/20/2021	212.86
G-06B	4/20/2021	210.15
G-08D2	4/20/2021	215.58
G-09D	4/20/2021	222.69
G-10D	4/20/2021	237.50
G-13D	4/20/2021	221.13
G-14D	4/20/2021	298.95
G-24D	4/20/2021	302.41

0 125 250 500 750 1,000
Feet



N

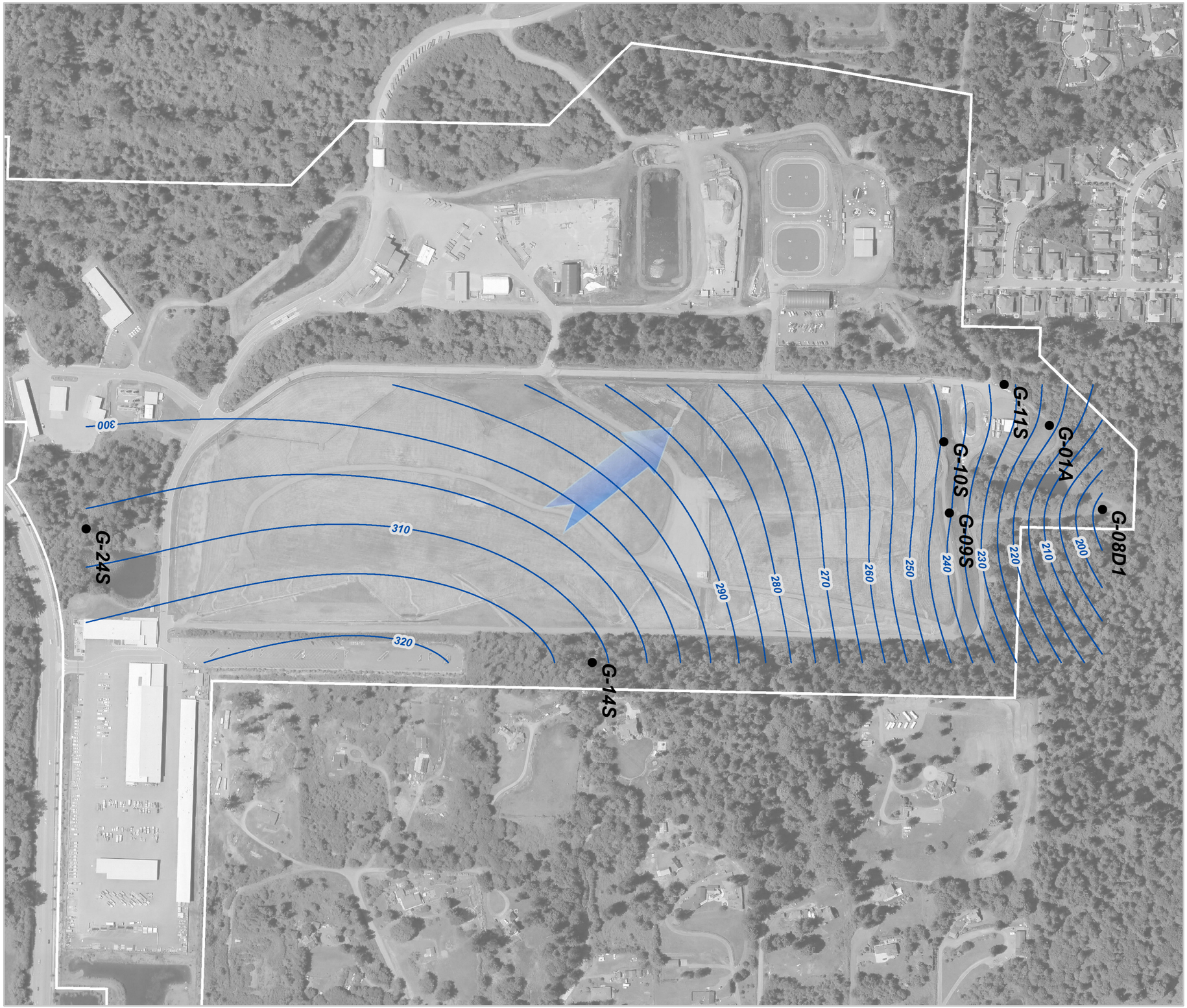
Snohomish County
Public Works
Solid Waste Division
Date: 7/8/2021

Document Path: I:\pw\swaste\projects\GroundwaterContours\ArcMaps\CathcartWaterElevationContours_Deep.mxd

Figure 6c

Cathcart Landfill

Shallow Aquifer Groundwater Elevation Contours Fourth Quarter 2021



DIRECTION OF GROUNDWATER FLOW
0.000368 ft / day
0.134 ft / year
128.26 degrees to the positive x - axis

PARCEL BOUNDARY

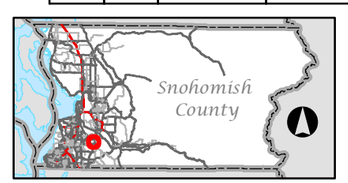
SUBJECT PROPERTY BOUNDARY

5 FT CONTOUR

WELL LOCATION

WELL_ID	SAMP_DATE	MEAS_HEAD
G-01A	10/19/2021	221.89
G-08D1	10/19/2021	192.67
G-09S	10/19/2021	240.57
G-10S	10/19/2021	244.32
G-11S	10/19/2021	232.19
G-14S	10/19/2021	311.78
G-24S	10/19/2021	306.47

0 125 250 500 750 1,000
Feet



N

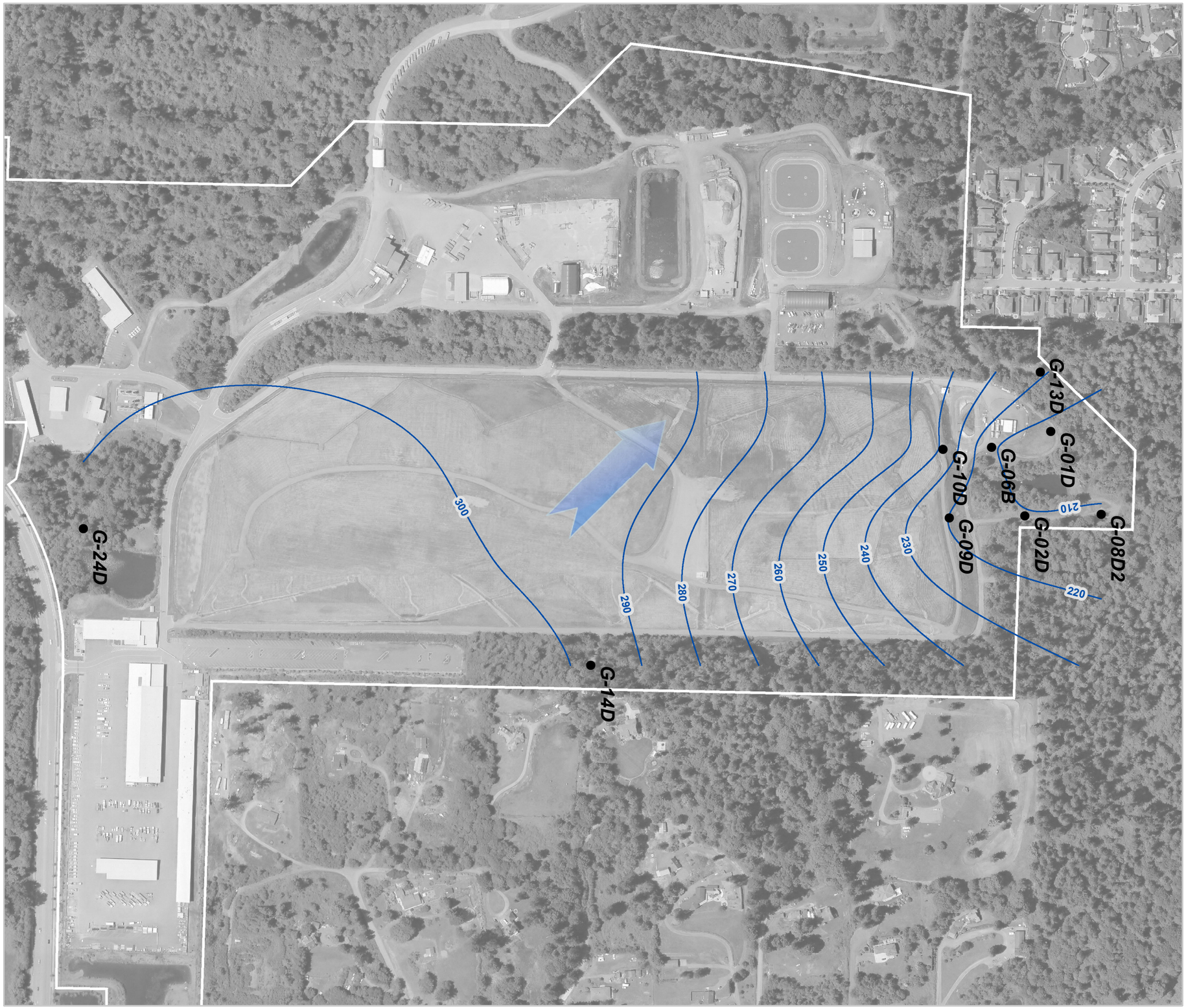
Snohomish County
Public Works
Solid Waste Division
Date: 3/3/2022

Document Path: I:\pw\swaste\projects\GroundwaterContours\ArcMaps\GroundwaterContours_Cathcart_Shallow.mxd

Figure 6d

Cathcart Landfill

Deep Aquifer Groundwater Elevation Contours Fourth Quarter 2021



DIRECTION OF GROUNDWATER FLOW
0.0108 ft / day
3.93 ft / year
132.74 degrees to the positive x - axis

PARCEL BOUNDARY

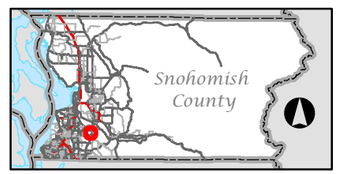
SUBJECT PROPERTY BOUNDARY

10 FT CONTOUR

WELL LOCATION

WELL_ID	SAMP_DATE	MEAS_HEAD
G-01D	10/19/2021	206.76
G-02D	10/19/2021	210.77
G-06B	10/19/2021	212.21
G-08D2	10/19/2021	212.15
G-09D	10/19/2021	219.80
G-10D	10/19/2021	237.92
G-13D	10/19/2021	221.35
G-14D	10/19/2021	297.68
G-24D	10/19/2021	301.00

0 125 250 500 750 1,000
Feet



Snohomish County
Public Works
Solid Waste Division
Date: 3/3/2022

Document Path: I:\pw\swaste\projects\GroundwaterContours\ArcMaps\GroundwaterContours_Cathcart_Deep.mxd

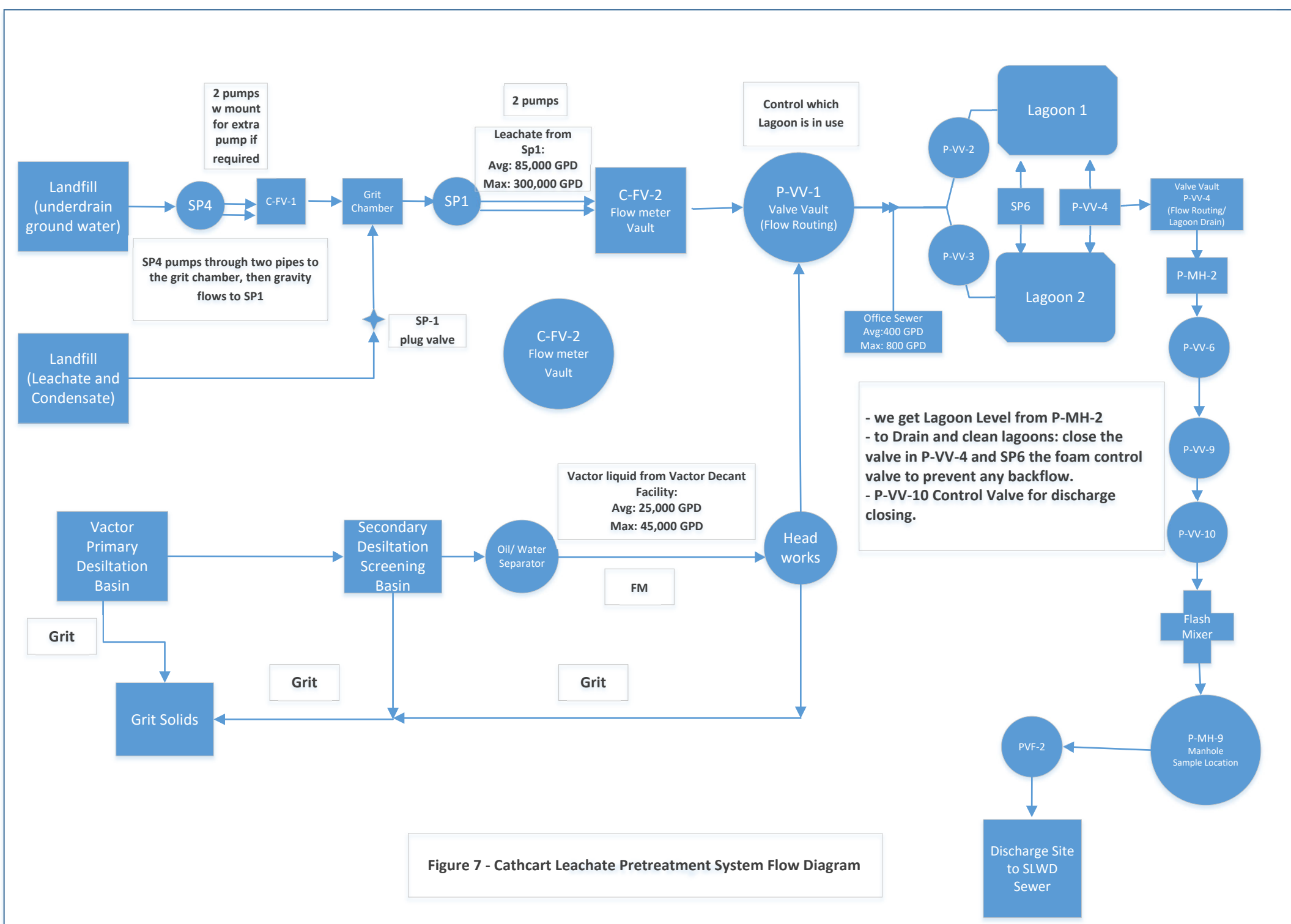
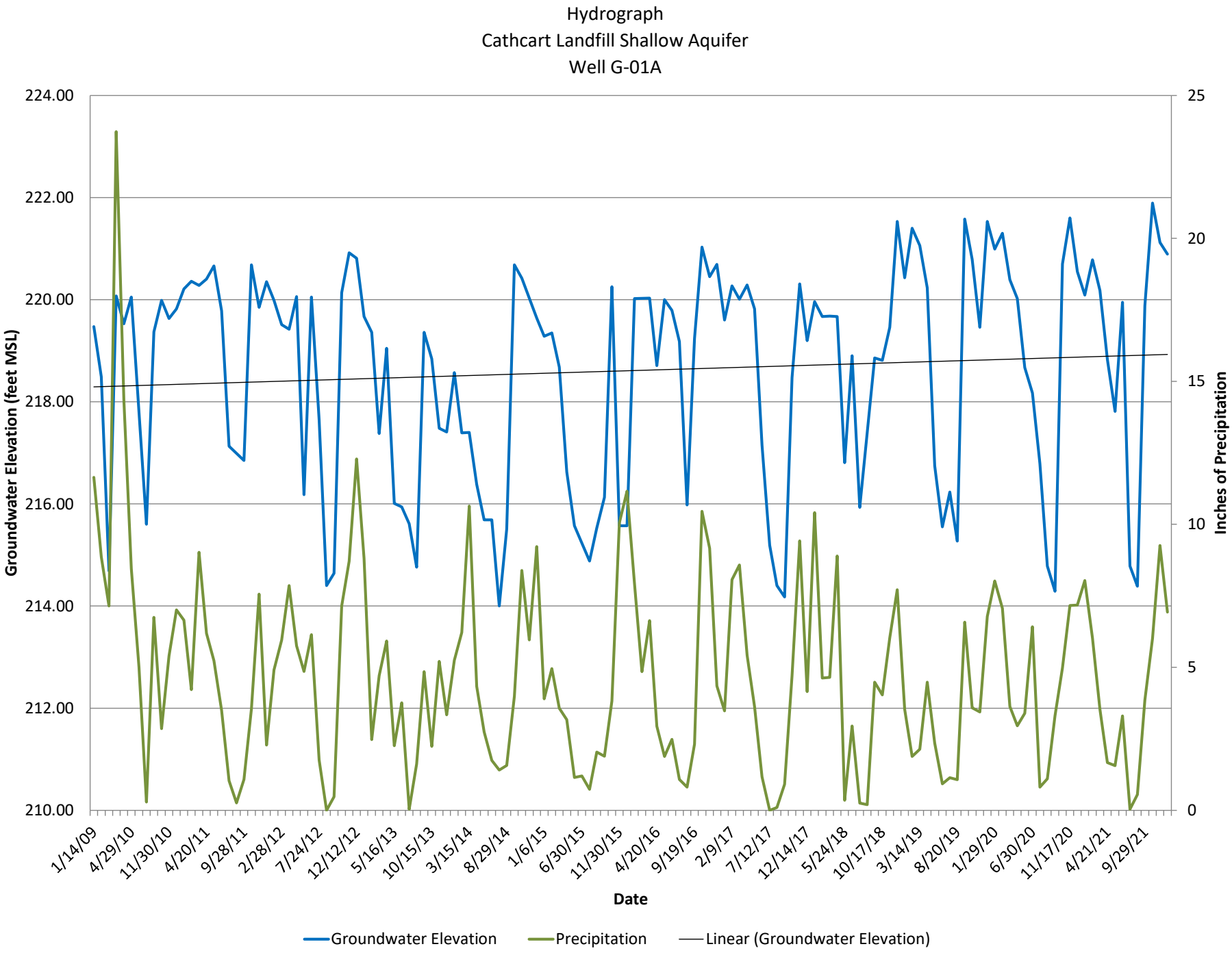


Figure 7 - Cathcart Leachate Pretreatment System Flow Diagram

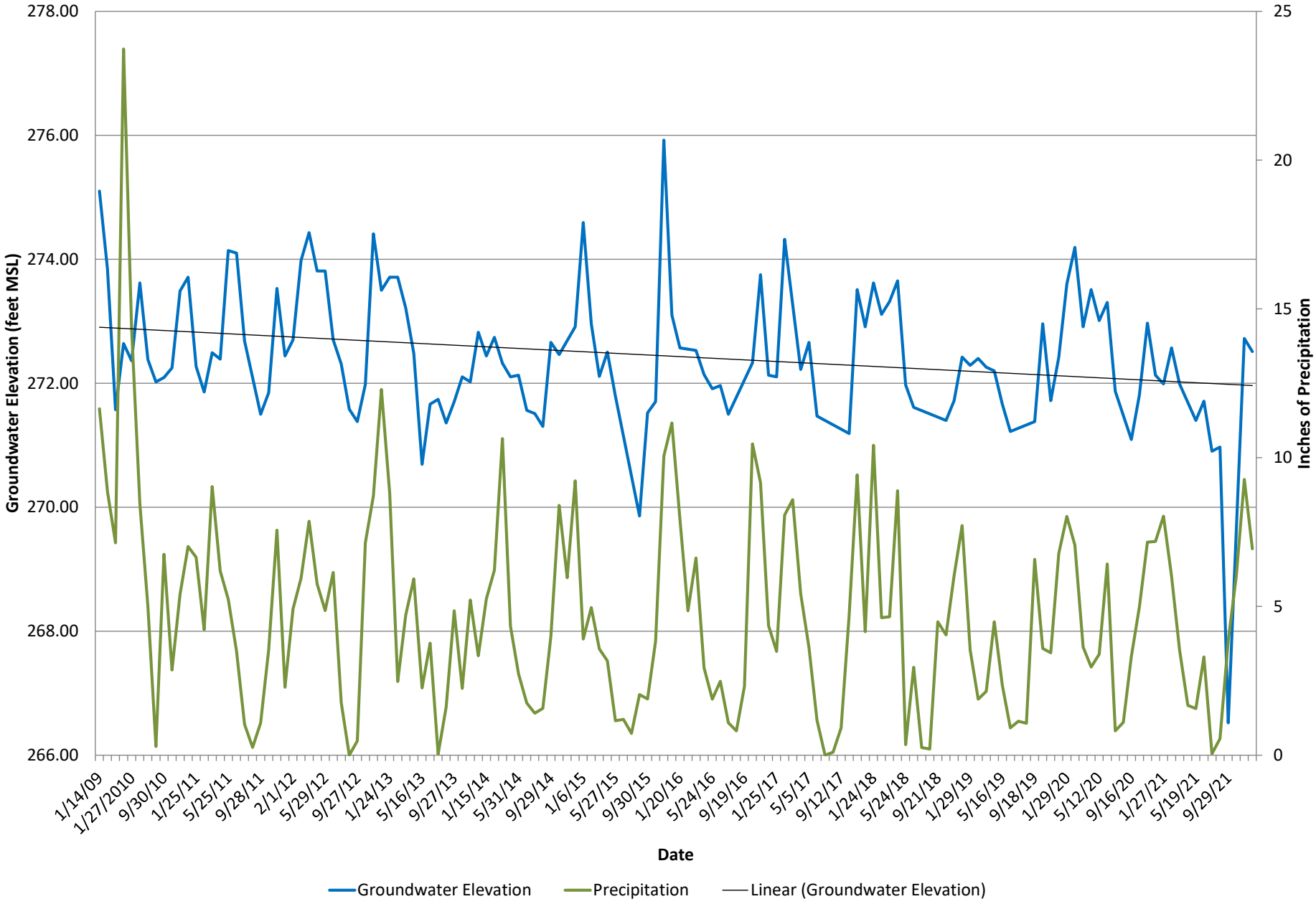
Appendix A

Hydrographs

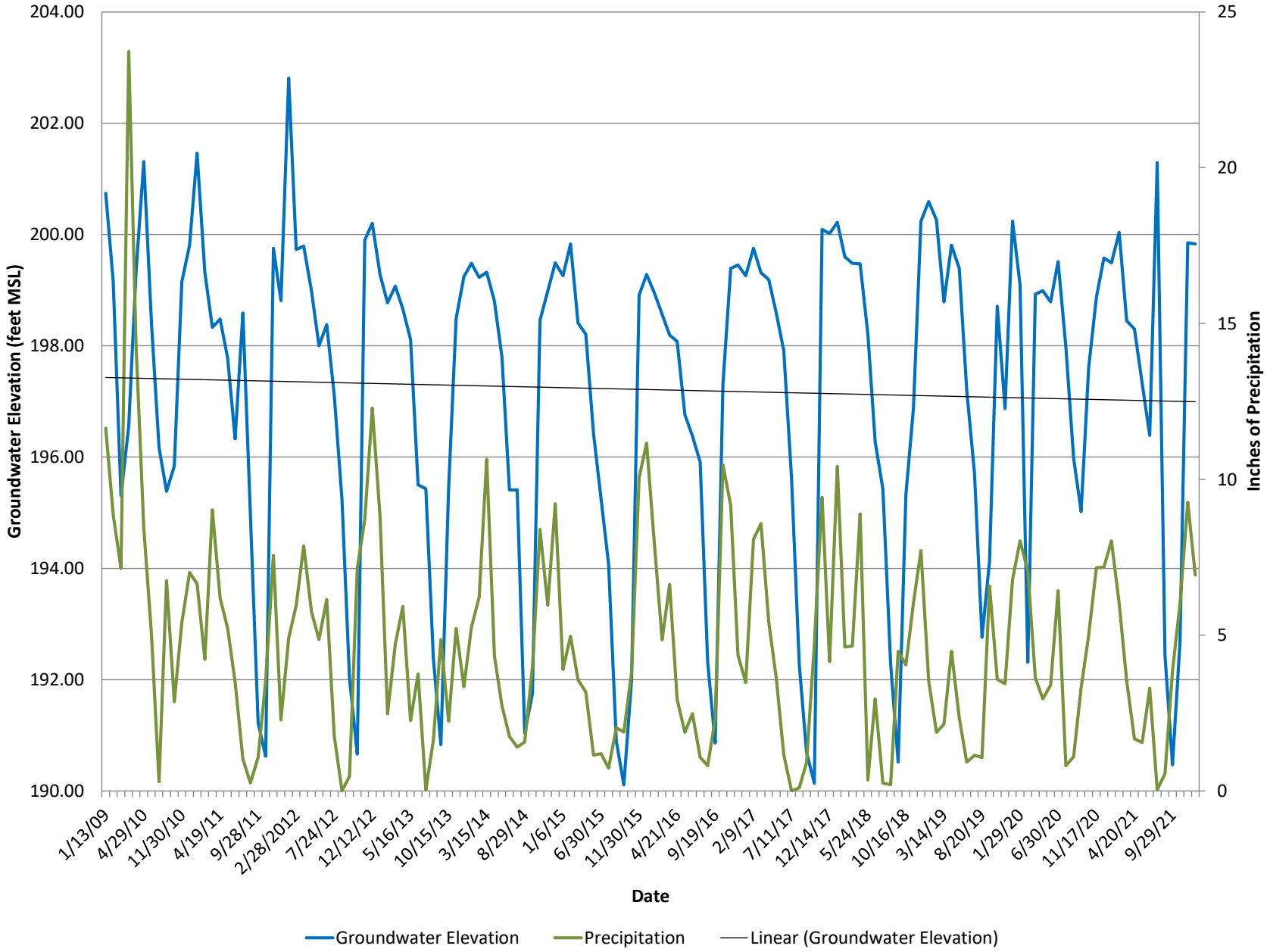
Shallow Wells

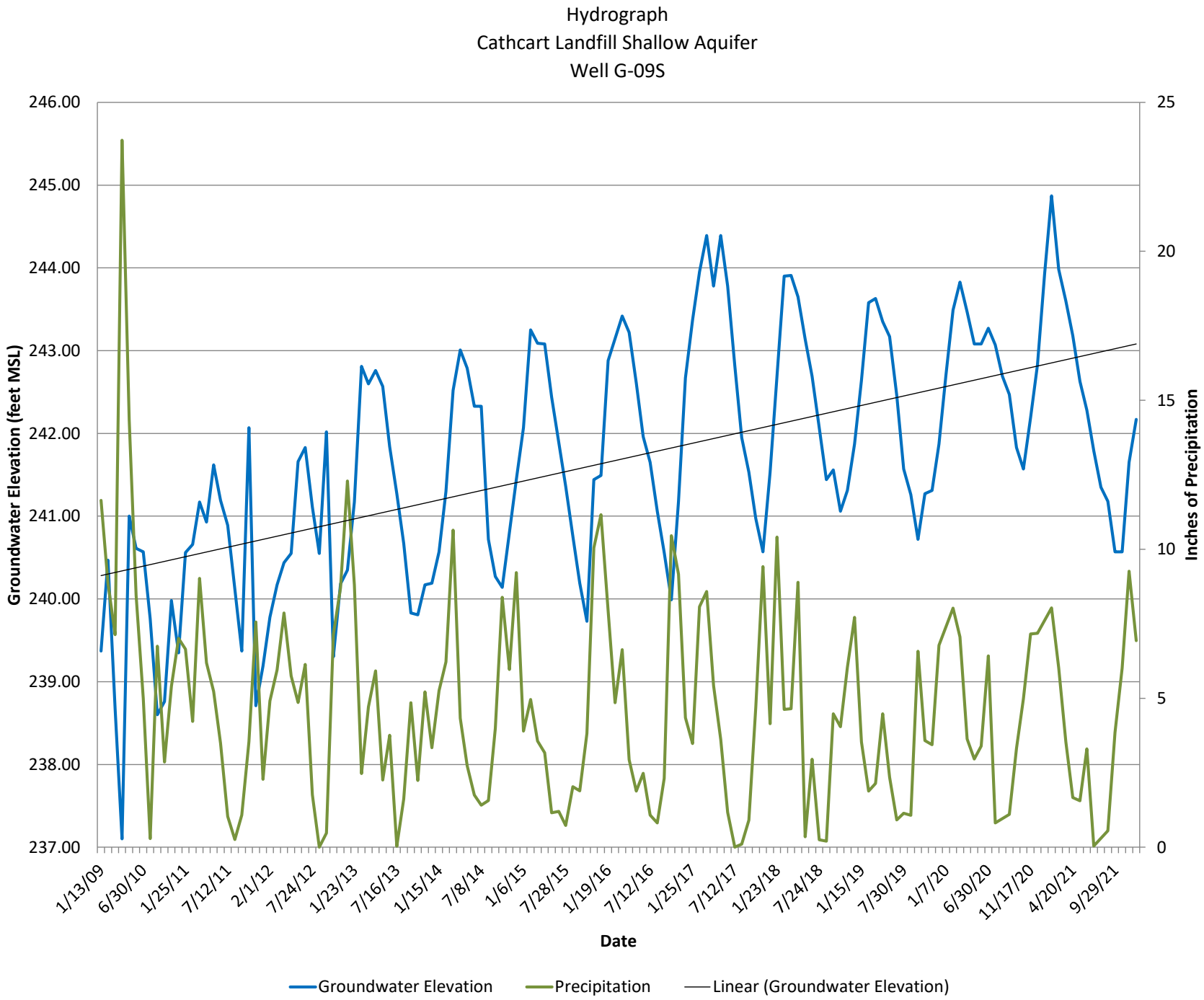

Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-01A
Groundwater Elevation (feet MSL)
224.00
222.00
220.00
218.00
216.00
214.00
212.00
210.00
Inches of Precipitation
25
20
15
10
5
0
1/14/09
4/29/10
11/30/10
4/20/11
9/28/11
2/28/12
7/24/12
12/12/12
5/16/13
10/15/13
3/15/14
8/29/14
1/6/15
6/30/15
11/30/15
4/20/16
9/19/16
2/9/17
7/12/17
12/14/17
5/24/18
10/17/18
3/14/19
8/20/19
1/29/20
6/30/20
11/17/20
4/21/21
9/29/21
Date
Groundwater Elevation
Precipitation
Linear (Groundwater Elevation)

Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-04A

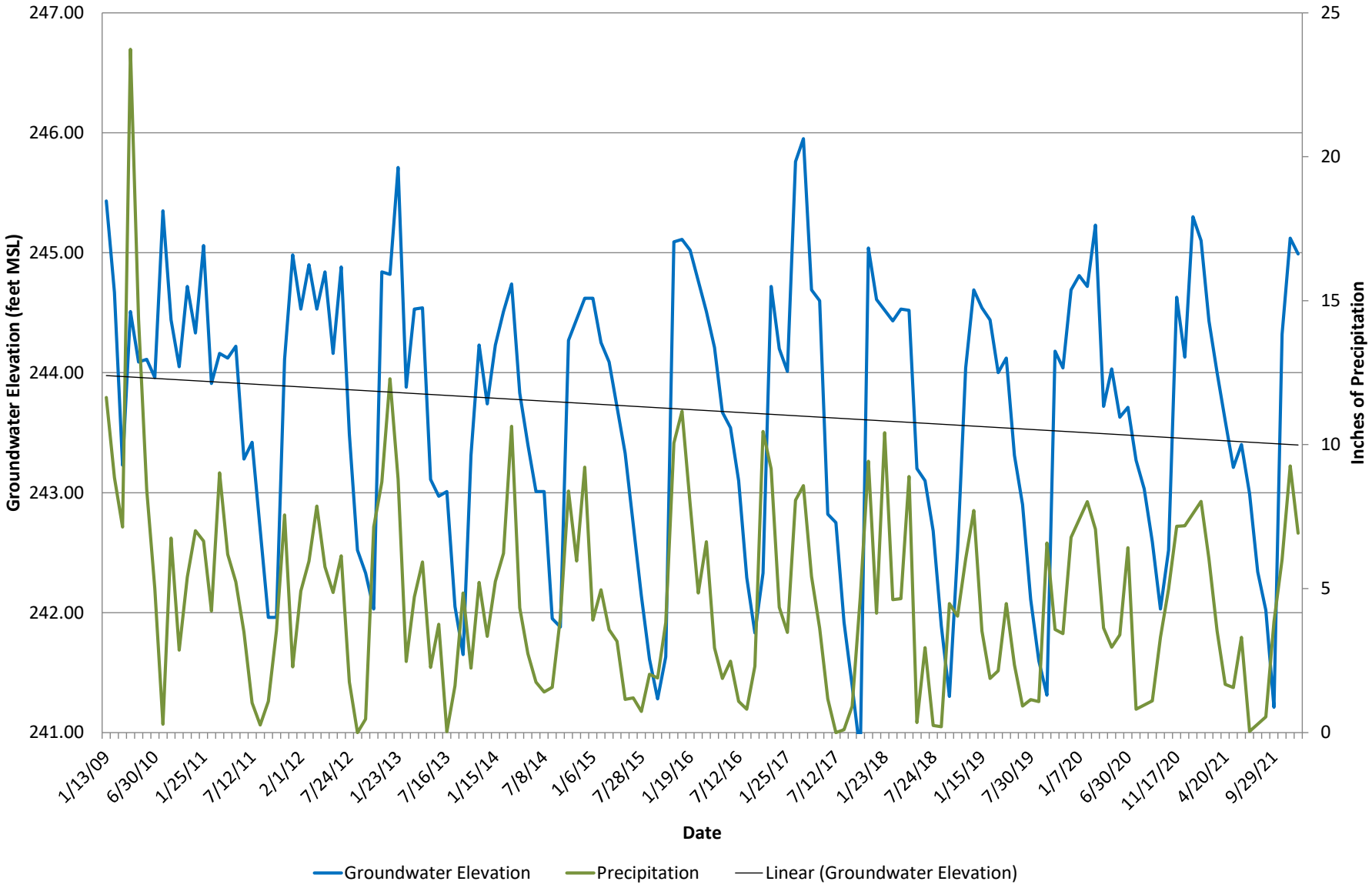


Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-08D1

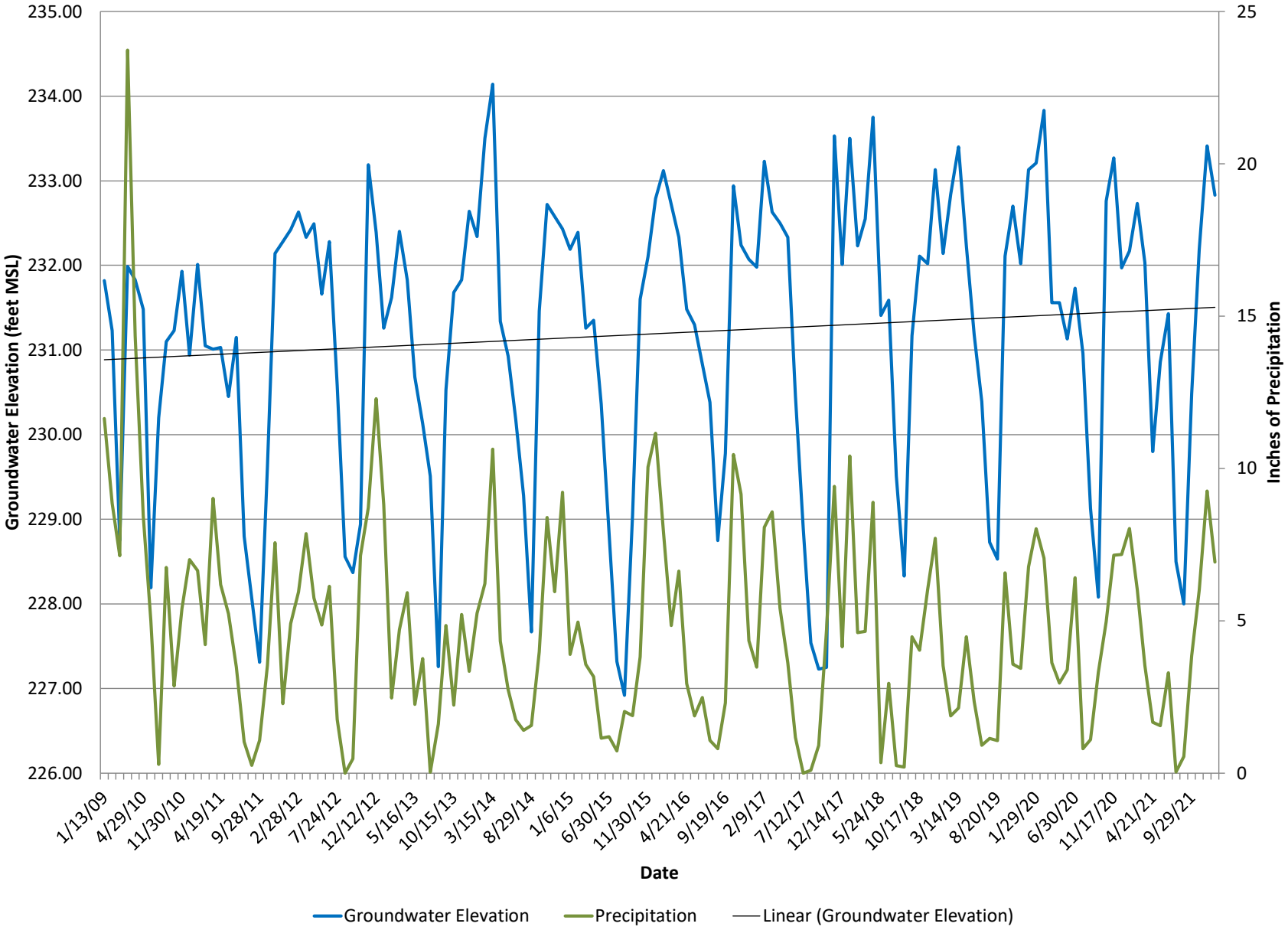



Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-09S
Groundwater Elevation (feet MSL)
246.00
245.00
244.00
243.00
242.00
241.00
240.00
239.00
238.00
237.00
Inches of Precipitation
25
20
15
10
5
0
1/13/09
6/30/10
1/25/11
7/12/11
2/1/12
7/24/12
1/23/13
7/16/13
1/15/14
7/8/14
1/6/15
7/28/15
1/19/16
7/12/16
1/25/17
7/12/17
1/23/18
7/24/18
1/15/19
7/30/19
1/7/20
6/30/20
11/17/20
4/20/21
9/29/21
Date
Groundwater Elevation
Precipitation
Linear (Groundwater Elevation)

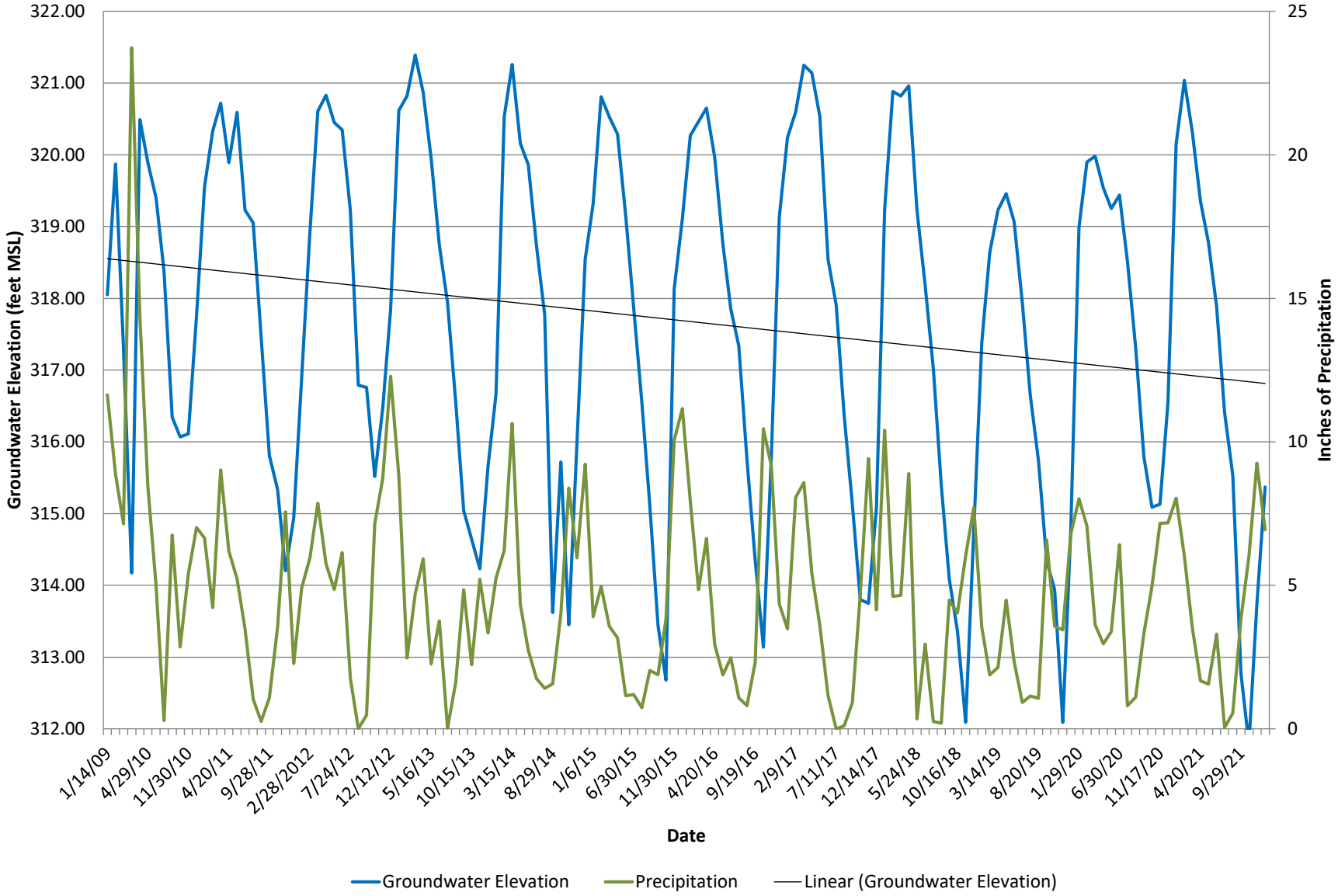
Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-10S

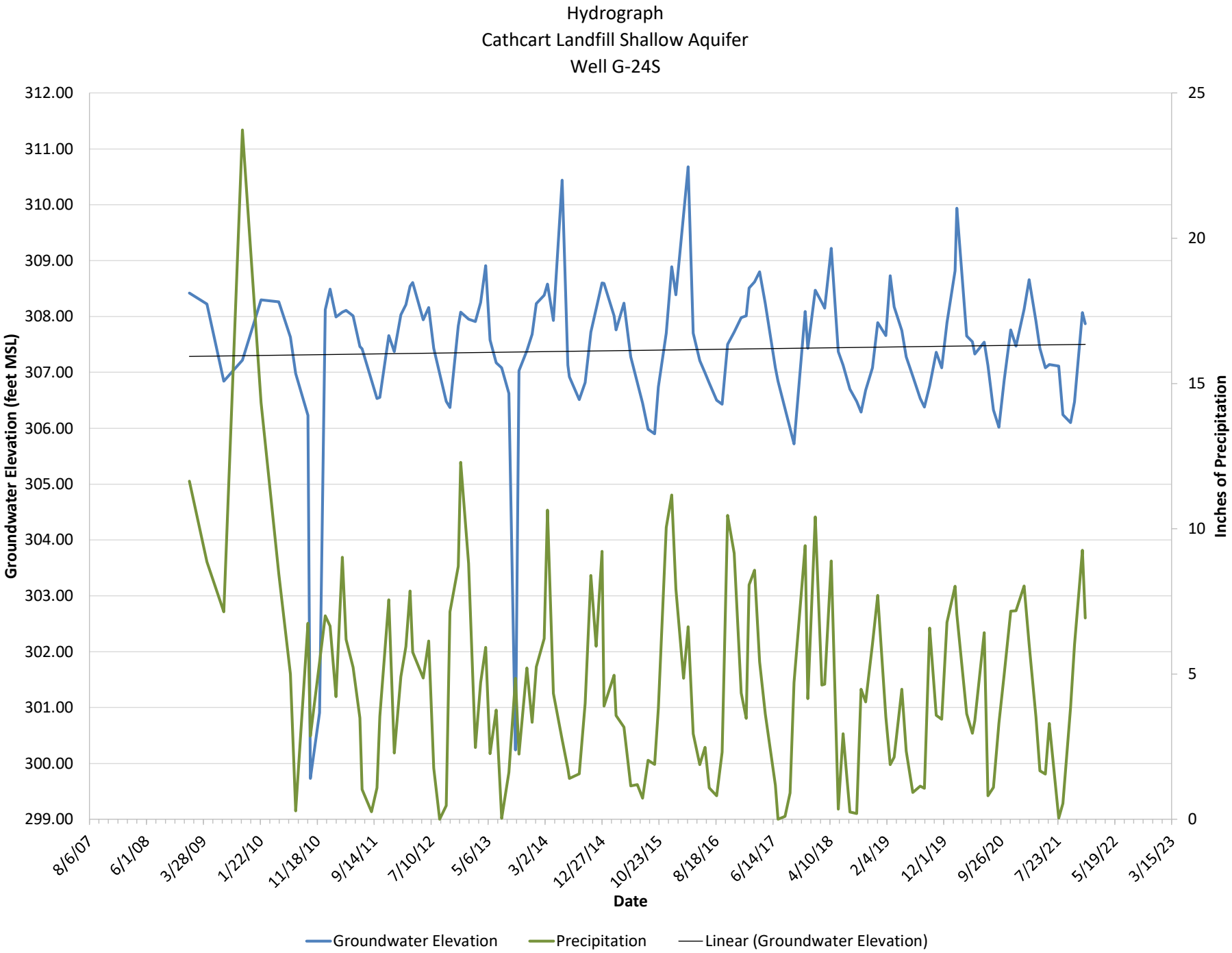


Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-11S



Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-14S




Hydrograph
Cathcart Landfill Shallow Aquifer
Well G-24S
Groundwater Elevation (feet MSL)
312.00
311.00
310.00
309.00
308.00
307.00
306.00
305.00
304.00
303.00
302.00
301.00
300.00
299.00
Inches of Precipitation
25
20
15
10
5
0
8/6/07
6/1/08
3/28/09
1/22/10
11/18/10
9/14/11
7/10/12
5/6/13
3/2/14
12/27/14
10/23/15
8/18/16
6/14/17
4/10/18
2/4/19
12/1/19
9/26/20
7/23/21
5/19/22
3/15/23
Date
Groundwater Elevation
Precipitation
Linear (Groundwater Elevation)

Site: **Cathcart Landfill - Shallow Aquifer**

Measurement Date: **4/20/2021**

	[**X**] matrix			[**D**] matrix
Well ID	**X-axis**	**Y-axis**	**GW Elev.**	D
G-01A	413.12	3968.37	**218.83**	1
G-08D1	710.11	4157.06	**198.30**	1
G-09S	723.45	3612.73	**243.18**	1
G-10S	470.79	3595.13	**243.60**	1
G-11S	267.66	3807.05	**229.80**	1
G-14S	1256.30	2341.04	**319.35**	1
G-24S	778.15	538.89	**307.43**	1
8	0	0	0	1
9	0	0	0	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	0	1
19	0	0	0	1
20	0	0	0	1

Pt

413.12	710.11	723.45	470.79	267.66	1256.3	778.15	0
3968.37	4157.06	3612.73	3595.1	3807.05	2341	538.89	0
218.83	198.3	243.18	243.6	229.8	319.35	307.43	0

{[P]t[P]}

3675396.461	13276944.47	1223765.2
13276944.47	79270386.49	5235202.9
1223765.205	5235202.921	454992.6

{[P]t[P]}'

2.85745E-06	1.20681E-07	-9.07E-06
1.20681E-07	5.76358E-08	-9.88E-07
-9.07409E-06	-9.87753E-07	3.797E-05

{[P]t[P]}'[P]t

-0.000326304	0.000731393	0.0002966	-4E-04	-0.000860961	0.001	-5E-04	0
6.2426E-05	0.000129421	5.533E-05	2E-05	2.47383E-05	-3E-05	-2E-04	0
0.000640312	-0.003020485	-0.0009	0.0014	0.002536094	-0.002	0.0041	0

{[P]t[P]}'[P]t [D] = [**A**] matrix

A	-0.000117174
B	8.77221E-05
C	0.003175084

Groundwater Gradient:	**0.0461**	
Conductivity (ft/day):	**0.001**	
Effective porosity:	**10%**	
GW velocity:	**0.000461**	**ft/day**
	0.168	**ft/year**
Flow direction:	**143.18**	**degrees from the positive x-axis**

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [**X**] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H30 and H35.

Site: **Cathcart Landfill - Shallow Aquifer**

Measurement Date: **10/19/2021**

	[**X**] matrix			[**D**] matrix
Well ID	**X-axis**	**Y-axis**	**GW Elev.**	D
G-01A	413.12	3968.37	**221.89**	1
G-08D1	710.11	4157.06	**192.67**	1
G-09S	723.45	3612.73	**240.57**	1
G-10S	470.79	3595.13	**244.32**	1
G-11S	267.66	3807.05	**232.19**	1
G-14S	1256.30	2341.04	**311.78**	1
G-24S	778.15	538.89	**306.47**	1
8	0	0	0	1
9	0	0	0	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	0	1
19	0	0	0	1
20	0	0	0	1

Pt

413.12	710.11	723.45	470.79	267.66	1256.3	778.15	0
3968.37	4157.06	3612.73	3595.1	3807.05	2341	538.89	0
221.89	192.67	240.57	244.32	232.19	311.78	306.47	0

{[P]t[P]}

3675396.461	13276944.47	1209864.7
13276944.47	79270386.49	5207961
1209864.69	5207960.996	448965.91

{[P]t[P]}'

2.5997E-06	1.04405E-07	-8.22E-06
1.04405E-07	5.72193E-08	-9.45E-07
-8.2167E-06	-9.45088E-07	3.533E-05

{[P]t[P]}'[P]t

-0.000334899	0.000696977	0.0002812	-4E-04	-0.000814526	0.0009	-4E-04	0
6.04938E-05	0.000129913	5.489E-05	2E-05	2.6342E-05	-3E-05	-2E-04	0
0.000694982	-0.00295604	-0.000859	0.0014	0.00240657	-0.002	0.0039	0

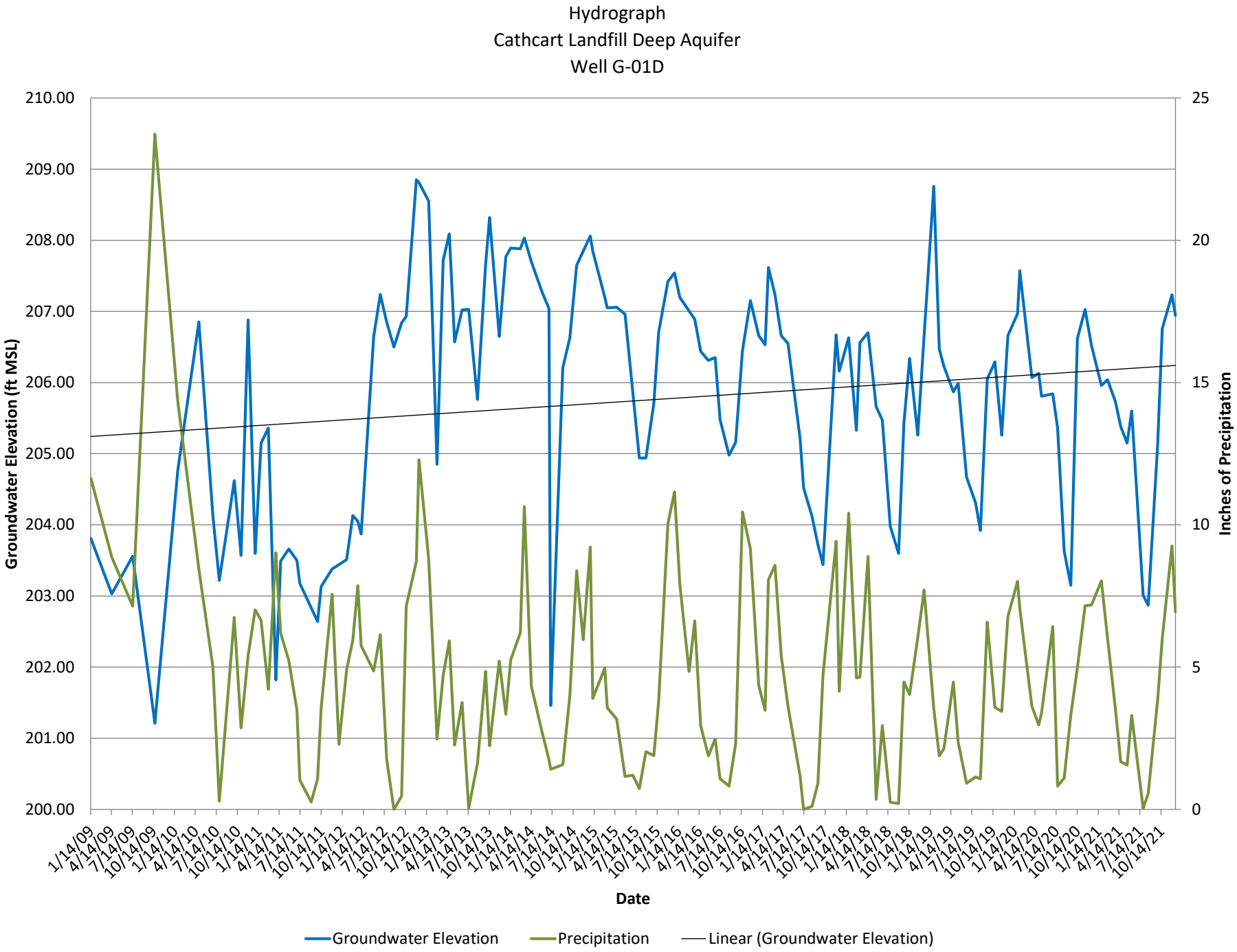
{[P]t[P]}'[P]t [D] = [**A**] matrix

A	-6.97886E-05
B	8.84936E-05
C	0.003059149

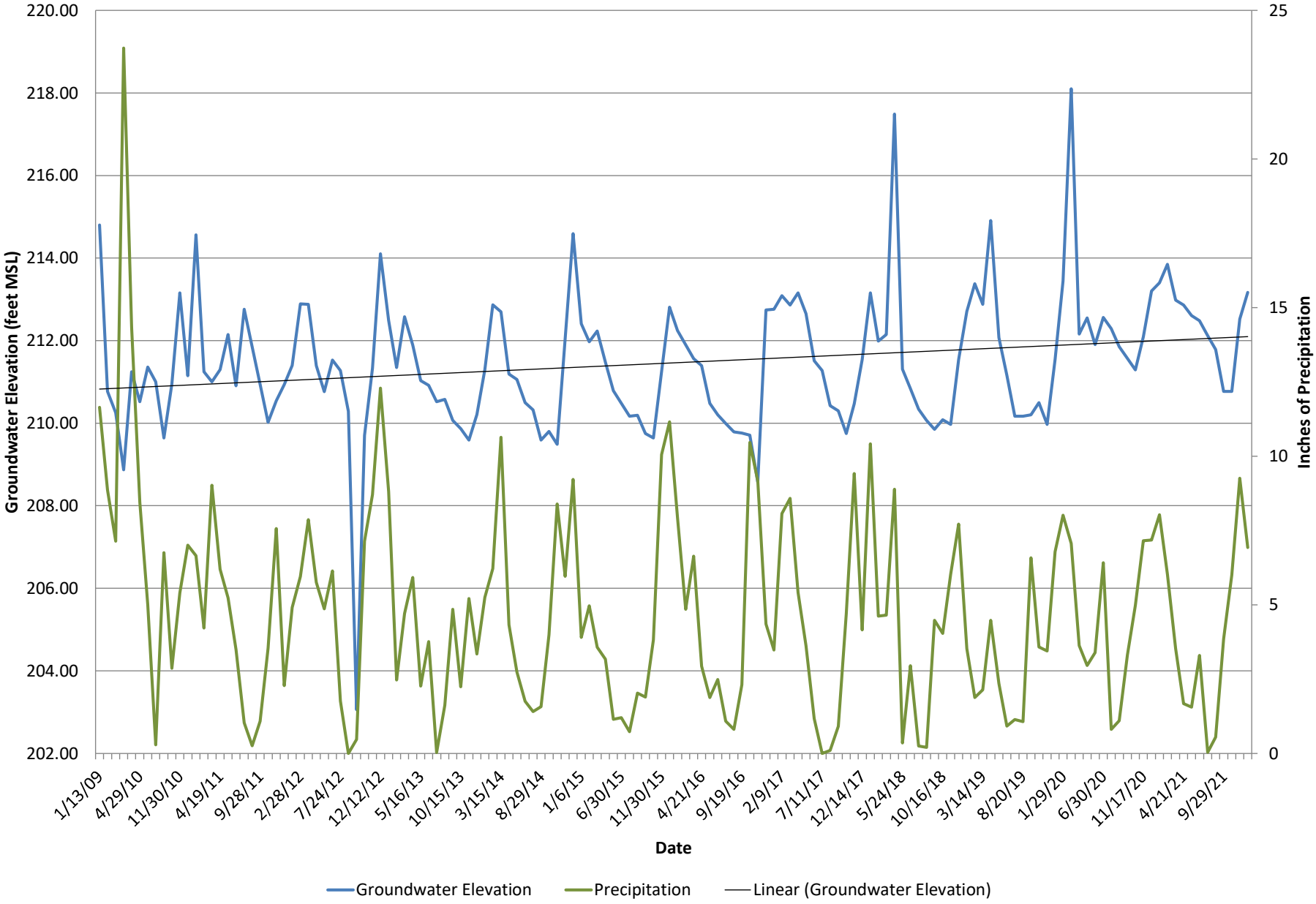
Groundwater Gradient:	**0.0368**	
Conductivity (ft/day):	**0.001**	
Effective porosity:	**10%**	
GW velocity:	**0.000368**	**ft/day**
	0.134	**ft/year**
Flow direction:	**128.26**	**degrees from the positive x-axis**

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [**X**] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H30 and H35.

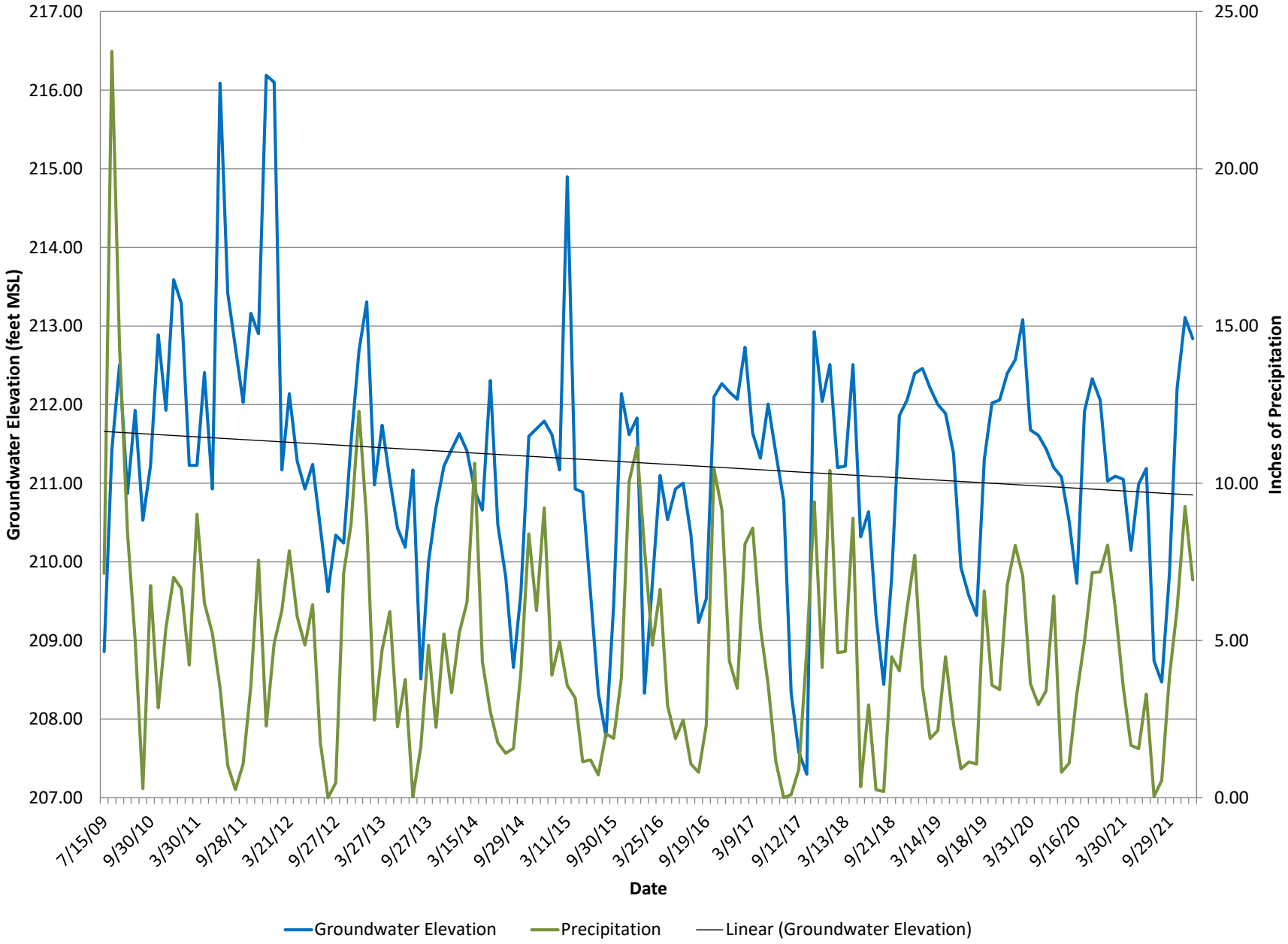
Deep Wells

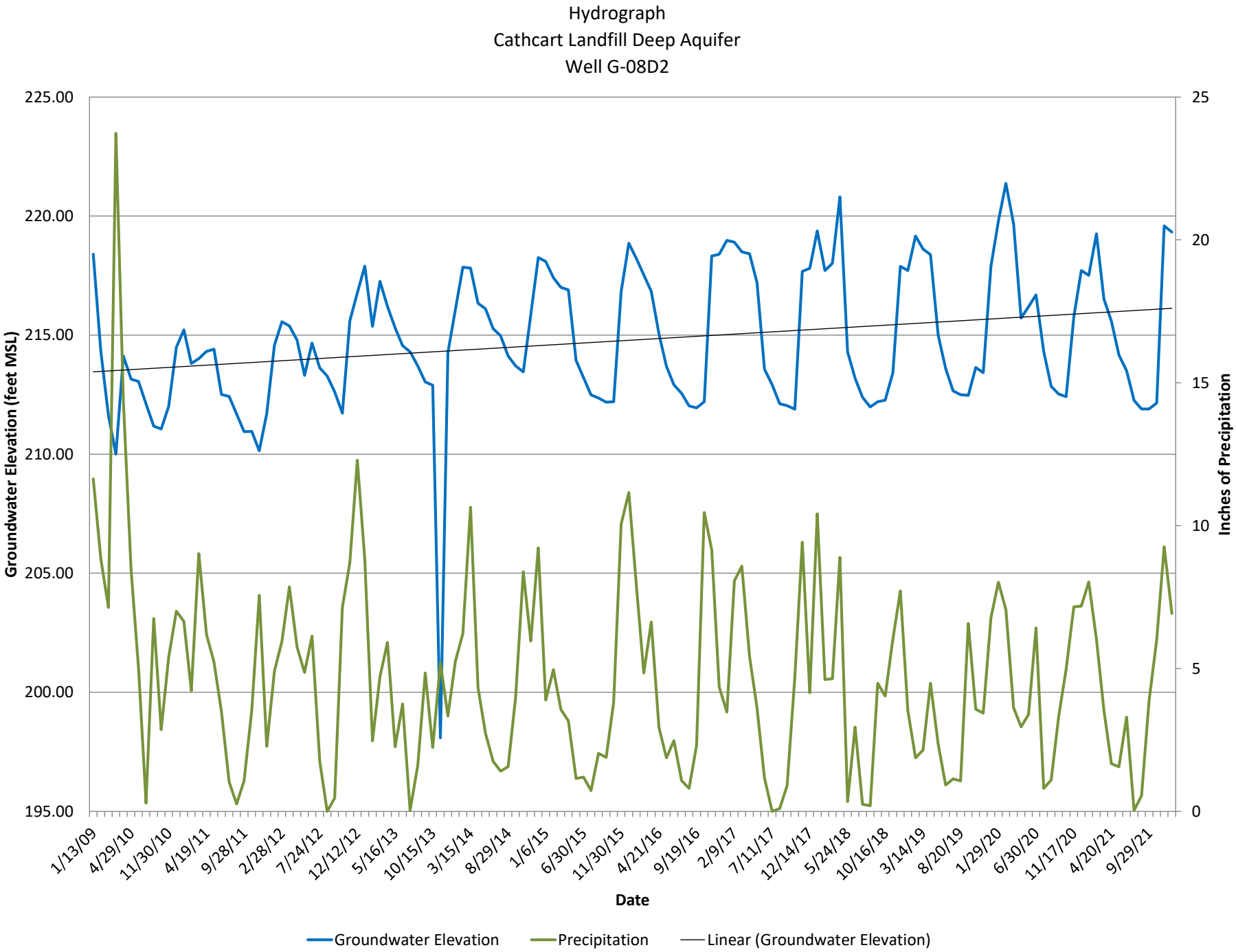

Hydrograph
Cathcart Landfill Deep Aquifer
Well G-01D
Groundwater Elevation (ft MSL)
Inches of Precipitation
Date
Groundwater Elevation
Precipitation
Linear (Groundwater Elevation)

Hydrograph
Cathcart Landfill Deep Aquifer
Well G-02D

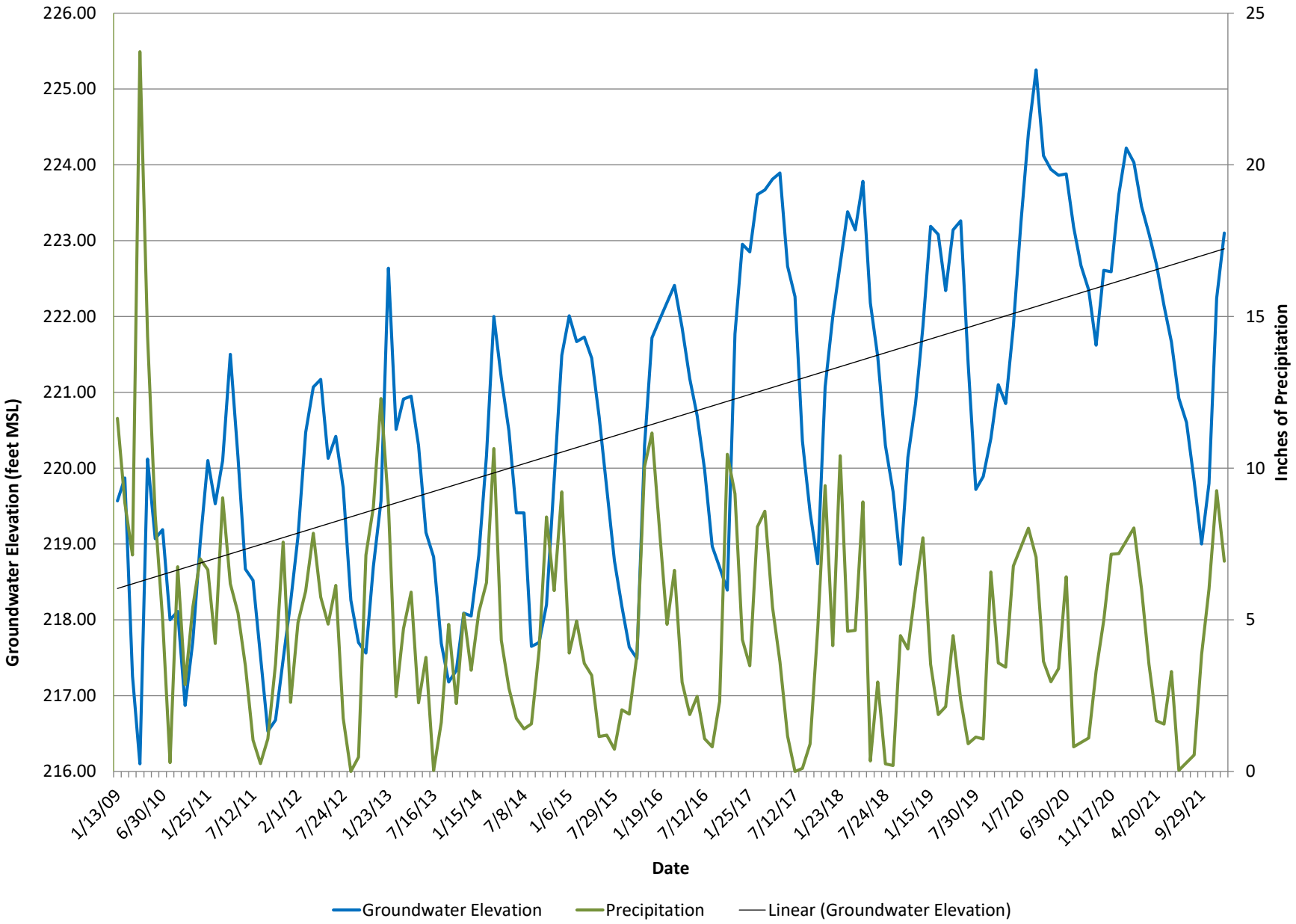


Hydrograph
Cathcart Landfill Deep Aquifer
Well G-06B

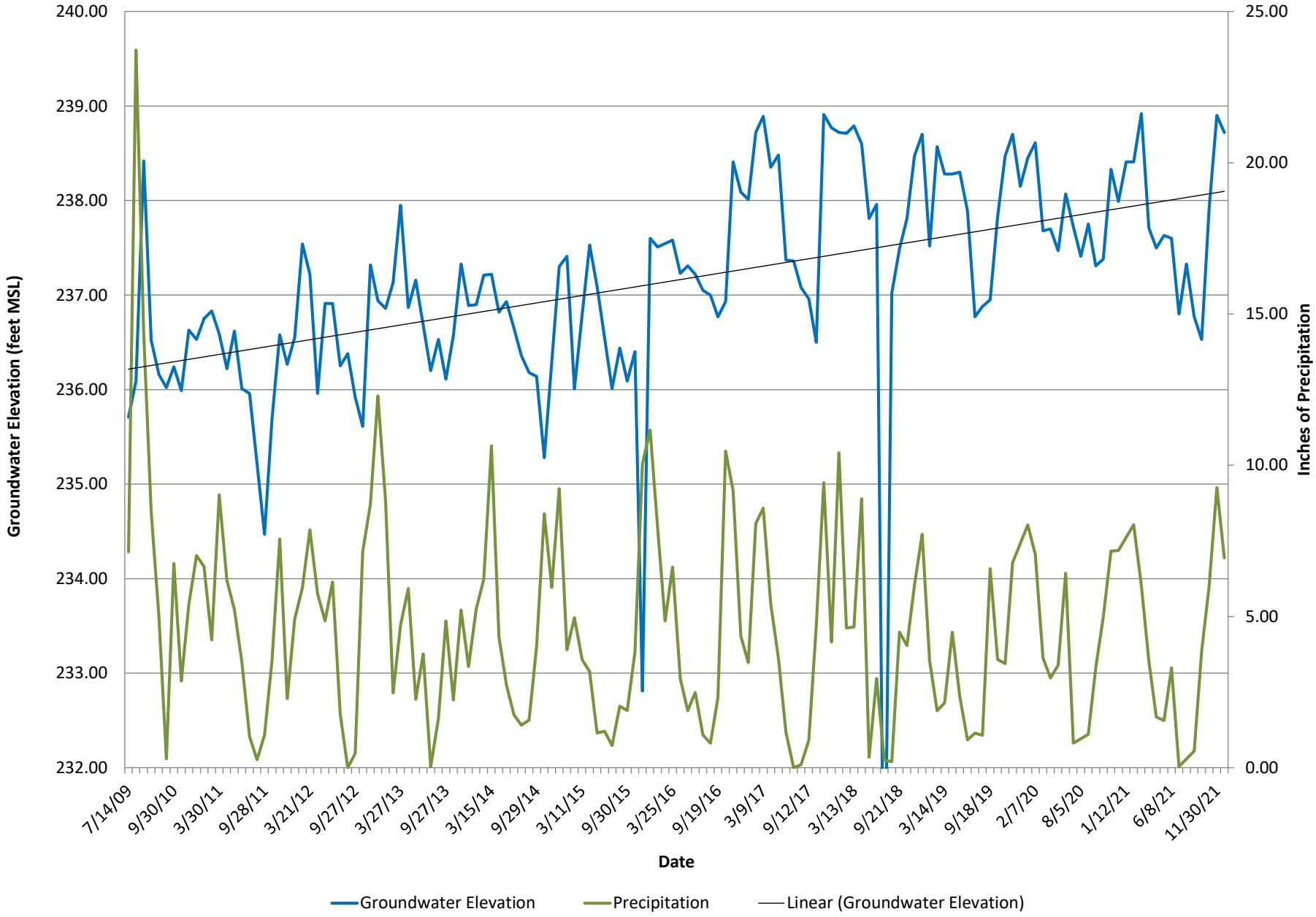



Hydrograph
Cathcart Landfill Deep Aquifer
Well G-08D2
Groundwater Elevation (feet MSL)
225.00
220.00
215.00
210.00
205.00
200.00
195.00
Inches of Precipitation
25
20
15
10
5
0
1/13/09
4/29/10
11/30/10
4/19/11
9/28/11
2/28/12
7/24/12
12/12/12
5/16/13
10/15/13
3/15/14
8/29/14
1/6/15
6/30/15
11/30/15
4/21/16
9/19/16
2/9/17
7/11/17
12/14/17
5/24/18
10/16/18
3/14/19
8/20/19
1/29/20
6/30/20
11/17/20
4/20/21
9/29/21
Date
Groundwater Elevation
Precipitation
Linear (Groundwater Elevation)

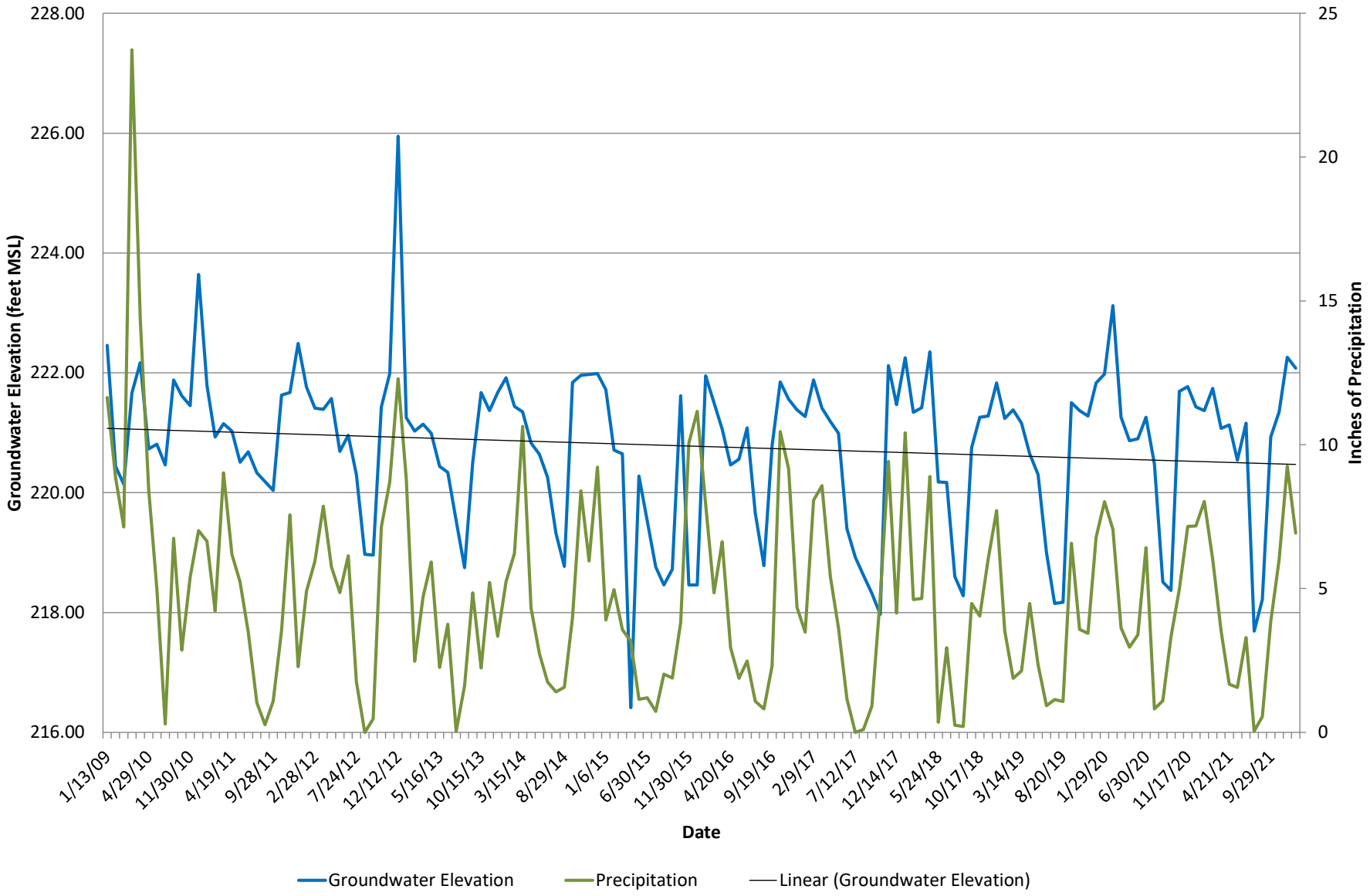
Hydrograph
Cathcart Landfill Deep Aquifer
Well G-09D

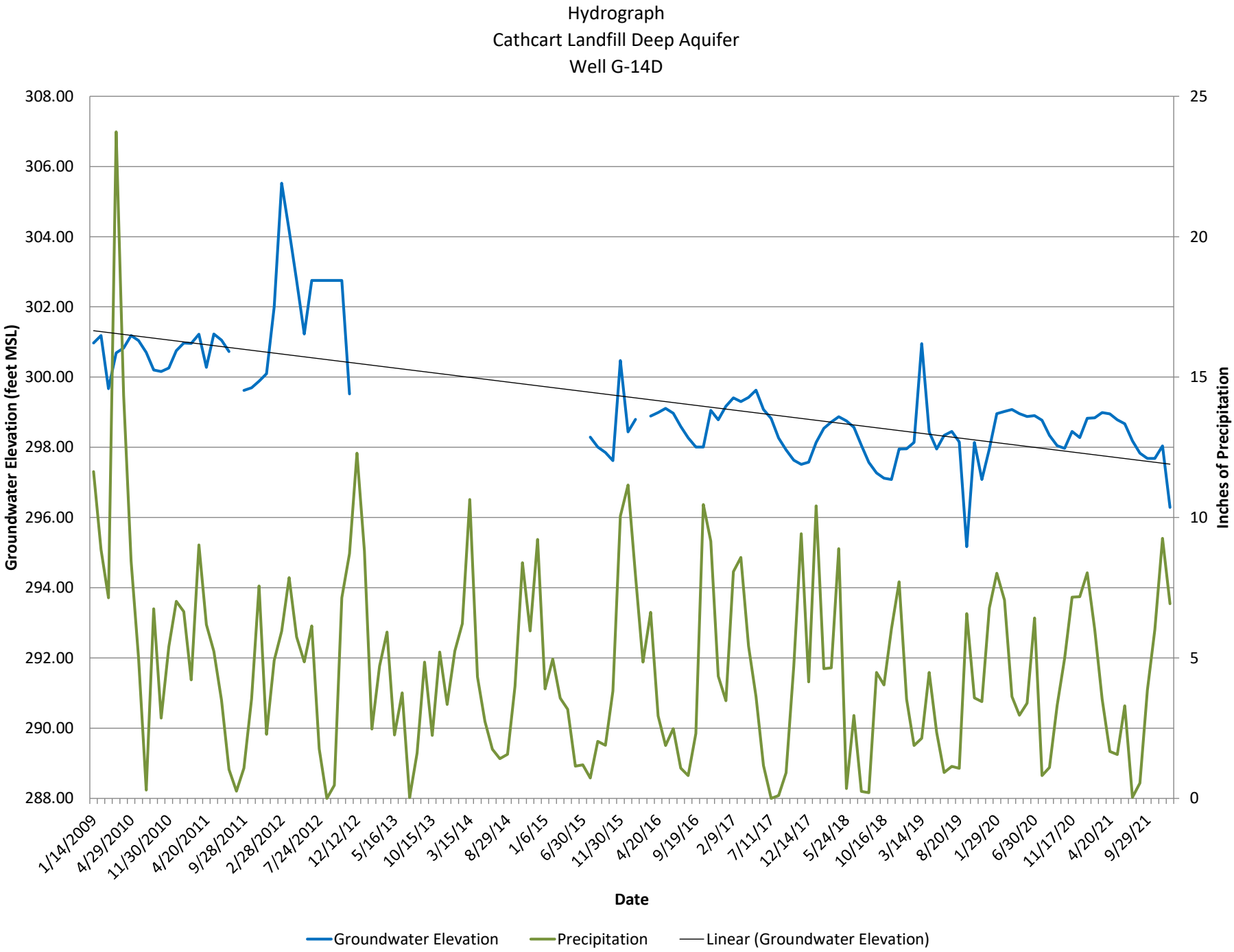


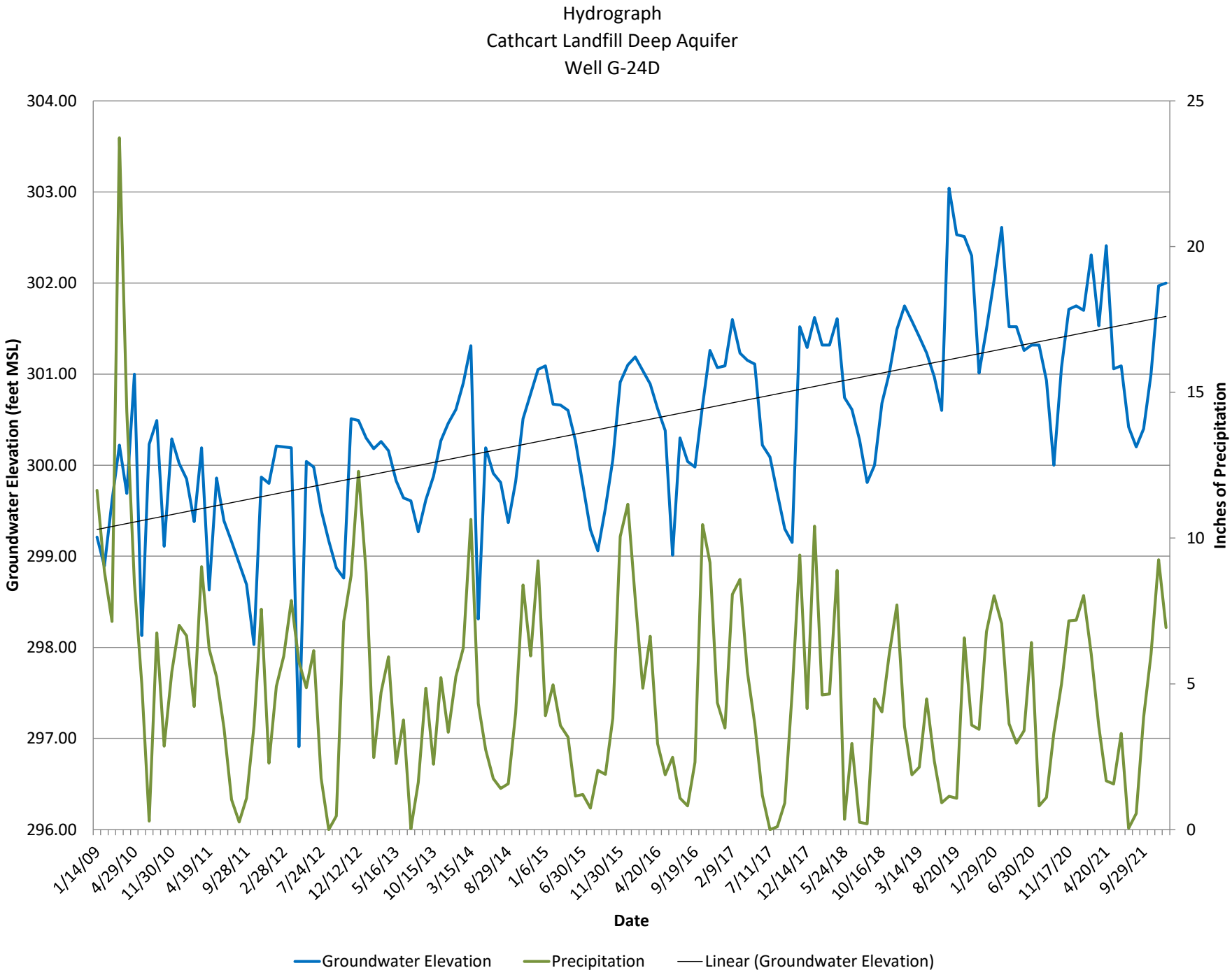
Hydrograph
Cathcart Landfill Deep Aquifer
Well G-10D



Hydrograph
Cathcart Landfill Deep Aquifer
Well G-13D




Hydrograph
Cathcart Landfill Deep Aquifer
Well G-14D
Groundwater Elevation (feet MSL)
Inches of Precipitation
308.00
306.00
304.00
302.00
300.00
298.00
296.00
294.00
292.00
290.00
288.00
25
20
15
10
5
0
1/14/2009
4/29/2010
11/30/2010
4/20/2011
9/28/2011
2/28/2012
7/24/2012
12/12/12
5/16/13
10/15/13
3/15/14
8/29/14
1/6/15
6/30/15
11/30/15
4/20/16
9/19/16
2/9/17
7/11/17
12/14/17
5/24/18
10/16/18
3/14/19
8/20/19
1/29/20
6/30/20
11/17/20
4/20/21
9/29/21
Date
Groundwater Elevation
Precipitation
Linear (Groundwater Elevation)


Hydrograph
Cathcart Landfill Deep Aquifer
Well G-24D
Groundwater Elevation (feet MSL)
304.00
303.00
302.00
301.00
300.00
299.00
298.00
297.00
296.00
Inches of Precipitation
25
20
15
10
5
0
1/14/09
4/29/10
11/30/10
4/19/11
9/28/11
2/28/12
7/24/12
12/12/12
5/16/13
10/15/13
3/15/14
8/29/14
1/6/15
6/30/15
11/30/15
4/20/16
9/19/16
2/9/17
7/11/17
12/14/17
5/24/18
10/16/18
3/14/19
8/20/19
1/29/20
6/30/20
11/17/20
4/20/21
9/29/21
Date
Groundwater Elevation
Precipitation
Linear (Groundwater Elevation)

Site: **Cathcart Landfill - Deep Aquifer**

Measurement Date: **4/20/2021**

	[**X**] matrix			[**D**] matrix
Well ID	**X-axis**	**Y-axis**	**GW Elev.**	D
G-01D	431.12	3977.30	**205.38**	1
G-02D	733.79	3884.79	**212.86**	1
G-06B	488.43	3765.90	**210.15**	1
G-08D2	728.12	4156.36	**215.58**	1
G-09D	739.20	3614.85	**222.69**	1
G-10D	495.97	3593.41	**237.50**	1
G-13D	220.31	3939.18	**221.13**	1
G-14D	1266.00	2337.53	**298.95**	1
G-24D	780.99	528.85	**302.41**	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	0	1
19	0	0	0	1
20	0	0	0	1

Pt

431.12	733.79	488.43	728.1	739.2	496	220.3	1266	781
3977.3	3884.79	3765.9	4156	3614.85	3593	3939	2338	528.9
205.38	212.86	210.15	215.6	222.69	237.5	221.1	299	302.4

{[P]t[P]}

4546675.575	18125521.98	1450122
18125521.98	109608443.7	6719437
1450121.998	6719437.064	513846.6

{[P]t[P]}'

2.3694E-06	9.12601E-08	-7.88E-06
9.12601E-08	4.95129E-08	-9.05E-07
-7.88005E-06	-9.05011E-07	3.6E-05

{[P]t[P]}'[P]t

-0.00023394	0.000415822	-0.000155	4E-04	0.000326544	-4E-04	-9E-04	9E-04	-5E-04
5.04004E-05	6.66722E-05	4.08E-05	8E-05	4.49041E-05	8E-06	2E-05	-4E-05	-2E-04
0.000400819	-0.001631093	0.000312	-0.002	-0.001075359	0.001	0.003	-0.001	0.004

{[P]t[P]}'[P]t [D] = [**A**] matrix

A	-9.73368E-05
B	8.77189E-05
C	0.003266303

Groundwater Gradient:	**0.0401**	
Conductivity (ft/day):	**0.029**	
Effective porosity:	**10%**	
GW velocity:	**0.0116**	**ft/day**
	4.25	**ft/year**
Flow direction:	**137.98**	**degrees from the positive x-axis**

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [**X**] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H30 and H35.

Site: **Cathcart Landfill - Deep Aquifer**

Measurement Date: **10/19/2021**

	[**X**] matrix			[**D**] matrix
Well ID	**X-axis**	**Y-axis**	**GW Elev.**	D
G-01D	431.12	3977.30	**206.76**	1
G-02D	733.79	3884.79	**210.77**	1
G-06B	488.43	3765.90	**212.21**	1
G-08D2	728.12	4156.36	**212.15**	1
G-09D	739.20	3614.85	**219.80**	1
G-10D	495.97	3593.41	**237.92**	1
G-13D	220.31	3939.18	**221.35**	1
G-14D	1266.00	2337.53	**297.68**	1
G-24D	780.99	528.85	**301.00**	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	0	1
19	0	0	0	1
20	0	0	0	1

Pt

431.12	733.79	488.43	728.1	739.2	496	220.3	1266	781
3977.3	3884.79	3765.9	4156	3614.85	3593	3939	2338	528.9
206.76	210.77	212.21	212.2	219.8	237.9	221.4	297.7	301

{[P]t[P]}

4546675.575	18125521.98	1443104
18125521.98	109608443.7	6698523
1443103.509	6698522.56	510342.6

{[P]t[P]}'

2.29734E-06	8.64405E-08	-7.63E-06
8.64405E-08	4.93636E-08	-8.92E-07
-7.63079E-06	-8.92354E-07	3.52E-05

{[P]t[P]}'[P]t

-0.000243515	0.000413224	-0.000172	4E-04	0.000333412	-4E-04	-8E-04	8E-04	-5E-04
4.90972E-05	6.71152E-05	3.88E-05	8E-05	4.61996E-05	8E-06	2E-05	-4E-05	-2E-04
0.000449303	-0.001636405	0.000393	-0.002	-0.0011185	0.001	0.003	-0.001	0.004

{[P]t[P]}'[P]t [D] = [**A**] matrix

A	-8.13961E-05
B	8.80875E-05
C	0.003227335

Groundwater Gradient:	**0.0372**	
Conductivity (ft/day):	**0.029**	
Effective porosity:	**10%**	
GW velocity:	**0.0108**	**ft/day**
	3.93	**ft/year**
Flow direction:	**132.74**	**degrees from the positive x-axis**

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [**X**] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H30 and H35.

Appendix B

Groundwater Analytical Summary Tables

Shallow Wells

Groundwater Analytical Summary - Shallow Wells: First Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09S					G-10S				
						1/12/21	D	V	Tr	Ch	1/12/21	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)															
Alkalinity (as CaCO3)	nonpar	77	77	200	--	360		V	I	N	480		V	I	Y
Ammonia Nitrogen	lognor	73	42	16.6482	--	0.02	U				0.274			I	N
Bicarbonate	nonpar	77	77	200	--	360		V	I	N	480		V	I	Y
Calcium, Dissolved	normal	75	75	23.8526	--	79.7		V	D	N	104		V	D	N
Chemical Oxygen Demand	nonpar	77	10	16	--	10	U				10	U			
Chloride	nonpar	77	76	18.3	250	3.96			D	N	10.6			D	N
Conductivity (umhos/cm)	nonpar	76	76	540	700	980		V	D	N	1400		V		
Magnesium, Dissolved	lognor	73	64	53.3909	--	31.4			D	N	24.7			D	N
Nitrate Nitrogen (mg-N/L)	lognor	74	69	2.2263	10	0.024					0.01	U			
Nitrite Nitrogen (mg-N/L)	lognor	69	43	36.85	1	0.002	U				0.002	U			
pH (std units)	normal	77	77	6.00-9.39	6.5-8.5	6.43			I	N	6.70				
Potassium, Dissolved	lognor	75	74	2.7509	--	4.82		V	D	N	3.69		V		
Sodium, Dissolved	normal	75	75	123	20	88.5					181		V		
Sulfate	normal	76	76	169	250	187			D	N	294			D	N
Total Dissolved Solids	normal	77	77	404.5425	500	680		V	D	N	970		V		
Total Organic Carbon	nonpar	77	68	16	--	5.1					4.6				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony	nonpar	77	34	0.0019	0.006	0.0003	U				0.0003	U			
Arsenic	nonpar	72	68	0.0038	0.00005	0.000607					0.00501		V		Y
Barium	lognor	70	55	2.8609	1	0.005	U			Y	0.0053				
Beryllium	nonpar	77	0	0.0005	0.004	0.005	U				0.005	U			
Cadmium	nonpar	72	35	0.001	0.005	0.00005	U				0.00005	U			
Chromium	nonpar	75	28	0.015	0.05	0.01	U				0.01	U			
Cobalt	nonpar	76	5	0.003	--	0.01	U				0.01	U			
Copper	nonpar	73	39	0.115	1	0.02	U			Y	0.02	U			
Iron	lognor	74	46	10.4257	0.3	0.02	U				9.44				Y
Lead	nonpar	77	33	0.0027	0.05	0.0001	U				0.00019				
Manganese	lognor	70	55	6.9361	0.05	0.054					3.22			D	N
Nickel	nonpar	75	19	0.038	0.1	0.02					0.01	U			
Selenium	nonpar	76	6	0.002	0.01	0.0005	U		D	Y	0.0005	U			
Silver	nonpar	71	4	0.0002	0.05	0.0001	U				0.0001	U			
Thallium	nonpar	76	6	0.0001	0.002	0.00005	U				0.00005	U			
Vanadium	nonpar	77	2	0.005	--	0.01	U				0.01	U			
Zinc	nonpar	76	33	0.03	5	0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony					0.006	0.0003	U				0.0003	U			
Arsenic					0.00005	0.000717					0.0048				
Barium					1	0.0057					0.005	U			
Beryllium					0.004	0.005	U				0.005	U			
Cadmium					0.005	0.00005	U				0.00005	U			
Chromium					0.05	0.01	U				0.01	U			
Cobalt					--	0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U			
Iron					0.3	0.373					9.49				
Lead					0.05	0.000535					0.0001	U			
Manganese					0.05	0.087					3.16				
Nickel					0.1	0.025					0.01	U			
Selenium					0.01	0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U			
Vanadium					--	0.02	U				0.02	U			
Zinc					5	0.01	U				0.01	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260/8260 SIM (µg/L)															
1,1,1-Trichloroethane					200	1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U			
1,1-Dichloroethylene					--	1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	0.05	U				0.05	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U			

Groundwater Analytical Summary - Shallow Wells: First Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09S					G-10S				
						1/12/21	D	V	Tr	Ch	1/12/21	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260/8260 SIM (µg/L) (cont.)															
1,2-Dichloroethane					0.5	0.03	U				0.03	U			
1,2-Dichloropropane					0.6	0.02	U				0.02	U			
1,4-Dichlorobenzene					4	1	U				1	U			
2-Butanone					--	5	U				5	U			
2-Hexanone					--	5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					--	5	U				5	U			
Acetone					--	5	U				5	U			
Acrylonitrile					0.07	0.03	U				0.03	U			
Benzene					1	1	U				1	U			
Bromodichloromethane					0.3	0.02	U				0.02	U			
Bromoform					5	1	U				1	U			
Bromomethane					--	1	U				1	U			
Carbon Disulfide					--	1	U				1	U			
Carbon Tetrachloride					0.3	0.02	U				0.02	U			
Chlorobenzene					--	0.03	U				0.03	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U			
Chloroethane					--	1	U				1	U			
Chloroform					7	1	U				1	U			
Chloromethane					--	2	U				2	U			
cis-1,2-Dichloroethene					--	**0.08**					**0.1**				
cis-1,3-Dichloropropene					0.2	0.03	U				0.03	U			
Dibromomethane					--	0.02	U				0.02	U			
Ethyl Benzene					--	1	U				1	U			
m,p-Xylene					--	1	U				1	U			
Methyl Iodide					--	1	U				1	U			
Methylene Chloride					5	2	U				2	U			
o-Xylene					--	1	U				1	U			
Styrene					--	1	U				1	U			
Tetrachloroethylene					0.8	0.02	U				0.02	U			
Toluene					--	2	U				2	U			
trans-1,2-Dichloroethene					--	1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.02	U				0.02	U			
trans-1,4-Dichloro-2-butene					--	5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U			
Trichlorofluoromethane					--	1	U				1	U			
Vinyl Acetate					--	5	U				5	U			
Vinyl Chloride					0.02	0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in **purple** exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards - the most restrictive of the two is used.

B = Methylene chloride was measured in the lab blank at a similar concentration - contamination during analysis suspected.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01A	10/15/2020		34.0000		230.0000
Ammonia nitrogen	mg-N/L	G-01A	10/15/2020		0.0720		12.5375
Bicarbonate	mg/L	G-01A	10/15/2020		34.0000		200.0000
Chemical oxygen demand	mg/L	G-01A	10/15/2020	ND	10.0000		16.0000
Chloride	mg/L	G-01A	10/15/2020		2.4800		18.3000
Conductivity	umhos/cm	G-01A	10/15/2020		160.0000		548.9315
Dissolved antimony	mg/L	G-01A	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-01A	10/15/2020		0.0002		0.0035
Dissolved barium	mg/L	G-01A	10/15/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-01A	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01A	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-01A	10/15/2020		14.9000		23.8179
Dissolved chromium	mg/L	G-01A	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-01A	10/15/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-01A	10/15/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-01A	10/15/2020	ND	0.0500		9.8243
Dissolved lead	mg/L	G-01A	10/15/2020		0.0002		0.0027
Dissolved magnesium	mg/L	G-01A	10/15/2020		3.9800		51.3609
Dissolved manganese	mg/L	G-01A	10/15/2020	ND	0.0050		6.4627
Dissolved nickel	mg/L	G-01A	10/15/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-01A	10/15/2020		1.2100		2.6321
Dissolved selenium	mg/L	G-01A	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-01A	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-01A	10/15/2020		6.7700		121.6395
Dissolved thallium	mg/L	G-01A	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-01A	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01A	10/15/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-01A	10/15/2020		0.3900		1.3000
Nitrite nitrogen	mg-N/L	G-01A	10/15/2020	ND	0.0020		0.0210
pH	std units	G-01A	10/15/2020		6.0100		6.00 - 9.39
Sulfate	mg/L	G-01A	10/15/2020		36.0000		338.8047
Total dissolved solids	mg/L	G-01A	10/15/2020		120.0000		397.5917
Total organic carbon	mg/L	G-01A	10/15/2020		5.2000		14.0000
Alkalinity (as caco3)	mg/L	G-04A	10/15/2020		230.0000		230.0000
Ammonia nitrogen	mg-N/L	G-04A	10/15/2020		0.1910		12.5375
Bicarbonate	mg/L	G-04A	10/15/2020		230.0000	*	200.0000
Chemical oxygen demand	mg/L	G-04A	10/15/2020	ND	10.0000	**	16.0000
Chloride	mg/L	G-04A	10/15/2020		5.5100		18.3000
Conductivity	umhos/cm	G-04A	10/15/2020		510.0000		548.9315
Dissolved antimony	mg/L	G-04A	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-04A	10/15/2020		0.0108	***	0.0035
Dissolved barium	mg/L	G-04A	10/15/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-04A	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-04A	10/15/2020		46.5000	***	23.8179
Dissolved chromium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-04A	10/15/2020		0.0110	***	0.0030
Dissolved copper	mg/L	G-04A	10/15/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-04A	10/15/2020		16.9000	***	9.8243
Dissolved lead	mg/L	G-04A	10/15/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-04A	10/15/2020		27.1000		51.3609
Dissolved manganese	mg/L	G-04A	10/15/2020		6.8300	*	6.4627
Dissolved nickel	mg/L	G-04A	10/15/2020		0.0120		0.0380
Dissolved potassium	mg/L	G-04A	10/15/2020		2.4200		2.6321
Dissolved selenium	mg/L	G-04A	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-04A	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-04A	10/15/2020		14.4000		121.6395
Dissolved thallium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-04A	10/15/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0020		0.0210
pH	std units	G-04A	10/15/2020		6.7100		6.00 - 9.39
Sulfate	mg/L	G-04A	10/15/2020		32.3000		338.8047
Total dissolved solids	mg/L	G-04A	10/15/2020		330.0000		397.5917
Total organic carbon	mg/L	G-04A	10/15/2020		8.6000	**	14.0000
Alkalinity (as caco3)	mg/L	G-08D1	10/14/2020		180.0000		230.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-08D1	10/14/2020		0.1720		12.5375
Bicarbonate	mg/L	G-08D1	10/14/2020		80.0000		200.0000
Chemical oxygen demand	mg/L	G-08D1	10/14/2020	ND	10.0000		16.0000
Chloride	mg/L	G-08D1	10/14/2020		3.1600		18.3000
Conductivity	umhos/cm	G-08D1	10/14/2020		460.0000		548.9315
Dissolved antimony	mg/L	G-08D1	10/14/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-08D1	10/14/2020		0.0019		0.0035
Dissolved barium	mg/L	G-08D1	10/14/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-08D1	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D1	10/14/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-08D1	10/14/2020		0.7200		23.8179
Dissolved chromium	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-08D1	10/14/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-08D1	10/14/2020	ND	0.0500		9.8243
Dissolved lead	mg/L	G-08D1	10/14/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-08D1	10/14/2020	ND	0.2000		51.3609
Dissolved manganese	mg/L	G-08D1	10/14/2020	ND	0.0050		6.4627
Dissolved nickel	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-08D1	10/14/2020	ND	0.5000		2.6321
Dissolved selenium	mg/L	G-08D1	10/14/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-08D1	10/14/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-08D1	10/14/2020		110.0000		121.6395
Dissolved thallium	mg/L	G-08D1	10/14/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D1	10/14/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-08D1	10/14/2020		0.4700		1.3000
Nitrite nitrogen	mg-N/L	G-08D1	10/14/2020		0.0030		0.0210
pH	std units	G-08D1	10/14/2020		9.6700	***	6.00 - 9.39
Sulfate	mg/L	G-08D1	10/14/2020		49.1000		338.8047
Total dissolved solids	mg/L	G-08D1	10/14/2020		300.0000		397.5917
Total organic carbon	mg/L	G-08D1	10/14/2020		1.3000		14.0000
Alkalinity (as caco3)	mg/L	G-09S	01/12/2021		360.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-09S	01/12/2021	ND	0.0200		12.5375
Bicarbonate	mg/L	G-09S	01/12/2021		360.0000	***	200.0000
Chemical oxygen demand	mg/L	G-09S	01/12/2021	ND	10.0000		16.0000
Chloride	mg/L	G-09S	01/12/2021		3.9600		18.3000
Conductivity	umhos/cm	G-09S	01/12/2021		980.0000	***	548.9315
Dissolved antimony	mg/L	G-09S	01/12/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-09S	01/12/2021		0.0006		0.0035
Dissolved barium	mg/L	G-09S	01/12/2021	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-09S	01/12/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09S	01/12/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-09S	01/12/2021		79.7000	***	23.8179
Dissolved chromium	mg/L	G-09S	01/12/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-09S	01/12/2021	ND	0.0100		0.0030
Dissolved copper	mg/L	G-09S	01/12/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-09S	01/12/2021	ND	0.0200		9.8243
Dissolved lead	mg/L	G-09S	01/12/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-09S	01/12/2021		31.4000		51.3609
Dissolved manganese	mg/L	G-09S	01/12/2021		0.0540		6.4627
Dissolved nickel	mg/L	G-09S	01/12/2021		0.0200		0.0380
Dissolved potassium	mg/L	G-09S	01/12/2021		4.8200	***	2.6321
Dissolved selenium	mg/L	G-09S	01/12/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-09S	01/12/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-09S	01/12/2021		88.5000		121.6395
Dissolved thallium	mg/L	G-09S	01/12/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-09S	01/12/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09S	01/12/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-09S	01/12/2021		0.0240		1.3000
Nitrite nitrogen	mg-N/L	G-09S	01/12/2021	ND	0.0020		0.0210
pH	std units	G-09S	01/12/2021		6.4300		6.00 - 9.39
Sulfate	mg/L	G-09S	01/12/2021		187.0000		338.8047
Total dissolved solids	mg/L	G-09S	01/12/2021		680.0000	***	397.5917
Total organic carbon	mg/L	G-09S	01/12/2021		5.1000		14.0000
Alkalinity (as caco3)	mg/L	G-10S	01/12/2021		480.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-10S	01/12/2021		0.2740		12.5375

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-10S	01/12/2021		480.0000	***	200.0000
Chemical oxygen demand	mg/L	G-10S	01/12/2021	ND	10.0000		16.0000
Chloride	mg/L	G-10S	01/12/2021		10.6000		18.3000
Conductivity	umhos/cm	G-10S	01/12/2021		1400.0000	***	548.9315
Dissolved antimony	mg/L	G-10S	01/12/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-10S	01/12/2021		0.0050	***	0.0035
Dissolved barium	mg/L	G-10S	01/12/2021		0.0053		3.7002
Dissolved beryllium	mg/L	G-10S	01/12/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10S	01/12/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-10S	01/12/2021		104.0000	***	23.8179
Dissolved chromium	mg/L	G-10S	01/12/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-10S	01/12/2021	ND	0.0100		0.0030
Dissolved copper	mg/L	G-10S	01/12/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-10S	01/12/2021		9.4400		9.8243
Dissolved lead	mg/L	G-10S	01/12/2021		0.0002		0.0027
Dissolved magnesium	mg/L	G-10S	01/12/2021		24.7000		51.3609
Dissolved manganese	mg/L	G-10S	01/12/2021		3.2200		6.4627
Dissolved nickel	mg/L	G-10S	01/12/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-10S	01/12/2021		3.6900	***	2.6321
Dissolved selenium	mg/L	G-10S	01/12/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-10S	01/12/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-10S	01/12/2021		181.0000	***	121.6395
Dissolved thallium	mg/L	G-10S	01/12/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-10S	01/12/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10S	01/12/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-10S	01/12/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-10S	01/12/2021	ND	0.0020		0.0210
pH	std units	G-10S	01/12/2021		6.7000		6.00 - 9.39
Sulfate	mg/L	G-10S	01/12/2021		294.0000		338.8047
Total dissolved solids	mg/L	G-10S	01/12/2021		970.0000	***	397.5917
Total organic carbon	mg/L	G-10S	01/12/2021		4.6000		14.0000
Alkalinity (as caco3)	mg/L	G-11S	10/14/2020		80.0000		230.0000
Ammonia nitrogen	mg-N/L	G-11S	10/14/2020		0.0360		12.5375
Bicarbonate	mg/L	G-11S	10/14/2020		80.0000		200.0000
Chemical oxygen demand	mg/L	G-11S	10/14/2020	ND	10.0000		16.0000
Chloride	mg/L	G-11S	10/14/2020		5.2900		18.3000
Conductivity	umhos/cm	G-11S	10/14/2020		250.0000		548.9315
Dissolved antimony	mg/L	G-11S	10/14/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-11S	10/14/2020		0.0005		0.0035
Dissolved barium	mg/L	G-11S	10/14/2020	ND	0.0050		3.7002
Dissolved beryllium	mg/L	G-11S	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-11S	10/14/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-11S	10/14/2020		11.5000		23.8179
Dissolved chromium	mg/L	G-11S	10/14/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-11S	10/14/2020	ND	0.0100		0.0030
Dissolved copper	mg/L	G-11S	10/14/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-11S	10/14/2020	ND	0.0500		9.8243
Dissolved lead	mg/L	G-11S	10/14/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-11S	10/14/2020		2.5800		51.3609
Dissolved manganese	mg/L	G-11S	10/14/2020		0.0440		6.4627
Dissolved nickel	mg/L	G-11S	10/14/2020	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-11S	10/14/2020		1.0600		2.6321
Dissolved selenium	mg/L	G-11S	10/14/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-11S	10/14/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-11S	10/14/2020		41.0000		121.6395
Dissolved thallium	mg/L	G-11S	10/14/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-11S	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-11S	10/14/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-11S	10/14/2020	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-11S	10/14/2020	ND	0.0020		0.0210
pH	std units	G-11S	10/14/2020		6.7300		6.00 - 9.39
Sulfate	mg/L	G-11S	10/14/2020		29.0000		338.8047
Total dissolved solids	mg/L	G-11S	10/14/2020		160.0000		397.5917

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Total organic carbon	mg/L	G-11S	10/14/2020		3.2000		14.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	69	69					230.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	41	69	-2.2960	2.0106	0.0100	2.3996	12.5375	lognor		
Bicarbonate	mg/L	69	69					200.0000	nonpar		0.99
Chemical oxygen demand	mg/L	10	69					16.0000	nonpar		0.99
Chloride	mg/L	68	69					18.3000	nonpar		0.99
Conductivity	umhos/cm	68	68	418.3824	54.3787	0.0100	2.4007	548.9315	normal		
Dissolved antimony	mg/L	32	67					0.0006	nonpar		0.99
Dissolved arsenic	mg/L	69	69					0.0035	nonpar		0.99
Dissolved barium	mg/L	54	68	-4.6000	2.4611	0.0100	2.4007	3.7002	lognor		
Dissolved beryllium	mg/L	0	65					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	30	69					0.0010	nonpar		0.99
Dissolved calcium	mg/L	67	67	7.1127	6.9550	0.0100	2.4019	23.8179	normal		
Dissolved chromium	mg/L	26	69					0.0150	nonpar		0.99
Dissolved cobalt	mg/L	4	69					0.0030	nonpar		0.99
Dissolved copper	mg/L	36	68					0.1150	nonpar		0.99
Dissolved iron	mg/L	48	69	-1.9861	1.7798	0.0100	2.3996	9.8243	lognor		
Dissolved lead	mg/L	33	69					0.0027	nonpar		0.99
Dissolved magnesium	mg/L	58	68	-0.1479	1.7023	0.0100	2.4007	51.3609	lognor		
Dissolved manganese	mg/L	52	69	-3.9782	2.4355	0.0100	2.3996	6.4627	lognor		
Dissolved nickel	mg/L	20	69					0.0380	nonpar		0.99
Dissolved potassium	mg/L	63	68	-0.6160	0.6597	0.0100	2.4007	2.6321	lognor		
Dissolved selenium	mg/L	1	65					0.0003	nonpar		0.99
Dissolved silver	mg/L	3	66					0.0002	nonpar		0.99
Dissolved sodium	mg/L	69	69	89.8551	13.2456	0.0100	2.3996	121.6395	normal		
Dissolved thallium	mg/L	3	69					0.0000	nonpar		0.99
Dissolved vanadium	mg/L	0	69					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	31	69					0.0300	nonpar		0.99
Nitrate nitrogen	mg-N/L	65	69					1.3000	nonpar		0.99
Nitrite nitrogen	mg-N/L	39	69					0.0210	nonpar		0.99
pH	std units	70	70					6.00- 9.39	nonpar		0.99
Sulfate	mg/L	68	68	3.8047	0.8417	0.0100	2.4007	338.8047	lognor		
Total dissolved solids	mg/L	69	69	279.8551	49.0646	0.0100	2.3996	397.5917	normal		
Total organic carbon	mg/L	63	69					14.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Groundwater Analytical Summary - Shallow Wells: Second Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																										Upgradient Wells									
						G-01A					G-04A					G-08D1					G-09S					G-10S					G-11S					G-14S					G-24S				
						4/21/21	D	V	Tr	Ch		D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																											
Alkalinity (as CaCO3)	nonpar	71	71	230	--	32					Not sampled - insufficient water					160					340		V	I	N	480		V	I	N	72			D	Y	200					120				
Ammonia Nitrogen	lognor	71	42	12.5265	--	0.02	U									0.11					0.02	U				0.295			I	N	0.02	U				0.031					0.02	U			
Bicarbonate	nonpar	71	71	200	--	32										13					340		V	I	N	480		V	I	N	72			D	Y	140					120				
Calcium, Dissolved	normal	68	68	23.7546	--	10.2										0.66			I	N	63.2		V	D	N	91.8		V	D	N	7.64			I	N	0.2	U				10.2			D	N
Chemical Oxygen Demand	nonpar	71	11	18	--	10	U									12					24		E			18					10	U				10	U				18				
Chloride	nonpar	71	70	18.3	250	0.28										2.86			D	N	3.66			D	N	10.7				Y	2.12					2.15			D	N	5.12			D	N
Conductivity (umhos/cm)	normal	70	70	546.7776	700	120										410					950		V		Y	1400		V			190			D	N	400					420				
Magnesium, Dissolved	lognor	70	60	50.1666	--	2.85										0.18					24.2			D	N	22.0			D	N	1.85			I	N	0.16					3.08			D	N
Nitrate Nitrogen (mg-N/L)	nonpar	71	66	1.3	10	0.10										0.01	U				0.01	U				0.01	U				0.01	U				0.01	U		D	N	0.097				
Nitrite Nitrogen (mg-N/L)	nonpar	71	39	0.021	1	0.002	U									0.003				Y	0.002	U				0.002	U				0.002	U				0.002	U				0.002	U			
pH (std units)	nonpar	70	70	6.00-9.39	6.5-8.5	6.34			I	Y						9.59		V			6.42			I	N	6.62					6.85					9.25			I	N	7.34				
Potassium, Dissolved	lognor	70	64	2.6282	--	0.58										0.2	U			Y	4.51		V	D	N	3.34		V			0.76					0.2	U				0.67				
Sodium, Dissolved	normal	71	71	121.1148	20	4.21										103					79.0					193		V			30.9			D	N	83.5					78.9				
Sulfate	lognor	70	70	339.0862	250	26.5										46.1					188			D	N	298			D	N	25.6			D	N	11.9				Y	79.1			D	Y
Total Dissolved Solids	normal	71	71	395.6869	500	78										280					660		V	D	N	970		V			140					250					280				
Total Organic Carbon	nonpar	71	65	14	--	2.9										0.5	U				13.0			I	Y	9.3					2.7					1.9					0.57				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																											
Antimony	nonpar	69	32	0.0006	0.006	0.0003	U				Not sampled - insufficient water					0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	normal	71	71	0.004	0.00005	0.00015										0.00088					0.00075					0.00564		E			0.000495					0.00352			I	N	0.000624				
Barium	lognor	70	54	5.1339	1	0.005	U									0.005	U				0.005	U				0.0083					0.005	U				0.005	U				0.005	U			Y
Beryllium	nonpar	65	0	0.0005	0.004	0.005	U									0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	nonpar	71	30	0.001	0.005	0.00005	U									0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	nonpar	71	26	0.015	0.05	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	nonpar	71	4	0.003	--	0.01	U									0.01	U				0.01	U				0.013		E			0.011		E			0.01	U				0.01	U			
Copper	nonpar	70	36	0.115	1	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Iron	lognor	71	49	9.783	0.3	0.027										0.02	U			Y	0.02					10.3		E			0.02	U				0.063					0.02	U			
Lead	nonpar	71	34	0.0027	0.05	0.000487										0.0001	U				0.000286					0.0001	U				0.0001	U				0.000219					0.0001	U			
Manganese	lognor	71	52	8.2026	0.05	0.005	U									0.005	U				0.02					3.41			D	N	0.038			I	N	0.005	U			Y	0.005	U			
Nickel	nonpar	71	20	0.038	0.1	0.01	U									0.01	U				0.019					0.01	U				0.01	U				0.01	U				0.01	U			
Selenium	nonpar	67	1	0.0003	0.01	0.0005	U									0.0005	U				0.0005	U			Y	0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	nonpar	68	3	0.0002	0.05	0.0001	U									0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	nonpar	71	3	0.00009	0.002	0.00005	U									0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Vanadium	nonpar	71	0	0.01	--	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc	nonpar	71	31	0.03	5	0.012										0.01	U				0.01					0.01	U				0.01	U				0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)																																											
Antimony	--	--	--	--	0.006	0.0003	U				Not sampled - insufficient water					0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	--	--	--	--	0.00005	0.000167										0.000473					0.000848					0.0048					0.000381					0.00231					0.000779				
Barium	--	--	--	--	1	0.005	U									0.0121					0.005	U				0.005	U				0.005	U				0.027					0.0175				
Beryllium	--	--	--	--	0.004	0.005	U									0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	--	--	--	--	0.005	0.00005	U									0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00043				
Chromium	--	--	--	--	0.05	0.01	U									0.01	U				0.012					0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	--	--	--	--	--	0.01	U									0.01	U				0.01	U				0.01					0.01	U				0.01	U				0.01	U			
Copper	--	--	--	--	1	0.01	U									0.01	U				0.011					0.01	U				0.01	U				0.01	U				0.011				
Iron	--	--	--	--	0.3	0.044										2.39					1.45					9.78					0.03	U				4.4					0.375				
Lead	--	--	--	--	0.05	0.0001	U									0.000147					0.00114					0.0001	U				0.0001	U				0.000352					0.000159				
Manganese	--	--	--	--	0.05	0.005	U									0.0428					0.101					3.22					0.0442					0.134					0.0462				
Nickel	--	--	--	--	0.1	0.01	U									0.01	U				0.015					0.01	U				0.01	U				0.01	U				0.01	U			
Selenium	--	--	--	--	0.01	0.0005	U									0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	--	--	--	--	0.05	0.0001	U									0.0001	U				0.00438					0.0001	U				0.0001	U				0.0001	U				0.00018				
Thallium	--	--	--	--	0.002	0.0001	U									0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Vanadium	--	--	--	--	--	0.02	U									0.02	U				0.02	U				0.043					0.02	U				0.02	U				0.02	U			
Zinc	--	--	--	--	5	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.0142					0.01	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																											
1,1,1-Trichloroethane	--	--	--	--	200	1	U				Not sampled - insufficient water					1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2,2-Tetrachloroethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2-Trichloroethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
1,1-Dichloroethane	--	--	--	--	1	1	U									1	U				1	U				1	U				1	U				1	U				1	U			

Groundwater Analytical Summary - Shallow Wells: Second Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																										Upgradient Wells									
						G-01A					G-04A					G-08D1					G-09S					G-10S					G-11S					G-14S					G-24S				
						4/21/21	D	V	Tr	Ch		D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																											
1,1-Dichloroethylene	--	--	--	--	--	1	U				Not sampled - insufficient water					1	U				1	U				1	U				1	U				1	U				1	U			
1,2,3-Trichloropropane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dibromo-3-chloropropane	--	--	--	--	0.2	0.05	U									0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U			
1,2-Dibromoethane	--	--	--	--	0.001	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dichlorobenzene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dichloroethane	--	--	--	--	0.5	0.03	U									0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
1,2-Dichloropropane	--	--	--	--	0.6	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
1,4-Dichlorobenzene	--	--	--	--	4	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
2-Butanone	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
2-Hexanone	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
4-Methyl-2-Pentanone (MIBK)	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
Acetone	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
Acrylonitrile	--	--	--	--	0.07	0.03	U									0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Benzene	--	--	--	--	1	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Bromodichloromethane	--	--	--	--	0.3	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Bromoform	--	--	--	--	5	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Bromomethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Disulfide	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Tetrachloride	--	--	--	--	0.3	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Chlorobenzene	--	--	--	--	--	0.03	U									0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Chlorodibromomethane	--	--	--	--	0.5	0.5	U									0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
Chloroethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Chloroform	--	--	--	--	7	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Chloromethane	--	--	--	--	--	2	U									2	U				2	U				2	U				2	U				2	U				2	U			
cis-1,2-Dichloroethene	--	--	--	--	--	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
cis-1,3-Dichloropropene	--	--	--	--	0.2	0.03	U									0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Dibromomethane	--	--	--	--	--	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Ethyl Benzene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
m,p-Xylene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Methyl Iodide	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Methylene Chloride	--	--	--	--	5	2.0	U									2.0	U				2.0	U				2.0	U				2.0	U				2.0	U				2.0	U			
o-Xylene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Styrene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Tetrachloroethylene	--	--	--	--	0.8	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Toluene	--	--	--	--	--	2	U									2	U				2	U				2	U				2	U				2	U				2	U			
trans-1,2-Dichloroethene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,3-Dichloropropene	--	--	--	--	0.2	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
trans-1,4-Dichloro-2-butene	--	--	--	--	--	2	U									2	U				2	U				2	U				2	U				2	U				2	U			
Trichlorethene (1,1,2-Trichloro	--	--	--	--	3	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Trichlorofluoromethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Vinyl Acetate	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
Vinyl Chloride	--	--	--	--	0.02	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in **purple** exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits or WAC 246-290, whichever is more protective of groundwater quality.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01A	04/21/2021		32.0000		230.0000
Ammonia nitrogen	mg-N/L	G-01A	04/21/2021	ND	0.0200		12.5265
Bicarbonate	mg/L	G-01A	04/21/2021		32.0000		200.0000
Chemical oxygen demand	mg/L	G-01A	04/21/2021	ND	10.0000		18.0000
Chloride	mg/L	G-01A	04/21/2021		0.2800		18.3000
Conductivity	umhos/cm	G-01A	04/21/2021		120.0000		546.7776
Dissolved antimony	mg/L	G-01A	04/21/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-01A	04/21/2021		0.0001		0.0040
Dissolved barium	mg/L	G-01A	04/21/2021	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-01A	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01A	04/21/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-01A	04/21/2021		10.2000		23.7546
Dissolved chromium	mg/L	G-01A	04/21/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-01A	04/21/2021	ND	0.0100		0.0030
Dissolved copper	mg/L	G-01A	04/21/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-01A	04/21/2021		0.0270		9.7830
Dissolved lead	mg/L	G-01A	04/21/2021		0.0005		0.0027
Dissolved magnesium	mg/L	G-01A	04/21/2021		2.8500		50.1666
Dissolved manganese	mg/L	G-01A	04/21/2021	ND	0.0050		8.2026
Dissolved nickel	mg/L	G-01A	04/21/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-01A	04/21/2021		0.5800		2.6282
Dissolved selenium	mg/L	G-01A	04/21/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-01A	04/21/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-01A	04/21/2021		4.2100		121.1148
Dissolved thallium	mg/L	G-01A	04/21/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-01A	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01A	04/21/2021		0.0120		0.0300
Nitrate nitrogen	mg-N/L	G-01A	04/21/2021		0.1000		1.3000
Nitrite nitrogen	mg-N/L	G-01A	04/21/2021	ND	0.0020		0.0210
pH	std units	G-01A	04/21/2021		6.3400		6.00 - 9.39
Sulfate	mg/L	G-01A	04/21/2021		26.5000		339.0862
Total dissolved solids	mg/L	G-01A	04/21/2021		78.0000		395.6869
Total organic carbon	mg/L	G-01A	04/21/2021		2.9000		14.0000
Alkalinity (as caco3)	mg/L	G-04A	10/15/2020		230.0000		230.0000
Ammonia nitrogen	mg-N/L	G-04A	10/15/2020		0.1910		12.5265
Bicarbonate	mg/L	G-04A	10/15/2020		230.0000	*	200.0000
Chemical oxygen demand	mg/L	G-04A	10/15/2020	ND	10.0000	**	18.0000
Chloride	mg/L	G-04A	10/15/2020		5.5100		18.3000
Conductivity	umhos/cm	G-04A	10/15/2020		510.0000		546.7776
Dissolved antimony	mg/L	G-04A	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-04A	10/15/2020		0.0108	***	0.0040
Dissolved barium	mg/L	G-04A	10/15/2020	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-04A	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-04A	10/15/2020		46.5000	***	23.7546
Dissolved chromium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-04A	10/15/2020		0.0110	***	0.0030
Dissolved copper	mg/L	G-04A	10/15/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-04A	10/15/2020		16.9000	***	9.7830
Dissolved lead	mg/L	G-04A	10/15/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-04A	10/15/2020		27.1000		50.1666
Dissolved manganese	mg/L	G-04A	10/15/2020		6.8300		8.2026
Dissolved nickel	mg/L	G-04A	10/15/2020		0.0120		0.0380
Dissolved potassium	mg/L	G-04A	10/15/2020		2.4200		2.6282
Dissolved selenium	mg/L	G-04A	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-04A	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-04A	10/15/2020		14.4000		121.1148
Dissolved thallium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-04A	10/15/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0020		0.0210
pH	std units	G-04A	10/15/2020		6.7100		6.00 - 9.39
Sulfate	mg/L	G-04A	10/15/2020		32.3000		339.0862
Total dissolved solids	mg/L	G-04A	10/15/2020		330.0000		395.6869
Total organic carbon	mg/L	G-04A	10/15/2020		8.6000	**	14.0000
Alkalinity (as caco3)	mg/L	G-08D1	04/20/2021		160.0000		230.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-08D1	04/20/2021		0.1100		12.5265
Bicarbonate	mg/L	G-08D1	04/20/2021		13.0000		200.0000
Chemical oxygen demand	mg/L	G-08D1	04/20/2021		12.0000		18.0000
Chloride	mg/L	G-08D1	04/20/2021		2.8600		18.3000
Conductivity	umhos/cm	G-08D1	04/20/2021		410.0000		546.7776
Dissolved antimony	mg/L	G-08D1	04/20/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-08D1	04/20/2021		0.0009		0.0040
Dissolved barium	mg/L	G-08D1	04/20/2021	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-08D1	04/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D1	04/20/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-08D1	04/20/2021		0.6600		23.7546
Dissolved chromium	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0030
Dissolved copper	mg/L	G-08D1	04/20/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-08D1	04/20/2021	ND	0.0200		9.7830
Dissolved lead	mg/L	G-08D1	04/20/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-08D1	04/20/2021		0.1800		50.1666
Dissolved manganese	mg/L	G-08D1	04/20/2021	ND	0.0050		8.2026
Dissolved nickel	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-08D1	04/20/2021	ND	0.2000		2.6282
Dissolved selenium	mg/L	G-08D1	04/20/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-08D1	04/20/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-08D1	04/20/2021		103.0000		121.1148
Dissolved thallium	mg/L	G-08D1	04/20/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-08D1	04/20/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-08D1	04/20/2021		0.0030		0.0210
pH	std units	G-08D1	04/20/2021		9.5900	***	6.00 - 9.39
Sulfate	mg/L	G-08D1	04/20/2021		46.1000		339.0862
Total dissolved solids	mg/L	G-08D1	04/20/2021		280.0000		395.6869
Total organic carbon	mg/L	G-08D1	04/20/2021	ND	0.5000		14.0000
Alkalinity (as caco3)	mg/L	G-09S	04/20/2021		340.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-09S	04/20/2021	ND	0.0200		12.5265
Bicarbonate	mg/L	G-09S	04/20/2021		340.0000	***	200.0000
Chemical oxygen demand	mg/L	G-09S	04/20/2021		24.0000	*	18.0000
Chloride	mg/L	G-09S	04/20/2021		3.6600		18.3000
Conductivity	umhos/cm	G-09S	04/20/2021		950.0000	***	546.7776
Dissolved antimony	mg/L	G-09S	04/20/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-09S	04/20/2021		0.0008		0.0040
Dissolved barium	mg/L	G-09S	04/20/2021	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-09S	04/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09S	04/20/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-09S	04/20/2021		63.2000	***	23.7546
Dissolved chromium	mg/L	G-09S	04/20/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-09S	04/20/2021	ND	0.0100		0.0030
Dissolved copper	mg/L	G-09S	04/20/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-09S	04/20/2021		0.0200		9.7830
Dissolved lead	mg/L	G-09S	04/20/2021		0.0003		0.0027
Dissolved magnesium	mg/L	G-09S	04/20/2021		24.2000		50.1666
Dissolved manganese	mg/L	G-09S	04/20/2021		0.0200		8.2026
Dissolved nickel	mg/L	G-09S	04/20/2021		0.0190		0.0380
Dissolved potassium	mg/L	G-09S	04/20/2021		4.5100	***	2.6282
Dissolved selenium	mg/L	G-09S	04/20/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-09S	04/20/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-09S	04/20/2021		79.0000		121.1148
Dissolved thallium	mg/L	G-09S	04/20/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-09S	04/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09S	04/20/2021		0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-09S	04/20/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-09S	04/20/2021	ND	0.0020		0.0210
pH	std units	G-09S	04/20/2021		6.4200		6.00 - 9.39
Sulfate	mg/L	G-09S	04/20/2021		188.0000		339.0862
Total dissolved solids	mg/L	G-09S	04/20/2021		660.0000	***	395.6869
Total organic carbon	mg/L	G-09S	04/20/2021		13.0000		14.0000
Alkalinity (as caco3)	mg/L	G-10S	04/20/2021		480.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-10S	04/20/2021		0.2950		12.5265

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-10S	04/20/2021		480.0000	***	200.0000
Chemical oxygen demand	mg/L	G-10S	04/20/2021		18.0000		18.0000
Chloride	mg/L	G-10S	04/20/2021		10.7000		18.3000
Conductivity	umhos/cm	G-10S	04/20/2021		1400.0000	***	546.7776
Dissolved antimony	mg/L	G-10S	04/20/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-10S	04/20/2021		0.0056	*	0.0040
Dissolved barium	mg/L	G-10S	04/20/2021		0.0083		5.1339
Dissolved beryllium	mg/L	G-10S	04/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10S	04/20/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-10S	04/20/2021		91.8000	***	23.7546
Dissolved chromium	mg/L	G-10S	04/20/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-10S	04/20/2021		0.0130	*	0.0030
Dissolved copper	mg/L	G-10S	04/20/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-10S	04/20/2021		10.3000	*	9.7830
Dissolved lead	mg/L	G-10S	04/20/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-10S	04/20/2021		22.0000		50.1666
Dissolved manganese	mg/L	G-10S	04/20/2021		3.4100		8.2026
Dissolved nickel	mg/L	G-10S	04/20/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-10S	04/20/2021		3.3400	***	2.6282
Dissolved selenium	mg/L	G-10S	04/20/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-10S	04/20/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-10S	04/20/2021		193.0000	***	121.1148
Dissolved thallium	mg/L	G-10S	04/20/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-10S	04/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10S	04/20/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-10S	04/20/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-10S	04/20/2021	ND	0.0020		0.0210
pH	std units	G-10S	04/20/2021		6.6200		6.00 - 9.39
Sulfate	mg/L	G-10S	04/20/2021		298.0000		339.0862
Total dissolved solids	mg/L	G-10S	04/20/2021		970.0000	***	395.6869
Total organic carbon	mg/L	G-10S	04/20/2021		9.3000		14.0000
Alkalinity (as caco3)	mg/L	G-11S	04/21/2021		72.0000		230.0000
Ammonia nitrogen	mg-N/L	G-11S	04/21/2021	ND	0.0200		12.5265
Bicarbonate	mg/L	G-11S	04/21/2021		72.0000		200.0000
Chemical oxygen demand	mg/L	G-11S	04/21/2021	ND	10.0000		18.0000
Chloride	mg/L	G-11S	04/21/2021		2.1200		18.3000
Conductivity	umhos/cm	G-11S	04/21/2021		190.0000		546.7776
Dissolved antimony	mg/L	G-11S	04/21/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-11S	04/21/2021		0.0005		0.0040
Dissolved barium	mg/L	G-11S	04/21/2021	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-11S	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-11S	04/21/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-11S	04/21/2021		7.6400		23.7546
Dissolved chromium	mg/L	G-11S	04/21/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-11S	04/21/2021		0.0110	*	0.0030
Dissolved copper	mg/L	G-11S	04/21/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-11S	04/21/2021	ND	0.0200		9.7830
Dissolved lead	mg/L	G-11S	04/21/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-11S	04/21/2021		1.8500		50.1666
Dissolved manganese	mg/L	G-11S	04/21/2021		0.0380		8.2026
Dissolved nickel	mg/L	G-11S	04/21/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-11S	04/21/2021		0.7600		2.6282
Dissolved selenium	mg/L	G-11S	04/21/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-11S	04/21/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-11S	04/21/2021		30.9000		121.1148
Dissolved thallium	mg/L	G-11S	04/21/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-11S	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-11S	04/21/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-11S	04/21/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-11S	04/21/2021	ND	0.0020		0.0210
pH	std units	G-11S	04/21/2021		6.8500		6.00 - 9.39
Sulfate	mg/L	G-11S	04/21/2021		25.6000		339.0862
Total dissolved solids	mg/L	G-11S	04/21/2021		140.0000		395.6869

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Total organic carbon	mg/L	G-11S	04/21/2021		2.7000		14.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	71	71					230.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	42	71	-2.2802	2.0054	0.0100	2.3975	12.5265	lognor		
Bicarbonate	mg/L	71	71					200.0000	nonpar		0.99
Chemical oxygen demand	mg/L	11	71					18.0000	nonpar		0.99
Chloride	mg/L	70	71					18.3000	nonpar		0.99
Conductivity	umhos/cm	70	70	418.1429	53.6303	0.0100	2.3985	546.7776	normal		
Dissolved antimony	mg/L	32	69					0.0006	nonpar		0.99
Dissolved arsenic	mg/L	71	71	0.0015	0.0010	0.0100	2.3975	0.0040	normal		
Dissolved barium	mg/L	54	70	-4.4686	2.5451	0.0100	2.3985	5.1339	lognor		
Dissolved beryllium	mg/L	0	65					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	30	71					0.0010	nonpar		0.99
Dissolved calcium	mg/L	68	68	7.1581	6.9131	0.0100	2.4007	23.7546	normal		
Dissolved chromium	mg/L	26	71					0.0150	nonpar		0.99
Dissolved cobalt	mg/L	4	71					0.0030	nonpar		0.99
Dissolved copper	mg/L	36	70					0.1150	nonpar		0.99
Dissolved iron	mg/L	49	71	-1.9691	1.7726	0.0100	2.3975	9.7830	lognor		
Dissolved lead	mg/L	34	71					0.0027	nonpar		0.99
Dissolved magnesium	mg/L	60	70	-0.1538	1.6965	0.0100	2.3985	50.1666	lognor		
Dissolved manganese	mg/L	52	71	-3.8661	2.4903	0.0100	2.3975	8.2026	lognor		
Dissolved nickel	mg/L	20	71					0.0380	nonpar		0.99
Dissolved potassium	mg/L	64	70	-0.6041	0.6547	0.0100	2.3985	2.6282	lognor		
Dissolved selenium	mg/L	1	67					0.0003	nonpar		0.99
Dissolved silver	mg/L	3	68					0.0002	nonpar		0.99
Dissolved sodium	mg/L	71	71	89.6113	13.1402	0.0100	2.3975	121.1148	normal		
Dissolved thallium	mg/L	3	71					0.0000	nonpar		0.99
Dissolved vanadium	mg/L	0	71					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	31	71					0.0300	nonpar		0.99
Nitrate nitrogen	mg-N/L	66	71					1.3000	nonpar		0.99
Nitrite nitrogen	mg-N/L	39	71					0.0210	nonpar		0.99
pH	std units	72	72					6.00- 9.39	nonpar		0.99
Sulfate	mg/L	70	70	3.7938	0.8474	0.0100	2.3985	339.0862	lognor		
Total dissolved solids	mg/L	71	71	279.4366	48.4882	0.0100	2.3975	395.6869	normal		
Total organic carbon	mg/L	65	71					14.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Groundwater Analytical Summary - Shallow Wells: Third Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09S					G-10S				
						7/14/21	D	V	Tr	Ch	7/14/21	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)															
Alkalinity (as CaCO3)	nonpar	71	71	230	--	350			I	N	480			I	N
Ammonia Nitrogen	lognor	71	42	12.5265	--	0.02	U				0.296			I	N
Bicarbonate	nonpar	71	71	200	--	350			I	N	480			I	N
Calcium, Dissolved	normal	68	68	23.7546	--	78.4			D	N	105			D	N
Chemical Oxygen Demand	nonpar	71	11	18	--	10	U				10	U			
Chloride	nonpar	71	70	18.3	250	4.62			D	N	10.4			D	N
Conductivity (umhos/cm)	normal	70	70	546.7776	700	970			D	N	1400				
Magnesium, Dissolved	lognor	70	60	50.1666	--	30.4			D	N	25.2			D	N
Nitrate Nitrogen (mg-N/L)	nonpar	71	66	1.3	10	0.010	U				0.01	U			
Nitrite Nitrogen (mg-N/L)	nonpar	71	39	0.021	1	0.006					0.022				
pH (std units)	nonpar	72	72	6.00-9.39	6.5-8.5	6.15			I	N	6.51				
Potassium, Dissolved	lognor	70	64	2.6282	--	4.96			D	N	3.64				
Sodium, Dissolved	normal	71	71	121.1148	20	90.4					183				
Sulfate	lognor	70	70	339.0862	250	178			D	N	271			D	N
Total Dissolved Solids	normal	71	71	395.6869	500	640			D	N	960			D	Y
Total Organic Carbon	nonpar	71	65	14	--	11			I	Y	10				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony	nonpar	69	32	0.0006	0.006	0.0003	U				0.0003	U			
Arsenic	normal	71	71	0.004	0.00005	0.000774					0.00573				
Barium	lognor	70	54	5.1339	1	0.0051					0.0088				
Beryllium	nonpar	65	0	0.0005	0.004	0.005	U				0.005	U			
Cadmium	nonpar	71	30	0.001	0.005	0.00005	U				0.00005	U			
Chromium	nonpar	71	26	0.015	0.05	0.01	U				0.01	U			
Cobalt	nonpar	71	4	0.003	--	0.01	U				0.01	U			
Copper	nonpar	70	36	0.115	1	0.02	U				0.02	U			
Iron	lognor	71	49	9.783	0.3	0.02	U				10.2				
Lead	nonpar	71	34	0.0027	0.05	0.0001	U				0.0001	U			
Manganese	lognor	71	52	8.2026	0.05	0.027					3.35			D	N
Nickel	nonpar	71	20	0.038	0.1	0.05					0.03				
Selenium	nonpar	67	1	0.0003	0.01	0.0005	U			Y	0.0005	U			
Silver	nonpar	68	3	0.0002	0.05	0.0001	U				0.0001	U			
Thallium	nonpar	71	3	0.00009	0.002	0.00382					0.00005	U			
Vanadium	nonpar	71	0	0.01	--	0.01	U				0.01	U			
Zinc	nonpar	71	31	0.03	5	0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony					0.006	0.0003	U				0.0003	U			
Arsenic					0.00005	0.00057					0.00487				
Barium					1	0.0068					0.0058				
Beryllium					0.004	0.005	U				0.005	U			
Cadmium					0.005	0.00005	U				0.00005	U			
Chromium					0.05	0.01	U				0.0103				
Cobalt					--	0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U			
Iron					0.3	0.465					10.2				
Lead					0.05	0.00129					0.0001	U			
Manganese					0.05	0.134					3.28				
Nickel					0.1	0.067					0.037				
Selenium					0.01	0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U			
Vanadium					--	0.02	U				0.02	U			
Zinc					5	0.01	U				0.01	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260/8260 SIM (µg/L)															
1,1,1-Trichloroethane					200	1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U			
1,1-Dichloroethylene					--	1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	0.05	U				0.05	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U			

Groundwater Analytical Summary - Shallow Wells: Third Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09S					G-10S				
						7/14/21	D	V	Tr	Ch	7/14/21	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260/8260 SIM (µg/L) (cont.)															
1,2-Dichloroethane					**0.5**	0.03	U				0.03	U			
1,2-Dichloropropane					**0.6**	0.02	U				0.02	U			
1,4-Dichlorobenzene					**4**	1	U				1	U			
2-Butanone					**--**	5	U				5	U			
2-Hexanone					**--**	5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					**--**	5	U				5	U			
Acetone					**--**	5	U				5	U			
Acrylonitrile					**0.07**	0.03	U				0.03	U			
Benzene					**1**	1	U				1	U			
Bromodichloromethane					**0.3**	0.02	U				0.02	U			
Bromoform					**5**	1	U				1	U			
Bromomethane					**--**	1	U				1	U			
Carbon Disulfide					**--**	1	U				1	U			
Carbon Tetrachloride					**0.3**	0.02	U				0.02	U			
Chlorobenzene					**--**	0.03	U				0.03	U			
Chlorodibromomethane					**0.5**	0.5	U				0.5	U			
Chloroethane					**--**	1	U				1	U			
Chloroform					**7**	1	U				1	U			
Chloromethane					**--**	2	U				2	U			
cis-1,2-Dichloroethene					**--**	0.02	U				**0.11**				
cis-1,3-Dichloropropene					**0.2**	0.03	U				0.03	U			
Dibromomethane					**--**	0.02	U				0.02	U			
Ethyl Benzene					**--**	1	U				1	U			
m,p-Xylene					**--**	1	U				1	U			
Methyl Iodide					**--**	1	U				1	U			
Methylene Chloride					**5**	2	U				2	U			
o-Xylene					**--**	1	U				1	U			
Styrene					**--**	1	U				1	U			
Tetrachloroethylene					**0.8**	0.02	U				0.02	U			
Toluene					**--**	2	U				2	U			
trans-1,2-Dichloroethene					**--**	1	U				1	U			
trans-1,3-Dichloropropene					**0.2**	0.02	U				0.02	U			
trans-1,4-Dichloro-2-butene					**--**	5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					**3**	1	U				1	U			
Trichlorofluoromethane					**--**	1	U				1	U			
Vinyl Acetate					**--**	5	U				5	U			
Vinyl Chloride					**0.02**	0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in **purple** exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards - the most restrictive of the two is used.

B = Methylene chloride was measured in the lab blank at a similar concentration - contamination during analysis suspected.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01A	04/21/2021		32.0000		230.0000
Ammonia nitrogen	mg-N/L	G-01A	04/21/2021	ND	0.0200		12.5265
Bicarbonate	mg/L	G-01A	04/21/2021		32.0000		200.0000
Chemical oxygen demand	mg/L	G-01A	04/21/2021	ND	10.0000		18.0000
Chloride	mg/L	G-01A	04/21/2021		0.2800		18.3000
Conductivity	umhos/cm	G-01A	04/21/2021		120.0000		546.7776
Dissolved antimony	mg/L	G-01A	04/21/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-01A	04/21/2021		0.0001		0.0040
Dissolved barium	mg/L	G-01A	04/21/2021	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-01A	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01A	04/21/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-01A	04/21/2021		10.2000		23.7546
Dissolved chromium	mg/L	G-01A	04/21/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-01A	04/21/2021	ND	0.0100		0.0030
Dissolved copper	mg/L	G-01A	04/21/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-01A	04/21/2021		0.0270		9.7830
Dissolved lead	mg/L	G-01A	04/21/2021		0.0005		0.0027
Dissolved magnesium	mg/L	G-01A	04/21/2021		2.8500		50.1666
Dissolved manganese	mg/L	G-01A	04/21/2021	ND	0.0050		8.2026
Dissolved nickel	mg/L	G-01A	04/21/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-01A	04/21/2021		0.5800		2.6282
Dissolved selenium	mg/L	G-01A	04/21/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-01A	04/21/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-01A	04/21/2021		4.2100		121.1148
Dissolved thallium	mg/L	G-01A	04/21/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-01A	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01A	04/21/2021		0.0120		0.0300
Nitrate nitrogen	mg-N/L	G-01A	04/21/2021		0.1000		1.3000
Nitrite nitrogen	mg-N/L	G-01A	04/21/2021	ND	0.0020		0.0210
pH	std units	G-01A	04/21/2021		6.3400		6.00 - 9.39
Sulfate	mg/L	G-01A	04/21/2021		26.5000		339.0862
Total dissolved solids	mg/L	G-01A	04/21/2021		78.0000		395.6869
Total organic carbon	mg/L	G-01A	04/21/2021		2.9000		14.0000
Alkalinity (as caco3)	mg/L	G-04A	10/15/2020		230.0000		230.0000
Ammonia nitrogen	mg-N/L	G-04A	10/15/2020		0.1910		12.5265
Bicarbonate	mg/L	G-04A	10/15/2020		230.0000	*	200.0000
Chemical oxygen demand	mg/L	G-04A	10/15/2020	ND	10.0000	**	18.0000
Chloride	mg/L	G-04A	10/15/2020		5.5100		18.3000
Conductivity	umhos/cm	G-04A	10/15/2020		510.0000		546.7776
Dissolved antimony	mg/L	G-04A	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-04A	10/15/2020		0.0108	***	0.0040
Dissolved barium	mg/L	G-04A	10/15/2020	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-04A	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-04A	10/15/2020		46.5000	***	23.7546
Dissolved chromium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-04A	10/15/2020		0.0110	***	0.0030
Dissolved copper	mg/L	G-04A	10/15/2020	ND	0.0100		0.1150
Dissolved iron	mg/L	G-04A	10/15/2020		16.9000	***	9.7830
Dissolved lead	mg/L	G-04A	10/15/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-04A	10/15/2020		27.1000		50.1666
Dissolved manganese	mg/L	G-04A	10/15/2020		6.8300		8.2026
Dissolved nickel	mg/L	G-04A	10/15/2020		0.0120		0.0380
Dissolved potassium	mg/L	G-04A	10/15/2020		2.4200		2.6282
Dissolved selenium	mg/L	G-04A	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-04A	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-04A	10/15/2020		14.4000		121.1148
Dissolved thallium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-04A	10/15/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0020		0.0210
pH	std units	G-04A	10/15/2020		6.7100		6.00 - 9.39
Sulfate	mg/L	G-04A	10/15/2020		32.3000		339.0862
Total dissolved solids	mg/L	G-04A	10/15/2020		330.0000		395.6869
Total organic carbon	mg/L	G-04A	10/15/2020		8.6000	**	14.0000
Alkalinity (as caco3)	mg/L	G-08D1	04/20/2021		160.0000		230.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-08D1	04/20/2021		0.1100		12.5265
Bicarbonate	mg/L	G-08D1	04/20/2021		13.0000		200.0000
Chemical oxygen demand	mg/L	G-08D1	04/20/2021		12.0000		18.0000
Chloride	mg/L	G-08D1	04/20/2021		2.8600		18.3000
Conductivity	umhos/cm	G-08D1	04/20/2021		410.0000		546.7776
Dissolved antimony	mg/L	G-08D1	04/20/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-08D1	04/20/2021		0.0009		0.0040
Dissolved barium	mg/L	G-08D1	04/20/2021	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-08D1	04/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D1	04/20/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-08D1	04/20/2021		0.6600		23.7546
Dissolved chromium	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0030
Dissolved copper	mg/L	G-08D1	04/20/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-08D1	04/20/2021	ND	0.0200		9.7830
Dissolved lead	mg/L	G-08D1	04/20/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-08D1	04/20/2021		0.1800		50.1666
Dissolved manganese	mg/L	G-08D1	04/20/2021	ND	0.0050		8.2026
Dissolved nickel	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-08D1	04/20/2021	ND	0.2000		2.6282
Dissolved selenium	mg/L	G-08D1	04/20/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-08D1	04/20/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-08D1	04/20/2021		103.0000		121.1148
Dissolved thallium	mg/L	G-08D1	04/20/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D1	04/20/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-08D1	04/20/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-08D1	04/20/2021		0.0030		0.0210
pH	std units	G-08D1	04/20/2021		9.5900	***	6.00 - 9.39
Sulfate	mg/L	G-08D1	04/20/2021		46.1000		339.0862
Total dissolved solids	mg/L	G-08D1	04/20/2021		280.0000		395.6869
Total organic carbon	mg/L	G-08D1	04/20/2021	ND	0.5000		14.0000
Alkalinity (as caco3)	mg/L	G-09S	07/14/2021		350.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-09S	07/14/2021	ND	0.0200		12.5265
Bicarbonate	mg/L	G-09S	07/14/2021		350.0000	***	200.0000
Chemical oxygen demand	mg/L	G-09S	07/14/2021	ND	10.0000	**	18.0000
Chloride	mg/L	G-09S	07/14/2021		4.6200		18.3000
Conductivity	umhos/cm	G-09S	07/14/2021		970.0000	***	546.7776
Dissolved antimony	mg/L	G-09S	07/14/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-09S	07/14/2021		0.0008		0.0040
Dissolved barium	mg/L	G-09S	07/14/2021		0.0051		5.1339
Dissolved beryllium	mg/L	G-09S	07/14/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09S	07/14/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-09S	07/14/2021		78.4000	***	23.7546
Dissolved chromium	mg/L	G-09S	07/14/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-09S	07/14/2021	ND	0.0100		0.0030
Dissolved copper	mg/L	G-09S	07/14/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-09S	07/14/2021	ND	0.0200		9.7830
Dissolved lead	mg/L	G-09S	07/14/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-09S	07/14/2021		30.4000		50.1666
Dissolved manganese	mg/L	G-09S	07/14/2021		0.0270		8.2026
Dissolved nickel	mg/L	G-09S	07/14/2021		0.0500	*	0.0380
Dissolved potassium	mg/L	G-09S	07/14/2021		4.9600	***	2.6282
Dissolved selenium	mg/L	G-09S	07/14/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-09S	07/14/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-09S	07/14/2021		90.4000		121.1148
Dissolved thallium	mg/L	G-09S	07/14/2021		0.0038	*	0.0000
Dissolved vanadium	mg/L	G-09S	07/14/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09S	07/14/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-09S	07/14/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-09S	07/14/2021		0.0060		0.0210
pH	std units	G-09S	07/14/2021	ND	0.1000		6.00 - 9.39
Sulfate	mg/L	G-09S	07/14/2021		178.0000		339.0862
Total dissolved solids	mg/L	G-09S	07/14/2021		640.0000	***	395.6869
Total organic carbon	mg/L	G-09S	07/14/2021		11.0000		14.0000
Alkalinity (as caco3)	mg/L	G-10S	07/14/2021		485.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-10S	07/14/2021		0.2880		12.5265

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-10S	07/14/2021		485.0000	***	200.0000
Chemical oxygen demand	mg/L	G-10S	07/14/2021	ND	10.0000		18.0000
Chloride	mg/L	G-10S	07/14/2021		10.2500		18.3000
Conductivity	umhos/cm	G-10S	07/14/2021		1400.0000	***	546.7776
Dissolved antimony	mg/L	G-10S	07/14/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-10S	07/14/2021		0.0057	***	0.0040
Dissolved barium	mg/L	G-10S	07/14/2021		0.0091		5.1339
Dissolved beryllium	mg/L	G-10S	07/14/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10S	07/14/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-10S	07/14/2021		106.0000	***	23.7546
Dissolved chromium	mg/L	G-10S	07/14/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-10S	07/14/2021	ND	0.0100	**	0.0030
Dissolved copper	mg/L	G-10S	07/14/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-10S	07/14/2021		10.2000	*	9.7830
Dissolved lead	mg/L	G-10S	07/14/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-10S	07/14/2021		25.3000		50.1666
Dissolved manganese	mg/L	G-10S	07/14/2021		3.3650		8.2026
Dissolved nickel	mg/L	G-10S	07/14/2021		0.0300		0.0380
Dissolved potassium	mg/L	G-10S	07/14/2021		3.7250	***	2.6282
Dissolved selenium	mg/L	G-10S	07/14/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-10S	07/14/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-10S	07/14/2021		187.0000	***	121.1148
Dissolved thallium	mg/L	G-10S	07/14/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-10S	07/14/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10S	07/14/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-10S	07/14/2021		0.0115		1.3000
Nitrite nitrogen	mg-N/L	G-10S	07/14/2021		0.0200		0.0210
pH	std units	G-10S	07/14/2021	ND	0.1000		6.00 - 9.39
Sulfate	mg/L	G-10S	07/14/2021		273.5000		339.0862
Total dissolved solids	mg/L	G-10S	07/14/2021		935.0000	***	395.6869
Total organic carbon	mg/L	G-10S	07/14/2021		10.0000		14.0000
Alkalinity (as caco3)	mg/L	G-11S	04/21/2021		72.0000		230.0000
Ammonia nitrogen	mg-N/L	G-11S	04/21/2021	ND	0.0200		12.5265
Bicarbonate	mg/L	G-11S	04/21/2021		72.0000		200.0000
Chemical oxygen demand	mg/L	G-11S	04/21/2021	ND	10.0000		18.0000
Chloride	mg/L	G-11S	04/21/2021		2.1200		18.3000
Conductivity	umhos/cm	G-11S	04/21/2021		190.0000		546.7776
Dissolved antimony	mg/L	G-11S	04/21/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-11S	04/21/2021		0.0005		0.0040
Dissolved barium	mg/L	G-11S	04/21/2021	ND	0.0050		5.1339
Dissolved beryllium	mg/L	G-11S	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-11S	04/21/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-11S	04/21/2021		7.6400		23.7546
Dissolved chromium	mg/L	G-11S	04/21/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-11S	04/21/2021		0.0110	*	0.0030
Dissolved copper	mg/L	G-11S	04/21/2021	ND	0.0200		0.1150
Dissolved iron	mg/L	G-11S	04/21/2021	ND	0.0200		9.7830
Dissolved lead	mg/L	G-11S	04/21/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-11S	04/21/2021		1.8500		50.1666
Dissolved manganese	mg/L	G-11S	04/21/2021		0.0380		8.2026
Dissolved nickel	mg/L	G-11S	04/21/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-11S	04/21/2021		0.7600		2.6282
Dissolved selenium	mg/L	G-11S	04/21/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-11S	04/21/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-11S	04/21/2021		30.9000		121.1148
Dissolved thallium	mg/L	G-11S	04/21/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-11S	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-11S	04/21/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-11S	04/21/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-11S	04/21/2021	ND	0.0020		0.0210
pH	std units	G-11S	04/21/2021		6.8500		6.00 - 9.39
Sulfate	mg/L	G-11S	04/21/2021		25.6000		339.0862
Total dissolved solids	mg/L	G-11S	04/21/2021		140.0000		395.6869

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Total organic carbon	mg/L	G-11S	04/21/2021		2.7000		14.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	71	71					230.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	42	71	-2.2802	2.0054	0.0100	2.3975	12.5265	lognor		
Bicarbonate	mg/L	71	71					200.0000	nonpar		0.99
Chemical oxygen demand	mg/L	11	71					18.0000	nonpar		0.99
Chloride	mg/L	70	71					18.3000	nonpar		0.99
Conductivity	umhos/cm	70	70	418.1429	53.6303	0.0100	2.3985	546.7776	normal		
Dissolved antimony	mg/L	32	69					0.0006	nonpar		0.99
Dissolved arsenic	mg/L	71	71	0.0015	0.0010	0.0100	2.3975	0.0040	normal		
Dissolved barium	mg/L	54	70	-4.4686	2.5451	0.0100	2.3985	5.1339	lognor		
Dissolved beryllium	mg/L	0	65					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	30	71					0.0010	nonpar		0.99
Dissolved calcium	mg/L	68	68	7.1581	6.9131	0.0100	2.4007	23.7546	normal		
Dissolved chromium	mg/L	26	71					0.0150	nonpar		0.99
Dissolved cobalt	mg/L	4	71					0.0030	nonpar		0.99
Dissolved copper	mg/L	36	70					0.1150	nonpar		0.99
Dissolved iron	mg/L	49	71	-1.9691	1.7726	0.0100	2.3975	9.7830	lognor		
Dissolved lead	mg/L	34	71					0.0027	nonpar		0.99
Dissolved magnesium	mg/L	60	70	-0.1538	1.6965	0.0100	2.3985	50.1666	lognor		
Dissolved manganese	mg/L	52	71	-3.8661	2.4903	0.0100	2.3975	8.2026	lognor		
Dissolved nickel	mg/L	20	71					0.0380	nonpar		0.99
Dissolved potassium	mg/L	64	70	-0.6041	0.6547	0.0100	2.3985	2.6282	lognor		
Dissolved selenium	mg/L	1	67					0.0003	nonpar		0.99
Dissolved silver	mg/L	3	68					0.0002	nonpar		0.99
Dissolved sodium	mg/L	71	71	89.6113	13.1402	0.0100	2.3975	121.1148	normal		
Dissolved thallium	mg/L	3	71					0.0000	nonpar		0.99
Dissolved vanadium	mg/L	0	71					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	31	71					0.0300	nonpar		0.99
Nitrate nitrogen	mg-N/L	66	71					1.3000	nonpar		0.99
Nitrite nitrogen	mg-N/L	39	71					0.0210	nonpar		0.99
pH	std units	72	72					6.00- 9.39	nonpar		0.99
Sulfate	mg/L	70	70	3.7938	0.8474	0.0100	2.3985	339.0862	lognor		
Total dissolved solids	mg/L	71	71	279.4366	48.4882	0.0100	2.3975	395.6869	normal		
Total organic carbon	mg/L	65	71					14.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Groundwater Analytical Summary - Shallow Wells: Fourth Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																												Upgradient Wells									
						G-01A					G-04A					G-08D1					G-09S					G-10S					G-11S					G-14S					G-24S				
						10/19/21	D	V	Tr	Ch		D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																											
Alkalinity (as CaCO3)	nonpar	69	69	230	--	35					Not sampled - insufficient water					160					350		V	I	N	520		V	I	N	84				Y	210					130				
Ammonia Nitrogen	lognor	69	40	12.5265	--	0.02	U									0.129					0.02	U				0.279			I	N	0.02	U				0.032					0.02	U			
Bicarbonate	nonpar	69	69	200	--	35										160					350		V	I	N	520		V	I	N	84				Y	210					130				
Calcium, Dissolved	normal	66	66	23.7546	--	19.0										0.67				Y	88.1		V	D	N	116.0		V	D	N	14.5			I	N	0.64					8.42			D	N
Chemical Oxygen Demand	nonpar	69	10	18	--	10	U									10	U				10	U				10	U				10	U				10	U				10	U			
Chloride	lognor	69	68	18.3	250	4.68										2.98			D	N	4.36			D	N	10.5			D	Y	6.11					2.20			D	N	4.85			D	N
Conductivity (umhos/cm)	normal	68	68	546.7776	700	190										450					920		V	D	Y	1300					270			D	N	420					430				
Magnesium, Dissolved	lognor	68	58	50.1666	--	5.07										0.05	U				33.3			D	N	27.2			D	N	2.99			I	N	0.05	U				2.45			D	N
Nitrate Nitrogen (mg-N/L)	nonpar	69	63	1.3	10	1.0										0.16					0.01	U				0.05					0.046					0.01	U		D	N	0.034				
Nitrite Nitrogen (mg-N/L)	lognor	68	36	0.021	1	0.002	U									0.035					0.003					0.007					0.002	U				0.073					0.012				
pH (std units)	nonpar	70	70	6.00-9.39	6.5-8.5	5.58		V		Y						9.14		P			6.06			I	N	6.37					6.26					8.48			I	N	6.75				
Potassium, Dissolved	lognor	68	61	2.6282	--	1.49										0.31					5.19		V	D	N	3.9		V			1.17					0.2	U				0.75				
Sodium, Dissolved	normal	69	69	121.1148	20	7.11										104					94.4					186		V			42.9			D	N	107.0					97.0				
Sulfate	lognor	68	68	339.0862	250	42.4										49.1					185			D	N	260			D	N	41.2			D	N	13.5			D	Y	78.4			D	N
Total Dissolved Solids	normal	69	69	395.6869	500	120										250					600		V	D	Y	860		V	D	Y	180					260					280				
Total Organic Carbon	nonpar	69	64	14	--	4.0										0.55					4.0				Y	3.7					2.1					0.94					2.1				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																											
Antimony	nonpar	67	28	0.0006	0.006	0.0003	U				Not sampled - insufficient water					0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	nonpar	69	69	0.004	0.00005	0.000173										0.00161					0.000549					0.00501		V			0.000319					0.00285			I	N	0.000552				
Barium	lognor	68	51	5.1339	1	0.005	U									0.005	U				0.0065					0.0072					0.005	U				0.005	U				0.005	U			
Beryllium	nonpar	69	0	0.0005	0.004	0.005	U									0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	nonpar	68	27	0.001	0.005	0.00005	U									0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	nonpar	69	24	0.015	0.05	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	nonpar	69	4	0.003	--	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U	P			0.01	U				0.01	U			
Copper	lognor	68	34	0.115	1	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Iron	lognor	69	47	9.783	0.3	0.023										0.02	U		I	Y	0.02	U				12.2		V			0.02	U				0.02	U				0.02	U			
Lead	nonpar	69	30	0.0027	0.05	0.0001	U									0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Manganese	lognor	69	50	8.2026	0.05	0.005	U									0.005	U				0.02					3.52			D	N	0.056			I	N	0.005	U		I	Y	0.013				
Nickel	nonpar	69	19	0.038	0.1	0.01	U									0.01	U				0.036		P			0.022					0.01	U				0.01	U				0.016				
Selenium	nonpar	65	1	0.0003	0.01	0.0005	U									0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	nonpar	67	2	0.0002	0.05	0.0001	U									0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	nonpar	69	3	0.00009	0.002	0.00005	U									0.00005	U				0.00005	U	P			0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Vanadium	nonpar	69	0	0.01	--	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc	nonpar	69	30	0.03	5	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)																																											
Antimony	--	--	--	--	0.006	0.0003	U				Not sampled - insufficient water					0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	--	--	--	--	0.00005	0.000313										0.000926					0.000932					0.00713					0.000459					0.0064					0.000865				
Barium	--	--	--	--	1	0.005	U									0.0105					0.0068					0.0056					0.005	U				0.116					0.0081				
Beryllium	--	--	--	--	0.004	0.005	U									0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	--	--	--	--	0.005	0.00005	U									0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.000228					0.00005	U			
Chromium	--	--	--	--	0.05	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.0374					0.01	U			
Cobalt	--	--	--	--	--	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper	--	--	--	--	1	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.035					0.015				
Iron	--	--	--	--	0.3	0.469										2.23					0.777					13.0					0.052					20.3					0.76				
Lead	--	--	--	--	0.05	0.000105										0.000532					0.00102					0.0001	U				0.0001	U				0.00388					0.000642				
Manganese	--	--	--	--	0.05	0.0092										0.0402					0.103					3.8					0.288					0.487					0.0563				
Nickel	--	--	--	--	0.1	0.01	U									0.01	U				0.022					0.01	U				0.01	U				0.046					0.016				
Selenium	--	--	--	--	0.01	0.0005	U									0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	--	--	--	--	0.05	0.0001	U									0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	--	--	--	--	0.002	0.0001	U									0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Vanadium	--	--	--	--	--	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.032					0.02	U			
Zinc	--	--	--	--	5	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.0662					0.01	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																											
1,1,1-Trichloroethane	--	--	--	--	200	1	U				Not sampled - insufficient water					1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2,2-Tetrachloroethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2-Trichloroethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
1,1-Dichloroethane	--	--	--	--	1	1	U									1	U				1	U				1	U				1	U				1	U				1	U			

Groundwater Analytical Summary - Shallow Wells: Fourth Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																										Upgradient Wells									
						G-01A					G-04A					G-08D1					G-09S					G-10S					G-11S					G-14S					G-24S				
						10/19/21	D	V	Tr	Ch		D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																											
1,1-Dichloroethylene	--	--	--	--	--	1	U				Not sampled - insufficient water					1	U				1	U				1	U				1	U				1	U				1	U			
1,2,3-Trichloropropane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dibromo-3-chloropropane	--	--	--	--	0.2	0.05	U									0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U			
1,2-Dibromoethane	--	--	--	--	0.001	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dichlorobenzene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dichloroethane	--	--	--	--	0.5	0.03	U									0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
1,2-Dichloropropane	--	--	--	--	0.6	0.02	U									0.02	U				**0.11**					0.02	U				0.02	U				0.02	U				0.02	U			
1,4-Dichlorobenzene	--	--	--	--	4	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
2-Butanone	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
2-Hexanone	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
4-Methyl-2-Pentanone (MIBK)	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
Acetone	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
Acrylonitrile	--	--	--	--	0.07	0.03	U									0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Benzene	--	--	--	--	1	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Bromodichloromethane	--	--	--	--	0.3	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Bromoform	--	--	--	--	5	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Bromomethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Disulfide	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Tetrachloride	--	--	--	--	0.3	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Chlorobenzene	--	--	--	--	--	0.03	U									0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Chlorodibromomethane	--	--	--	--	0.5	0.5	U									0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
Chloroethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Chloroform	--	--	--	--	7	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Chloromethane	--	--	--	--	--	2	U									2	U				2	U				2	U				2	U				2	U				2	U			
cis-1,2-Dichloroethene	--	--	--	--	--	0.02	U									0.02	U				**0.11**					**0.16**					0.02	U				0.02	U				0.02	U			
cis-1,3-Dichloropropene	--	--	--	--	0.2	0.03	U									0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Dibromomethane	--	--	--	--	--	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Ethyl Benzene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
m,p-Xylene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Methyl Iodide	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Methylene Chloride	--	--	--	--	5	2.0	U									2.0	U				2.0	U				2.0	U				2.0	U				2.0	U				2.0	U			
o-Xylene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Styrene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Tetrachloroethylene	--	--	--	--	0.8	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Toluene	--	--	--	--	--	2	U									2	U				2	U				2	U				2	U				2	U				2	U			
trans-1,2-Dichloroethene	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,3-Dichloropropene	--	--	--	--	0.2	0.02	U									0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
trans-1,4-Dichloro-2-butene	--	--	--	--	--	2	U									2	U				2	U				2	U				2	U				2	U				2	U			
Trichlorethene (1,1,2-Trichloro	--	--	--	--	3	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Trichlorofluoromethane	--	--	--	--	--	1	U									1	U				1	U				1	U				1	U				1	U				1	U			
Vinyl Acetate	--	--	--	--	--	5	U									5	U				5	U				5	U				5	U				5	U				5	U			
Vinyl Chloride	--	--	--	--	0.02	0.01	U									0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in **purple** exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits or WAC 246-290, whichever is more protective of groundwater quality.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01A	10/19/2021		35.0000		230.0000
Ammonia nitrogen	mg-N/L	G-01A	10/19/2021	ND	0.0200		13.2976
Bicarbonate	mg/L	G-01A	10/19/2021		35.0000		210.0000
Chemical oxygen demand	mg/L	G-01A	10/19/2021	ND	10.0000		18.0000
Chloride	mg/L	G-01A	10/19/2021		4.6800		18.3725
Conductivity	umhos/cm	G-01A	10/19/2021		190.0000		543.3391
Dissolved antimony	mg/L	G-01A	10/19/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-01A	10/19/2021		0.0002		0.0035
Dissolved barium	mg/L	G-01A	10/19/2021	ND	0.0050		6.9450
Dissolved beryllium	mg/L	G-01A	10/19/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01A	10/19/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-01A	10/19/2021		19.0000		23.6663
Dissolved chromium	mg/L	G-01A	10/19/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-01A	10/19/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-01A	10/19/2021	ND	0.0200		46.2274
Dissolved iron	mg/L	G-01A	10/19/2021		0.0230		9.9951
Dissolved lead	mg/L	G-01A	10/19/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-01A	10/19/2021		5.0700		47.7851
Dissolved manganese	mg/L	G-01A	10/19/2021	ND	0.0050		8.9972
Dissolved nickel	mg/L	G-01A	10/19/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-01A	10/19/2021		1.4900		2.6292
Dissolved selenium	mg/L	G-01A	10/19/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-01A	10/19/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-01A	10/19/2021		7.1100		119.9159
Dissolved thallium	mg/L	G-01A	10/19/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-01A	10/19/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01A	10/19/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-01A	10/19/2021		1.0000		1.3000
Nitrite nitrogen	mg-N/L	G-01A	10/19/2021	ND	0.0020		47.6219
pH	std units	G-01A	10/19/2021		5.5800	***	6.60 - 9.39
Sulfate	mg/L	G-01A	10/19/2021		42.4000		346.8839
Total dissolved solids	mg/L	G-01A	10/19/2021		120.0000		391.0438
Total organic carbon	mg/L	G-01A	10/19/2021		4.0000		14.0000
Alkalinity (as caco3)	mg/L	G-04A	10/15/2020		230.0000		230.0000
Ammonia nitrogen	mg-N/L	G-04A	10/15/2020		0.1910		13.2976
Bicarbonate	mg/L	G-04A	10/15/2020		230.0000	*	210.0000
Chemical oxygen demand	mg/L	G-04A	10/15/2020	ND	10.0000	**	18.0000
Chloride	mg/L	G-04A	10/15/2020		5.5100		18.3725
Conductivity	umhos/cm	G-04A	10/15/2020		510.0000		543.3391
Dissolved antimony	mg/L	G-04A	10/15/2020	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-04A	10/15/2020		0.0108	***	0.0035
Dissolved barium	mg/L	G-04A	10/15/2020	ND	0.0050		6.9450
Dissolved beryllium	mg/L	G-04A	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-04A	10/15/2020		46.5000	***	23.6663
Dissolved chromium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-04A	10/15/2020		0.0110	***	0.0050
Dissolved copper	mg/L	G-04A	10/15/2020	ND	0.0100		46.2274
Dissolved iron	mg/L	G-04A	10/15/2020		16.9000	***	9.9951
Dissolved lead	mg/L	G-04A	10/15/2020	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-04A	10/15/2020		27.1000		47.7851
Dissolved manganese	mg/L	G-04A	10/15/2020		6.8300		8.9972
Dissolved nickel	mg/L	G-04A	10/15/2020		0.0120		0.0380
Dissolved potassium	mg/L	G-04A	10/15/2020		2.4200		2.6292
Dissolved selenium	mg/L	G-04A	10/15/2020	ND	0.0005		0.0003
Dissolved silver	mg/L	G-04A	10/15/2020	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-04A	10/15/2020		14.4000		119.9159
Dissolved thallium	mg/L	G-04A	10/15/2020	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-04A	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-04A	10/15/2020	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-04A	10/15/2020	ND	0.0020		47.6219
pH	std units	G-04A	10/15/2020		6.7100	**	6.60 - 9.39
Sulfate	mg/L	G-04A	10/15/2020		32.3000		346.8839
Total dissolved solids	mg/L	G-04A	10/15/2020		330.0000		391.0438
Total organic carbon	mg/L	G-04A	10/15/2020		8.6000	**	14.0000
Alkalinity (as caco3)	mg/L	G-08D1	10/19/2021		160.0000		230.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-08D1	10/19/2021		0.1290		13.2976
Bicarbonate	mg/L	G-08D1	10/19/2021		160.0000		210.0000
Chemical oxygen demand	mg/L	G-08D1	10/19/2021	ND	10.0000		18.0000
Chloride	mg/L	G-08D1	10/19/2021		2.9800		18.3725
Conductivity	umhos/cm	G-08D1	10/19/2021		450.0000		543.3391
Dissolved antimony	mg/L	G-08D1	10/19/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-08D1	10/19/2021		0.0016		0.0035
Dissolved barium	mg/L	G-08D1	10/19/2021	ND	0.0050		6.9450
Dissolved beryllium	mg/L	G-08D1	10/19/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D1	10/19/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-08D1	10/19/2021		0.6700		23.6663
Dissolved chromium	mg/L	G-08D1	10/19/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-08D1	10/19/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-08D1	10/19/2021	ND	0.0200		46.2274
Dissolved iron	mg/L	G-08D1	10/19/2021	ND	0.0200		9.9951
Dissolved lead	mg/L	G-08D1	10/19/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-08D1	10/19/2021	ND	0.0500		47.7851
Dissolved manganese	mg/L	G-08D1	10/19/2021	ND	0.0050		8.9972
Dissolved nickel	mg/L	G-08D1	10/19/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-08D1	10/19/2021		0.3100		2.6292
Dissolved selenium	mg/L	G-08D1	10/19/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-08D1	10/19/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-08D1	10/19/2021		104.0000		119.9159
Dissolved thallium	mg/L	G-08D1	10/19/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-08D1	10/19/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D1	10/19/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-08D1	10/19/2021		0.1600		1.3000
Nitrite nitrogen	mg-N/L	G-08D1	10/19/2021		0.0350		47.6219
pH	std units	G-08D1	10/19/2021		9.1400	**	6.60 - 9.39
Sulfate	mg/L	G-08D1	10/19/2021		49.1000		346.8839
Total dissolved solids	mg/L	G-08D1	10/19/2021		250.0000		391.0438
Total organic carbon	mg/L	G-08D1	10/19/2021		0.5500		14.0000
Alkalinity (as caco3)	mg/L	G-09S	10/20/2021		350.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-09S	10/20/2021	ND	0.0200		13.2976
Bicarbonate	mg/L	G-09S	10/20/2021		350.0000	***	210.0000
Chemical oxygen demand	mg/L	G-09S	10/20/2021	ND	10.0000		18.0000
Chloride	mg/L	G-09S	10/20/2021		4.3600		18.3725
Conductivity	umhos/cm	G-09S	10/20/2021		920.0000	***	543.3391
Dissolved antimony	mg/L	G-09S	10/20/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-09S	10/20/2021		0.0005		0.0035
Dissolved barium	mg/L	G-09S	10/20/2021		0.0065		6.9450
Dissolved beryllium	mg/L	G-09S	10/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09S	10/20/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-09S	10/20/2021		88.1000	***	23.6663
Dissolved chromium	mg/L	G-09S	10/20/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-09S	10/20/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-09S	10/20/2021	ND	0.0200		46.2274
Dissolved iron	mg/L	G-09S	10/20/2021	ND	0.0200		9.9951
Dissolved lead	mg/L	G-09S	10/20/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-09S	10/20/2021		33.3000		47.7851
Dissolved manganese	mg/L	G-09S	10/20/2021		0.0200		8.9972
Dissolved nickel	mg/L	G-09S	10/20/2021		0.0360	**	0.0380
Dissolved potassium	mg/L	G-09S	10/20/2021		5.1900	***	2.6292
Dissolved selenium	mg/L	G-09S	10/20/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-09S	10/20/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-09S	10/20/2021		94.4000		119.9159
Dissolved thallium	mg/L	G-09S	10/20/2021	ND	0.0001	**	0.0000
Dissolved vanadium	mg/L	G-09S	10/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09S	10/20/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-09S	10/20/2021	ND	0.0100		1.3000
Nitrite nitrogen	mg-N/L	G-09S	10/20/2021		0.0030		47.6219
pH	std units	G-09S	10/20/2021		6.0600	*	6.60 - 9.39
Sulfate	mg/L	G-09S	10/20/2021		185.0000		346.8839
Total dissolved solids	mg/L	G-09S	10/20/2021		600.0000	***	391.0438
Total organic carbon	mg/L	G-09S	10/20/2021		4.0000		14.0000
Alkalinity (as caco3)	mg/L	G-10S	10/20/2021		520.0000	***	230.0000
Ammonia nitrogen	mg-N/L	G-10S	10/20/2021		0.2790		13.2976

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-10S	10/20/2021		520.0000	***	210.0000
Chemical oxygen demand	mg/L	G-10S	10/20/2021	ND	10.0000		18.0000
Chloride	mg/L	G-10S	10/20/2021		10.5000		18.3725
Conductivity	umhos/cm	G-10S	10/20/2021		1300.0000	***	543.3391
Dissolved antimony	mg/L	G-10S	10/20/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-10S	10/20/2021		0.0050	***	0.0035
Dissolved barium	mg/L	G-10S	10/20/2021		0.0072		6.9450
Dissolved beryllium	mg/L	G-10S	10/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10S	10/20/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-10S	10/20/2021		116.0000	***	23.6663
Dissolved chromium	mg/L	G-10S	10/20/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-10S	10/20/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-10S	10/20/2021	ND	0.0200		46.2274
Dissolved iron	mg/L	G-10S	10/20/2021		12.2000	***	9.9951
Dissolved lead	mg/L	G-10S	10/20/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-10S	10/20/2021		27.2000		47.7851
Dissolved manganese	mg/L	G-10S	10/20/2021		3.5200		8.9972
Dissolved nickel	mg/L	G-10S	10/20/2021		0.0220		0.0380
Dissolved potassium	mg/L	G-10S	10/20/2021		3.9000	***	2.6292
Dissolved selenium	mg/L	G-10S	10/20/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-10S	10/20/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-10S	10/20/2021		186.0000	***	119.9159
Dissolved thallium	mg/L	G-10S	10/20/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-10S	10/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10S	10/20/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-10S	10/20/2021		0.0500		1.3000
Nitrite nitrogen	mg-N/L	G-10S	10/20/2021		0.0070		47.6219
pH	std units	G-10S	10/20/2021		6.3700	*	6.60 - 9.39
Sulfate	mg/L	G-10S	10/20/2021		260.0000		346.8839
Total dissolved solids	mg/L	G-10S	10/20/2021		860.0000	***	391.0438
Total organic carbon	mg/L	G-10S	10/20/2021		3.7000		14.0000
Alkalinity (as caco3)	mg/L	G-11S	10/19/2021		84.0000		230.0000
Ammonia nitrogen	mg-N/L	G-11S	10/19/2021	ND	0.0200		13.2976
Bicarbonate	mg/L	G-11S	10/19/2021		84.0000		210.0000
Chemical oxygen demand	mg/L	G-11S	10/19/2021	ND	10.0000		18.0000
Chloride	mg/L	G-11S	10/19/2021		6.1100		18.3725
Conductivity	umhos/cm	G-11S	10/19/2021		270.0000		543.3391
Dissolved antimony	mg/L	G-11S	10/19/2021	ND	0.0003		0.0006
Dissolved arsenic	mg/L	G-11S	10/19/2021		0.0003		0.0035
Dissolved barium	mg/L	G-11S	10/19/2021	ND	0.0050		6.9450
Dissolved beryllium	mg/L	G-11S	10/19/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-11S	10/19/2021	ND	0.0001		0.0010
Dissolved calcium	mg/L	G-11S	10/19/2021		14.5000		23.6663
Dissolved chromium	mg/L	G-11S	10/19/2021	ND	0.0100		0.0150
Dissolved cobalt	mg/L	G-11S	10/19/2021	ND	0.0100	**	0.0050
Dissolved copper	mg/L	G-11S	10/19/2021	ND	0.0200		46.2274
Dissolved iron	mg/L	G-11S	10/19/2021	ND	0.0200		9.9951
Dissolved lead	mg/L	G-11S	10/19/2021	ND	0.0001		0.0027
Dissolved magnesium	mg/L	G-11S	10/19/2021		2.9900		47.7851
Dissolved manganese	mg/L	G-11S	10/19/2021		0.0560		8.9972
Dissolved nickel	mg/L	G-11S	10/19/2021	ND	0.0100		0.0380
Dissolved potassium	mg/L	G-11S	10/19/2021		1.1700		2.6292
Dissolved selenium	mg/L	G-11S	10/19/2021	ND	0.0005		0.0003
Dissolved silver	mg/L	G-11S	10/19/2021	ND	0.0001		0.0002
Dissolved sodium	mg/L	G-11S	10/19/2021		42.9000		119.9159
Dissolved thallium	mg/L	G-11S	10/19/2021	ND	0.0001		0.0000
Dissolved vanadium	mg/L	G-11S	10/19/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-11S	10/19/2021	ND	0.0100		0.0300
Nitrate nitrogen	mg-N/L	G-11S	10/19/2021		0.0460		1.3000
Nitrite nitrogen	mg-N/L	G-11S	10/19/2021	ND	0.0020		47.6219
pH	std units	G-11S	10/19/2021		6.2600	*	6.60 - 9.39
Sulfate	mg/L	G-11S	10/19/2021		41.2000		346.8839
Total dissolved solids	mg/L	G-11S	10/19/2021		180.0000		391.0438

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Total organic carbon	mg/L	G-11S	10/19/2021		2.1000		14.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	69	69					230.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	40	69	-2.2437	2.0133	0.0100	2.3996	13.2976	lognor		
Bicarbonate	mg/L	69	69					210.0000	nonpar		0.99
Chemical oxygen demand	mg/L	10	69					18.0000	nonpar		0.99
Chloride	mg/L	68	69	1.4340	0.6154	0.0100	2.3996	18.3725	lognor		
Conductivity	umhos/cm	68	68	415.8824	53.0906	0.0100	2.4007	543.3391	normal		
Dissolved antimony	mg/L	28	67					0.0006	nonpar		0.99
Dissolved arsenic	mg/L	69	69					0.0035	nonpar		0.99
Dissolved barium	mg/L	51	68	-4.3626	2.6245	0.0100	2.4007	6.9450	lognor		
Dissolved beryllium	mg/L	0	69					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	27	68					0.0010	nonpar		0.99
Dissolved calcium	mg/L	66	66	7.1002	6.8937	0.0100	2.4031	23.6663	normal		
Dissolved chromium	mg/L	24	69					0.0150	nonpar		0.99
Dissolved cobalt	mg/L	4	69					0.0050	nonpar	***	0.99
Dissolved copper	mg/L	34	68	-2.4871	2.6328	0.0100	2.4007	46.2274	lognor		
Dissolved iron	mg/L	47	69	-1.9020	1.7520	0.0100	2.3996	9.9951	lognor		
Dissolved lead	mg/L	30	69					0.0027	nonpar		0.99
Dissolved magnesium	mg/L	58	68	-0.1421	1.6698	0.0100	2.4007	47.7851	lognor		
Dissolved manganese	mg/L	50	69	-3.8234	2.5088	0.0100	2.3996	8.9972	lognor		
Dissolved nickel	mg/L	19	69					0.0380	nonpar		0.99
Dissolved potassium	mg/L	61	68	-0.5762	0.6427	0.0100	2.4007	2.6292	lognor		
Dissolved selenium	mg/L	1	65					0.0003	nonpar		0.99
Dissolved silver	mg/L	2	67					0.0002	nonpar		0.99
Dissolved sodium	mg/L	69	69	89.2652	12.7731	0.0100	2.3996	119.9159	normal		
Dissolved thallium	mg/L	3	69					0.0000	nonpar		0.99
Dissolved vanadium	mg/L	0	69					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	30	69					0.0300	nonpar		0.99
Nitrate nitrogen	mg-N/L	63	69					1.3000	nonpar		0.99
Nitrite nitrogen	mg-N/L	36	68	-2.9407	2.8341	0.0100	2.4007	47.6219	lognor		
pH	std units	70	70					6.60- 9.39	nonpar		0.99
Sulfate	mg/L	68	68	3.7678	0.8669	0.0100	2.4007	346.8839	lognor		
Total dissolved solids	mg/L	69	69	276.8116	47.6042	0.0100	2.3996	391.0438	normal		
Total organic carbon	mg/L	64	69					14.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Deep Wells

Groundwater Analytical Summary - Deep Wells: First Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09D					G-10D				
						1/12/21	D	V	Tr	Ch	1/12/21	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)															
Alkalinity (as CaCO3)	nonpar	66	66	280	--	200					540				
Ammonia Nitrogen	nonpar	59	59	0.2403	--	0.162			I	N	0.337				
Bicarbonate	nonpar	66	66	280	--	100					540				
Calcium, Dissolved	nonpar	63	63	6.32	--	1.25			D	Y	21.7			D	N
Chemical Oxygen Demand	nonpar	66	16	28	--	15					10	U			
Chloride	lognor	66	65	6.86	250	6.65		P			16.7			D	N
Conductivity (umhos/cm)	nonpar	66	66	510	700	660		V			1500				
Magnesium, Dissolved	nonpar	62	40	2.33	--	0.05	U				1.8			D	N
Nitrate Nitrogen (mg-N/L)	nonpar	65	14	0.21	10	0.13			D	N	0.01	U			
Nitrite Nitrogen (mg-N/L)	nonpar	59	29	0.47	1	0.003					0.002	U			
pH (std units)	nonpar	65	65	6.02-10.02	6.5-8.5	9.35					7.11				
Potassium, Dissolved	nonpar	66	62	1.6	--	0.43					1.66				
Sodium, Dissolved	nonpar	63	63	127.8505	20	164					364				
Sulfate	nonpar	65	65	230.291	250	113					286			D	Y
Total Dissolved Solids	nonpar	66	66	460	500	430					1000				
Total Organic Carbon	nonpar	66	62	26	--	2.5					7.3				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony	nonpar	66	11	0.0015	0.006	0.0003	U				0.0003	U			
Arsenic	lognor	62	45	10.0722	0.00005	0.00276			D	N	0.00105				
Barium	nonpar	63	13	0.0037	1	0.005	U				0.005	U			
Beryllium	nonpar	66	0	0.0005	0.004	0.005	U				0.005	U			
Cadmium	nonpar	58	9	0.0001	0.005	0.00005	U				0.00005	U			
Chromium	nonpar	66	8	0.0136	0.05	0.01	U				0.01	U			
Cobalt	nonpar	66	4	0.004	--	0.01	U				0.01	U			
Copper	nonpar	63	10	0.055	1	0.02	U				0.02	U			
Iron	lognor	60	30	19.5342	0.3	0.02	U				0.499				Y
Lead	nonpar	66	20	0.0023	0.05	0.000113			D	N	0.0001	U			
Manganese	lognor	57	43	11.7351	0.05	0.005	U				0.37			D	N
Nickel	nonpar	65	2	0.006	0.1	0.01	U				0.01	U			
Selenium	nonpar	65	16	0.0025	0.01	0.0005	U				0.0005	U			
Silver	nonpar	62	6	0.0007	0.05	0.0001	U				0.0001	U			
Thallium	nonpar	65	7	0.0001	0.002	0.00005	U				0.00005	U			
Vanadium	nonpar	66	0	0.01	--	0.01	U				0.01	U			
Zinc	nonpar	65	17	0.012	5	0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony					0.006	0.0003	U				0.0003	U			
Arsenic					0.00005	0.0024					0.000957				
Barium					1	0.0053					0.005	U			
Beryllium					0.004	0.005	U				0.005	U			
Cadmium					0.005	0.00005	U				0.00005	U			
Chromium					0.05	0.01	U				0.01	U			
Cobalt					--	0.01	U				0.01	U			
Copper					1	0.01	U				0.01	U			
Iron					0.3	0.62					0.535				
Lead					0.05	0.00113					0.000104				
Manganese					0.05	0.0646					0.364				
Nickel					0.1	0.01	U				0.01	U			
Selenium					0.01	0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U			
Vanadium					--	0.02	U				0.02	U			
Zinc					5	0.01	U				0.01	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)															
1,1,1-Trichloroethane					200	1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U			

Groundwater Analytical Summary - Deep Wells: First Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09D					G-10D				
						1/12/21	D	V	Tr	Ch	1/12/21	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)															
1,1-Dichloroethylene					--	1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	0.05	U				0.05	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U			
1,2-Dichloroethane					0.5	0.03	U				0.03	U			
1,2-Dichloropropane					0.6	**0.13**					0.02	U			
1,4-Dichlorobenzene					4	1	U				1	U			
2-Butanone					--	5	U				5	U			
2-Hexanone					--	5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					--	5	U				5	U			
Acetone					--	5	U				5	U			
Acrylonitrile					0.07	0.03	U				0.03	U			
Benzene					1	1	U				1	U			
Bromodichloromethane					0.3	0.02	U				0.02	U			
Bromoform					5	1	U				1	U			
Bromomethane					--	1	U				1	U			
Carbon Disulfide					--	1	U				1	U			
Carbon Tetrachloride					0.3	0.02	U				0.02	U			
Chlorobenzene					--	0.03	U				0.03	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U			
Chloroethane					--	1	U				1	U			
Chloroform					7	1	U				1	U			
Chloromethane					--	2	U				2	U			
cis-1,2-Dichloroethene					--	**0.07**					0.02	U			
cis-1,3-Dichloropropene					0.2	0.03	U				0.03	U			
Dibromomethane					--	0.02	U				0.02	U			
Ethyl Benzene					--	1	U				1	U			
m,p-Xylene					--	1	U				1	U			
Methyl Iodide					--	1	U				1	U			
Methylene Chloride					5	2	U				2	U			
o-Xylene					--	1	U				1	U			
Styrene					--	1	U				1	U			
Tetrachloroethylene					0.8	0.02	U				0.02	U			
Toluene					--	2	U				2	U			
trans-1,2-Dichloroethene					--	1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.02	U				0.02	U			
trans-1,4-Dichloro-2-butene					--	5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U			
Trichlorofluoromethane					--	1	U				1	U			
Vinyl Acetate					--	5	U				5	U			
Vinyl Chloride					0.02	0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in **purple** exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards.

B = Methylene chloride was measured in the lab blank at a similar concentration - contamination during analysis suspected.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01D	10/15/2020		240.0000		280.0000
Ammonia nitrogen	mg-N/L	G-01D	10/15/2020	ND	0.0200		0.2931
Bicarbonate	mg/L	G-01D	10/15/2020		120.0000		280.0000
Chemical oxygen demand	mg/L	G-01D	10/15/2020	ND	10.0000		28.0000
Chloride	mg/L	G-01D	10/15/2020		7.8100		8.8360
Conductivity	umhos/cm	G-01D	10/15/2020		610.0000	***	530.0000
Dissolved antimony	mg/L	G-01D	10/15/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-01D	10/15/2020		0.0004		0.0021
Dissolved barium	mg/L	G-01D	10/15/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-01D	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01D	10/15/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-01D	10/15/2020		0.7300		6.3200
Dissolved chromium	mg/L	G-01D	10/15/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-01D	10/15/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-01D	10/15/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-01D	10/15/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-01D	10/15/2020		0.0001		0.0023
Dissolved magnesium	mg/L	G-01D	10/15/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-01D	10/15/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-01D	10/15/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-01D	10/15/2020	ND	0.5000		1.7013
Dissolved selenium	mg/L	G-01D	10/15/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-01D	10/15/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-01D	10/15/2020		145.0000	***	131.0645
Dissolved thallium	mg/L	G-01D	10/15/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-01D	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01D	10/15/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-01D	10/15/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-01D	10/15/2020	ND	0.0020		0.0540
pH	std units	G-01D	10/15/2020		10.0400	*	6.02 - 9.88
Sulfate	mg/L	G-01D	10/15/2020		49.8000		66.0500
Total dissolved solids	mg/L	G-01D	10/15/2020		380.0000		460.0000
Total organic carbon	mg/L	G-01D	10/15/2020		1.9000		26.0000
Alkalinity (as caco3)	mg/L	G-02D	10/14/2020		90.0000		280.0000
Ammonia nitrogen	mg-N/L	G-02D	10/14/2020		0.0530		0.2931
Bicarbonate	mg/L	G-02D	10/14/2020		90.0000		280.0000
Chemical oxygen demand	mg/L	G-02D	10/14/2020	ND	10.0000		28.0000
Chloride	mg/L	G-02D	10/14/2020		5.3700		8.8360
Conductivity	umhos/cm	G-02D	10/14/2020		360.0000		530.0000
Dissolved antimony	mg/L	G-02D	10/14/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-02D	10/14/2020		0.0042	***	0.0021
Dissolved barium	mg/L	G-02D	10/14/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-02D	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-02D	10/14/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-02D	10/14/2020		0.4400		6.3200
Dissolved chromium	mg/L	G-02D	10/14/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-02D	10/14/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-02D	10/14/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-02D	10/14/2020		0.1050		19.4192
Dissolved lead	mg/L	G-02D	10/14/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-02D	10/14/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-02D	10/14/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-02D	10/14/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-02D	10/14/2020	ND	0.5000		1.7013
Dissolved selenium	mg/L	G-02D	10/14/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-02D	10/14/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-02D	10/14/2020		83.5000		131.0645
Dissolved thallium	mg/L	G-02D	10/14/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-02D	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-02D	10/14/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-02D	10/14/2020		0.4200	*	0.2100
Nitrite nitrogen	mg-N/L	G-02D	10/14/2020		0.0030		0.0540
pH	std units	G-02D	10/14/2020		7.6100		6.02 - 9.88
Sulfate	mg/L	G-02D	10/14/2020		69.1000	***	66.0500
Total dissolved solids	mg/L	G-02D	10/14/2020		240.0000		460.0000
Total organic carbon	mg/L	G-02D	10/14/2020		1.2000		26.0000
Alkalinity (as caco3)	mg/L	G-06B	10/14/2020		290.0000	*	280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-06B	10/14/2020		0.0700		0.2931
Bicarbonate	mg/L	G-06B	10/14/2020		230.0000		280.0000
Chemical oxygen demand	mg/L	G-06B	10/14/2020	ND	10.0000		28.0000
Chloride	mg/L	G-06B	10/14/2020		7.8500		8.8360
Conductivity	umhos/cm	G-06B	10/14/2020		710.0000	***	530.0000
Dissolved antimony	mg/L	G-06B	10/14/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-06B	10/14/2020		0.0042	***	0.0021
Dissolved barium	mg/L	G-06B	10/14/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-06B	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-06B	10/14/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-06B	10/14/2020		1.0200		6.3200
Dissolved chromium	mg/L	G-06B	10/14/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-06B	10/14/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-06B	10/14/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-06B	10/14/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-06B	10/14/2020		0.0001		0.0023
Dissolved magnesium	mg/L	G-06B	10/14/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-06B	10/14/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-06B	10/14/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-06B	10/14/2020		0.5000		1.7013
Dissolved selenium	mg/L	G-06B	10/14/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-06B	10/14/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-06B	10/14/2020		176.0000	***	131.0645
Dissolved thallium	mg/L	G-06B	10/14/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-06B	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-06B	10/14/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-06B	10/14/2020		0.2400	*	0.2100
Nitrite nitrogen	mg-N/L	G-06B	10/14/2020	ND	0.0020		0.0540
pH	std units	G-06B	10/14/2020		8.8400		6.02 - 9.88
Sulfate	mg/L	G-06B	10/14/2020		74.6000	***	66.0500
Total dissolved solids	mg/L	G-06B	10/14/2020		460.0000	**	460.0000
Total organic carbon	mg/L	G-06B	10/14/2020		3.6000		26.0000
Alkalinity (as caco3)	mg/L	G-08D2	10/14/2020		190.0000		280.0000
Ammonia nitrogen	mg-N/L	G-08D2	10/14/2020		0.2470		0.2931
Bicarbonate	mg/L	G-08D2	10/14/2020		72.0000		280.0000
Chemical oxygen demand	mg/L	G-08D2	10/14/2020	ND	10.0000		28.0000
Chloride	mg/L	G-08D2	10/14/2020		0.9200		8.8360
Conductivity	umhos/cm	G-08D2	10/14/2020		490.0000		530.0000
Dissolved antimony	mg/L	G-08D2	10/14/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-08D2	10/14/2020		0.0006		0.0021
Dissolved barium	mg/L	G-08D2	10/14/2020	ND	0.0050	**	0.0046
Dissolved beryllium	mg/L	G-08D2	10/14/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D2	10/14/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-08D2	10/14/2020		0.5700		6.3200
Dissolved chromium	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-08D2	10/14/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-08D2	10/14/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-08D2	10/14/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-08D2	10/14/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-08D2	10/14/2020	ND	0.5000		1.7013
Dissolved selenium	mg/L	G-08D2	10/14/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-08D2	10/14/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-08D2	10/14/2020		111.0000		131.0645
Dissolved thallium	mg/L	G-08D2	10/14/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D2	10/14/2020	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-08D2	10/14/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-08D2	10/14/2020	ND	0.0020		0.0540
pH	std units	G-08D2	10/14/2020		9.8500	**	6.02 - 9.88
Sulfate	mg/L	G-08D2	10/14/2020		45.5000		66.0500
Total dissolved solids	mg/L	G-08D2	10/14/2020		320.0000		460.0000
Total organic carbon	mg/L	G-08D2	10/14/2020		1.2000		26.0000
Alkalinity (as caco3)	mg/L	G-09D	01/12/2021		200.0000		280.0000
Ammonia nitrogen	mg-N/L	G-09D	01/12/2021		0.1625		0.2931

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-09D	01/12/2021		110.0000		280.0000
Chemical oxygen demand	mg/L	G-09D	01/12/2021		12.5000		28.0000
Chloride	mg/L	G-09D	01/12/2021		6.5950	**	8.8360
Conductivity	umhos/cm	G-09D	01/12/2021		645.0000	***	530.0000
Dissolved antimony	mg/L	G-09D	01/12/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-09D	01/12/2021		0.0027	***	0.0021
Dissolved barium	mg/L	G-09D	01/12/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-09D	01/12/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09D	01/12/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-09D	01/12/2021		1.1450		6.3200
Dissolved chromium	mg/L	G-09D	01/12/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-09D	01/12/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-09D	01/12/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-09D	01/12/2021	ND	0.0200		19.4192
Dissolved lead	mg/L	G-09D	01/12/2021		0.0002		0.0023
Dissolved magnesium	mg/L	G-09D	01/12/2021	ND	0.0500		2.3300
Dissolved manganese	mg/L	G-09D	01/12/2021	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-09D	01/12/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-09D	01/12/2021		0.4450		1.7013
Dissolved selenium	mg/L	G-09D	01/12/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-09D	01/12/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-09D	01/12/2021		165.5000	***	131.0645
Dissolved thallium	mg/L	G-09D	01/12/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-09D	01/12/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09D	01/12/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-09D	01/12/2021		0.1400		0.2100
Nitrite nitrogen	mg-N/L	G-09D	01/12/2021		0.0030		0.0540
pH	std units	G-09D	01/12/2021		9.3500		6.02 - 9.88
Sulfate	mg/L	G-09D	01/12/2021		112.0000	***	66.0500
Total dissolved solids	mg/L	G-09D	01/12/2021		425.0000		460.0000
Total organic carbon	mg/L	G-09D	01/12/2021		2.8500		26.0000
Alkalinity (as caco3)	mg/L	G-10D	01/12/2021		540.0000	***	280.0000
Ammonia nitrogen	mg-N/L	G-10D	01/12/2021		0.3370	***	0.2931
Bicarbonate	mg/L	G-10D	01/12/2021		540.0000	***	280.0000
Chemical oxygen demand	mg/L	G-10D	01/12/2021	ND	10.0000		28.0000
Chloride	mg/L	G-10D	01/12/2021		16.7000	***	8.8360
Conductivity	umhos/cm	G-10D	01/12/2021		1500.0000	***	530.0000
Dissolved antimony	mg/L	G-10D	01/12/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-10D	01/12/2021		0.0011		0.0021
Dissolved barium	mg/L	G-10D	01/12/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-10D	01/12/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10D	01/12/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-10D	01/12/2021		21.7000	***	6.3200
Dissolved chromium	mg/L	G-10D	01/12/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-10D	01/12/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-10D	01/12/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-10D	01/12/2021		0.4990		19.4192
Dissolved lead	mg/L	G-10D	01/12/2021	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-10D	01/12/2021		1.8000		2.3300
Dissolved manganese	mg/L	G-10D	01/12/2021		0.3700		10.2259
Dissolved nickel	mg/L	G-10D	01/12/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-10D	01/12/2021		1.6600		1.7013
Dissolved selenium	mg/L	G-10D	01/12/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-10D	01/12/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-10D	01/12/2021		364.0000	***	131.0645
Dissolved thallium	mg/L	G-10D	01/12/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-10D	01/12/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10D	01/12/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-10D	01/12/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-10D	01/12/2021	ND	0.0020		0.0540
pH	std units	G-10D	01/12/2021		7.1100		6.02 - 9.88
Sulfate	mg/L	G-10D	01/12/2021		286.0000	***	66.0500
Total dissolved solids	mg/L	G-10D	01/12/2021		1000.0000	***	460.0000
Total organic carbon	mg/L	G-10D	01/12/2021		7.3000		26.0000
Alkalinity (as caco3)	mg/L	G-13D	10/15/2020		180.0000		280.0000
Ammonia nitrogen	mg-N/L	G-13D	10/15/2020		0.0740		0.2931
Bicarbonate	mg/L	G-13D	10/15/2020		100.0000		280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Chemical oxygen demand	mg/L	G-13D	10/15/2020	ND	10.0000		28.0000
Chloride	mg/L	G-13D	10/15/2020		14.1000	***	8.8360
Conductivity	umhos/cm	G-13D	10/15/2020		450.0000		530.0000
Dissolved antimony	mg/L	G-13D	10/15/2020	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-13D	10/15/2020		0.0001		0.0021
Dissolved barium	mg/L	G-13D	10/15/2020	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-13D	10/15/2020	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-13D	10/15/2020	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-13D	10/15/2020		0.5100		6.3200
Dissolved chromium	mg/L	G-13D	10/15/2020	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-13D	10/15/2020	ND	0.0100		0.0050
Dissolved copper	mg/L	G-13D	10/15/2020	ND	0.0100		0.0550
Dissolved iron	mg/L	G-13D	10/15/2020	ND	0.0500		19.4192
Dissolved lead	mg/L	G-13D	10/15/2020	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-13D	10/15/2020	ND	0.2000		2.3300
Dissolved manganese	mg/L	G-13D	10/15/2020	ND	0.0050		10.2259
Dissolved nickel	mg/L	G-13D	10/15/2020	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-13D	10/15/2020	ND	0.5000		1.7013
Dissolved selenium	mg/L	G-13D	10/15/2020	ND	0.0005		0.0014
Dissolved silver	mg/L	G-13D	10/15/2020	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-13D	10/15/2020		107.0000		131.0645
Dissolved thallium	mg/L	G-13D	10/15/2020	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-13D	10/15/2020	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-13D	10/15/2020	ND	0.0100	**	0.0120
Nitrate nitrogen	mg-N/L	G-13D	10/15/2020	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-13D	10/15/2020	ND	0.0020		0.0540
pH	std units	G-13D	10/15/2020		10.1300	*	6.02 - 9.88
Sulfate	mg/L	G-13D	10/15/2020		32.6000		66.0500
Total dissolved solids	mg/L	G-13D	10/15/2020		300.0000		460.0000
Total organic carbon	mg/L	G-13D	10/15/2020		1.3000		26.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	58	58					280.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	55	55	-2.2071	0.4050	0.0100	2.4191	0.2931	lognor		
Bicarbonate	mg/L	58	58					280.0000	nonpar		0.99
Chemical oxygen demand	mg/L	9	57					28.0000	nonpar		0.99
Chloride	mg/L	57	58	1.2681	0.3773	0.0100	2.4141	8.8360	lognor		
Conductivity	umhos/cm	58	58					530.0000	nonpar		0.99
Dissolved antimony	mg/L	9	56					0.0008	nonpar		0.99
Dissolved arsenic	mg/L	47	57					0.0021	nonpar		0.99
Dissolved barium	mg/L	16	58					0.0046	nonpar		0.99
Dissolved beryllium	mg/L	0	54					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	8	54					0.0001	nonpar		0.99
Dissolved calcium	mg/L	55	55					6.3200	nonpar		0.99
Dissolved chromium	mg/L	7	58					0.0136	nonpar		0.99
Dissolved cobalt	mg/L	2	58					0.0050	nonpar	***	0.99
Dissolved copper	mg/L	11	58					0.0550	nonpar		0.99
Dissolved iron	mg/L	30	55	-1.7421	1.9464	0.0100	2.4191	19.4192	lognor		
Dissolved lead	mg/L	19	56					0.0023	nonpar		0.99
Dissolved magnesium	mg/L	39	56					2.3300	nonpar		0.99
Dissolved manganese	mg/L	40	56	-3.9817	2.6089	0.0100	2.4173	10.2259	lognor		
Dissolved nickel	mg/L	3	58					0.0260	nonpar		0.99
Dissolved potassium	mg/L	48	58	-1.1431	0.6936	0.0100	2.4141	1.7013	lognor		
Dissolved selenium	mg/L	15	56					0.0014	nonpar		0.99
Dissolved silver	mg/L	2	55					0.0001	nonpar		0.99
Dissolved sodium	mg/L	57	57	109.2719	9.0213	0.0100	2.4157	131.0645	normal		
Dissolved thallium	mg/L	4	58					0.0001	nonpar		0.99
Dissolved vanadium	mg/L	1	58					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	15	58					0.0120	nonpar		0.99
Nitrate nitrogen	mg-N/L	15	57					0.2100	nonpar		0.99
Nitrite nitrogen	mg-N/L	26	58					0.0540	nonpar		0.99
pH	std units	58	58					6.02- 9.88	nonpar		0.99
Sulfate	mg/L	57	57					66.0500	nonpar		0.99
Total dissolved solids	mg/L	58	58					460.0000	nonpar		0.99
Total organic carbon	mg/L	58	58					26.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Groundwater Analytical Summary - Deep Wells: Second Quarter 2021
Cathcart Landfill, Snohomish County, WA

						Downgradient Wells																																Upgradient Wells									
	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-01D					G-02D					G-06B					G-08D2					G-09D					G-10D					G-13D					G-14D					G-24D				
						4/21/21	D	V	Tr	Ch	4/21/21	D	V	Tr	Ch	4/21/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/21/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																																
Alkalinity (as CaCO3)	nonpar	60	60	280	--	290		E			90					270		P			270					190					540		V			180					240					220				
Ammonia Nitrogen	lognor	57	57	0.2927	--	0.223					0.02	U				0.081					0.198					0.151			I	N	0.038		P			0.089				D	N	0.174					0.105				
Bicarbonate	nonpar	60	60	280	--	190			D	N	90					270					110					69			D	Y	540		V			75					160					220				
Calcium, Dissolved	nonpar	57	57	6.32	--	1.9					0.37			D	N	1.36					0.4					1.31			D	N	18.9		V	D	N	0.63					0.23					0.27				
Chemical Oxygen Demand	nonpar	59	10	28	--	15					10	U				15					15					26					21					10	U				10	U				10	U			
Chloride	lognor	60	59	8.7455	250	7.64			D	N	6.34			D	N	7.26			D	N	2.96			D	N	7.97					17.1		V	D	N	12.2		V			2.44			D	N	4.24			D	N
Conductivity (umhos/cm)	nonpar	60	60	530	700	650		V			360			D	N	650		V			470					680		V			1500		V			460					480					500				
Magnesium, Dissolved	nonpar	58	41	2.33	--	0.26					0.21					0.24					0.18					0.15					1.7			D	N	0.17					0.1					0.17				
Nitrate Nitrogen (mg-N/L)	nonpar	59	15	0.21	10	0.01	U				0.32		E	D	N	0.18		P			0.01	U				0.14			D	N	0.01	U				0.01	U				0.01	U				0.01	U			
Nitrite Nitrogen (mg-N/L)	nonpar	60	27	0.054	1	0.016					0.002	U				0.002					0.006					0.011					0.002	U				0.002	U				0.008					0.002	U			
pH (std units)	nonpar	58	58	6.02-9.88	6.5-8.5	9.27		P	I	N	7.99					8.35					9.90		E			8.58					7.34					9.31		P	I	N	9.72					8.64			I	N
Potassium, Dissolved	lognor	60	49	1.849	--	0.33					0.2	U				0.2					0.2	U				0.34					1.24					0.32					0.2	U				1.02				
Sodium, Dissolved	normal	59	59	130.7721	20	205		V			79.4			D	N	178		V			106					176		V			376		V			106					115					111				
Sulfate	nonpar	59	59	66.05	250	58.2				Y	70.2		V			67.6		V	D	N	43.3			I	Y	128		V			289		V	D	Y	34.2			D	N	3.45			D	N	40.4				
Total Dissolved Solids	nonpar	60	60	460	500	540		E		Y	220			D	N	410			D	N	330					450					1000		V			300					300					330				
Total Organic Carbon	nonpar	60	60	26	--	11.0					1.9					3.4					0.91					5.3					12.0					2.1					38					1.9				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																																
Antimony	nonpar	58	9	0.0008	0.006	0.00036					0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	nonpar	59	48	0.0021	0.00005	0.00121					0.00373		E			0.00415		V	I	N	0.00134			I	N	0.00349		V	D	N	0.00125					0.00019					0.000907					0.00006	U			
Barium	nonpar	59	16	0.0046	1	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.104				
Beryllium	nonpar	54	0	0.0005	0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	nonpar	56	8	0.0001	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	nonpar	60	7	0.0136	0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	nonpar	60	2	0.005	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01		E			0.01	U				0.01	U			
Copper	nonpar	60	11	0.055	1	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Iron	lognor	59	31	19.6852	0.3	0.061					0.028			I	N	0.036					0.059					0.02	U			Y	0.493					0.037					0.037					0.02	U			
Lead	nonpar	60	22	0.0023	0.05	0.000389					0.000194					0.000152					0.000218					0.000104			D	N	0.0001	U				0.0001	U				0.000358					0.000249				
Manganese	lognor	58	40	13.3342	0.05	0.011					0.005	U				0.005	U				0.005	U				0.005	U				0.367			D	N	0.005	U			I	N	0.005	U		I	Y	0.005	U			
Nickel	nonpar	60	3	0.026	0.1	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Selenium	nonpar	58	15	0.0014	0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.00075					0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	nonpar	57	2	0.0001	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	nonpar	60	4	0.0001	0.002	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Vanadium	nonpar	60	1	0.01	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Zinc	nonpar	60	15	0.012	5	0.018		E			0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)																																																
Antimony	--	--	--	--	0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	--	--	--	--	0.00005	0.0013					0.00351					0.00217					0.001					0.00325					0.00107					0.000188					0.000751					0.0001	U			
Barium	--	--	--	--	1	0.131					0.0107					0.0081					0.0369					0.005	U				0.005	U				0.005	U				0.0195					0.005	U			
Beryllium	--	--	--	--	0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	--	--	--	--	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	--	--	--	--	0.05	0.0449					0.01	U				0.015					0.01					0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	--	--	--	--	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper	--	--	--	--	1	0.025					0.01	U				0.01	U				0.014					0.051					0.01	U				0.01	U				0.01	U				0.01	U			
Iron	--	--	--	--	0.3	27.1					1.71					1.22					9.87					0.701					0.488					0.769					6.31					0.04				
Lead	--	--	--	--	0.05	0.00173					0.000296					0.000157					0.000564					0.000687					0.0001	U				0.0001	U				0.000299					0.0001	U			
Manganese	--	--	--	--	0.05	0.4					0.0271					0.0408					0.234					0.0651					0.355					0.0136					0.0941					0.005	U			
Nickel	--	--	--	--	0.1	0.01	U				0.01	U				0.014					0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Selenium	--	--	--	--	0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	--	--	--	--	0.05	0.00015					0.0001					0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	--	--	--	--	0.002	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Vanadium	--	--	--	--	--	0.064					0.02	U				0.02	U				0.032					0.02	U				0.02	U				0.02	U				0.02					0.02	U			
Zinc	--	--	--	--	5	0.0577					0.0111					0.01	U				0.0198					0.01	U				0.01	U				0.01	U				0.0143					0.01	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																																
1,1,1-Trichloroethane	--	--	--	--	200	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2,2-Tetrachloroethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2-Trichloroethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1-Dichloroethane	--	--	--	--	1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			

Groundwater Analytical Summary - Deep Wells: Second Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																												Upgradient Wells										
						G-01D					G-02D					G-06B					G-08D2					G-09D					G-10D					G-13D					G-14D					G-24D				
						4/21/21	D	V	Tr	Ch	4/21/21	D	V	Tr	Ch	4/21/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/21/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch	4/20/21	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.																																													
1,1-Dichloroethylene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2,3-Trichloropropane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dibromo-3-chloropropane	--	--	--	--	0.2	0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U			
1,2-Dibromoethane	--	--	--	--	0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dichlorobenzene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dichloroethane	--	--	--	--	0.5	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
1,2-Dichloropropane	--	--	--	--	0.6	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
1,4-Dichlorobenzene	--	--	--	--	4	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
2-Butanone	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
2-Hexanone	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
4-Methyl-2-Pentanone (MIBK)	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acetone	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acrylonitrile	--	--	--	--	0.07	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Benzene	--	--	--	--	1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromodichloromethane	--	--	--	--	0.3	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Bromoform	--	--	--	--	5	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromomethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Disulfide	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Tetrachloride	--	--	--	--	0.3	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Chlorobenzene	--	--	--	--	--	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Chlorodibromomethane	--	--	--	--	0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
Chloroethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloroform	--	--	--	--	7	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloromethane	--	--	--	--	--	2	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
cis-1,2-Dichloroethene	--	--	--	--	--	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
cis-1,3-Dichloropropene	--	--	--	--	0.2	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Dibromomethane	--	--	--	--	--	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Ethyl Benzene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
m,p-Xylene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methyl Iodide	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methylene Chloride	--	--	--	--	5	2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U			
o-Xylene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Styrene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Tetrachloroethylene	--	--	--	--	0.8	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Toluene	--	--	--	--	--	2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U			
trans-1,2-Dichloroethene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,3-Dichloropropene	--	--	--	--	0.2	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
trans-1,4-Dichloro-2-butene	--	--	--	--	--	2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U			
Trichloroethene (1,1,2-Trichloro	--	--	--	--	3	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Trichlorofluoromethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Vinyl Acetate	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Vinyl Chloride	--	--	--	--	0.02	0.01	U				0.01	U				0.01	U				0.01	U				0.19					0.01	U				0.01	U				0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in **purple** exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits or WAC 246-290, whichever is more protective of groundwater quality.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01D	04/21/2021		290.0000	*	280.0000
Ammonia nitrogen	mg-N/L	G-01D	04/21/2021		0.2230		0.2927
Bicarbonate	mg/L	G-01D	04/21/2021		190.0000		280.0000
Chemical oxygen demand	mg/L	G-01D	04/21/2021		15.0000		28.0000
Chloride	mg/L	G-01D	04/21/2021		7.6400		8.7455
Conductivity	umhos/cm	G-01D	04/21/2021		650.0000	***	530.0000
Dissolved antimony	mg/L	G-01D	04/21/2021		0.0004		0.0008
Dissolved arsenic	mg/L	G-01D	04/21/2021		0.0012		0.0021
Dissolved barium	mg/L	G-01D	04/21/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-01D	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01D	04/21/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-01D	04/21/2021		1.9000		6.3200
Dissolved chromium	mg/L	G-01D	04/21/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-01D	04/21/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-01D	04/21/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-01D	04/21/2021		0.0610		19.6852
Dissolved lead	mg/L	G-01D	04/21/2021		0.0004		0.0023
Dissolved magnesium	mg/L	G-01D	04/21/2021		0.2600		2.3300
Dissolved manganese	mg/L	G-01D	04/21/2021		0.0110		13.3342
Dissolved nickel	mg/L	G-01D	04/21/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-01D	04/21/2021		0.3300		1.8490
Dissolved selenium	mg/L	G-01D	04/21/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-01D	04/21/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-01D	04/21/2021		205.0000	***	130.7721
Dissolved thallium	mg/L	G-01D	04/21/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-01D	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01D	04/21/2021		0.0180	*	0.0120
Nitrate nitrogen	mg-N/L	G-01D	04/21/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-01D	04/21/2021		0.0160		0.0540
pH	std units	G-01D	04/21/2021		9.2700	**	6.02 - 9.88
Sulfate	mg/L	G-01D	04/21/2021		58.2000		66.0500
Total dissolved solids	mg/L	G-01D	04/21/2021		540.0000	*	460.0000
Total organic carbon	mg/L	G-01D	04/21/2021		11.0000		26.0000
Alkalinity (as caco3)	mg/L	G-02D	04/21/2021		90.0000		280.0000
Ammonia nitrogen	mg-N/L	G-02D	04/21/2021	ND	0.0200		0.2927
Bicarbonate	mg/L	G-02D	04/21/2021		90.0000		280.0000
Chemical oxygen demand	mg/L	G-02D	04/21/2021	ND	10.0000		28.0000
Chloride	mg/L	G-02D	04/21/2021		6.3400		8.7455
Conductivity	umhos/cm	G-02D	04/21/2021		360.0000		530.0000
Dissolved antimony	mg/L	G-02D	04/21/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-02D	04/21/2021		0.0037	***	0.0021
Dissolved barium	mg/L	G-02D	04/21/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-02D	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-02D	04/21/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-02D	04/21/2021		0.3700		6.3200
Dissolved chromium	mg/L	G-02D	04/21/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-02D	04/21/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-02D	04/21/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-02D	04/21/2021		0.0280		19.6852
Dissolved lead	mg/L	G-02D	04/21/2021		0.0002		0.0023
Dissolved magnesium	mg/L	G-02D	04/21/2021		0.2100		2.3300
Dissolved manganese	mg/L	G-02D	04/21/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-02D	04/21/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-02D	04/21/2021	ND	0.2000		1.8490
Dissolved selenium	mg/L	G-02D	04/21/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-02D	04/21/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-02D	04/21/2021		79.4000		130.7721
Dissolved thallium	mg/L	G-02D	04/21/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-02D	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-02D	04/21/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-02D	04/21/2021		0.3200	*	0.2100
Nitrite nitrogen	mg-N/L	G-02D	04/21/2021	ND	0.0020		0.0540
pH	std units	G-02D	04/21/2021		7.9900		6.02 - 9.88
Sulfate	mg/L	G-02D	04/21/2021		70.2000	***	66.0500
Total dissolved solids	mg/L	G-02D	04/21/2021		220.0000		460.0000
Total organic carbon	mg/L	G-02D	04/21/2021		1.9000		26.0000
Alkalinity (as caco3)	mg/L	G-06B	04/21/2021		270.0000	**	280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-06B	04/21/2021		0.0810		0.2927
Bicarbonate	mg/L	G-06B	04/21/2021		270.0000		280.0000
Chemical oxygen demand	mg/L	G-06B	04/21/2021		15.0000		28.0000
Chloride	mg/L	G-06B	04/21/2021		7.2600		8.7455
Conductivity	umhos/cm	G-06B	04/21/2021		650.0000	***	530.0000
Dissolved antimony	mg/L	G-06B	04/21/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-06B	04/21/2021		0.0042	***	0.0021
Dissolved barium	mg/L	G-06B	04/21/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-06B	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-06B	04/21/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-06B	04/21/2021		1.3600		6.3200
Dissolved chromium	mg/L	G-06B	04/21/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-06B	04/21/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-06B	04/21/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-06B	04/21/2021		0.0360		19.6852
Dissolved lead	mg/L	G-06B	04/21/2021		0.0002		0.0023
Dissolved magnesium	mg/L	G-06B	04/21/2021		0.2400		2.3300
Dissolved manganese	mg/L	G-06B	04/21/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-06B	04/21/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-06B	04/21/2021		0.2000		1.8490
Dissolved selenium	mg/L	G-06B	04/21/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-06B	04/21/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-06B	04/21/2021		178.0000	***	130.7721
Dissolved thallium	mg/L	G-06B	04/21/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-06B	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-06B	04/21/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-06B	04/21/2021		0.1800	**	0.2100
Nitrite nitrogen	mg-N/L	G-06B	04/21/2021		0.0020		0.0540
pH	std units	G-06B	04/21/2021		8.3500		6.02 - 9.88
Sulfate	mg/L	G-06B	04/21/2021		67.6000	***	66.0500
Total dissolved solids	mg/L	G-06B	04/21/2021		410.0000		460.0000
Total organic carbon	mg/L	G-06B	04/21/2021		3.4000		26.0000
Alkalinity (as caco3)	mg/L	G-08D2	04/20/2021		270.0000		280.0000
Ammonia nitrogen	mg-N/L	G-08D2	04/20/2021		0.1980		0.2927
Bicarbonate	mg/L	G-08D2	04/20/2021		110.0000		280.0000
Chemical oxygen demand	mg/L	G-08D2	04/20/2021		15.0000		28.0000
Chloride	mg/L	G-08D2	04/20/2021		2.9600		8.7455
Conductivity	umhos/cm	G-08D2	04/20/2021		470.0000		530.0000
Dissolved antimony	mg/L	G-08D2	04/20/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-08D2	04/20/2021		0.0013		0.0021
Dissolved barium	mg/L	G-08D2	04/20/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-08D2	04/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D2	04/20/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-08D2	04/20/2021		0.4000		6.3200
Dissolved chromium	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-08D2	04/20/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-08D2	04/20/2021		0.0590		19.6852
Dissolved lead	mg/L	G-08D2	04/20/2021		0.0002		0.0023
Dissolved magnesium	mg/L	G-08D2	04/20/2021		0.1800		2.3300
Dissolved manganese	mg/L	G-08D2	04/20/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-08D2	04/20/2021	ND	0.2000		1.8490
Dissolved selenium	mg/L	G-08D2	04/20/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-08D2	04/20/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-08D2	04/20/2021		106.0000		130.7721
Dissolved thallium	mg/L	G-08D2	04/20/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-08D2	04/20/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-08D2	04/20/2021		0.0060		0.0540
pH	std units	G-08D2	04/20/2021		9.9000	*	6.02 - 9.88
Sulfate	mg/L	G-08D2	04/20/2021		43.3000		66.0500
Total dissolved solids	mg/L	G-08D2	04/20/2021		330.0000		460.0000
Total organic carbon	mg/L	G-08D2	04/20/2021		0.9100		26.0000
Alkalinity (as caco3)	mg/L	G-09D	04/20/2021		190.0000		280.0000
Ammonia nitrogen	mg-N/L	G-09D	04/20/2021		0.1510		0.2927

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-09D	04/20/2021		69.0000		280.0000
Chemical oxygen demand	mg/L	G-09D	04/20/2021		26.0000		28.0000
Chloride	mg/L	G-09D	04/20/2021		7.9700		8.7455
Conductivity	umhos/cm	G-09D	04/20/2021		680.0000	***	530.0000
Dissolved antimony	mg/L	G-09D	04/20/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-09D	04/20/2021		0.0035	***	0.0021
Dissolved barium	mg/L	G-09D	04/20/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-09D	04/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09D	04/20/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-09D	04/20/2021		1.3100		6.3200
Dissolved chromium	mg/L	G-09D	04/20/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-09D	04/20/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-09D	04/20/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-09D	04/20/2021	ND	0.0200		19.6852
Dissolved lead	mg/L	G-09D	04/20/2021		0.0001		0.0023
Dissolved magnesium	mg/L	G-09D	04/20/2021		0.1500		2.3300
Dissolved manganese	mg/L	G-09D	04/20/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-09D	04/20/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-09D	04/20/2021		0.3400		1.8490
Dissolved selenium	mg/L	G-09D	04/20/2021		0.0008		0.0014
Dissolved silver	mg/L	G-09D	04/20/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-09D	04/20/2021		176.0000	***	130.7721
Dissolved thallium	mg/L	G-09D	04/20/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-09D	04/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09D	04/20/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-09D	04/20/2021		0.1400		0.2100
Nitrite nitrogen	mg-N/L	G-09D	04/20/2021		0.0110		0.0540
pH	std units	G-09D	04/20/2021		8.5800		6.02 - 9.88
Sulfate	mg/L	G-09D	04/20/2021		128.0000	***	66.0500
Total dissolved solids	mg/L	G-09D	04/20/2021		450.0000		460.0000
Total organic carbon	mg/L	G-09D	04/20/2021		5.3000		26.0000
Alkalinity (as caco3)	mg/L	G-10D	04/20/2021		540.0000	***	280.0000
Ammonia nitrogen	mg-N/L	G-10D	04/20/2021		0.0380	**	0.2927
Bicarbonate	mg/L	G-10D	04/20/2021		540.0000	***	280.0000
Chemical oxygen demand	mg/L	G-10D	04/20/2021		21.0000		28.0000
Chloride	mg/L	G-10D	04/20/2021		17.1000	***	8.7455
Conductivity	umhos/cm	G-10D	04/20/2021		1500.0000	***	530.0000
Dissolved antimony	mg/L	G-10D	04/20/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-10D	04/20/2021		0.0013		0.0021
Dissolved barium	mg/L	G-10D	04/20/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-10D	04/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10D	04/20/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-10D	04/20/2021		18.9000	***	6.3200
Dissolved chromium	mg/L	G-10D	04/20/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-10D	04/20/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-10D	04/20/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-10D	04/20/2021		0.4930		19.6852
Dissolved lead	mg/L	G-10D	04/20/2021	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-10D	04/20/2021		1.7000		2.3300
Dissolved manganese	mg/L	G-10D	04/20/2021		0.3670		13.3342
Dissolved nickel	mg/L	G-10D	04/20/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-10D	04/20/2021		1.2400		1.8490
Dissolved selenium	mg/L	G-10D	04/20/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-10D	04/20/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-10D	04/20/2021		376.0000	***	130.7721
Dissolved thallium	mg/L	G-10D	04/20/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-10D	04/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10D	04/20/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-10D	04/20/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-10D	04/20/2021	ND	0.0020		0.0540
pH	std units	G-10D	04/20/2021		7.3400		6.02 - 9.88
Sulfate	mg/L	G-10D	04/20/2021		289.0000	***	66.0500
Total dissolved solids	mg/L	G-10D	04/20/2021		1000.0000	***	460.0000
Total organic carbon	mg/L	G-10D	04/20/2021		12.0000		26.0000
Alkalinity (as caco3)	mg/L	G-13D	04/21/2021		180.0000		280.0000
Ammonia nitrogen	mg-N/L	G-13D	04/21/2021		0.0890		0.2927
Bicarbonate	mg/L	G-13D	04/21/2021		75.0000		280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Chemical oxygen demand	mg/L	G-13D	04/21/2021	ND	10.0000		28.0000
Chloride	mg/L	G-13D	04/21/2021		12.2000	***	8.7455
Conductivity	umhos/cm	G-13D	04/21/2021		460.0000		530.0000
Dissolved antimony	mg/L	G-13D	04/21/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-13D	04/21/2021		0.0002		0.0021
Dissolved barium	mg/L	G-13D	04/21/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-13D	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-13D	04/21/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-13D	04/21/2021		0.6300		6.3200
Dissolved chromium	mg/L	G-13D	04/21/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-13D	04/21/2021		0.0100	*	0.0050
Dissolved copper	mg/L	G-13D	04/21/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-13D	04/21/2021		0.0370		19.6852
Dissolved lead	mg/L	G-13D	04/21/2021	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-13D	04/21/2021		0.1700		2.3300
Dissolved manganese	mg/L	G-13D	04/21/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-13D	04/21/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-13D	04/21/2021		0.3200		1.8490
Dissolved selenium	mg/L	G-13D	04/21/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-13D	04/21/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-13D	04/21/2021		106.0000		130.7721
Dissolved thallium	mg/L	G-13D	04/21/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-13D	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-13D	04/21/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-13D	04/21/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-13D	04/21/2021	ND	0.0020		0.0540
pH	std units	G-13D	04/21/2021		9.3100	**	6.02 - 9.88
Sulfate	mg/L	G-13D	04/21/2021		34.2000		66.0500
Total dissolved solids	mg/L	G-13D	04/21/2021		300.0000		460.0000
Total organic carbon	mg/L	G-13D	04/21/2021		2.1000		26.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	60	60					280.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	57	57	-2.2001	0.4021	0.0100	2.4157	0.2927	lognor		
Bicarbonate	mg/L	60	60					280.0000	nonpar		0.99
Chemical oxygen demand	mg/L	10	59					28.0000	nonpar		0.99
Chloride	mg/L	59	60	1.2645	0.3749	0.0100	2.4110	8.7455	lognor		
Conductivity	umhos/cm	60	60					530.0000	nonpar		0.99
Dissolved antimony	mg/L	9	58					0.0008	nonpar		0.99
Dissolved arsenic	mg/L	48	59					0.0021	nonpar		0.99
Dissolved barium	mg/L	16	59					0.0046	nonpar		0.99
Dissolved beryllium	mg/L	0	54					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	8	56					0.0001	nonpar		0.99
Dissolved calcium	mg/L	57	57					6.3200	nonpar		0.99
Dissolved chromium	mg/L	7	60					0.0136	nonpar		0.99
Dissolved cobalt	mg/L	2	60					0.0050	nonpar	***	0.99
Dissolved copper	mg/L	11	60					0.0550	nonpar		0.99
Dissolved iron	mg/L	31	59	-1.6843	1.9333	0.0100	2.4125	19.6852	lognor		
Dissolved lead	mg/L	22	60					0.0023	nonpar		0.99
Dissolved magnesium	mg/L	41	58					2.3300	nonpar		0.99
Dissolved manganese	mg/L	40	58	-3.8444	2.6655	0.0100	2.4141	13.3342	lognor		
Dissolved nickel	mg/L	3	60					0.0260	nonpar		0.99
Dissolved potassium	mg/L	49	60	-1.1046	0.7131	0.0100	2.4110	1.8490	lognor		
Dissolved selenium	mg/L	15	58					0.0014	nonpar		0.99
Dissolved silver	mg/L	2	57					0.0001	nonpar		0.99
Dissolved sodium	mg/L	59	59	109.3559	8.8770	0.0100	2.4125	130.7721	normal		
Dissolved thallium	mg/L	4	60					0.0001	nonpar		0.99
Dissolved vanadium	mg/L	1	60					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	15	60					0.0120	nonpar		0.99
Nitrate nitrogen	mg-N/L	15	59					0.2100	nonpar		0.99
Nitrite nitrogen	mg-N/L	27	60					0.0540	nonpar		0.99
pH	std units	60	60					6.02- 9.88	nonpar		0.99
Sulfate	mg/L	59	59					66.0500	nonpar		0.99
Total dissolved solids	mg/L	60	60					460.0000	nonpar		0.99
Total organic carbon	mg/L	60	60					26.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Groundwater Analytical Summary - Deep Wells: Third Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09D					G-10D				
						7/14/21	D	V	Tr	Ch	7/14/21	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)															
Alkalinity (as CaCO3)	nonpar	60	60	280	--	160					530				
Ammonia Nitrogen	lognor	57	57	0.2927	--	0.145			I	N	0.381				
Bicarbonate	nonpar	60	60	280	--	140			D	Y	530				
Calcium, Dissolved	nonpar	57	57	6.32	--	1.6			D	N	21.0			D	N
Chemical Oxygen Demand	nonpar	59	10	28	--	10	U				10	U			
Chloride	lognor	60	59	8.7455	250	8.12					18.8			D	N
Conductivity (umhos/cm)	nonpar	60	60	530	700	710					1500				
Magnesium, Dissolved	nonpar	58	41	2.33	--	0.05					1.75			D	N
Nitrate Nitrogen (mg-N/L)	nonpar	59	15	0.21	10	0.33				Y	0.01	U			
Nitrite Nitrogen (mg-N/L)	nonpar	60	27	0.054	1	0.05					0.002	U			
pH (std units)	nonpar	60	60	6.02-9.88	6.5-8.5	8.73					7.30				
Potassium, Dissolved	lognor	60	49	1.849	--	0.48					1.70				
Sodium, Dissolved	normal	59	59	130.7721	20	174					369				
Sulfate	nonpar	59	59	66.05	250	129					268			D	N
Total Dissolved Solids	nonpar	60	60	460	500	450					970				
Total Organic Carbon	nonpar	60	60	26	--	4.9					6.7				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony	nonpar	58	9	0.0008	0.006	0.0003	U				0.0003	U			
Arsenic	nonpar	59	48	0.0021	0.00005	0.00438			D	N	0.00128				
Barium	nonpar	59	16	0.0046	1	0.005	U				0.0075				
Beryllium	nonpar	54	0	0.0005	0.004	0.005	U				0.005	U			
Cadmium	nonpar	56	8	0.0001	0.005	0.00005	U				0.00005	U			
Chromium	nonpar	60	7	0.0136	0.05	0.01	U				0.01	U			
Cobalt	nonpar	60	2	0.005	--	0.01	U				0.01	U			
Copper	nonpar	60	11	0.055	1	0.02	U				0.02	U			
Iron	lognor	59	31	19.6852	0.3	0.022					0.499				
Lead	nonpar	60	22	0.0023	0.05	0.000329			D	N	0.0001	U			
Manganese	lognor	58	40	13.3342	0.05	0.005	U				0.354			D	N
Nickel	nonpar	60	3	0.026	0.1	0.017					0.04				
Selenium	nonpar	58	15	0.0014	0.01	0.0005	U				0.0005	U			
Silver	nonpar	57	2	0.0001	0.05	0.0001	U				0.0001	U			
Thallium	nonpar	60	4	0.0001	0.002	0.00005	U				0.00005	U			
Vanadium	nonpar	60	1	0.01	--	0.01	U				0.01	U			
Zinc	nonpar	60	15	0.012	5	0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)															
Antimony					0.006	0.0003	U				0.0003	U			
Arsenic					0.00005	0.0032					0.0011				
Barium					1	0.0092					0.005	U			
Beryllium					0.004	0.005	U				0.005	U			
Cadmium					0.005	0.00005	U				0.00005	U			
Chromium					0.05	0.01	U				0.01	U			
Cobalt					--	0.01	U				0.01	U			
Copper					1	0.11					0.01	U			
Iron					0.3	1.62					0.494				
Lead					0.05	0.00245					0.0001	U			
Manganese					0.05	0.148					0.34				
Nickel					0.1	0.01	U				0.046				
Selenium					0.01	0.0005	U				0.0005	U			
Silver					0.05	0.0001	U				0.0001	U			
Thallium					0.002	0.0001	U				0.0001	U			
Vanadium					--	0.02	U				0.02	U			
Zinc					5	0.01	U				0.01	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)															
1,1,1-Trichloroethane					200	1	U				1	U			
1,1,2,2-Tetrachloroethane					--	1	U				1	U			
1,1,2-Trichloroethane					--	1	U				1	U			
1,1-Dichloroethane					1	1	U				1	U			

Groundwater Analytical Summary - Deep Wells: Third Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-09D					G-10D				
						7/14/21	D	V	Tr	Ch	7/14/21	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)															
1,1-Dichloroethylene					--	1	U				1	U			
1,2,3-Trichloropropane					--	1	U				1	U			
1,2-Dibromo-3-chloropropane					0.2	0.05	U				0.05	U			
1,2-Dibromoethane					0.001	0.01	U				0.01	U			
1,2-Dichlorobenzene					--	1	U				1	U			
1,2-Dichloroethane					0.5	0.03	U				0.03	U			
1,2-Dichloropropane					0.6	0.02	U				0.02	U			
1,4-Dichlorobenzene					4	1	U				1	U			
2-Butanone					--	5	U				5	U			
2-Hexanone					--	5	U				5	U			
4-Methyl-2-Pentanone (MIBK)					--	5	U				5	U			
Acetone					--	5	U				5	U			
Acrylonitrile					0.07	0.03	U				0.03	U			
Benzene					1	1	U				1	U			
Bromodichloromethane					0.3	0.02	U				0.02	U			
Bromoform					5	1	U				1	U			
Bromomethane					--	1	U				1	U			
Carbon Disulfide					--	1	U				1	U			
Carbon Tetrachloride					0.3	0.02	U				0.02	U			
Chlorobenzene					--	0.03	U				0.03	U			
Chlorodibromomethane					0.5	0.5	U				0.5	U			
Chloroethane					--	1	U				1	U			
Chloroform					7	1	U				1	U			
Chloromethane					--	2	U				2	U			
cis-1,2-Dichloroethene					--	0.02	U				0.02	U			
cis-1,3-Dichloropropene					0.2	0.03	U				0.03	U			
Dibromomethane					--	0.02	U				0.02	U			
Ethyl Benzene					--	1	U				1	U			
m,p-Xylene					--	1	U				1	U			
Methyl Iodide					--	1	U				1	U			
Methylene Chloride					5	2	U				2	U			
o-Xylene					--	1	U				1	U			
Styrene					--	1	U				1	U			
Tetrachloroethylene					0.8	0.02	U				0.02	U			
Toluene					--	2	U				2	U			
trans-1,2-Dichloroethene					--	1	U				1	U			
trans-1,3-Dichloropropene					0.2	0.02	U				0.02	U			
trans-1,4-Dichloro-2-butene					--	5	U				5	U			
Trichlorethene (1,1,2-Trichloroethylene)					3	1	U				1	U			
Trichlorofluoromethane					--	1	U				1	U			
Vinyl Acetate					--	5	U				5	U			
Vinyl Chloride					0.02	**0.57**					0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in **purple** exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards.

B = Methylene chloride was measured in the lab blank at a similar concentration - contamination during analysis suspected.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01D	04/21/2021		290.0000	*	280.0000
Ammonia nitrogen	mg-N/L	G-01D	04/21/2021		0.2230		0.2927
Bicarbonate	mg/L	G-01D	04/21/2021		190.0000		280.0000
Chemical oxygen demand	mg/L	G-01D	04/21/2021		15.0000		28.0000
Chloride	mg/L	G-01D	04/21/2021		7.6400		8.7455
Conductivity	umhos/cm	G-01D	04/21/2021		650.0000	***	530.0000
Dissolved antimony	mg/L	G-01D	04/21/2021		0.0004		0.0008
Dissolved arsenic	mg/L	G-01D	04/21/2021		0.0012		0.0021
Dissolved barium	mg/L	G-01D	04/21/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-01D	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01D	04/21/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-01D	04/21/2021		1.9000		6.3200
Dissolved chromium	mg/L	G-01D	04/21/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-01D	04/21/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-01D	04/21/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-01D	04/21/2021		0.0610		19.6852
Dissolved lead	mg/L	G-01D	04/21/2021		0.0004		0.0023
Dissolved magnesium	mg/L	G-01D	04/21/2021		0.2600		2.3300
Dissolved manganese	mg/L	G-01D	04/21/2021		0.0110		13.3342
Dissolved nickel	mg/L	G-01D	04/21/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-01D	04/21/2021		0.3300		1.8490
Dissolved selenium	mg/L	G-01D	04/21/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-01D	04/21/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-01D	04/21/2021		205.0000	***	130.7721
Dissolved thallium	mg/L	G-01D	04/21/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-01D	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01D	04/21/2021		0.0180	*	0.0120
Nitrate nitrogen	mg-N/L	G-01D	04/21/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-01D	04/21/2021		0.0160		0.0540
pH	std units	G-01D	04/21/2021		9.2700	**	6.02 - 9.88
Sulfate	mg/L	G-01D	04/21/2021		58.2000		66.0500
Total dissolved solids	mg/L	G-01D	04/21/2021		540.0000	*	460.0000
Total organic carbon	mg/L	G-01D	04/21/2021		11.0000		26.0000
Alkalinity (as caco3)	mg/L	G-02D	04/21/2021		90.0000		280.0000
Ammonia nitrogen	mg-N/L	G-02D	04/21/2021	ND	0.0200		0.2927
Bicarbonate	mg/L	G-02D	04/21/2021		90.0000		280.0000
Chemical oxygen demand	mg/L	G-02D	04/21/2021	ND	10.0000		28.0000
Chloride	mg/L	G-02D	04/21/2021		6.3400		8.7455
Conductivity	umhos/cm	G-02D	04/21/2021		360.0000		530.0000
Dissolved antimony	mg/L	G-02D	04/21/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-02D	04/21/2021		0.0037	***	0.0021
Dissolved barium	mg/L	G-02D	04/21/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-02D	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-02D	04/21/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-02D	04/21/2021		0.3700		6.3200
Dissolved chromium	mg/L	G-02D	04/21/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-02D	04/21/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-02D	04/21/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-02D	04/21/2021		0.0280		19.6852
Dissolved lead	mg/L	G-02D	04/21/2021		0.0002		0.0023
Dissolved magnesium	mg/L	G-02D	04/21/2021		0.2100		2.3300
Dissolved manganese	mg/L	G-02D	04/21/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-02D	04/21/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-02D	04/21/2021	ND	0.2000		1.8490
Dissolved selenium	mg/L	G-02D	04/21/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-02D	04/21/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-02D	04/21/2021		79.4000		130.7721
Dissolved thallium	mg/L	G-02D	04/21/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-02D	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-02D	04/21/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-02D	04/21/2021		0.3200	*	0.2100
Nitrite nitrogen	mg-N/L	G-02D	04/21/2021	ND	0.0020		0.0540
pH	std units	G-02D	04/21/2021		7.9900		6.02 - 9.88
Sulfate	mg/L	G-02D	04/21/2021		70.2000	***	66.0500
Total dissolved solids	mg/L	G-02D	04/21/2021		220.0000		460.0000
Total organic carbon	mg/L	G-02D	04/21/2021		1.9000		26.0000
Alkalinity (as caco3)	mg/L	G-06B	04/21/2021		270.0000	**	280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-06B	04/21/2021		0.0810		0.2927
Bicarbonate	mg/L	G-06B	04/21/2021		270.0000		280.0000
Chemical oxygen demand	mg/L	G-06B	04/21/2021		15.0000		28.0000
Chloride	mg/L	G-06B	04/21/2021		7.2600		8.7455
Conductivity	umhos/cm	G-06B	04/21/2021		650.0000	***	530.0000
Dissolved antimony	mg/L	G-06B	04/21/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-06B	04/21/2021		0.0042	***	0.0021
Dissolved barium	mg/L	G-06B	04/21/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-06B	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-06B	04/21/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-06B	04/21/2021		1.3600		6.3200
Dissolved chromium	mg/L	G-06B	04/21/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-06B	04/21/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-06B	04/21/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-06B	04/21/2021		0.0360		19.6852
Dissolved lead	mg/L	G-06B	04/21/2021		0.0002		0.0023
Dissolved magnesium	mg/L	G-06B	04/21/2021		0.2400		2.3300
Dissolved manganese	mg/L	G-06B	04/21/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-06B	04/21/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-06B	04/21/2021		0.2000		1.8490
Dissolved selenium	mg/L	G-06B	04/21/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-06B	04/21/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-06B	04/21/2021		178.0000	***	130.7721
Dissolved thallium	mg/L	G-06B	04/21/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-06B	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-06B	04/21/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-06B	04/21/2021		0.1800	**	0.2100
Nitrite nitrogen	mg-N/L	G-06B	04/21/2021		0.0020		0.0540
pH	std units	G-06B	04/21/2021		8.3500		6.02 - 9.88
Sulfate	mg/L	G-06B	04/21/2021		67.6000	***	66.0500
Total dissolved solids	mg/L	G-06B	04/21/2021		410.0000		460.0000
Total organic carbon	mg/L	G-06B	04/21/2021		3.4000		26.0000
Alkalinity (as caco3)	mg/L	G-08D2	04/20/2021		270.0000		280.0000
Ammonia nitrogen	mg-N/L	G-08D2	04/20/2021		0.1980		0.2927
Bicarbonate	mg/L	G-08D2	04/20/2021		110.0000		280.0000
Chemical oxygen demand	mg/L	G-08D2	04/20/2021		15.0000		28.0000
Chloride	mg/L	G-08D2	04/20/2021		2.9600		8.7455
Conductivity	umhos/cm	G-08D2	04/20/2021		470.0000		530.0000
Dissolved antimony	mg/L	G-08D2	04/20/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-08D2	04/20/2021		0.0013		0.0021
Dissolved barium	mg/L	G-08D2	04/20/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-08D2	04/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D2	04/20/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-08D2	04/20/2021		0.4000		6.3200
Dissolved chromium	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-08D2	04/20/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-08D2	04/20/2021		0.0590		19.6852
Dissolved lead	mg/L	G-08D2	04/20/2021		0.0002		0.0023
Dissolved magnesium	mg/L	G-08D2	04/20/2021		0.1800		2.3300
Dissolved manganese	mg/L	G-08D2	04/20/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-08D2	04/20/2021	ND	0.2000		1.8490
Dissolved selenium	mg/L	G-08D2	04/20/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-08D2	04/20/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-08D2	04/20/2021		106.0000		130.7721
Dissolved thallium	mg/L	G-08D2	04/20/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D2	04/20/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-08D2	04/20/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-08D2	04/20/2021		0.0060		0.0540
pH	std units	G-08D2	04/20/2021		9.9000	*	6.02 - 9.88
Sulfate	mg/L	G-08D2	04/20/2021		43.3000		66.0500
Total dissolved solids	mg/L	G-08D2	04/20/2021		330.0000		460.0000
Total organic carbon	mg/L	G-08D2	04/20/2021		0.9100		26.0000
Alkalinity (as caco3)	mg/L	G-09D	07/14/2021		160.0000		280.0000
Ammonia nitrogen	mg-N/L	G-09D	07/14/2021		0.1450		0.2927

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-09D	07/14/2021		140.0000		280.0000
Chemical oxygen demand	mg/L	G-09D	07/14/2021	ND	10.0000		28.0000
Chloride	mg/L	G-09D	07/14/2021		8.1200		8.7455
Conductivity	umhos/cm	G-09D	07/14/2021		710.0000	***	530.0000
Dissolved antimony	mg/L	G-09D	07/14/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-09D	07/14/2021		0.0044	***	0.0021
Dissolved barium	mg/L	G-09D	07/14/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-09D	07/14/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09D	07/14/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-09D	07/14/2021		1.6000		6.3200
Dissolved chromium	mg/L	G-09D	07/14/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-09D	07/14/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-09D	07/14/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-09D	07/14/2021		0.0220		19.6852
Dissolved lead	mg/L	G-09D	07/14/2021		0.0003		0.0023
Dissolved magnesium	mg/L	G-09D	07/14/2021		0.0500		2.3300
Dissolved manganese	mg/L	G-09D	07/14/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-09D	07/14/2021		0.0170		0.0260
Dissolved potassium	mg/L	G-09D	07/14/2021		0.4800		1.8490
Dissolved selenium	mg/L	G-09D	07/14/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-09D	07/14/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-09D	07/14/2021		174.0000	***	130.7721
Dissolved thallium	mg/L	G-09D	07/14/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-09D	07/14/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-09D	07/14/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-09D	07/14/2021		0.3300	*	0.2100
Nitrite nitrogen	mg-N/L	G-09D	07/14/2021		0.0500		0.0540
pH	std units	G-09D	07/14/2021	ND	0.1000		6.02 - 9.88
Sulfate	mg/L	G-09D	07/14/2021		129.0000	***	66.0500
Total dissolved solids	mg/L	G-09D	07/14/2021		450.0000		460.0000
Total organic carbon	mg/L	G-09D	07/14/2021		4.9000		26.0000
Alkalinity (as caco3)	mg/L	G-10D	07/14/2021		530.0000	***	280.0000
Ammonia nitrogen	mg-N/L	G-10D	07/14/2021		0.3810	*	0.2927
Bicarbonate	mg/L	G-10D	07/14/2021		530.0000	***	280.0000
Chemical oxygen demand	mg/L	G-10D	07/14/2021	ND	10.0000		28.0000
Chloride	mg/L	G-10D	07/14/2021		18.8000	***	8.7455
Conductivity	umhos/cm	G-10D	07/14/2021		1500.0000	***	530.0000
Dissolved antimony	mg/L	G-10D	07/14/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-10D	07/14/2021		0.0013		0.0021
Dissolved barium	mg/L	G-10D	07/14/2021		0.0075	*	0.0046
Dissolved beryllium	mg/L	G-10D	07/14/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10D	07/14/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-10D	07/14/2021		21.0000	***	6.3200
Dissolved chromium	mg/L	G-10D	07/14/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-10D	07/14/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-10D	07/14/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-10D	07/14/2021		0.4990		19.6852
Dissolved lead	mg/L	G-10D	07/14/2021	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-10D	07/14/2021		1.7500		2.3300
Dissolved manganese	mg/L	G-10D	07/14/2021		0.3540		13.3342
Dissolved nickel	mg/L	G-10D	07/14/2021		0.0400	*	0.0260
Dissolved potassium	mg/L	G-10D	07/14/2021		1.7000		1.8490
Dissolved selenium	mg/L	G-10D	07/14/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-10D	07/14/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-10D	07/14/2021		369.0000	***	130.7721
Dissolved thallium	mg/L	G-10D	07/14/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-10D	07/14/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-10D	07/14/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-10D	07/14/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-10D	07/14/2021	ND	0.0020		0.0540
pH	std units	G-10D	07/14/2021	ND	0.1000		6.02 - 9.88
Sulfate	mg/L	G-10D	07/14/2021		268.0000	***	66.0500
Total dissolved solids	mg/L	G-10D	07/14/2021		970.0000	***	460.0000
Total organic carbon	mg/L	G-10D	07/14/2021		6.7000		26.0000
Alkalinity (as caco3)	mg/L	G-13D	04/21/2021		180.0000		280.0000
Ammonia nitrogen	mg-N/L	G-13D	04/21/2021		0.0890		0.2927
Bicarbonate	mg/L	G-13D	04/21/2021		75.0000		280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Chemical oxygen demand	mg/L	G-13D	04/21/2021	ND	10.0000		28.0000
Chloride	mg/L	G-13D	04/21/2021		12.2000	***	8.7455
Conductivity	umhos/cm	G-13D	04/21/2021		460.0000		530.0000
Dissolved antimony	mg/L	G-13D	04/21/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-13D	04/21/2021		0.0002		0.0021
Dissolved barium	mg/L	G-13D	04/21/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-13D	04/21/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-13D	04/21/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-13D	04/21/2021		0.6300		6.3200
Dissolved chromium	mg/L	G-13D	04/21/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-13D	04/21/2021		0.0100	*	0.0050
Dissolved copper	mg/L	G-13D	04/21/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-13D	04/21/2021		0.0370		19.6852
Dissolved lead	mg/L	G-13D	04/21/2021	ND	0.0001		0.0023
Dissolved magnesium	mg/L	G-13D	04/21/2021		0.1700		2.3300
Dissolved manganese	mg/L	G-13D	04/21/2021	ND	0.0050		13.3342
Dissolved nickel	mg/L	G-13D	04/21/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-13D	04/21/2021		0.3200		1.8490
Dissolved selenium	mg/L	G-13D	04/21/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-13D	04/21/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-13D	04/21/2021		106.0000		130.7721
Dissolved thallium	mg/L	G-13D	04/21/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-13D	04/21/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-13D	04/21/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-13D	04/21/2021	ND	0.0100		0.2100
Nitrite nitrogen	mg-N/L	G-13D	04/21/2021	ND	0.0020		0.0540
pH	std units	G-13D	04/21/2021		9.3100	**	6.02 - 9.88
Sulfate	mg/L	G-13D	04/21/2021		34.2000		66.0500
Total dissolved solids	mg/L	G-13D	04/21/2021		300.0000		460.0000
Total organic carbon	mg/L	G-13D	04/21/2021		2.1000		26.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	60	60					280.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	57	57	-2.2001	0.4021	0.0100	2.4157	0.2927	lognor		
Bicarbonate	mg/L	60	60					280.0000	nonpar		0.99
Chemical oxygen demand	mg/L	10	59					28.0000	nonpar		0.99
Chloride	mg/L	59	60	1.2645	0.3749	0.0100	2.4110	8.7455	lognor		
Conductivity	umhos/cm	60	60					530.0000	nonpar		0.99
Dissolved antimony	mg/L	9	58					0.0008	nonpar		0.99
Dissolved arsenic	mg/L	48	59					0.0021	nonpar		0.99
Dissolved barium	mg/L	16	59					0.0046	nonpar		0.99
Dissolved beryllium	mg/L	0	54					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	8	56					0.0001	nonpar		0.99
Dissolved calcium	mg/L	57	57					6.3200	nonpar		0.99
Dissolved chromium	mg/L	7	60					0.0136	nonpar		0.99
Dissolved cobalt	mg/L	2	60					0.0050	nonpar	***	0.99
Dissolved copper	mg/L	11	60					0.0550	nonpar		0.99
Dissolved iron	mg/L	31	59	-1.6843	1.9333	0.0100	2.4125	19.6852	lognor		
Dissolved lead	mg/L	22	60					0.0023	nonpar		0.99
Dissolved magnesium	mg/L	41	58					2.3300	nonpar		0.99
Dissolved manganese	mg/L	40	58	-3.8444	2.6655	0.0100	2.4141	13.3342	lognor		
Dissolved nickel	mg/L	3	60					0.0260	nonpar		0.99
Dissolved potassium	mg/L	49	60	-1.1046	0.7131	0.0100	2.4110	1.8490	lognor		
Dissolved selenium	mg/L	15	58					0.0014	nonpar		0.99
Dissolved silver	mg/L	2	57					0.0001	nonpar		0.99
Dissolved sodium	mg/L	59	59	109.3559	8.8770	0.0100	2.4125	130.7721	normal		
Dissolved thallium	mg/L	4	60					0.0001	nonpar		0.99
Dissolved vanadium	mg/L	1	60					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	15	60					0.0120	nonpar		0.99
Nitrate nitrogen	mg-N/L	15	59					0.2100	nonpar		0.99
Nitrite nitrogen	mg-N/L	27	60					0.0540	nonpar		0.99
pH	std units	60	60					6.02- 9.88	nonpar		0.99
Sulfate	mg/L	59	59					66.0500	nonpar		0.99
Total dissolved solids	mg/L	60	60					460.0000	nonpar		0.99
Total organic carbon	mg/L	60	60					26.0000	nonpar		0.99

Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Groundwater Analytical Summary - Deep Wells: Fourth Quarter 2021
Cathcart Landfill, Snohomish County, WA

						Downgradient Wells																												Upgradient Wells									
	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	G-01D					G-02D					G-06B					G-08D2					G-09D					G-10D					G-13D					G-14D					G-24D				
						10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																																
Alkalinity (as CaCO3)	nonpar	58	58	280	--	230		P			96					270					180					190					510		V			170					240					230				
Ammonia Nitrogen	lognor	55	55	0.2927	--	0.16			I	Y	0.02	U				0.078					0.183					0.14			I	N	0.394		E			0.103				Y	0.161					0.099			I	Y
Bicarbonate	nonpar	58	58	280	--	230			D	N	96					270					180					190			D	N	510		V			170					240					230				
Calcium, Dissolved	nonpar	55	55	6.32	--	1.04					0.42			D	N	1.05					0.59					1.6			D	N	23.1		V	D	N	0.62					0.62					0.66				
Chemical Oxygen Demand	nonpar	57	10	28	--	10	U				10	U				10	U				10	U				10	U				10	U				10	U				10	U				10	U			
Chloride	nonpar	58	57	8.7455	250	7.61			D	N	5.46			D	N	7.12		V	D	N	2.05			D	N	8.27					20.7		V	D	N	11.9		V			2.36				Y	6.42				Y
Conductivity (umhos/cm)	nonpar	58	58	530	700	590		V			340			D	N	660		V			480					660		V			1400		V			430					490					530				
Magnesium, Dissolved	nonpar	56	39	2.33	--	0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				1.84			D	N	0.05	U				0.05	U				0.05	U			
Nitrate Nitrogen (mg-N/L)	nonpar	57	15	0.21	10	0.01	U				0.01	U	P	D	N	0.19					0.01	U				0.17		P		Y	0.01	U				0.01	U				0.28					0.01	U			
Nitrite Nitrogen (mg-N/L)	nonpar	58	24	0.054	1	0.047					0.014					0.011					0.067		E			0.031					0.002	U				0.003					0.042					0.002	U			
pH (std units)	nonpar	58	58	6.02-9.88	6.5-8.5	8.98			I	N	7.05					7.67					9.27		P	I	Y	8.97					6.83					8.84			I	N	9.11					8.05			I	N
Potassium, Dissolved	lognor	58	46	1.849	--	0.46					0.24					0.42					0.27					0.53					1.75					0.26					0.2	U				0.23				
Sodium, Dissolved	normal	57	57	130.7721	20	140		V			80.8			D	N	181		V			115					182		V			377		V			104					123					121				
Sulfate	nonpar	57	57	66.05	250	51.4					57.3		P			63.5		P	D	N	43.7				Y	127		V	D	Y	252		V	D	N	35.1			D	N	3.44			D	N	27.7				
Total Dissolved Solids	nonpar	58	58	460	500	340		P			200			D	N	410				Y	290					400			D	Y	1000		V			330					290					310				
Total Organic Carbon	nonpar	58	58	26	--	1.3					0.6					2.2					0.66					2.3					3.6					1.0					1.1					3.3				
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																																
Antimony	nonpar	56	7	0.0008	0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	nonpar	57	45	0.0021	0.00005	0.000708					0.00364		V			0.00341		V	I	N	0.000519			I	N	0.00268		V	D	N	0.000716					0.000109					0.000638					0.00006	U			
Barium	nonpar	57	14	0.0046	1	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U	P			0.005	U				0.005	U				0.005	U			
Beryllium	nonpar	58	0	0.0005	0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	nonpar	56	8	0.0001	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	nonpar	58	6	0.0136	0.05	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	nonpar	58	2	0.005	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U	P			0.01	U				0.01	U			
Copper	nonpar	56	9	0.055	1	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Iron	nonpar	57	28	19.6852	0.3	0.02	U				0.029				Y	0.035					0.02	U				0.02	U				0.536					0.029					0.02	U				0.02	U			
Lead	nonpar	58	18	0.0023	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.000106			D	N	0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Manganese	normal	56	37	13.3342	0.05	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.354			D	N	0.005	U			Y	0.005	U			Y	0.006				
Nickel	nonpar	58	3	0.026	0.1	0.01	U				0.01	U				0.01	U				0.01	U				0.013					0.024		P			0.02					0.01	U				0.01	U			
Selenium	nonpar	57	15	0.0014	0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	nonpar	56	1	0.0001	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	nonpar	58	4	0.0001	0.002	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Vanadium	nonpar	58	1	0.01	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01					0.012					0.01	U				0.01	U				0.01	U			
Zinc	nonpar	58	14	0.012	5	0.01	U	P			0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
TOTAL METALS EPA Methods 200.7/200.8 (mg/L)																																																
Antimony	--	--	--	--	0.006	0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U				0.0003	U			
Arsenic	--	--	--	--	0.00005	0.000786					0.00545					0.00286					0.0013					0.00361					0.00108					0.000276					0.000741					0.0001	U			
Barium	--	--	--	--	1	0.0186					0.008					0.0057					0.0221					0.0054					0.005	U				0.005	U				0.0106					0.005	U			
Beryllium	--	--	--	--	0.004	0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U				0.005	U			
Cadmium	--	--	--	--	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U			
Chromium	--	--	--	--	0.05	0.01	U				0.0152					0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Cobalt	--	--	--	--	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Copper	--	--	--	--	1	0.01	U				0.01	U				0.01	U				0.01	U				0.053					0.01	U				0.01	U				0.01	U				0.01	U			
Iron	--	--	--	--	0.3	5.1					1.06					1.08					6.56					1.02					0.518					0.57					2.77					0.03	U			
Lead	--	--	--	--	0.05	0.000706					0.000652					0.000412					0.00091					0.00156					0.0001	U				0.000121					0.000262					0.0001	U			
Manganese	--	--	--	--	0.05	0.079					0.0113					0.0414					0.133					0.0923					0.354					0.0115					0.0462					0.0073				
Nickel	--	--	--	--	0.1	0.01					0.01	U				0.011					0.01					0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
Selenium	--	--	--	--	0.01	0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U				0.0005	U			
Silver	--	--	--	--	0.05	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Thallium	--	--	--	--	0.002	0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U				0.0001	U			
Vanadium	--	--	--	--	--	0.02	U				0.02	U				0.021					0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Zinc	--	--	--	--	5	0.0138					0.01	U				0.01	U				0.0151					0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																																
1,1,1-Trichloroethane	--	--	--	--	200	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2,2-Tetrachloroethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1,2-Trichloroethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,1-Dichloroethane	--	--	--	--	1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			

Groundwater Analytical Summary - Deep Wells: Fourth Quarter 2021
Cathcart Landfill, Snohomish County, WA

	Statistical Method	Number of Samples	Number of Detects	Prediction Limit	Primary GW Stds 173-200	Downgradient Wells																												Upgradient Wells									
						G-01D					G-02D					G-06B					G-08D2					G-09D					G-10D					G-13D					G-14D					G-24D				
						10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/20/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch	10/19/21	D	V	Tr	Ch
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																														
1,1-Dichloroethylene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2,3-Trichloropropane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dibromo-3-chloropropane	--	--	--	--	0.2	0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U			
1,2-Dibromoethane	--	--	--	--	0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U			
1,2-Dichlorobenzene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
1,2-Dichloroethane	--	--	--	--	0.5	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
1,2-Dichloropropane	--	--	--	--	0.6	0.02	U				0.02	U				0.02	U				0.02	U				**0.14**					0.02	U				0.02	U				0.02	U				0.02	U			
1,4-Dichlorobenzene	--	--	--	--	4	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
2-Butanone	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
2-Hexanone	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
4-Methyl-2-Pentanone (MIBK)	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acetone	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Acrylonitrile	--	--	--	--	0.07	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Benzene	--	--	--	--	1	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromodichloromethane	--	--	--	--	0.3	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Bromoform	--	--	--	--	5	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Bromomethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Disulfide	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Carbon Tetrachloride	--	--	--	--	0.3	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Chlorobenzene	--	--	--	--	--	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Chlorodibromomethane	--	--	--	--	0.5	0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U				0.5	U			
Chloroethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloroform	--	--	--	--	7	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Chloromethane	--	--	--	--	--	2	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
cis-1,2-Dichloroethene	--	--	--	--	--	0.02	U				0.02	U				0.02	U				0.02	U				**0.14**					**0.13**					0.02	U				0.02	U				0.02	U			
cis-1,3-Dichloropropene	--	--	--	--	0.2	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U			
Dibromomethane	--	--	--	--	--	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Ethyl Benzene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
m,p-Xylene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methyl Iodide	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Methylene Chloride	--	--	--	--	5	2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U			
o-Xylene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Styrene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Tetrachloroethylene	--	--	--	--	0.8	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
Toluene	--	--	--	--	--	2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U			
trans-1,2-Dichloroethene	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
trans-1,3-Dichloropropene	--	--	--	--	0.2	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U				0.02	U			
trans-1,4-Dichloro-2-butene	--	--	--	--	--	2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U				2	U			
Trichloroethene (1,1,2-Trichlorc	--	--	--	--	3	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Trichlorofluoromethane	--	--	--	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U				1	U			
Vinyl Acetate	--	--	--	--	--	5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U				5	U			
Vinyl Chloride	--	--	--	--	0.02	0.01	U				0.01	U				0.01	U				0.01	U				**0.12**					0.01	U				0.01	U				0.01	U				0.01	U			

D: U = Indicates compound was not detected at the given reporting limit; X indicates that the compound was detected in the trip blank and contamination is suspected.

V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data.

Tr: I=increasing Trend, D=Decreasing Trend;

Ch: Y indicates a change in trend from previous quarter; N means no change in trend.

Values in **purple** exceed the prediction limit; indicates that a value exceeded the Groundwater Standards

The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits or WAC 246-290, whichever is more protective of groundwater quality.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Alkalinity (as caco3)	mg/L	G-01D	10/19/2021		230.0000	**	280.0000
Ammonia nitrogen	mg-N/L	G-01D	10/19/2021		0.1600		0.2793
Bicarbonate	mg/L	G-01D	10/19/2021		230.0000		280.0000
Chemical oxygen demand	mg/L	G-01D	10/19/2021	ND	10.0000		28.0000
Chloride	mg/L	G-01D	10/19/2021		7.6100	***	6.8600
Conductivity	umhos/cm	G-01D	10/19/2021		590.0000	***	530.0000
Dissolved antimony	mg/L	G-01D	10/19/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-01D	10/19/2021		0.0007		0.0021
Dissolved barium	mg/L	G-01D	10/19/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-01D	10/19/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-01D	10/19/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-01D	10/19/2021		1.0400		6.3200
Dissolved chromium	mg/L	G-01D	10/19/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-01D	10/19/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-01D	10/19/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-01D	10/19/2021	ND	0.0200		0.8710
Dissolved lead	mg/L	G-01D	10/19/2021	ND	0.0001		0.0007
Dissolved magnesium	mg/L	G-01D	10/19/2021	ND	0.0500		2.3300
Dissolved manganese	mg/L	G-01D	10/19/2021	ND	0.0050		0.0120
Dissolved nickel	mg/L	G-01D	10/19/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-01D	10/19/2021		0.4600		2.0190
Dissolved selenium	mg/L	G-01D	10/19/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-01D	10/19/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-01D	10/19/2021		140.0000	***	131.9680
Dissolved thallium	mg/L	G-01D	10/19/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-01D	10/19/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-01D	10/19/2021	ND	0.0100	**	0.0120
Nitrate nitrogen	mg-N/L	G-01D	10/19/2021	ND	0.0100		0.2800
Nitrite nitrogen	mg-N/L	G-01D	10/19/2021		0.0470		0.0540
pH	std units	G-01D	10/19/2021		8.9800		7.27 - 9.88
Sulfate	mg/L	G-01D	10/19/2021		51.4000		66.0500
Total dissolved solids	mg/L	G-01D	10/19/2021		340.0000	**	460.0000
Total organic carbon	mg/L	G-01D	10/19/2021		1.3000		25.0000
Alkalinity (as caco3)	mg/L	G-02D	10/19/2021		96.0000		280.0000
Ammonia nitrogen	mg-N/L	G-02D	10/19/2021	ND	0.0200		0.2793
Bicarbonate	mg/L	G-02D	10/19/2021		96.0000		280.0000
Chemical oxygen demand	mg/L	G-02D	10/19/2021	ND	10.0000		28.0000
Chloride	mg/L	G-02D	10/19/2021		5.4600		6.8600
Conductivity	umhos/cm	G-02D	10/19/2021		340.0000		530.0000
Dissolved antimony	mg/L	G-02D	10/19/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-02D	10/19/2021		0.0036	***	0.0021
Dissolved barium	mg/L	G-02D	10/19/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-02D	10/19/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-02D	10/19/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-02D	10/19/2021		0.4200		6.3200
Dissolved chromium	mg/L	G-02D	10/19/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-02D	10/19/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-02D	10/19/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-02D	10/19/2021		0.0290		0.8710
Dissolved lead	mg/L	G-02D	10/19/2021	ND	0.0001		0.0007
Dissolved magnesium	mg/L	G-02D	10/19/2021	ND	0.0500		2.3300
Dissolved manganese	mg/L	G-02D	10/19/2021	ND	0.0050		0.0120
Dissolved nickel	mg/L	G-02D	10/19/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-02D	10/19/2021		0.2400		2.0190
Dissolved selenium	mg/L	G-02D	10/19/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-02D	10/19/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-02D	10/19/2021		80.8000		131.9680
Dissolved thallium	mg/L	G-02D	10/19/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-02D	10/19/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-02D	10/19/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-02D	10/19/2021	ND	0.0100	**	0.2800
Nitrite nitrogen	mg-N/L	G-02D	10/19/2021		0.0140		0.0540
pH	std units	G-02D	10/19/2021		7.0500	*	7.27 - 9.88
Sulfate	mg/L	G-02D	10/19/2021		57.3000	**	66.0500
Total dissolved solids	mg/L	G-02D	10/19/2021		200.0000		460.0000
Total organic carbon	mg/L	G-02D	10/19/2021		0.6000		25.0000
Alkalinity (as caco3)	mg/L	G-06B	10/19/2021		270.0000		280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Ammonia nitrogen	mg-N/L	G-06B	10/19/2021		0.0780		0.2793
Bicarbonate	mg/L	G-06B	10/19/2021		270.0000		280.0000
Chemical oxygen demand	mg/L	G-06B	10/19/2021	ND	10.0000		28.0000
Chloride	mg/L	G-06B	10/19/2021		7.1200	***	6.8600
Conductivity	umhos/cm	G-06B	10/19/2021		660.0000	***	530.0000
Dissolved antimony	mg/L	G-06B	10/19/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-06B	10/19/2021		0.0034	***	0.0021
Dissolved barium	mg/L	G-06B	10/19/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-06B	10/19/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-06B	10/19/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-06B	10/19/2021		1.0500		6.3200
Dissolved chromium	mg/L	G-06B	10/19/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-06B	10/19/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-06B	10/19/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-06B	10/19/2021		0.0350		0.8710
Dissolved lead	mg/L	G-06B	10/19/2021	ND	0.0001		0.0007
Dissolved magnesium	mg/L	G-06B	10/19/2021	ND	0.0500		2.3300
Dissolved manganese	mg/L	G-06B	10/19/2021	ND	0.0050		0.0120
Dissolved nickel	mg/L	G-06B	10/19/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-06B	10/19/2021		0.4200		2.0190
Dissolved selenium	mg/L	G-06B	10/19/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-06B	10/19/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-06B	10/19/2021		181.0000	***	131.9680
Dissolved thallium	mg/L	G-06B	10/19/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-06B	10/19/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-06B	10/19/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-06B	10/19/2021		0.1900		0.2800
Nitrite nitrogen	mg-N/L	G-06B	10/19/2021		0.0110		0.0540
pH	std units	G-06B	10/19/2021		7.6700		7.27 - 9.88
Sulfate	mg/L	G-06B	10/19/2021		63.5000	**	66.0500
Total dissolved solids	mg/L	G-06B	10/19/2021		410.0000		460.0000
Total organic carbon	mg/L	G-06B	10/19/2021		2.2000		25.0000
Alkalinity (as caco3)	mg/L	G-08D2	10/19/2021		180.0000		280.0000
Ammonia nitrogen	mg-N/L	G-08D2	10/19/2021		0.1830		0.2793
Bicarbonate	mg/L	G-08D2	10/19/2021		180.0000		280.0000
Chemical oxygen demand	mg/L	G-08D2	10/19/2021	ND	10.0000		28.0000
Chloride	mg/L	G-08D2	10/19/2021		2.5350		6.8600
Conductivity	umhos/cm	G-08D2	10/19/2021		480.0000		530.0000
Dissolved antimony	mg/L	G-08D2	10/19/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-08D2	10/19/2021		0.0005		0.0021
Dissolved barium	mg/L	G-08D2	10/19/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-08D2	10/19/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-08D2	10/19/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-08D2	10/19/2021		0.5550		6.3200
Dissolved chromium	mg/L	G-08D2	10/19/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-08D2	10/19/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-08D2	10/19/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-08D2	10/19/2021	ND	0.0200		0.8710
Dissolved lead	mg/L	G-08D2	10/19/2021	ND	0.0001		0.0007
Dissolved magnesium	mg/L	G-08D2	10/19/2021	ND	0.0500		2.3300
Dissolved manganese	mg/L	G-08D2	10/19/2021	ND	0.0050		0.0120
Dissolved nickel	mg/L	G-08D2	10/19/2021	ND	0.0100		0.0260
Dissolved potassium	mg/L	G-08D2	10/19/2021		0.2550		2.0190
Dissolved selenium	mg/L	G-08D2	10/19/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-08D2	10/19/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-08D2	10/19/2021		114.5000		131.9680
Dissolved thallium	mg/L	G-08D2	10/19/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-08D2	10/19/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-08D2	10/19/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-08D2	10/19/2021	ND	0.0100		0.2800
Nitrite nitrogen	mg-N/L	G-08D2	10/19/2021		0.0635	*	0.0540
pH	std units	G-08D2	10/19/2021		9.2700	**	7.27 - 9.88
Sulfate	mg/L	G-08D2	10/19/2021		43.8000		66.0500
Total dissolved solids	mg/L	G-08D2	10/19/2021		295.0000		460.0000
Total organic carbon	mg/L	G-08D2	10/19/2021		0.5900		25.0000
Alkalinity (as caco3)	mg/L	G-09D	10/20/2021		190.0000		280.0000
Ammonia nitrogen	mg-N/L	G-09D	10/20/2021		0.1400		0.2793

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Bicarbonate	mg/L	G-09D	10/20/2021		190.0000		280.0000
Chemical oxygen demand	mg/L	G-09D	10/20/2021	ND	10.0000		28.0000
Chloride	mg/L	G-09D	10/20/2021		8.2700	***	6.8600
Conductivity	umhos/cm	G-09D	10/20/2021		660.0000	***	530.0000
Dissolved antimony	mg/L	G-09D	10/20/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-09D	10/20/2021		0.0027	***	0.0021
Dissolved barium	mg/L	G-09D	10/20/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-09D	10/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-09D	10/20/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-09D	10/20/2021		1.6000		6.3200
Dissolved chromium	mg/L	G-09D	10/20/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-09D	10/20/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-09D	10/20/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-09D	10/20/2021	ND	0.0200		0.8710
Dissolved lead	mg/L	G-09D	10/20/2021		0.0001		0.0007
Dissolved magnesium	mg/L	G-09D	10/20/2021	ND	0.0500		2.3300
Dissolved manganese	mg/L	G-09D	10/20/2021	ND	0.0050		0.0120
Dissolved nickel	mg/L	G-09D	10/20/2021		0.0130		0.0260
Dissolved potassium	mg/L	G-09D	10/20/2021		0.5300		2.0190
Dissolved selenium	mg/L	G-09D	10/20/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-09D	10/20/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-09D	10/20/2021		182.0000	***	131.9680
Dissolved thallium	mg/L	G-09D	10/20/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-09D	10/20/2021		0.0100		0.0100
Dissolved zinc	mg/L	G-09D	10/20/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-09D	10/20/2021		0.1700	**	0.2800
Nitrite nitrogen	mg-N/L	G-09D	10/20/2021		0.0310		0.0540
pH	std units	G-09D	10/20/2021		8.9700		7.27 - 9.88
Sulfate	mg/L	G-09D	10/20/2021		127.0000	***	66.0500
Total dissolved solids	mg/L	G-09D	10/20/2021		400.0000		460.0000
Total organic carbon	mg/L	G-09D	10/20/2021		2.3000		25.0000
Alkalinity (as caco3)	mg/L	G-10D	10/20/2021		510.0000	***	280.0000
Ammonia nitrogen	mg-N/L	G-10D	10/20/2021		0.3940	*	0.2793
Bicarbonate	mg/L	G-10D	10/20/2021		510.0000	***	280.0000
Chemical oxygen demand	mg/L	G-10D	10/20/2021	ND	10.0000		28.0000
Chloride	mg/L	G-10D	10/20/2021		20.7000	***	6.8600
Conductivity	umhos/cm	G-10D	10/20/2021		1400.0000	***	530.0000
Dissolved antimony	mg/L	G-10D	10/20/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-10D	10/20/2021		0.0007		0.0021
Dissolved barium	mg/L	G-10D	10/20/2021	ND	0.0050	**	0.0046
Dissolved beryllium	mg/L	G-10D	10/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-10D	10/20/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-10D	10/20/2021		23.1000	***	6.3200
Dissolved chromium	mg/L	G-10D	10/20/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-10D	10/20/2021	ND	0.0100		0.0050
Dissolved copper	mg/L	G-10D	10/20/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-10D	10/20/2021		0.5360		0.8710
Dissolved lead	mg/L	G-10D	10/20/2021	ND	0.0001		0.0007
Dissolved magnesium	mg/L	G-10D	10/20/2021		1.8400		2.3300
Dissolved manganese	mg/L	G-10D	10/20/2021		0.3540	***	0.0120
Dissolved nickel	mg/L	G-10D	10/20/2021		0.0240	**	0.0260
Dissolved potassium	mg/L	G-10D	10/20/2021		1.7500		2.0190
Dissolved selenium	mg/L	G-10D	10/20/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-10D	10/20/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-10D	10/20/2021		377.0000	***	131.9680
Dissolved thallium	mg/L	G-10D	10/20/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-10D	10/20/2021		0.0120	*	0.0100
Dissolved zinc	mg/L	G-10D	10/20/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-10D	10/20/2021	ND	0.0100		0.2800
Nitrite nitrogen	mg-N/L	G-10D	10/20/2021	ND	0.0020		0.0540
pH	std units	G-10D	10/20/2021		6.8300	*	7.27 - 9.88
Sulfate	mg/L	G-10D	10/20/2021		252.0000	***	66.0500
Total dissolved solids	mg/L	G-10D	10/20/2021		1000.0000	***	460.0000
Total organic carbon	mg/L	G-10D	10/20/2021		3.6000		25.0000
Alkalinity (as caco3)	mg/L	G-13D	10/20/2021		170.0000		280.0000
Ammonia nitrogen	mg-N/L	G-13D	10/20/2021		0.1030		0.2793
Bicarbonate	mg/L	G-13D	10/20/2021		170.0000		280.0000

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Chemical oxygen demand	mg/L	G-13D	10/20/2021	ND	10.0000		28.0000
Chloride	mg/L	G-13D	10/20/2021		11.9000	***	6.8600
Conductivity	umhos/cm	G-13D	10/20/2021		430.0000		530.0000
Dissolved antimony	mg/L	G-13D	10/20/2021	ND	0.0003		0.0008
Dissolved arsenic	mg/L	G-13D	10/20/2021		0.0001		0.0021
Dissolved barium	mg/L	G-13D	10/20/2021	ND	0.0050		0.0046
Dissolved beryllium	mg/L	G-13D	10/20/2021	ND	0.0050		0.0005
Dissolved cadmium	mg/L	G-13D	10/20/2021	ND	0.0001		0.0001
Dissolved calcium	mg/L	G-13D	10/20/2021		0.6200		6.3200
Dissolved chromium	mg/L	G-13D	10/20/2021	ND	0.0100		0.0136
Dissolved cobalt	mg/L	G-13D	10/20/2021	ND	0.0100	**	0.0050
Dissolved copper	mg/L	G-13D	10/20/2021	ND	0.0200		0.0550
Dissolved iron	mg/L	G-13D	10/20/2021		0.0290		0.8710
Dissolved lead	mg/L	G-13D	10/20/2021	ND	0.0001		0.0007
Dissolved magnesium	mg/L	G-13D	10/20/2021	ND	0.0500		2.3300
Dissolved manganese	mg/L	G-13D	10/20/2021	ND	0.0050		0.0120
Dissolved nickel	mg/L	G-13D	10/20/2021		0.0200		0.0260
Dissolved potassium	mg/L	G-13D	10/20/2021		0.2600		2.0190
Dissolved selenium	mg/L	G-13D	10/20/2021	ND	0.0005		0.0014
Dissolved silver	mg/L	G-13D	10/20/2021	ND	0.0001		0.0001
Dissolved sodium	mg/L	G-13D	10/20/2021		104.0000		131.9680
Dissolved thallium	mg/L	G-13D	10/20/2021	ND	0.0001		0.0001
Dissolved vanadium	mg/L	G-13D	10/20/2021	ND	0.0100		0.0100
Dissolved zinc	mg/L	G-13D	10/20/2021	ND	0.0100		0.0120
Nitrate nitrogen	mg-N/L	G-13D	10/20/2021	ND	0.0100		0.2800
Nitrite nitrogen	mg-N/L	G-13D	10/20/2021		0.0030		0.0540
pH	std units	G-13D	10/20/2021		8.8400		7.27 - 9.88
Sulfate	mg/L	G-13D	10/20/2021		35.1000		66.0500
Total dissolved solids	mg/L	G-13D	10/20/2021		330.0000		460.0000
Total organic carbon	mg/L	G-13D	10/20/2021		1.0000		25.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, Result = detection limit.

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Detect	N	Mean	SD	alpha	Factor	Pred Limit	Type		Conf
Alkalinity (as caco3)	mg/L	58	58					280.0000	nonpar		0.99
Ammonia nitrogen	mg-N/L	55	55	-2.2197	0.3904	0.0100	2.4191	0.2793	lognor		
Bicarbonate	mg/L	58	58					280.0000	nonpar		0.99
Chemical oxygen demand	mg/L	10	57					28.0000	nonpar		0.99
Chloride	mg/L	57	58					6.8600	nonpar		0.99
Conductivity	umhos/cm	58	58					530.0000	nonpar		0.99
Dissolved antimony	mg/L	7	56					0.0008	nonpar		0.99
Dissolved arsenic	mg/L	45	57					0.0021	nonpar		0.99
Dissolved barium	mg/L	14	57					0.0046	nonpar		0.99
Dissolved beryllium	mg/L	0	58					0.0005	nonpar	***	0.99
Dissolved cadmium	mg/L	8	56					0.0001	nonpar		0.99
Dissolved calcium	mg/L	55	55					6.3200	nonpar		0.99
Dissolved chromium	mg/L	6	58					0.0136	nonpar		0.99
Dissolved cobalt	mg/L	2	58					0.0050	nonpar	***	0.99
Dissolved copper	mg/L	9	56					0.0550	nonpar		0.99
Dissolved iron	mg/L	28	57					0.8710	nonpar		0.99
Dissolved lead	mg/L	18	58					0.0007	nonpar		0.99
Dissolved magnesium	mg/L	39	56					2.3300	nonpar		0.99
Dissolved manganese	mg/L	37	56	0.0032	0.0037	0.0100	2.4173	0.0120	normal		
Dissolved nickel	mg/L	3	58					0.0260	nonpar		0.99
Dissolved potassium	mg/L	46	58	-1.0623	0.7311	0.0100	2.4141	2.0190	lognor		
Dissolved selenium	mg/L	15	57					0.0014	nonpar		0.99
Dissolved silver	mg/L	1	56					0.0001	nonpar	***	0.99
Dissolved sodium	mg/L	57	57	109.6842	9.2247	0.0100	2.4157	131.9680	normal		
Dissolved thallium	mg/L	4	58					0.0001	nonpar		0.99
Dissolved vanadium	mg/L	1	58					0.0100	nonpar	***	0.99
Dissolved zinc	mg/L	14	58					0.0120	nonpar		0.99
Nitrate nitrogen	mg-N/L	15	57					0.2800	nonpar		0.99
Nitrite nitrogen	mg-N/L	24	58					0.0540	nonpar		0.99
pH	std units	58	58					7.27- 9.88	nonpar		0.99
Sulfate	mg/L	57	57					66.0500	nonpar		0.99
Total dissolved solids	mg/L	58	58					460.0000	nonpar		0.99
Total organic carbon	mg/L	58	58					25.0000	nonpar		0.99

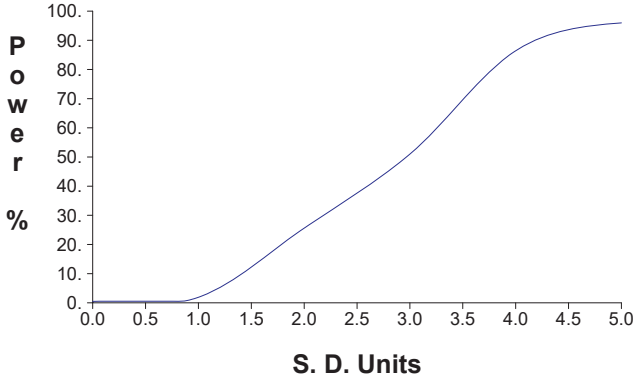
Conf = confidence level for passing initial test or one of two verification resamples at all downgradient wells for a single constituent (nonparametric test only).
* - Insufficient Data.
** - Calculated limit raised to Manual Reporting Limit.
*** - Nonparametric limit based on ND value.
For transformed data, mean and SD in transformed units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

Appendix C

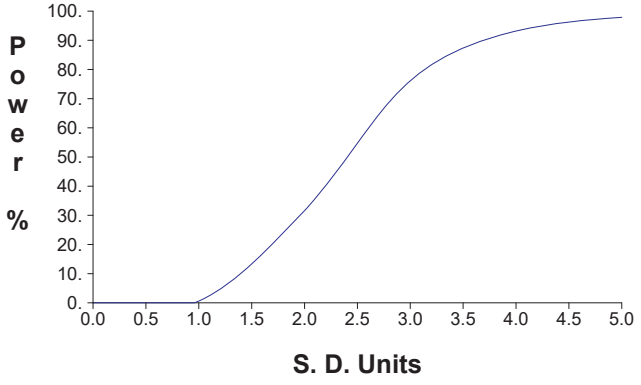
Groundwater Statistical Analyses

Shallow Wells

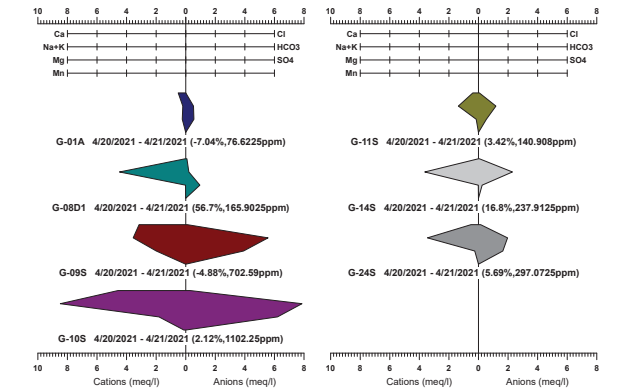
False Positive and False Negative Rates for Current Intra-Well Prediction Limits Monitoring Program



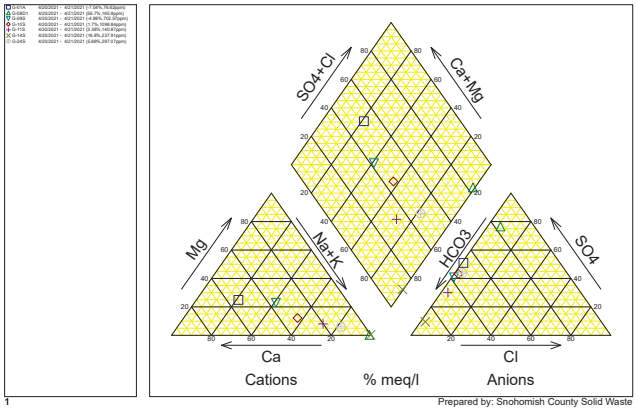
False Positive and False Negative Rates for Current Upgradient vs. Downgradient Monitoring Program



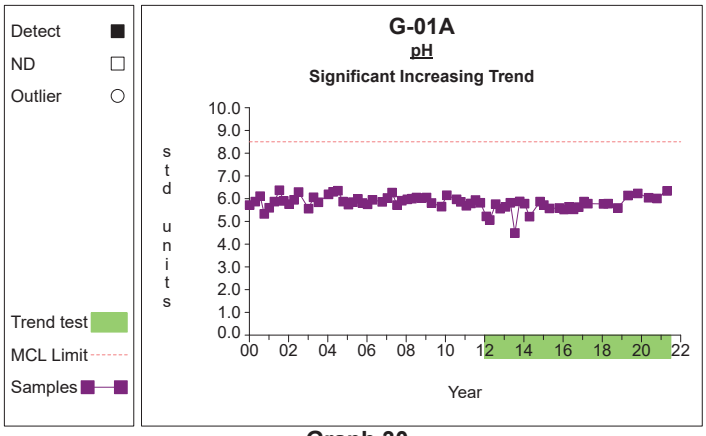
Cathcart Landfill



Cathcart Landfill

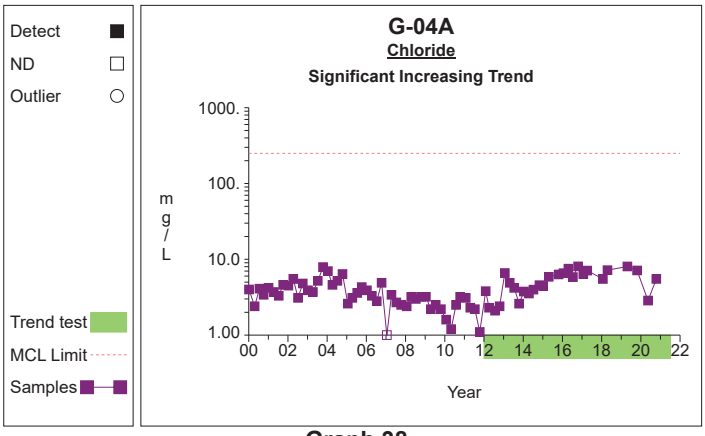


Time Series



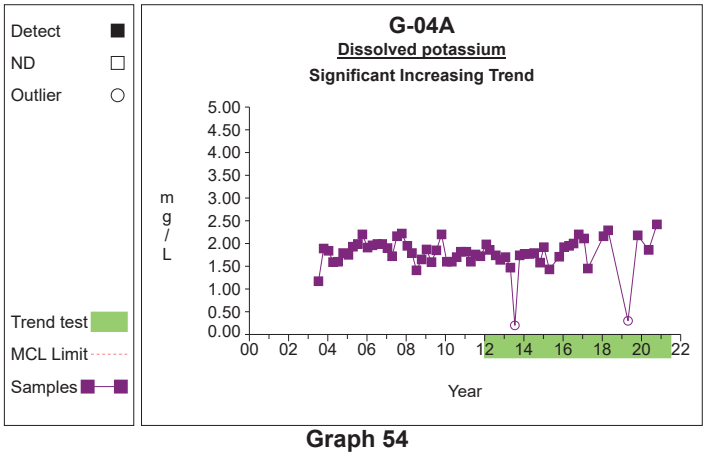
Graph 30

Time Series



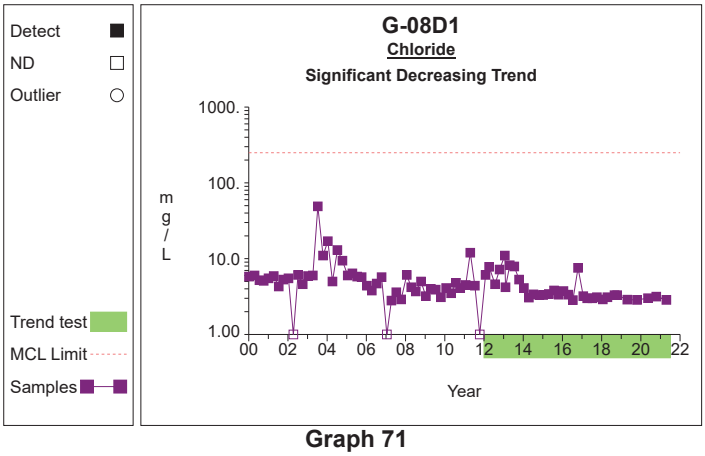
Graph 38

Time Series



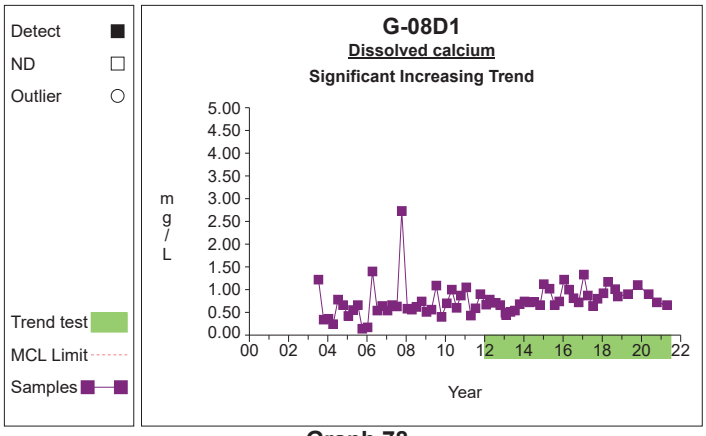
Graph 54

Time Series



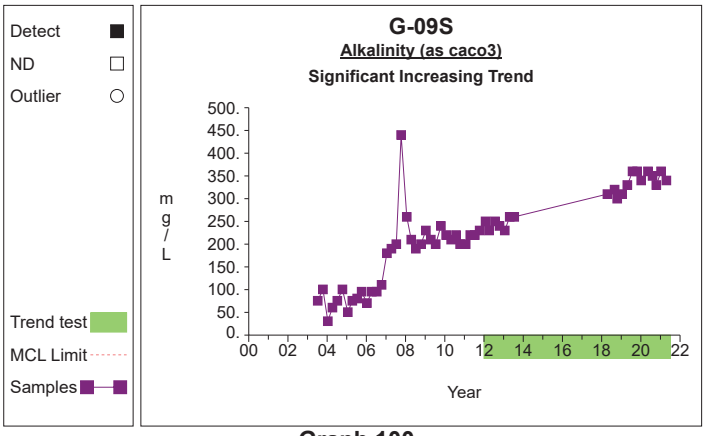
Graph 71

Time Series



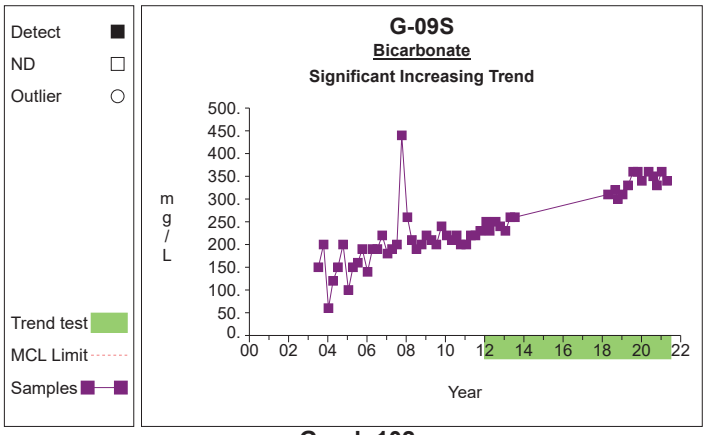
Graph 78

Time Series



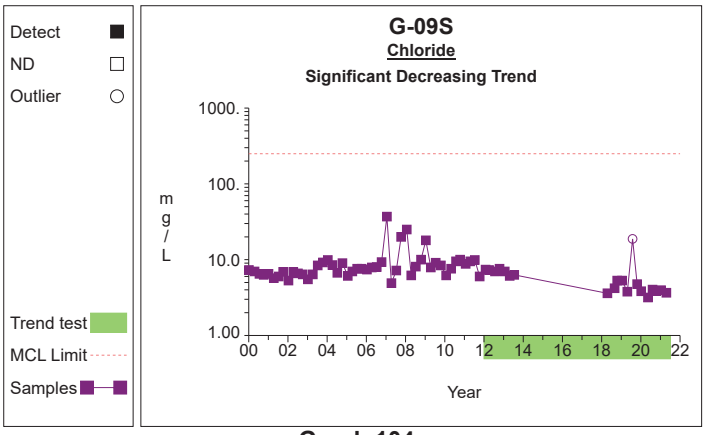
Graph 100

Time Series



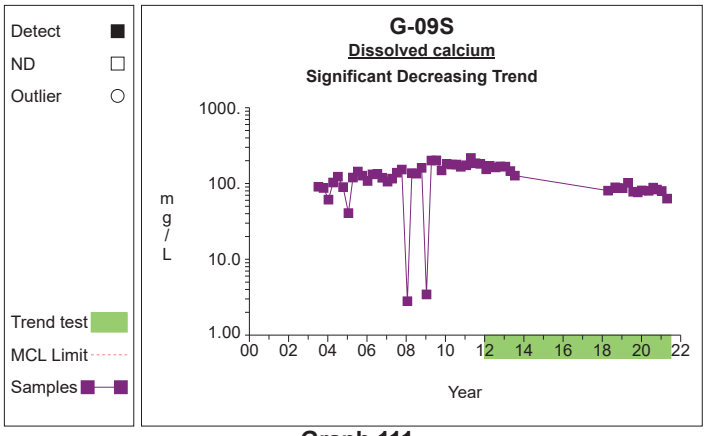
Graph 102

Time Series



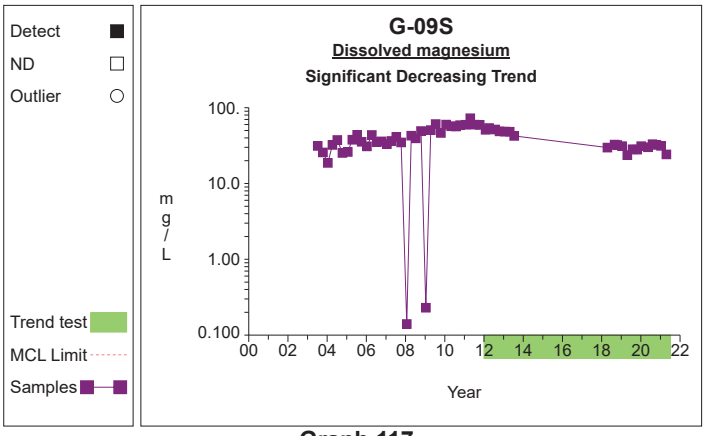
Graph 104

Time Series



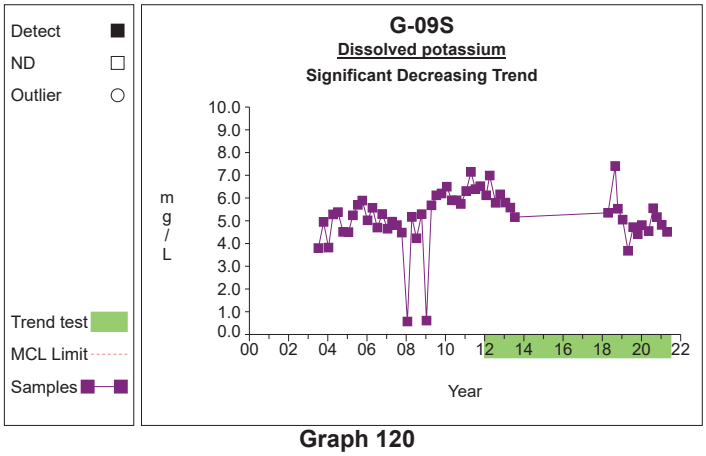
Graph 111

Time Series



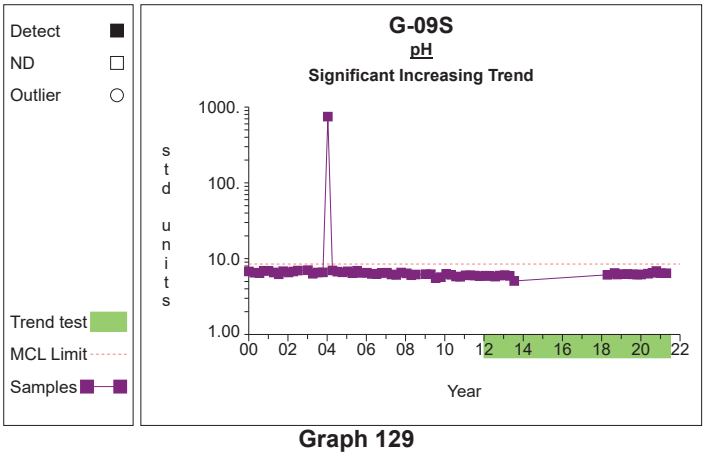
Graph 117

Time Series



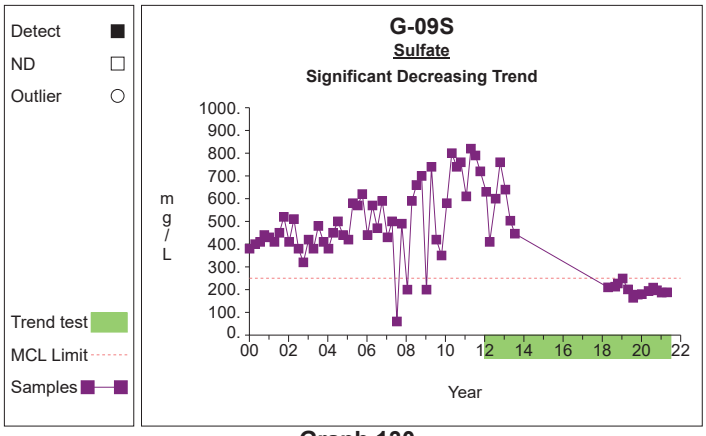
Graph 120

Time Series



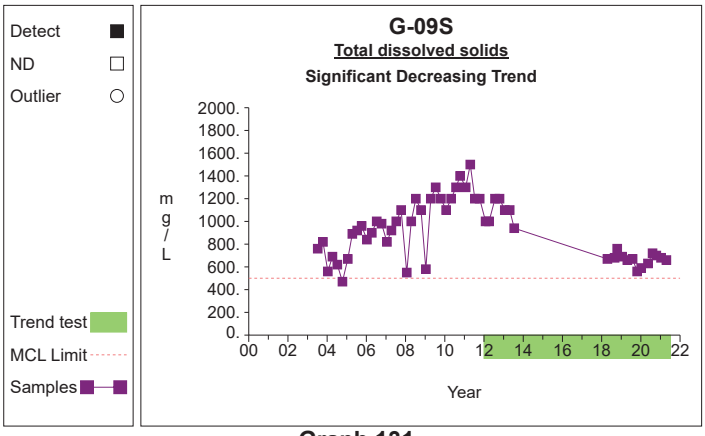
Graph 129

Time Series



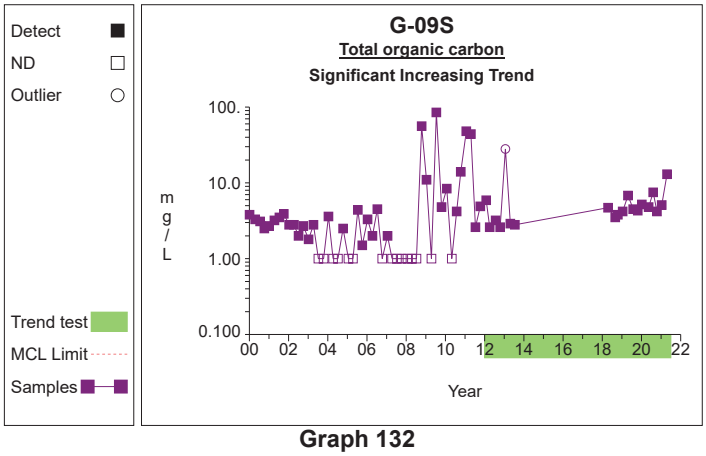
Graph 130

Time Series



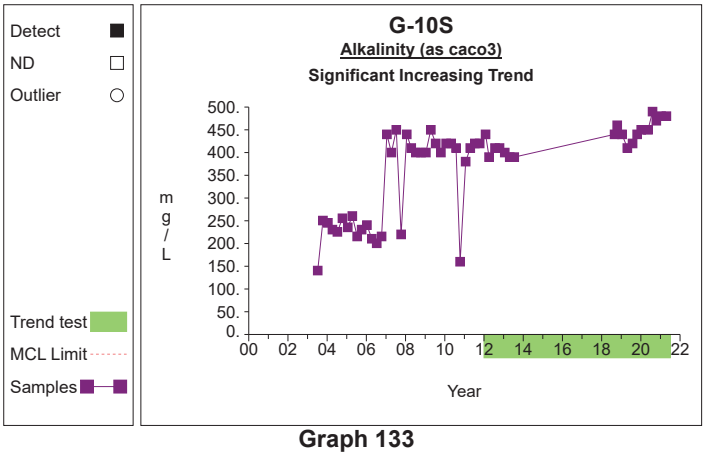
Graph 131

Time Series



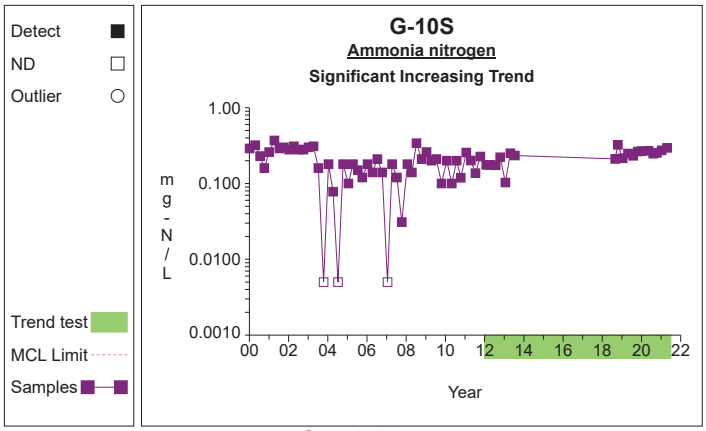
Graph 132

Time Series



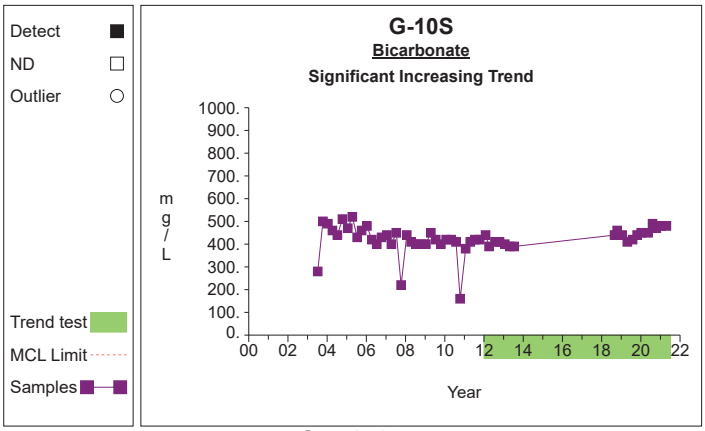
Graph 133

Time Series



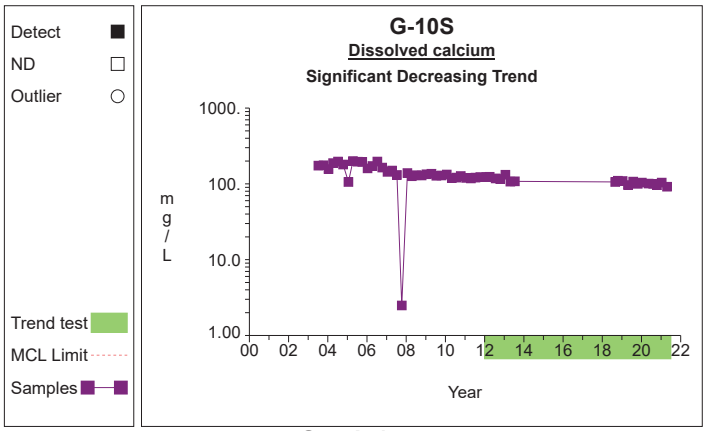
Graph 134

Time Series



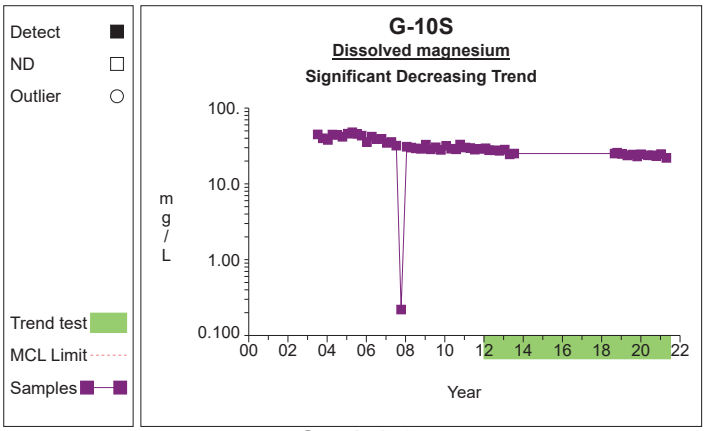
Graph 135

Time Series



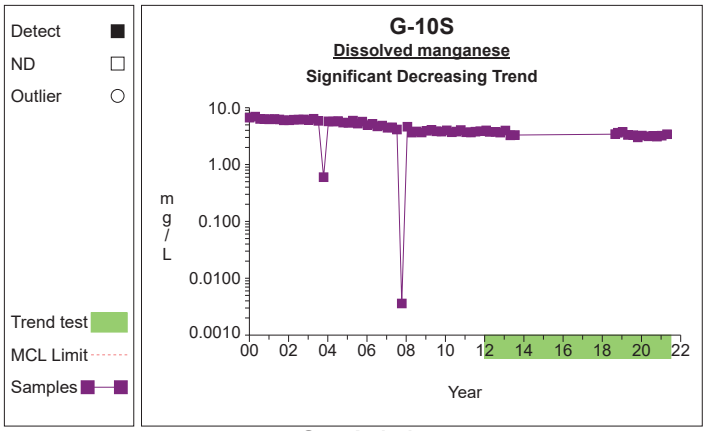
Graph 144

Time Series



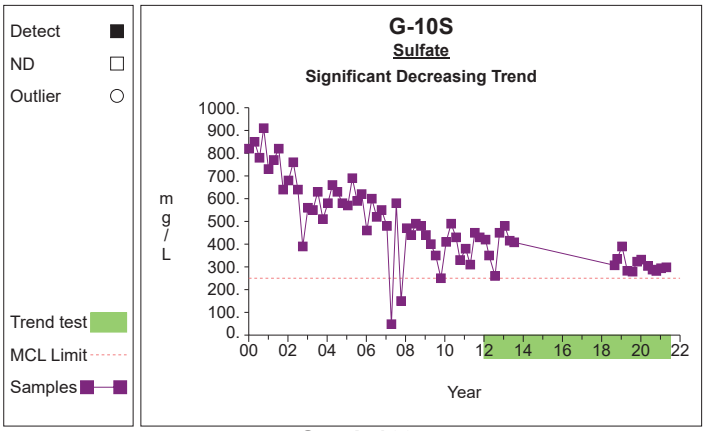
Graph 150

Time Series



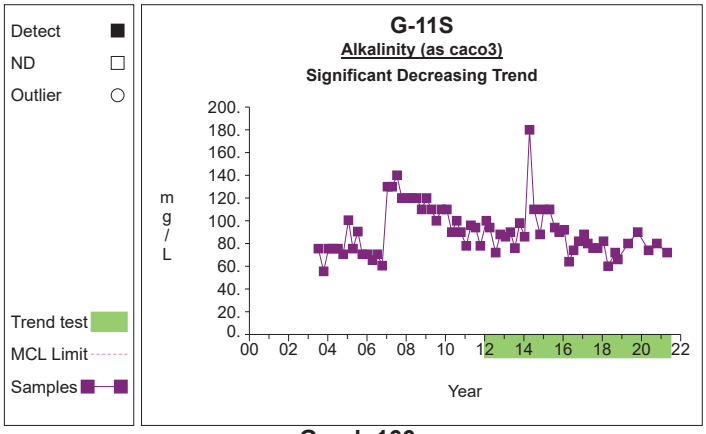
Graph 151

Time Series



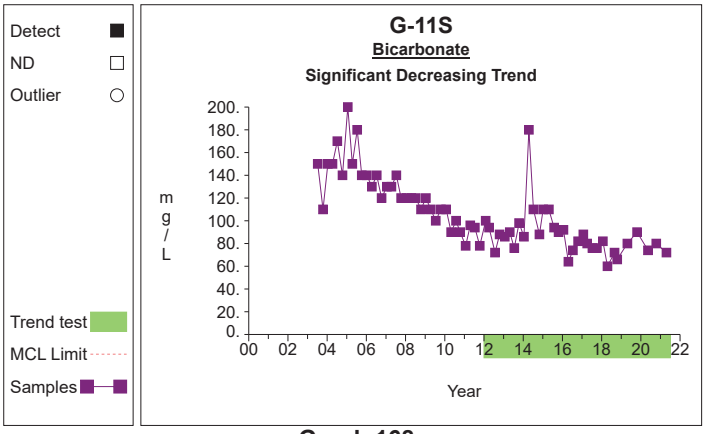
Graph 163

Time Series



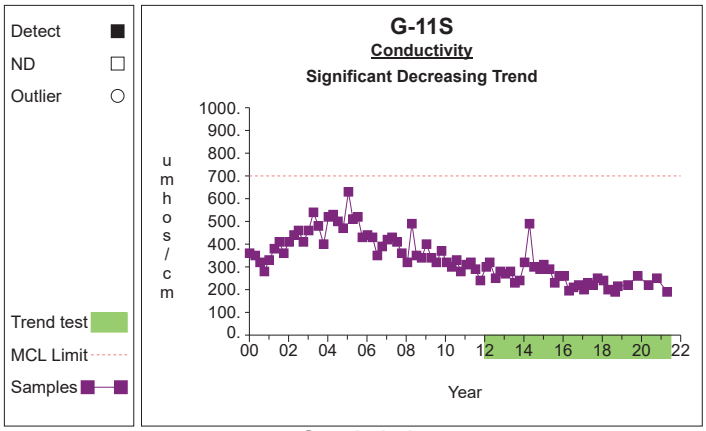
Graph 166

Time Series



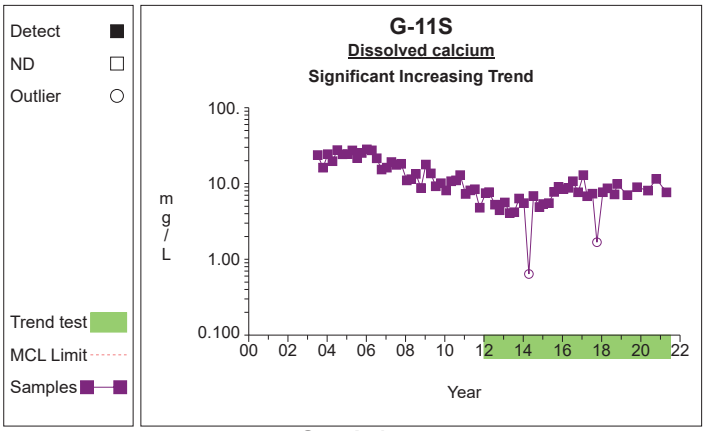
Graph 168

Time Series



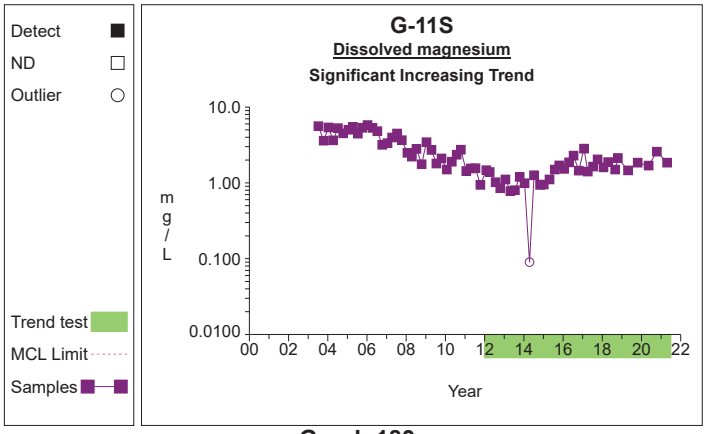
Graph 171

Time Series



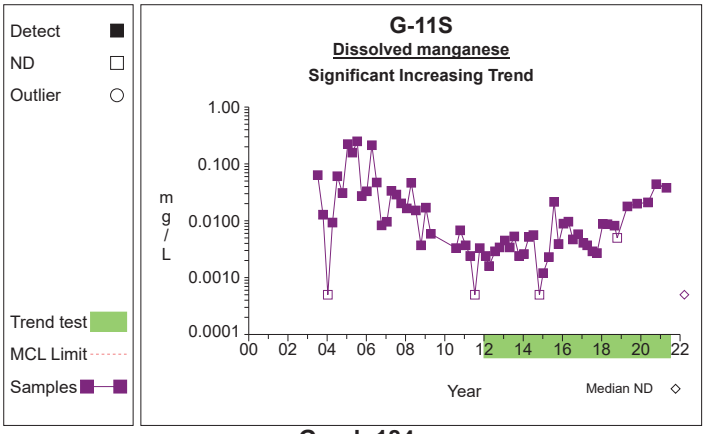
Graph 177

Time Series



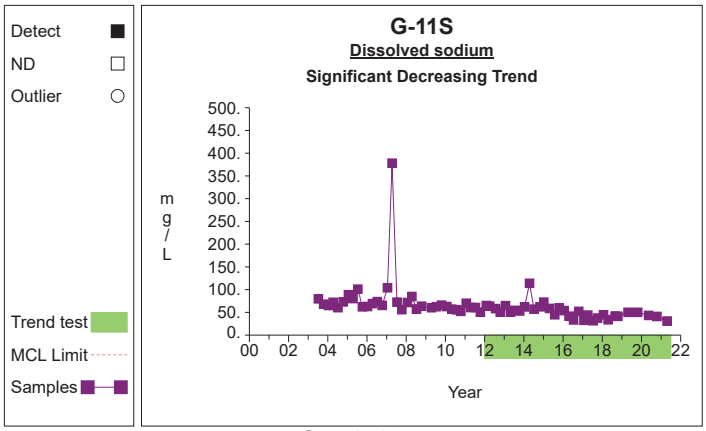
Graph 183

Time Series



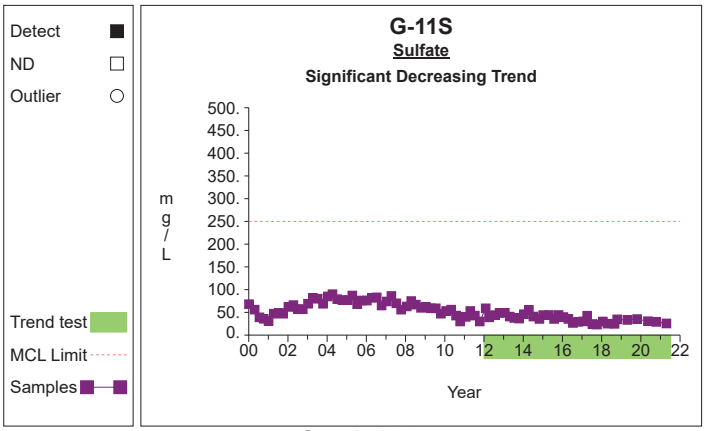
Graph 184

Time Series



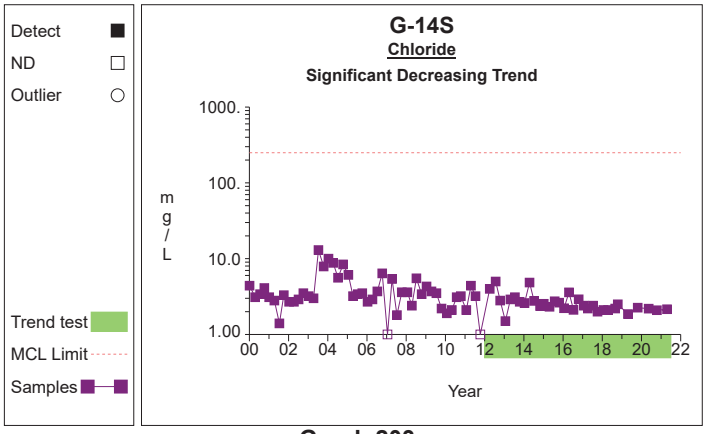
Graph 189

Time Series



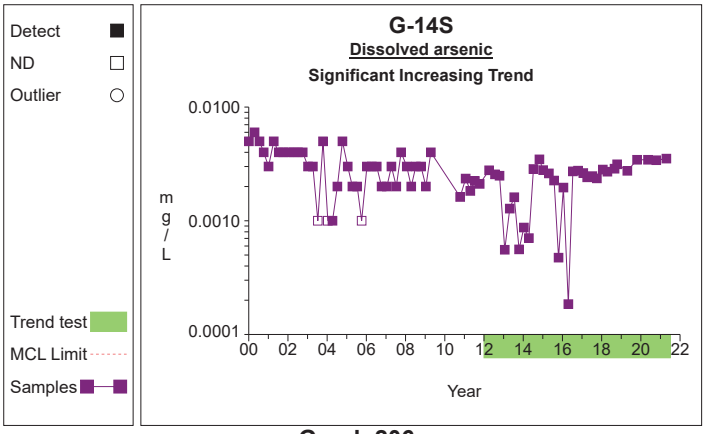
Graph 196

Time Series



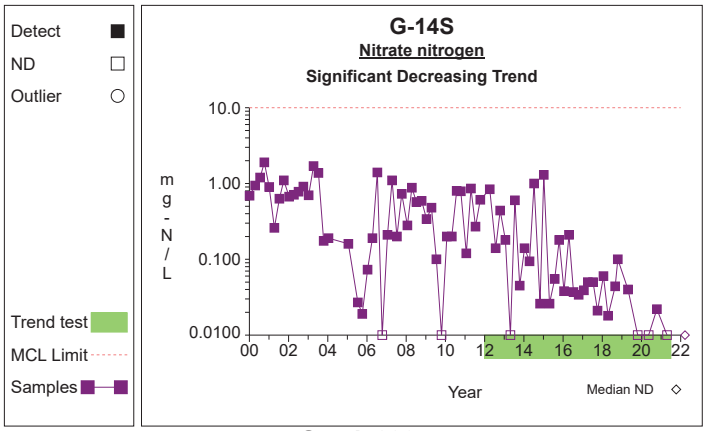
Graph 203

Time Series



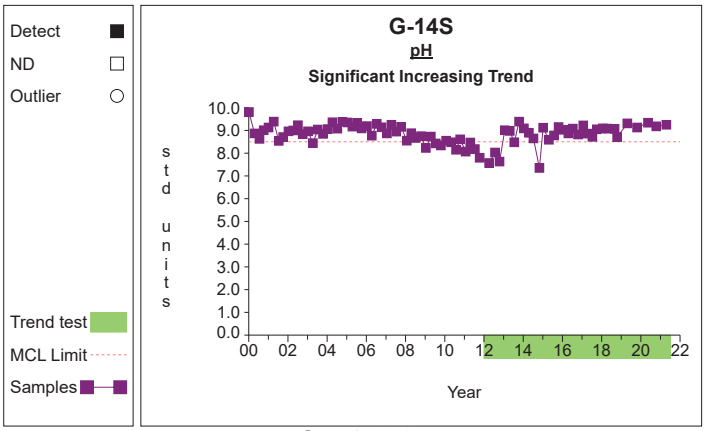
Graph 206

Time Series



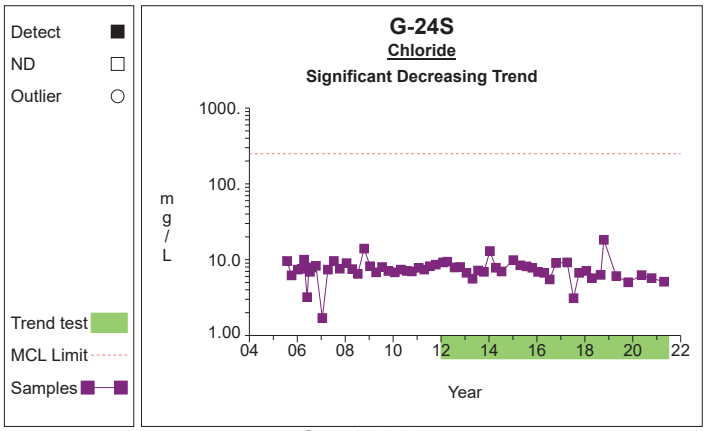
Graph 226

Time Series



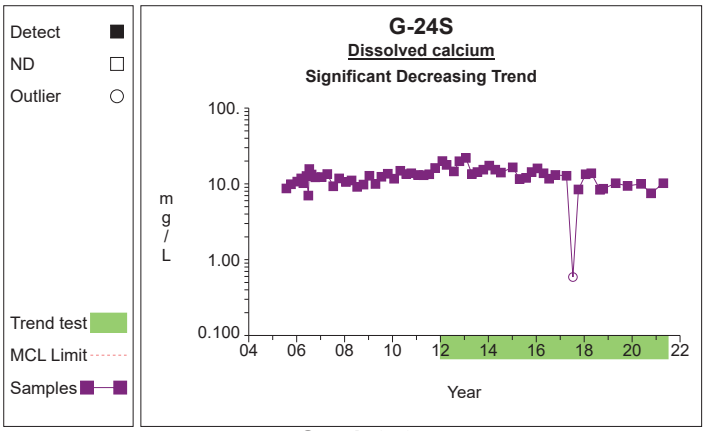
Graph 228

Time Series



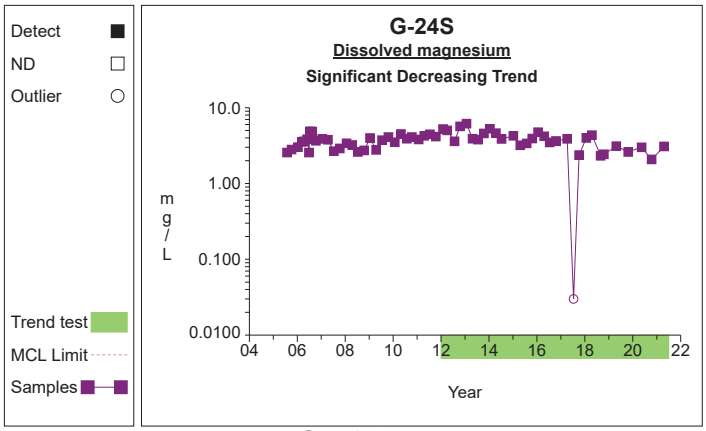
Graph 236

Time Series



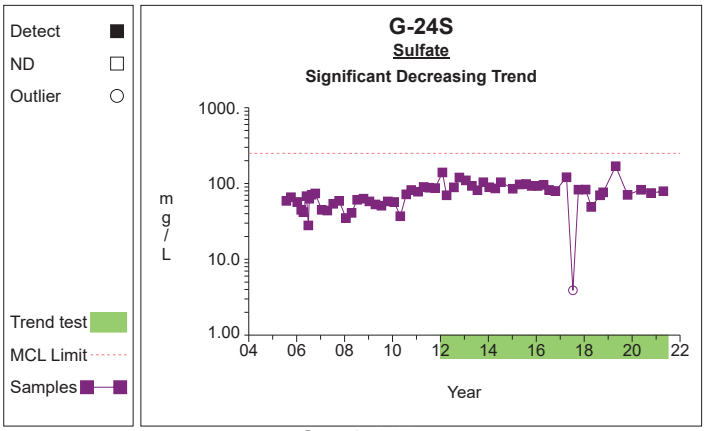
Graph 243

Time Series



Graph 249

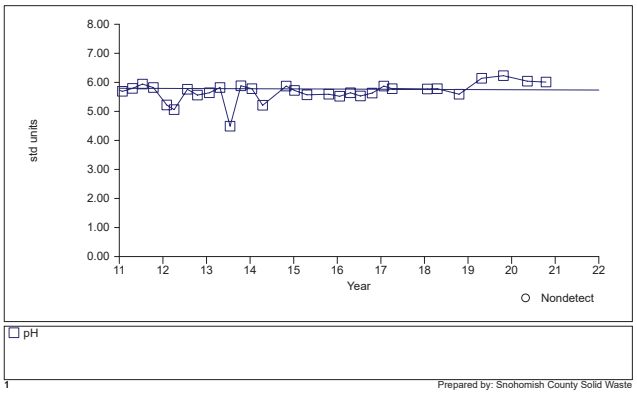
Time Series



Graph 262

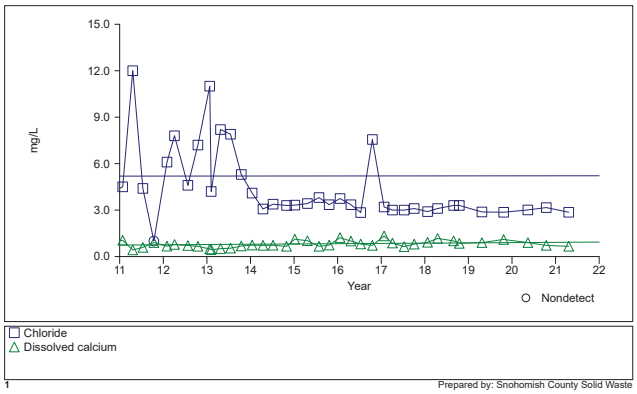
Cathcart Landfill

Time Series Plot for G-01A



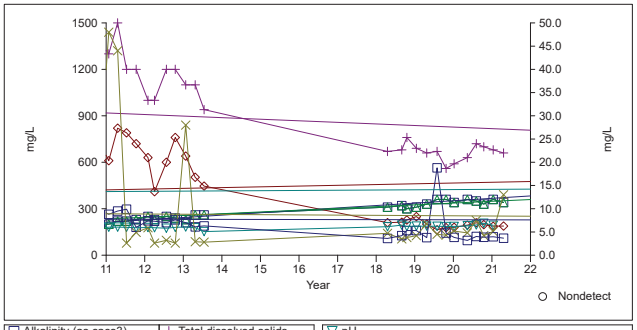
Cathcart Landfill

Time Series Plot for G-08D1



Cathcart Landfill

Time Series Plot for G-09S



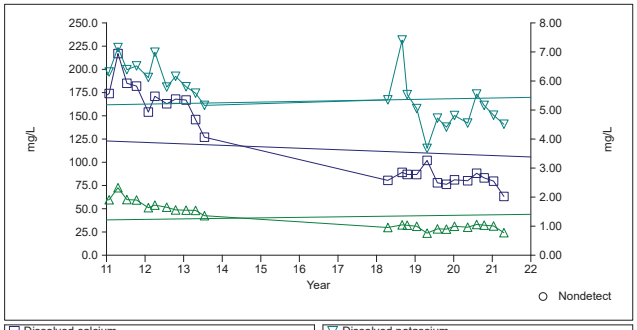
Alkalinity (as caco3)
Bicarbonate
Sulfate
Total dissolved solids
pH
Total organic carbon
Chloride

1

Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-09S



Dissolved calcium
Dissolved magnesium
Dissolved potassium

1

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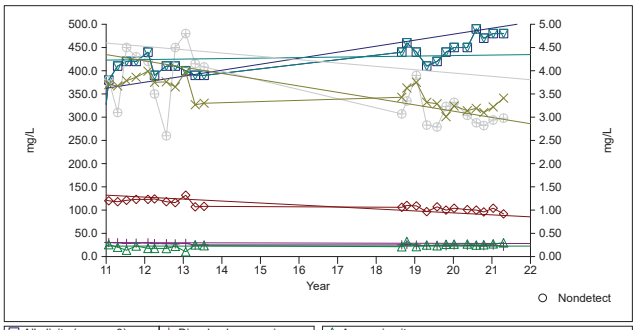
Cathcart Landfill

Time Series Plot for G-10S



Alkalinity (as caco3)
Bicarbonate
Dissolved calcium
Dissolved magnesium
Sulfate
Ammonia nitrogen
Dissolved manganese

1

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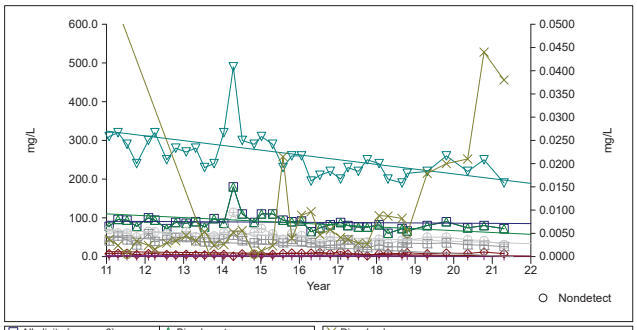
Cathcart Landfill

Time Series Plot for G-11S



Alkalinity (as caco3)
Dissolved magnesium
Dissolved calcium
Conductivity
Bicarbonate
Dissolved sodium
Sulfate
Dissolved manganese

1

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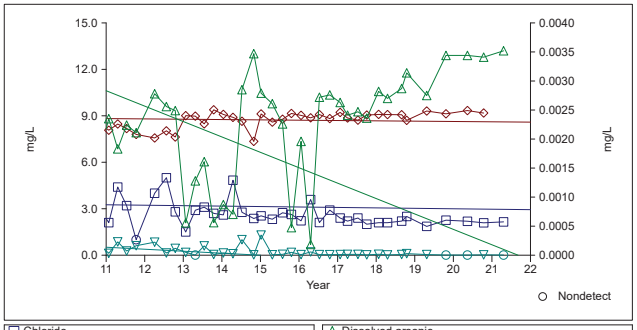
Cathcart Landfill

Time Series Plot for G-14S



- Chloride
- Nitrate nitrogen
- pH
- Dissolved arsenic

1

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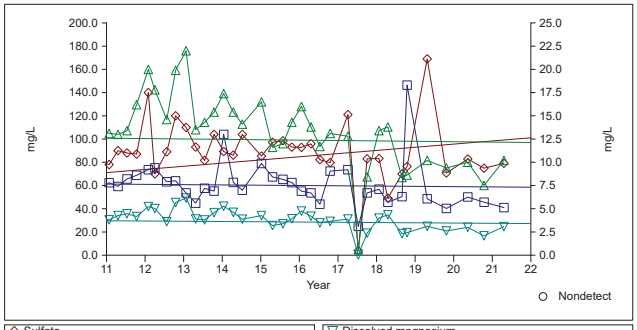
Cathcart Landfill

Time Series Plot for G-24S



- Sulfate
- Dissolved magnesium
- Dissolved calcium
- Chloride

1

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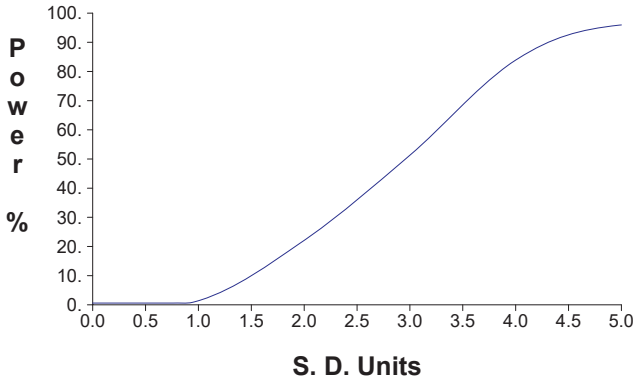
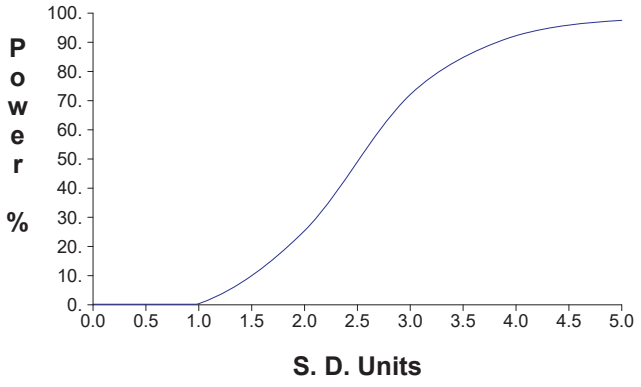
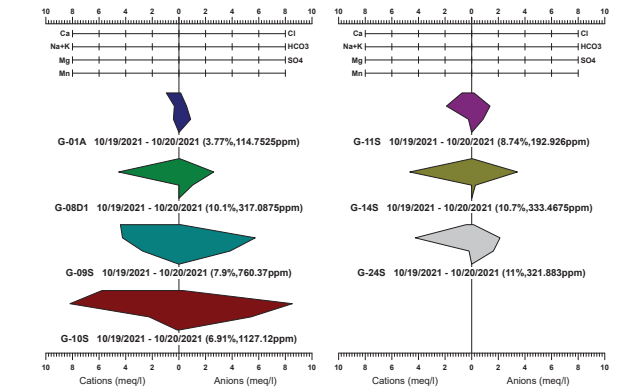
False Positive and False Negative Rates for Current Intra-Well Prediction Limits Monitoring Program



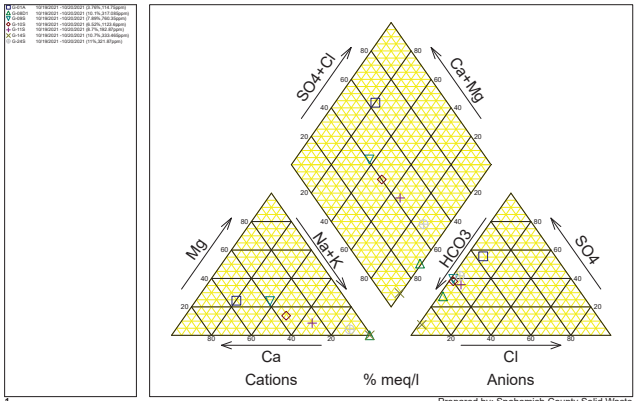
False Positive and False Negative Rates for Current Upgradient vs. Downgradient Monitoring Program



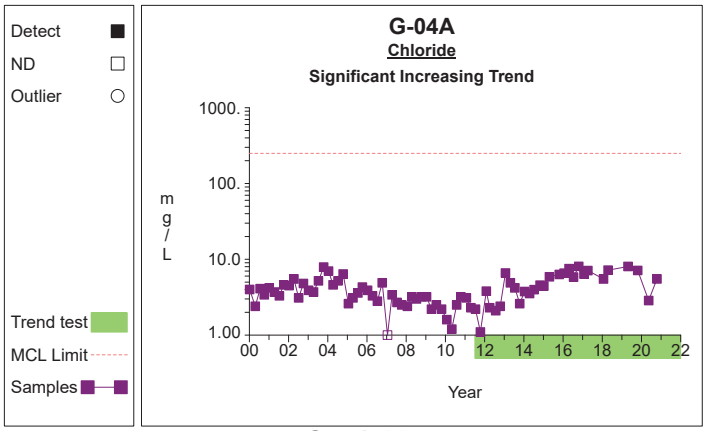
Cathcart Landfill



Cathcart Landfill

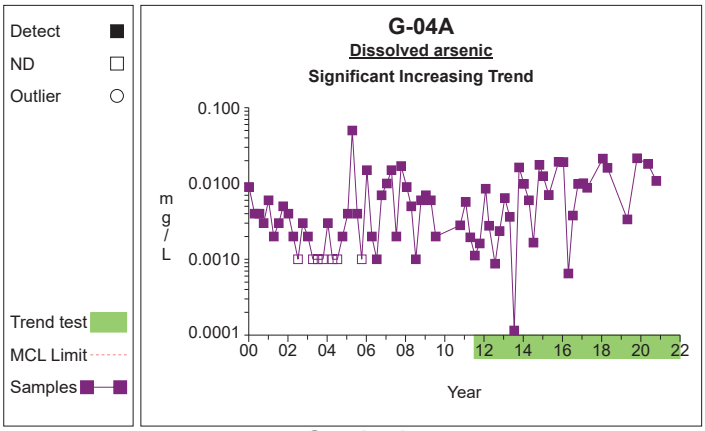


Time Series



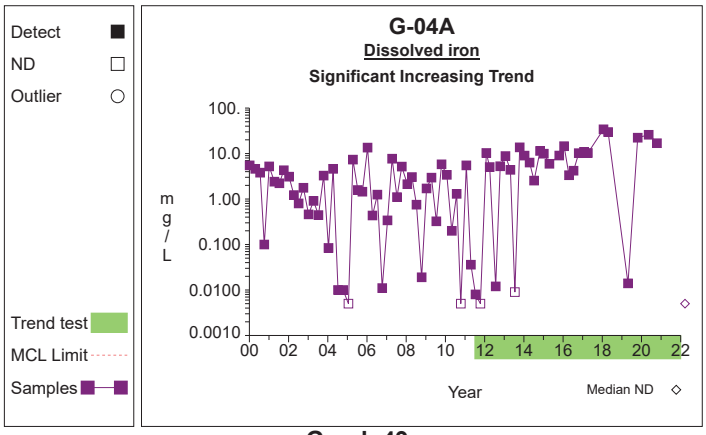
Graph 38

Time Series



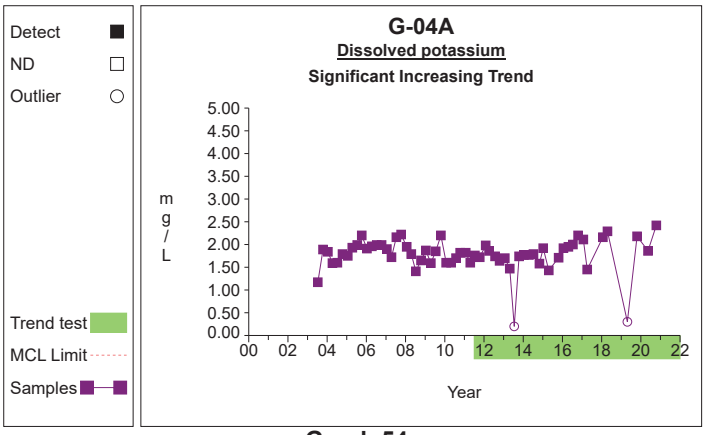
Graph 41

Time Series



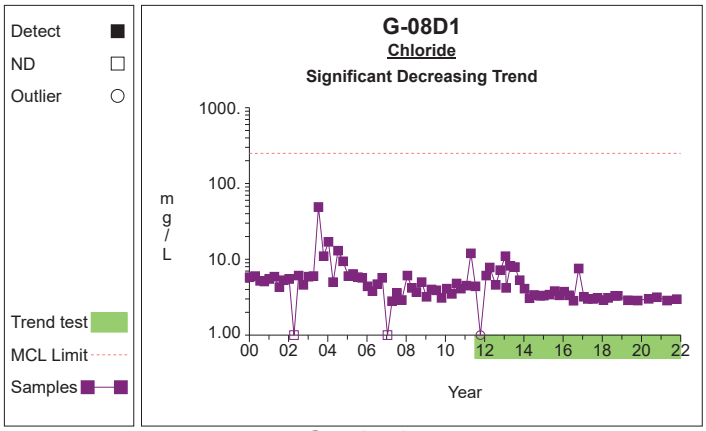
Graph 49

Time Series



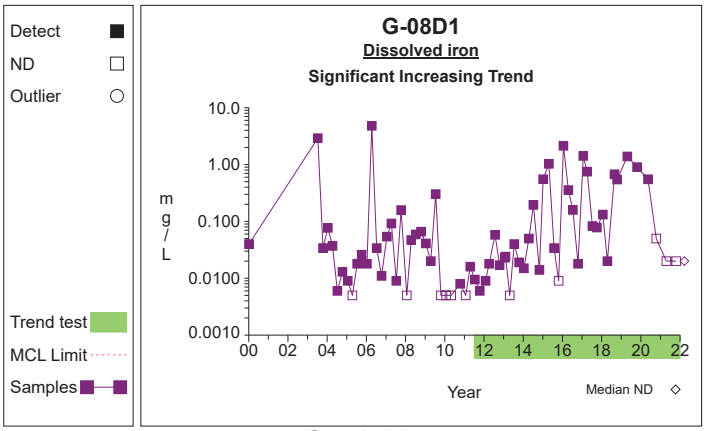
Graph 54

Time Series



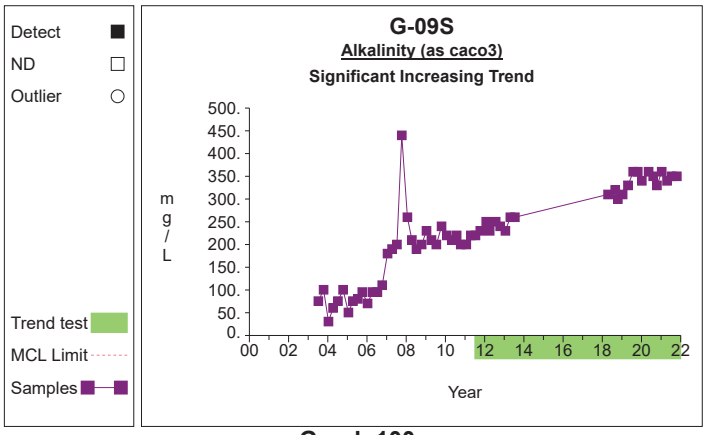
Graph 71

Time Series



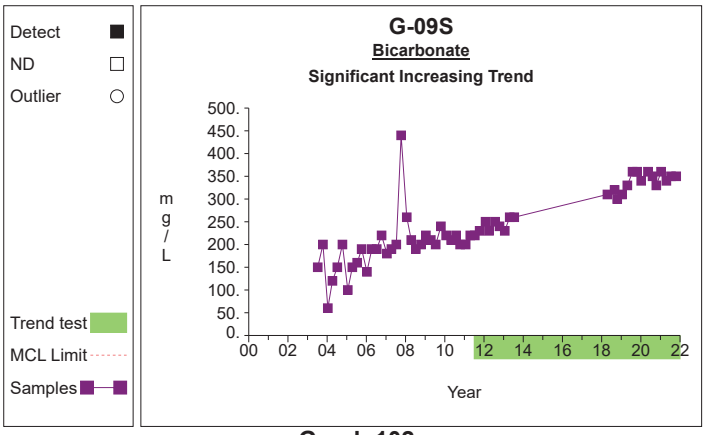
Graph 82

Time Series



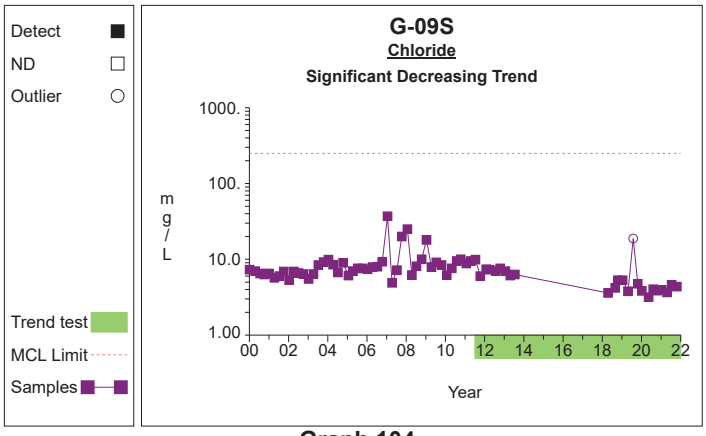
Graph 100

Time Series



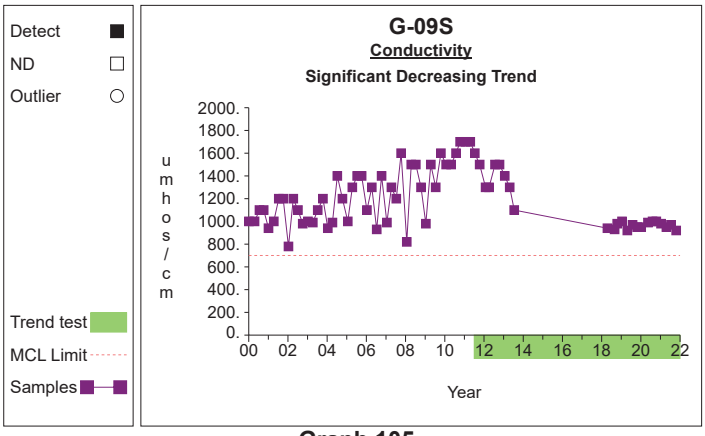
Graph 102

Time Series



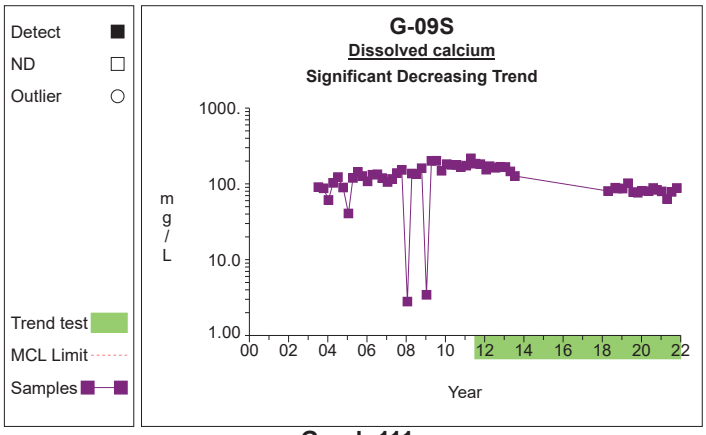
Graph 104

Time Series



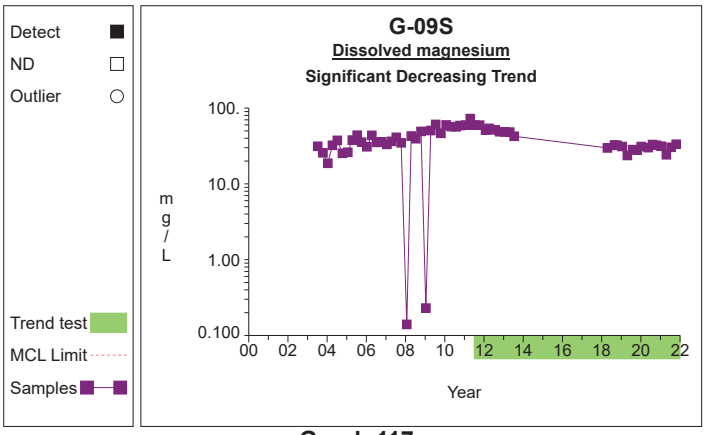
Graph 105

Time Series



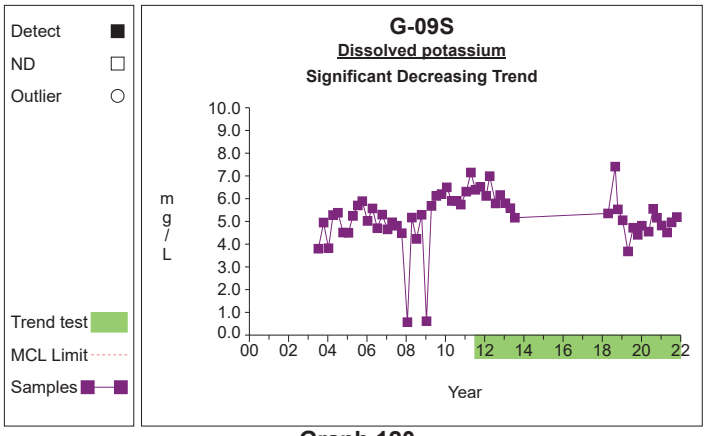
Graph 111

Time Series



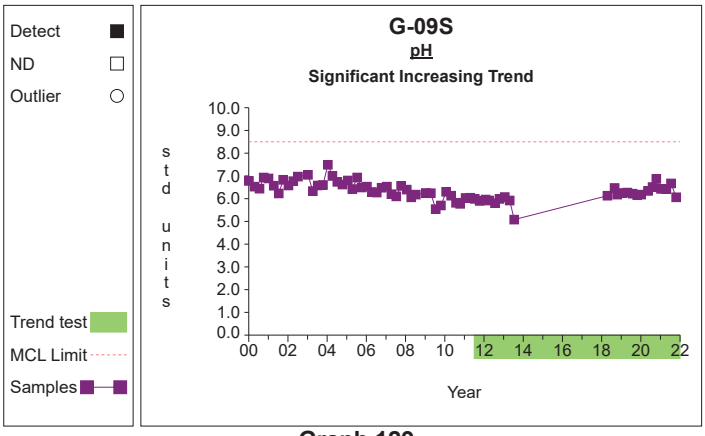
Graph 117

Time Series



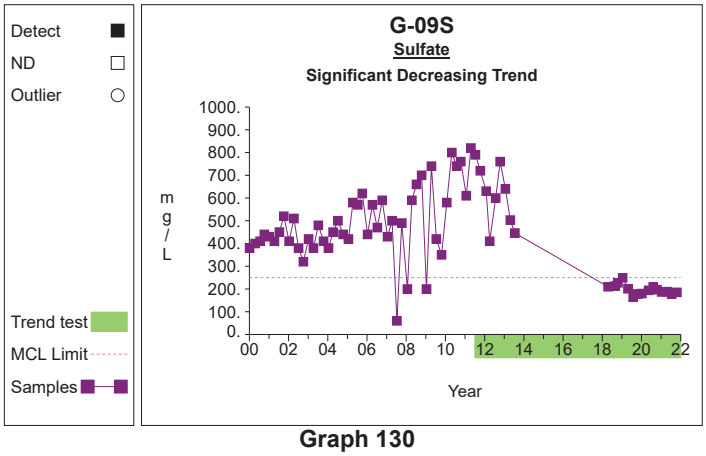
Graph 120

Time Series



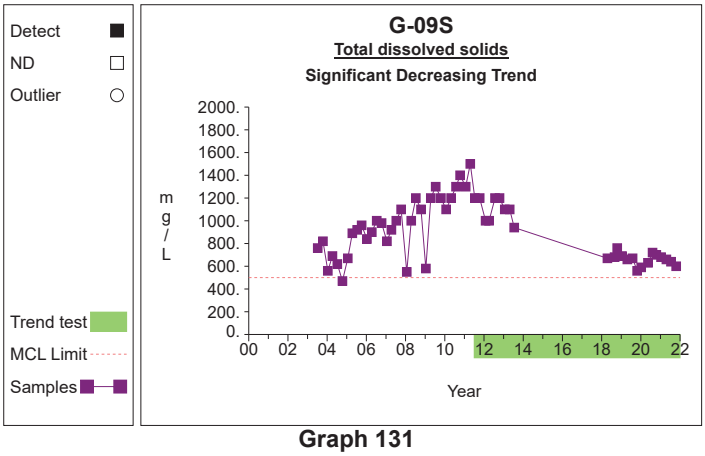
Graph 129

Time Series



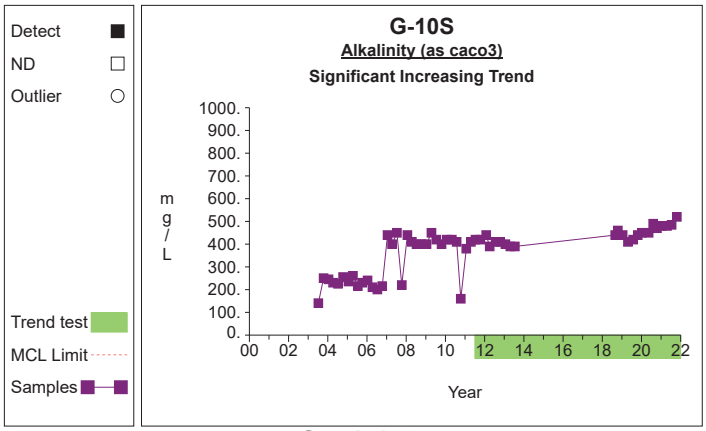
Graph 130

Time Series



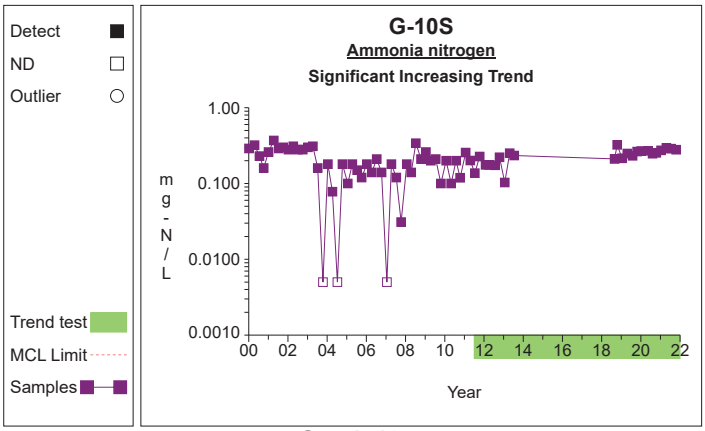
Graph 131

Time Series



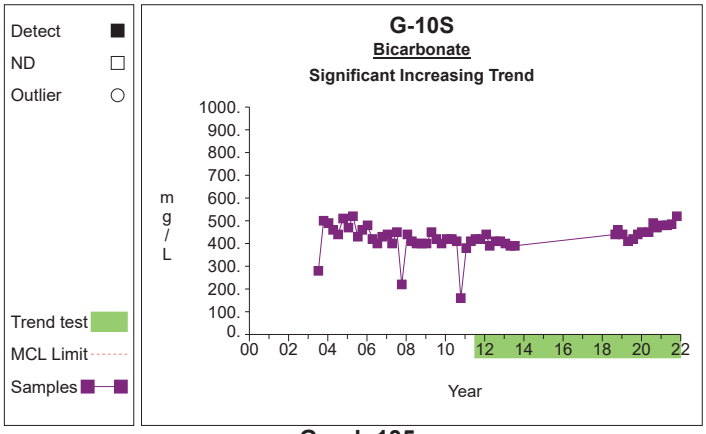
Graph 133

Time Series



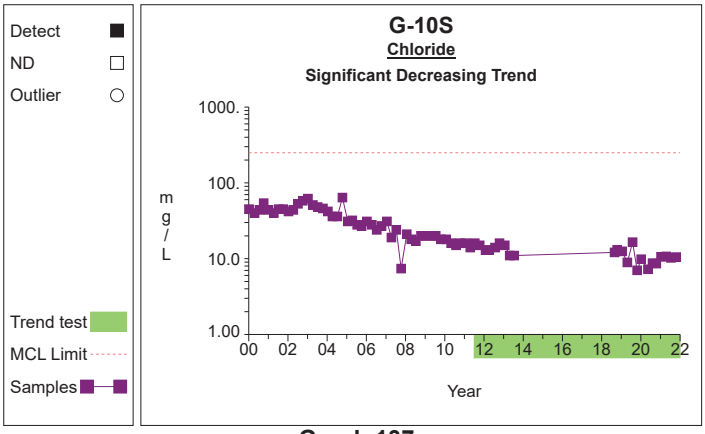
Graph 134

Time Series



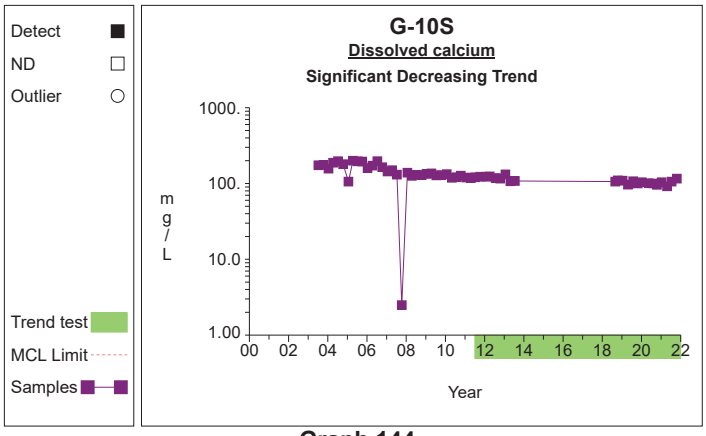
Graph 135

Time Series



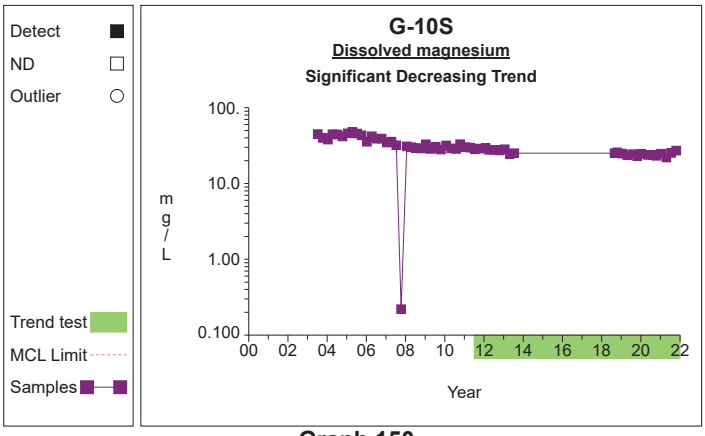
Graph 137

Time Series



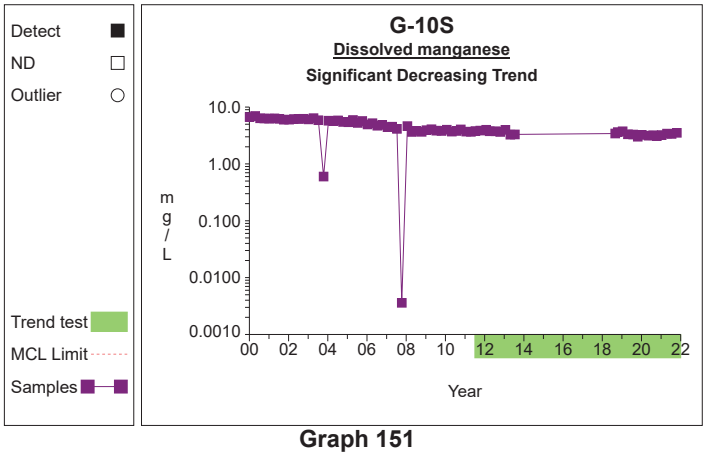
Graph 144

Time Series



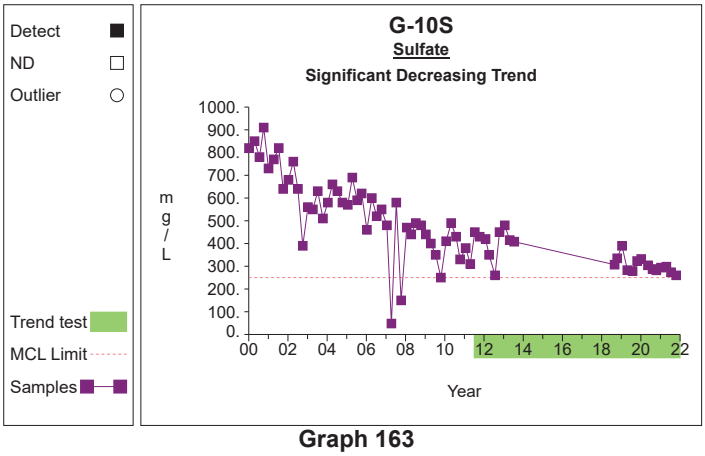
Graph 150

Time Series



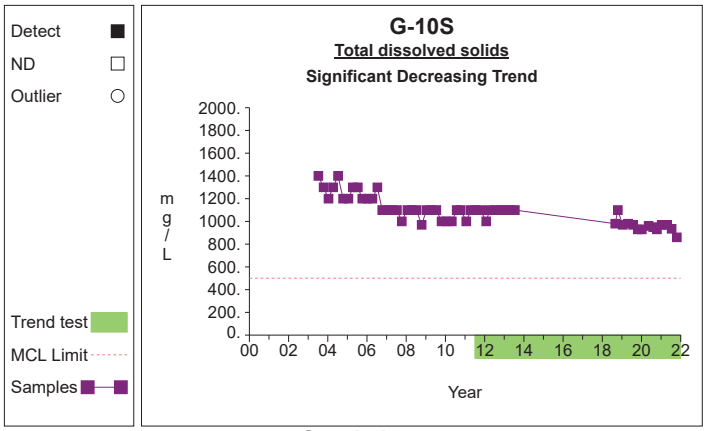
Graph 151

Time Series



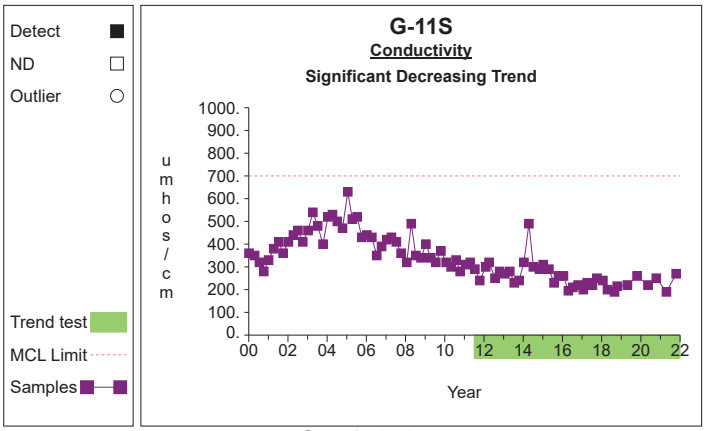
Graph 163

Time Series



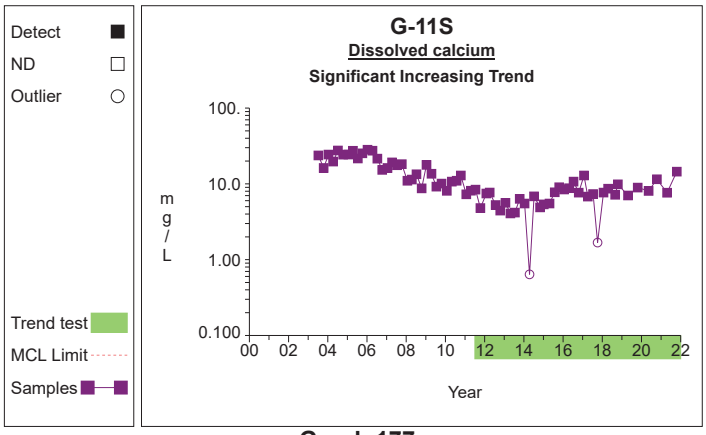
Graph 164

Time Series



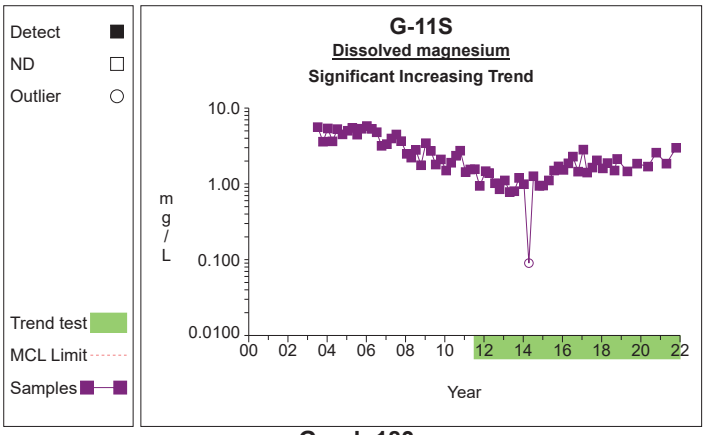
Graph 171

Time Series



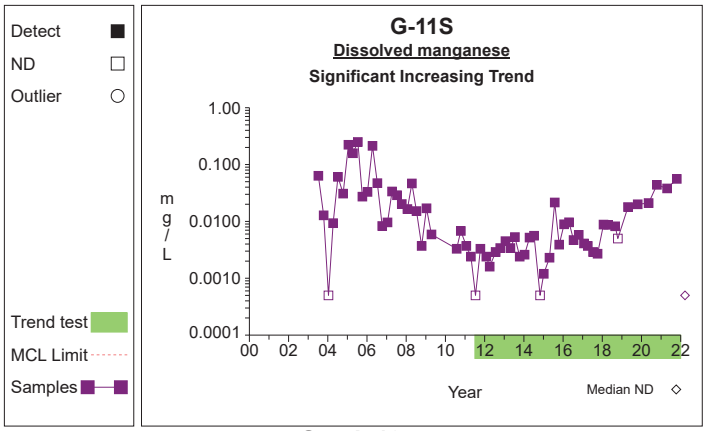
Graph 177

Time Series



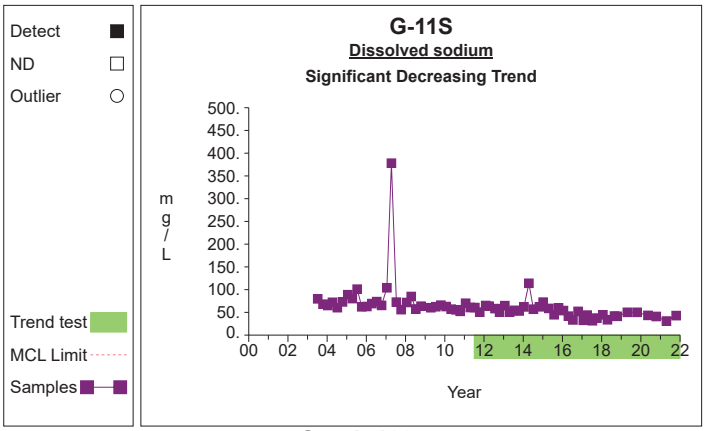
Graph 183

Time Series



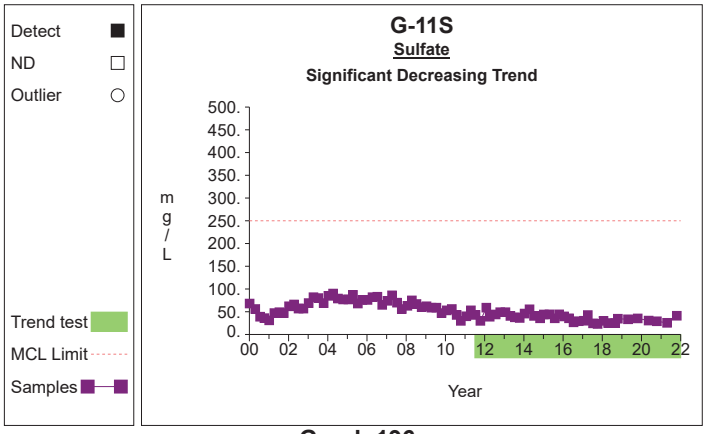
Graph 184

Time Series



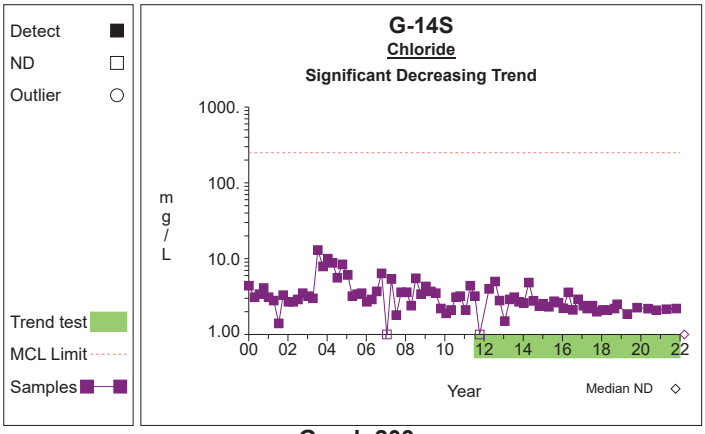
Graph 189

Time Series



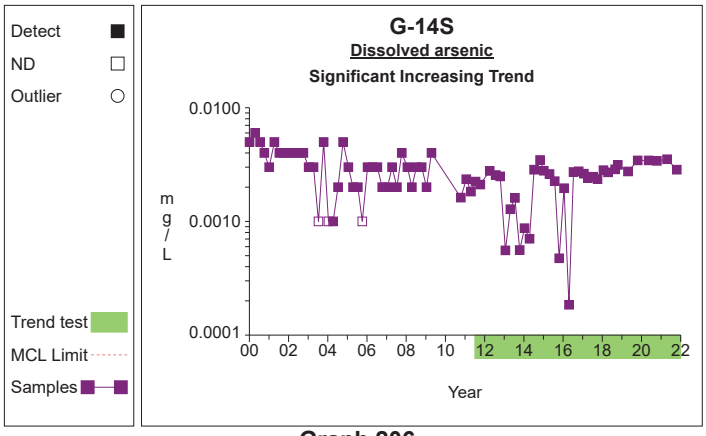
Graph 196

Time Series



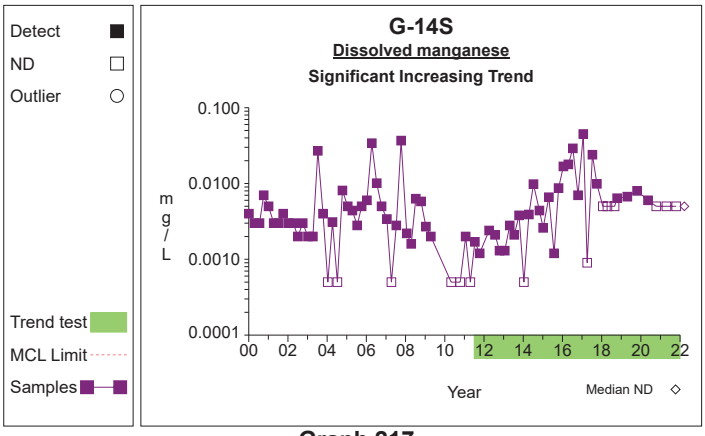
Graph 203

Time Series



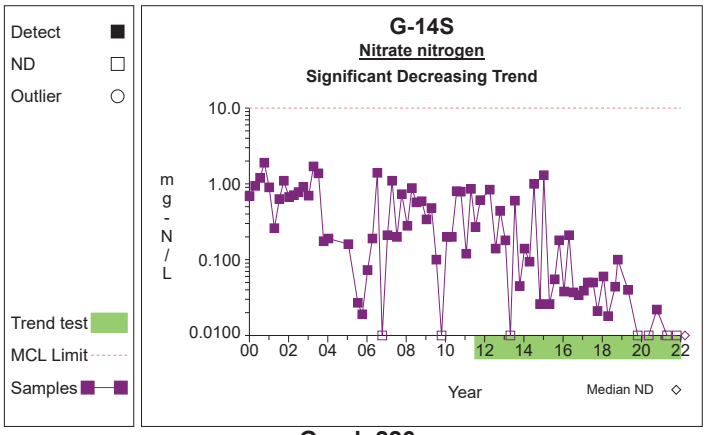
Graph 206

Time Series



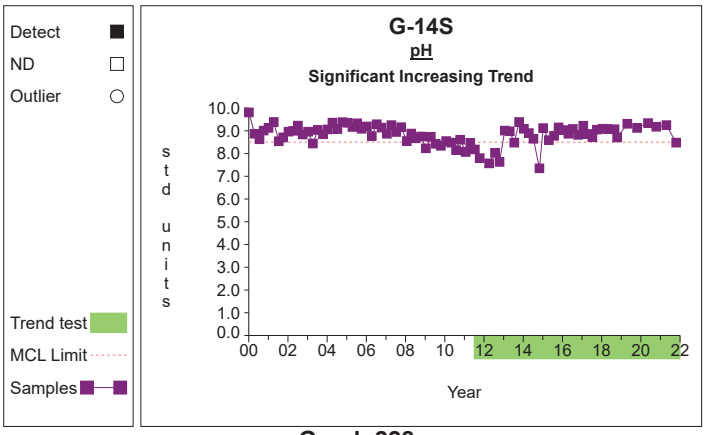
Graph 217

Time Series



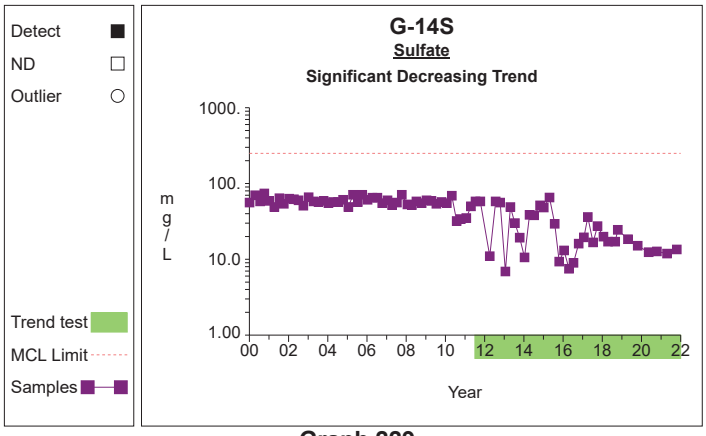
Graph 226

Time Series



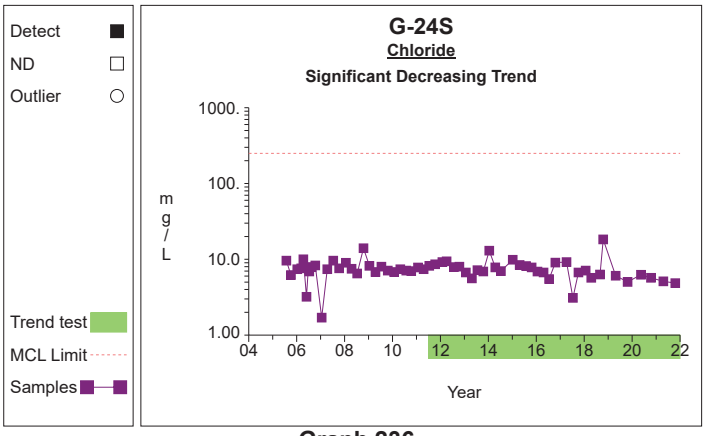
Graph 228

Time Series



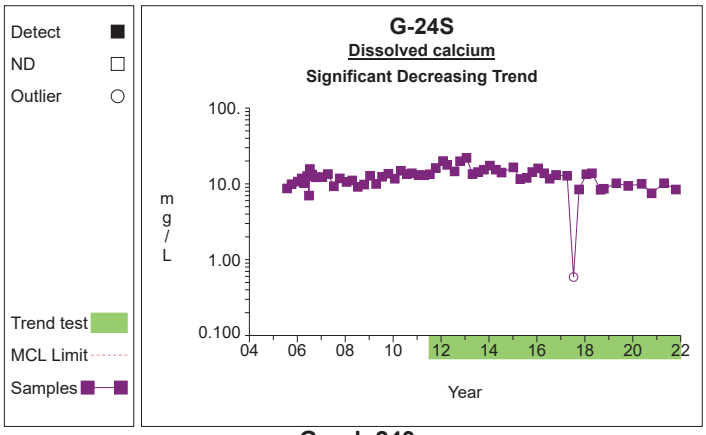
Graph 229

Time Series



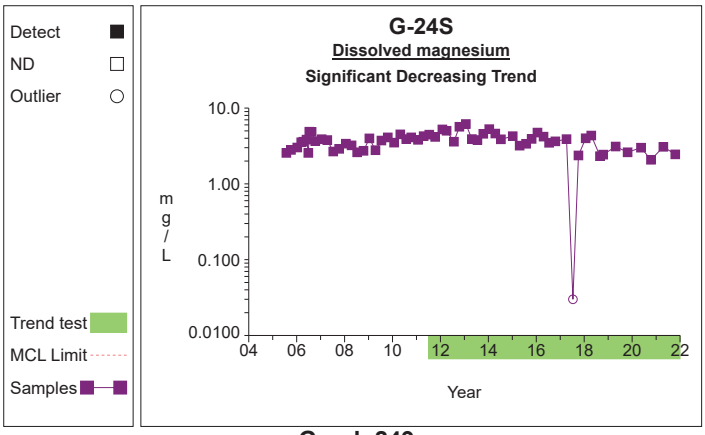
Graph 236

Time Series



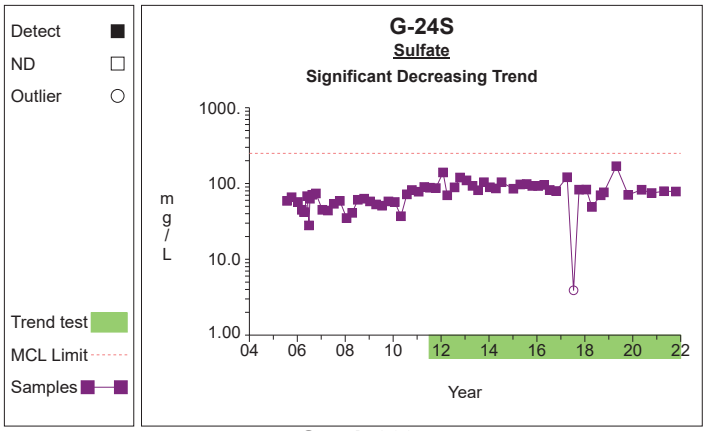
Graph 243

Time Series



Graph 249

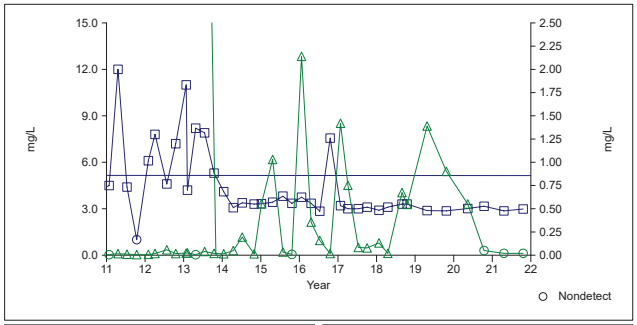
Time Series



Graph 262

Cathcart Landfill

Time Series Plot for G-08D1

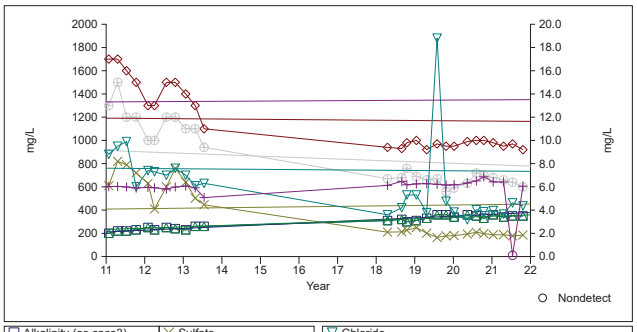


Chloride

Dissolved iron

Cathcart Landfill

Time Series Plot for G-09S



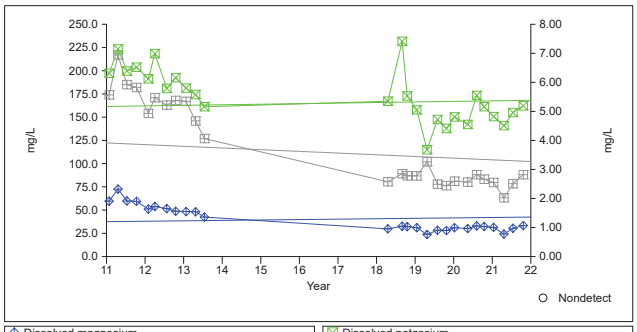
Alkalinity (as caco3)
Bicarbonate
Conductivity

Sulfate
Total dissolved solids

Chloride
pH

Cathcart Landfill

Time Series Plot for G-09S

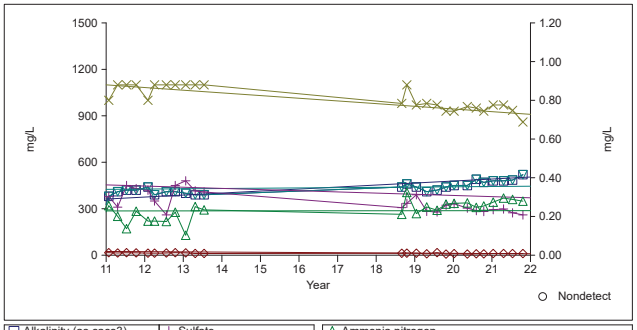


Dissolved magnesium
Dissolved calcium

Dissolved potassium

Cathcart Landfill

Time Series Plot for G-10S



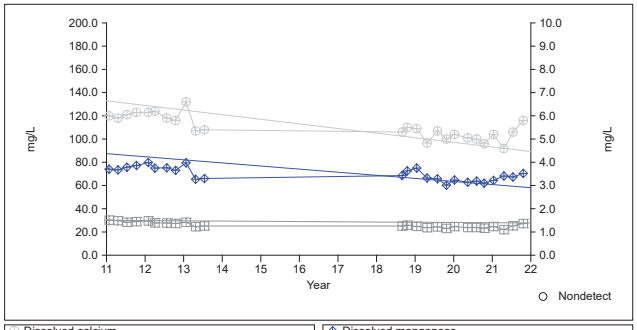
Alkalinity (as caco3)
Bicarbonate
Chloride
Sulfate
Total dissolved solids
Ammonia nitrogen

1

Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-10S



Dissolved calcium
Dissolved magnesium
Dissolved manganese

1

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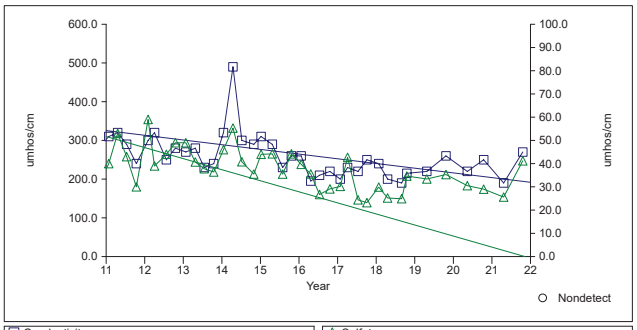
Cathcart Landfill

Time Series Plot for G-11S



Conductivity
Sulfate

1

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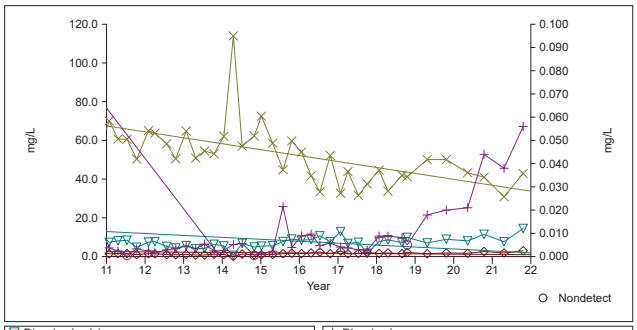
Cathcart Landfill

Time Series Plot for G-11S



Dissolved calcium
Dissolved sodium
Dissolved magnesium
Dissolved manganese

1

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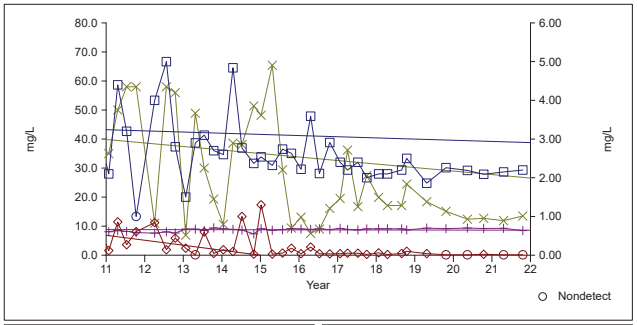
Cathcart Landfill

Time Series Plot for G-14S



1

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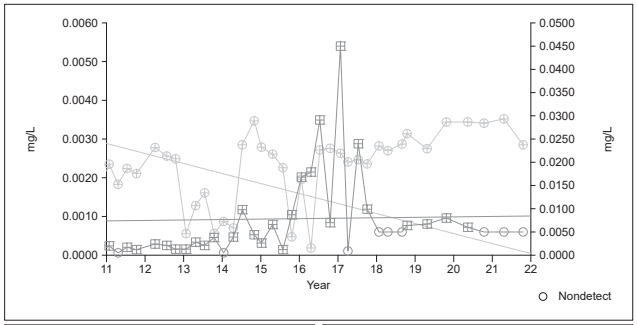
Cathcart Landfill

Time Series Plot for G-14S



1

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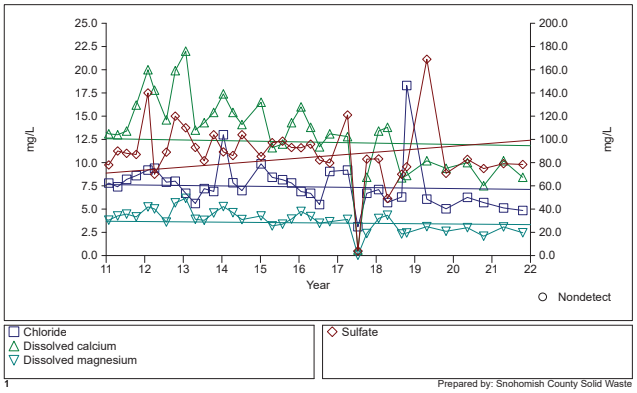
Cathcart Landfill

Time Series Plot for G-24S



1

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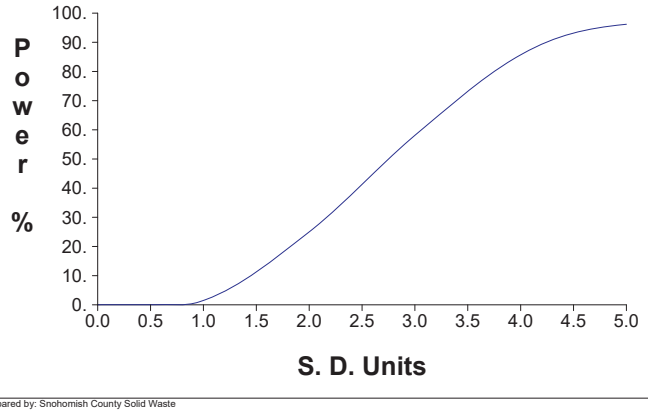
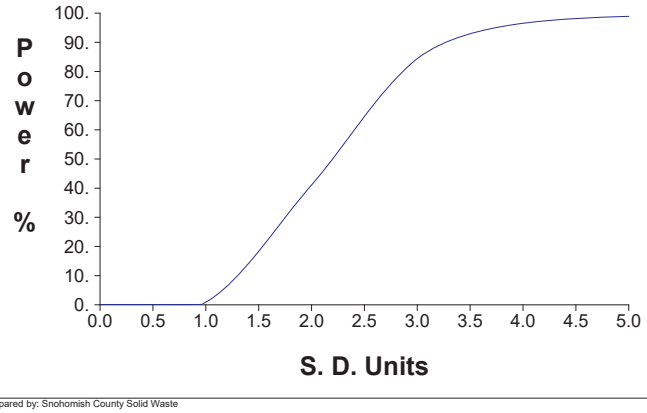
Deep Wells

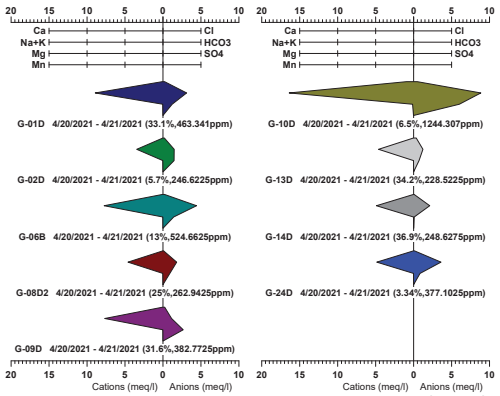
False Positive and False Negative Rates for Current Intra-Well Prediction Limits Monitoring Program



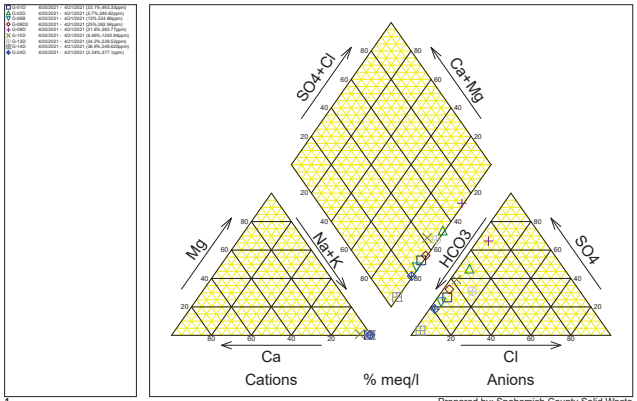
False Positive and False Negative Rates for Current Upgradient vs. Downgradient Monitoring Program



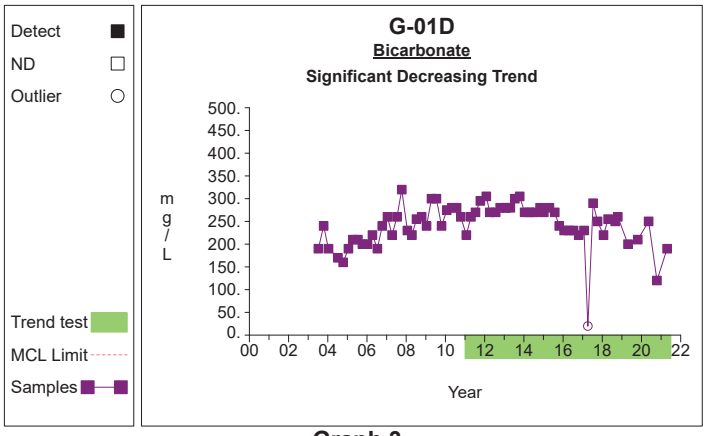
Cathcart Landfill



Cathcart Landfill

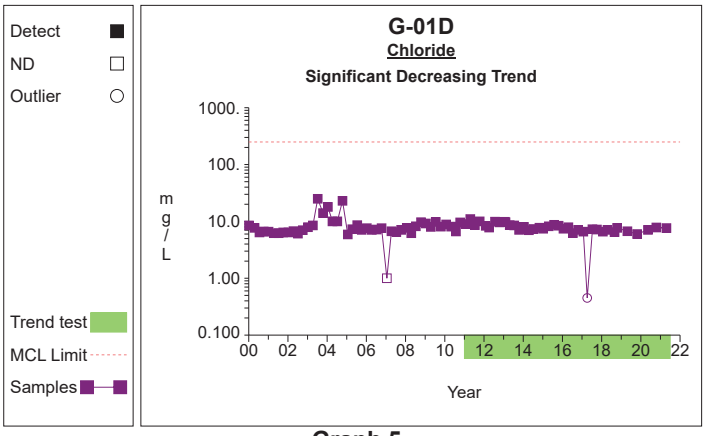


Time Series



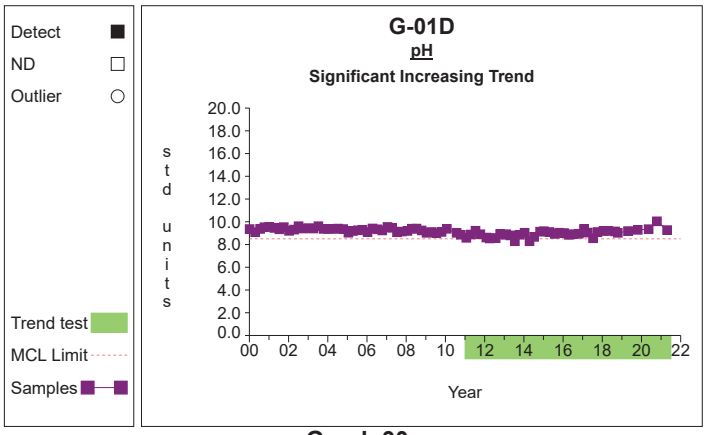
Graph 3

Time Series



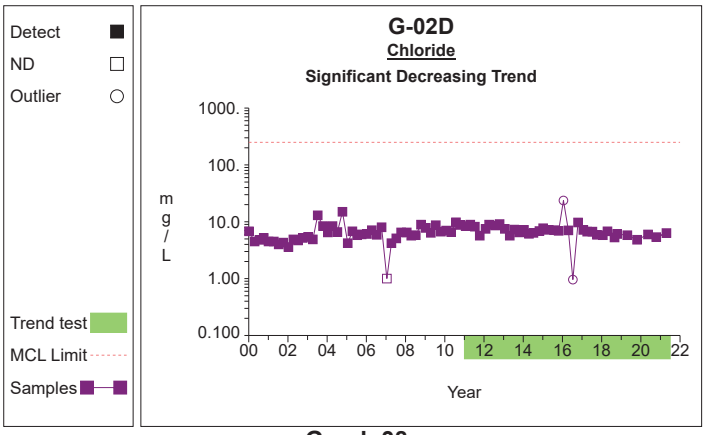
Graph 5

Time Series



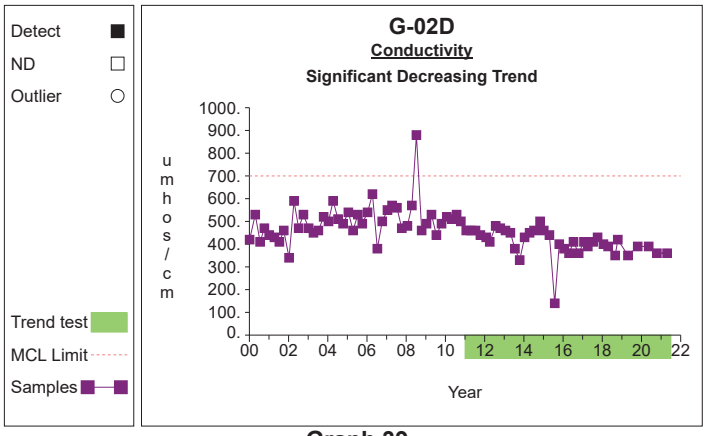
Graph 30

Time Series



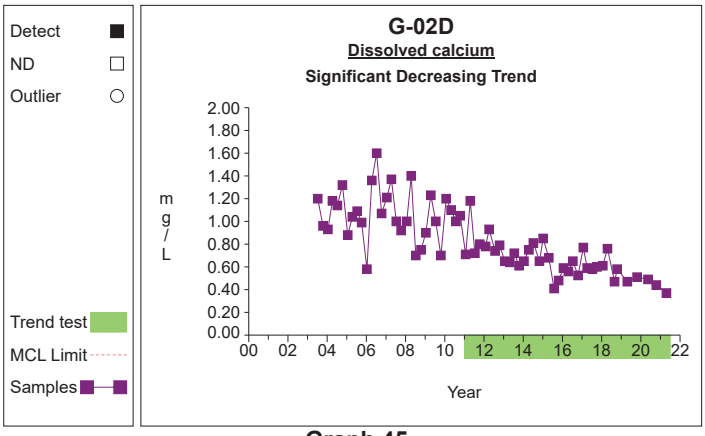
Graph 38

Time Series



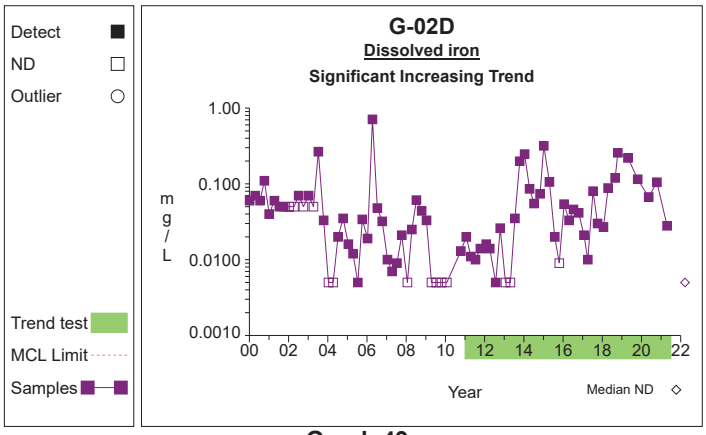
Graph 39

Time Series



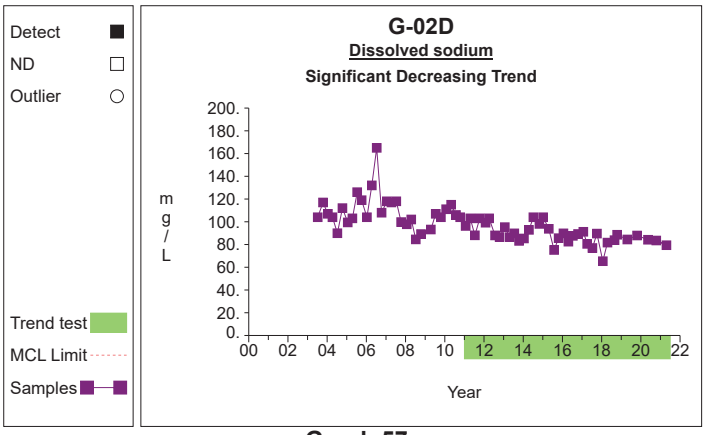
Graph 45

Time Series



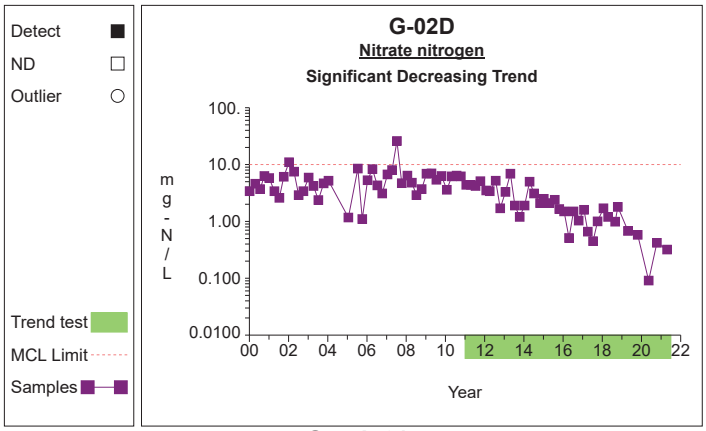
Graph 49

Time Series



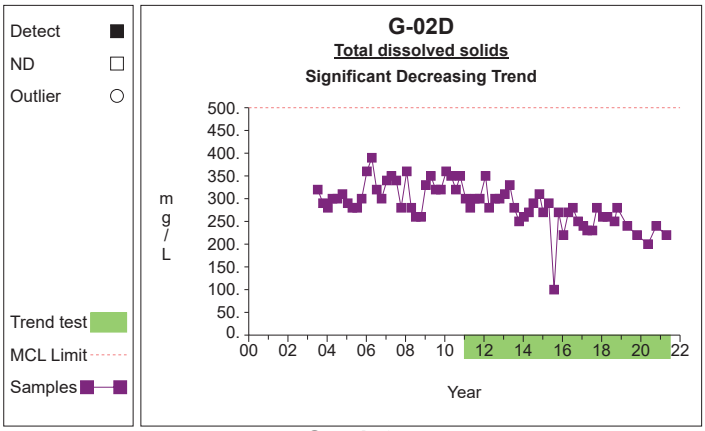
Graph 57

Time Series



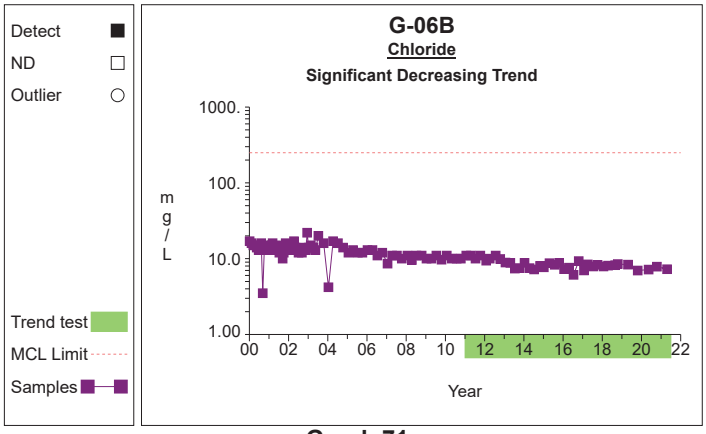
Graph 61

Time Series



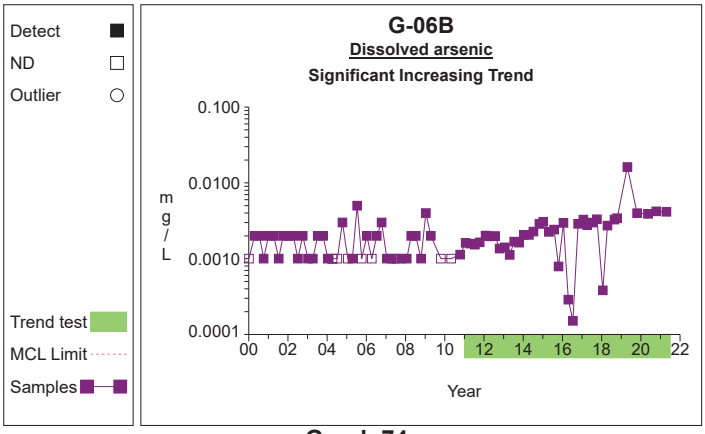
Graph 65

Time Series



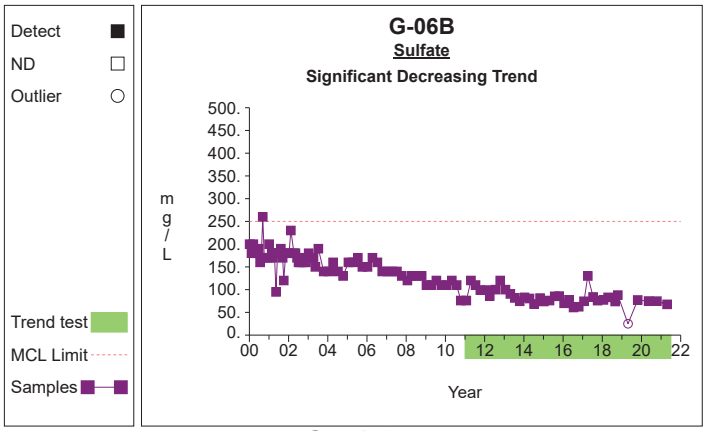
Graph 71

Time Series



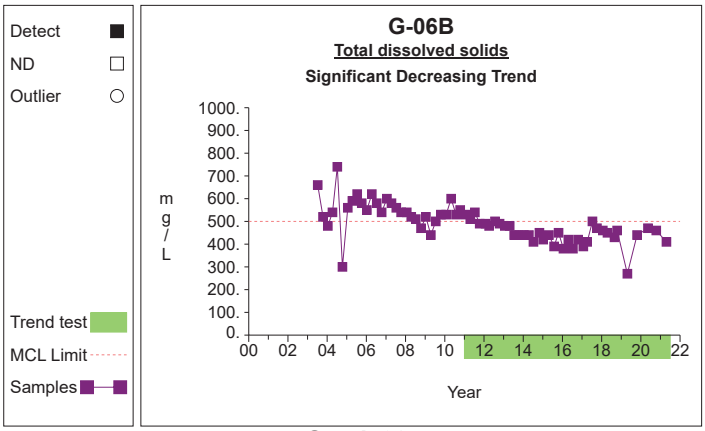
Graph 74

Time Series



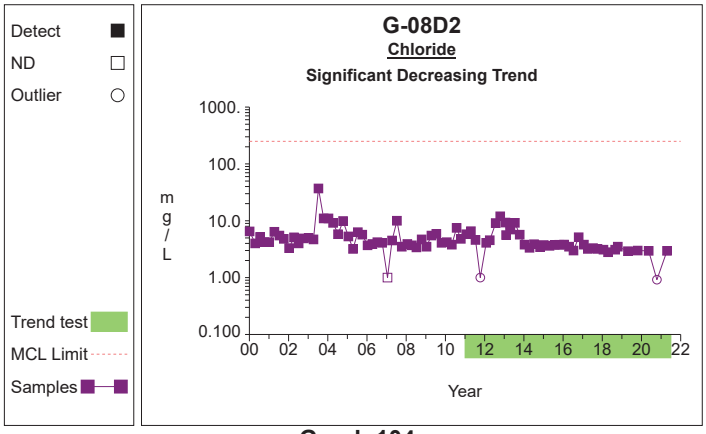
Graph 97

Time Series



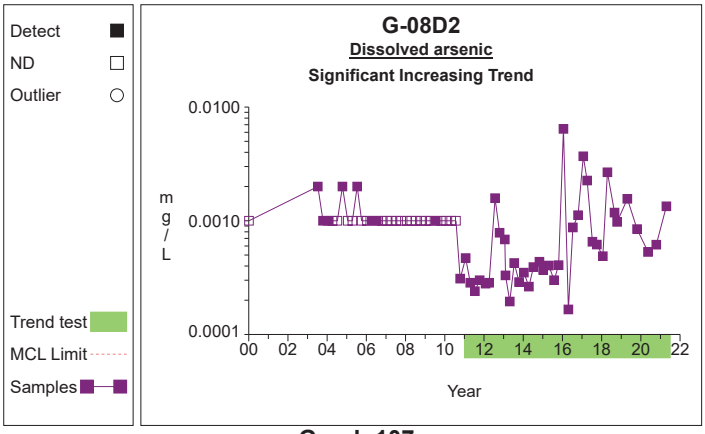
Graph 98

Time Series



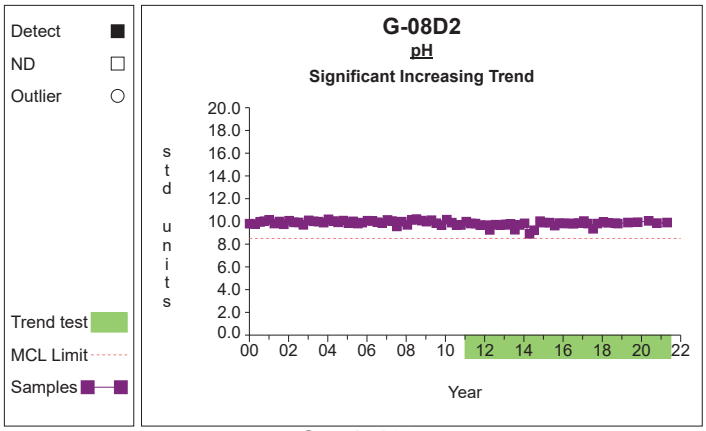
Graph 104

Time Series



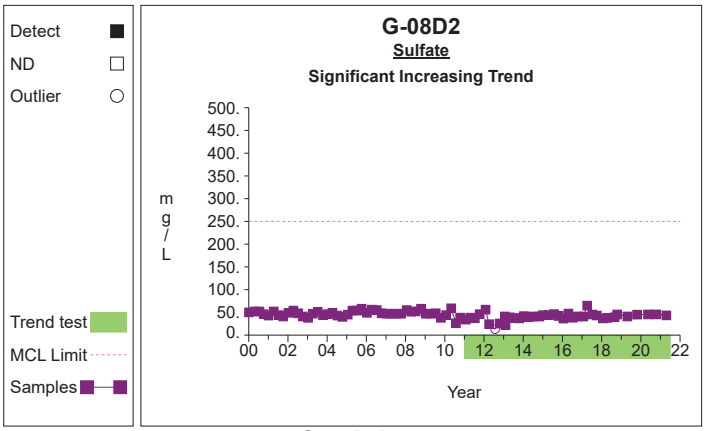
Graph 107

Time Series



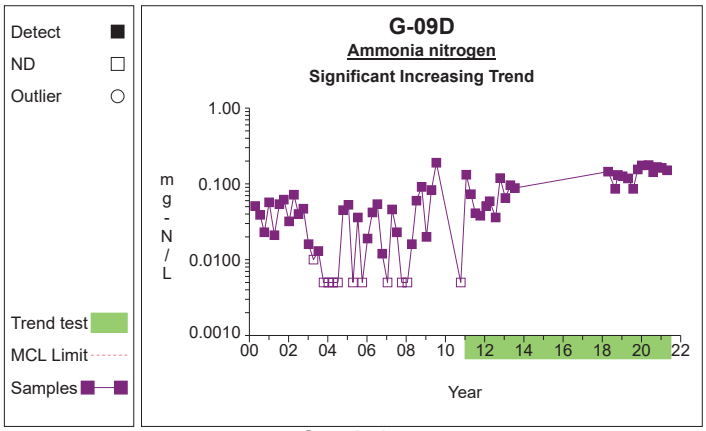
Graph 129

Time Series



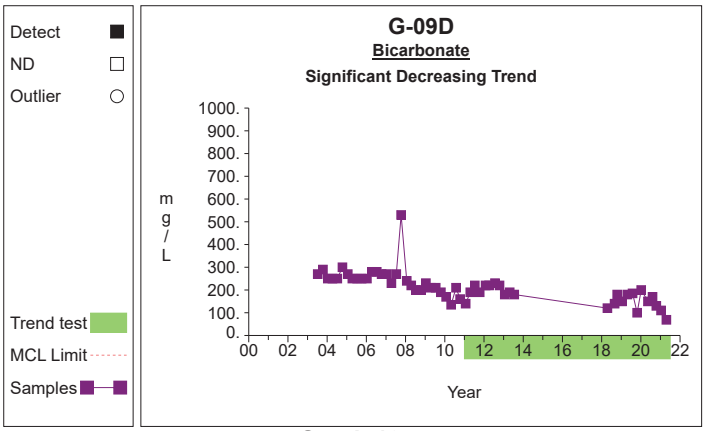
Graph 130

Time Series



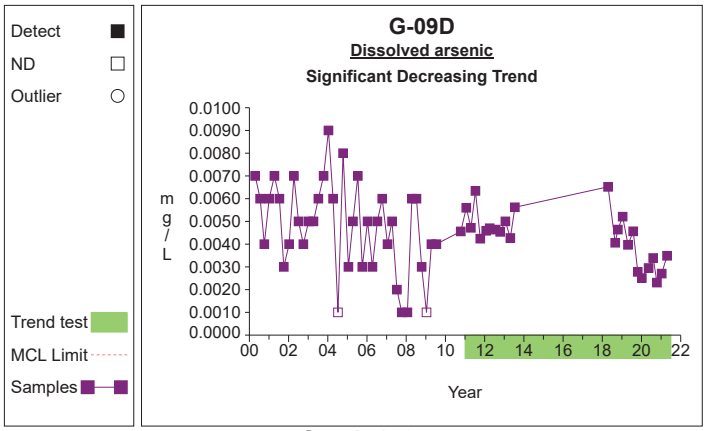
Graph 134

Time Series



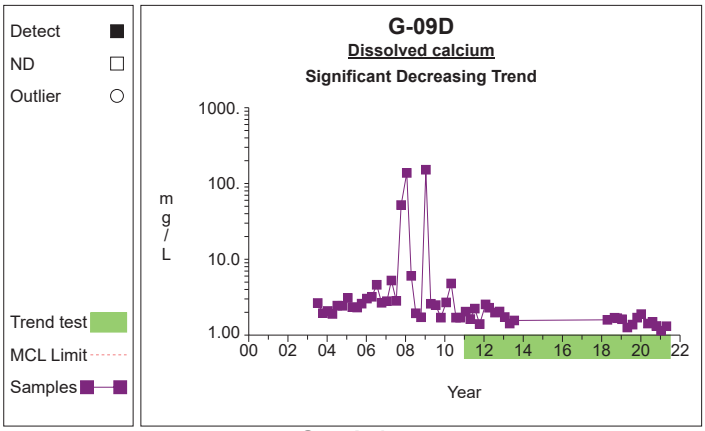
Graph 135

Time Series



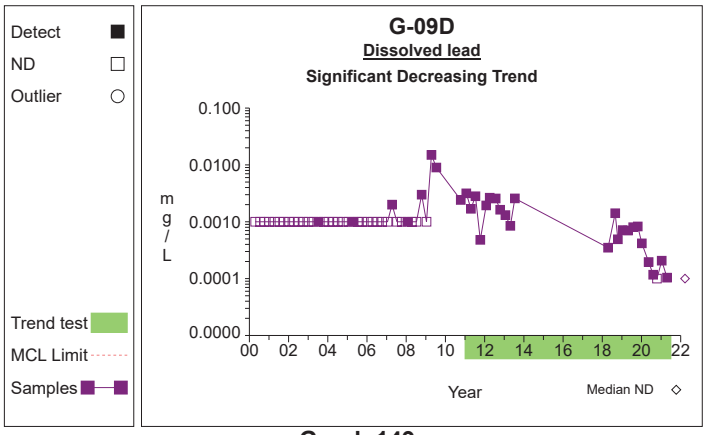
Graph 140

Time Series



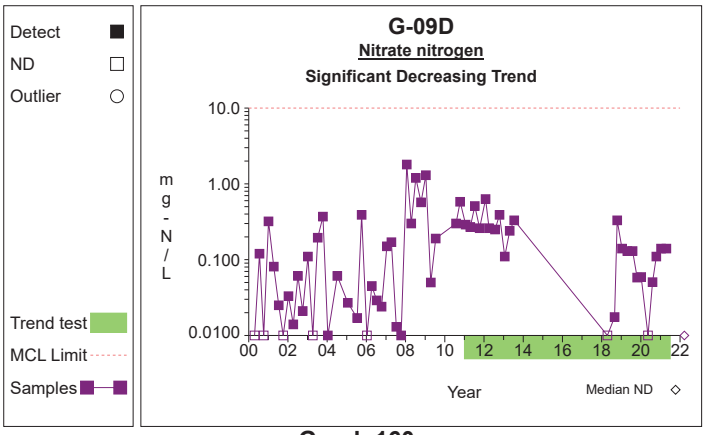
Graph 144

Time Series



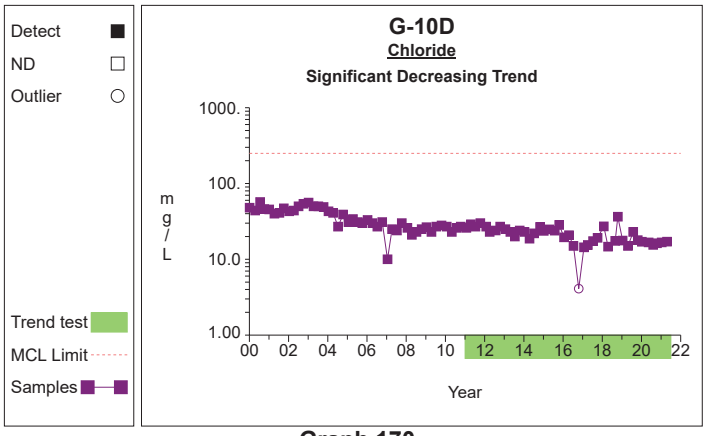
Graph 149

Time Series



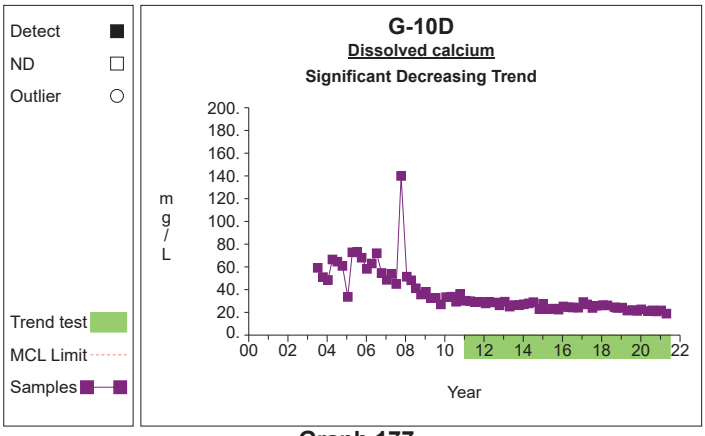
Graph 160

Time Series



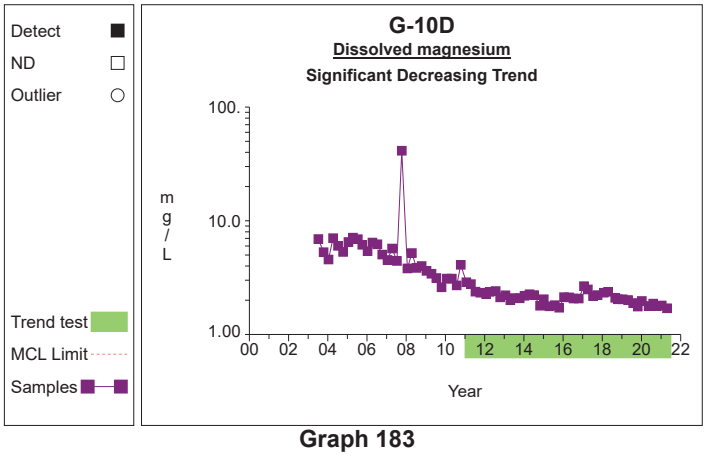
Graph 170

Time Series



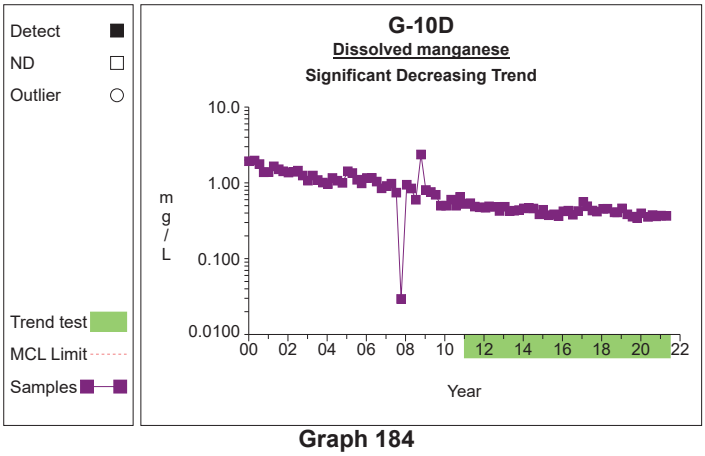
Graph 177

Time Series



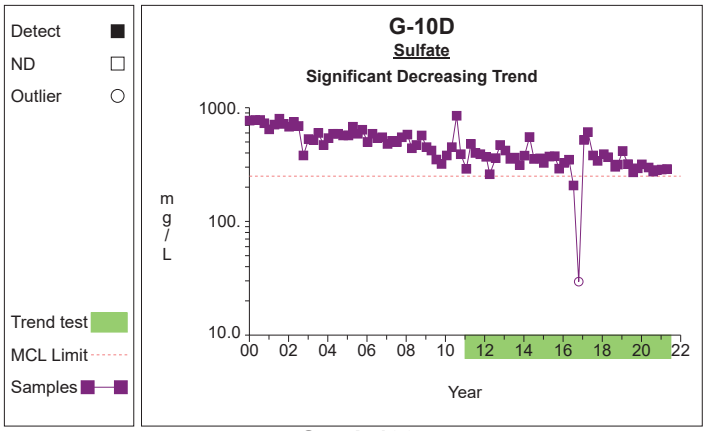
Graph 183

Time Series



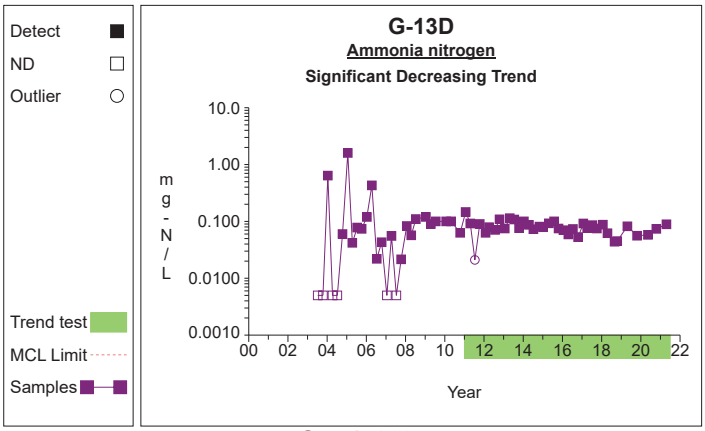
Graph 184

Time Series



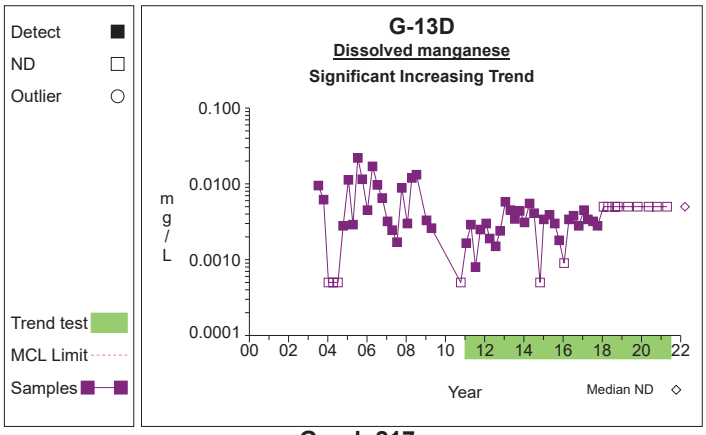
Graph 196

Time Series



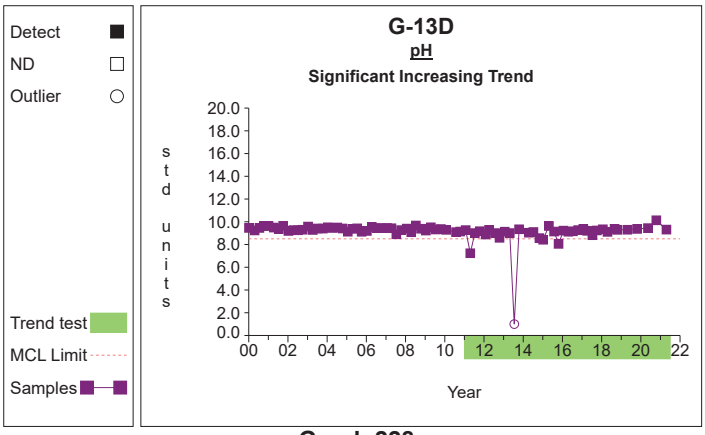
Graph 200

Time Series



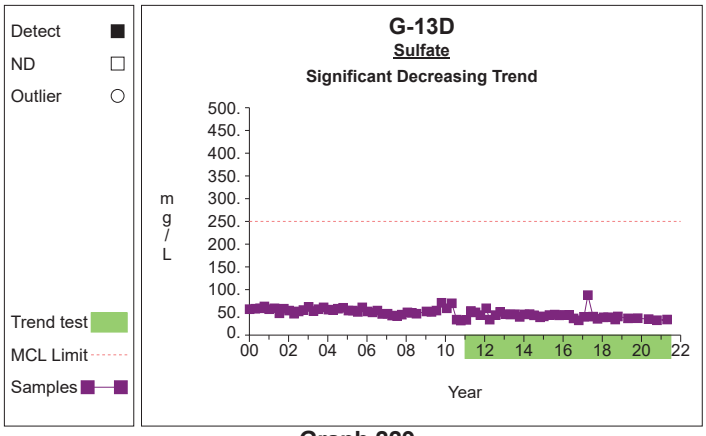
Graph 217

Time Series



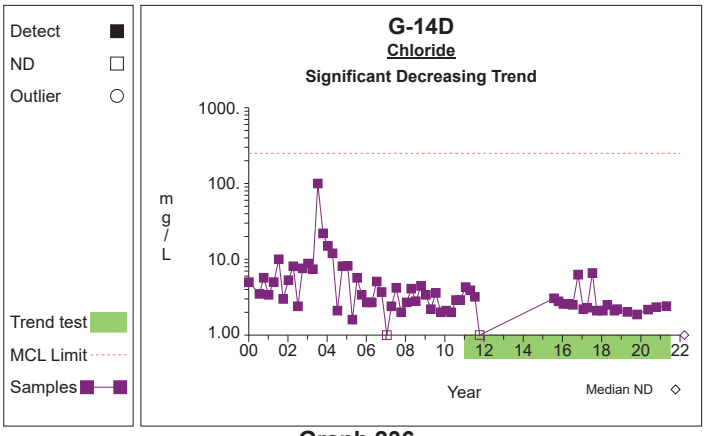
Graph 228

Time Series



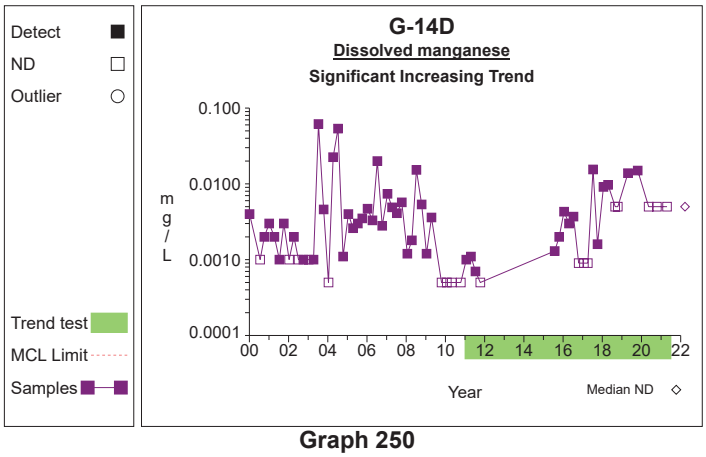
Graph 229

Time Series



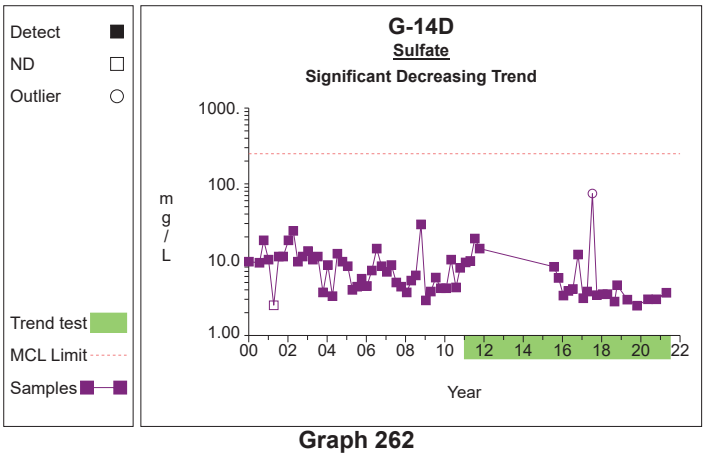
Graph 236

Time Series



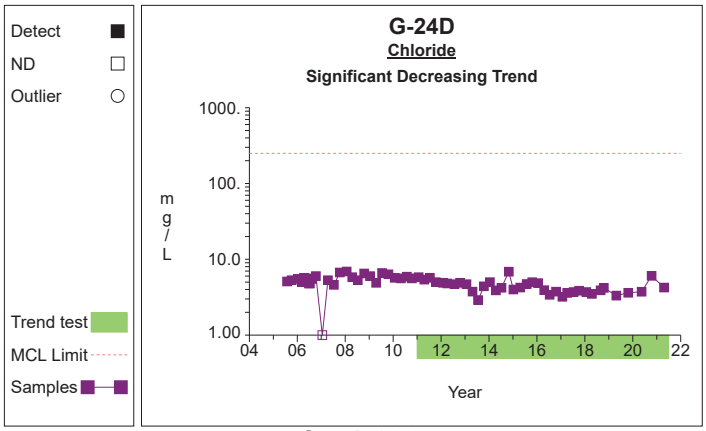
Graph 250

Time Series



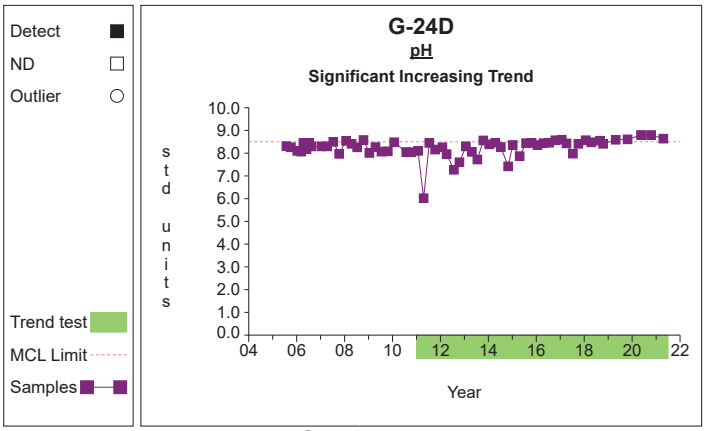
Graph 262

Time Series



Graph 269

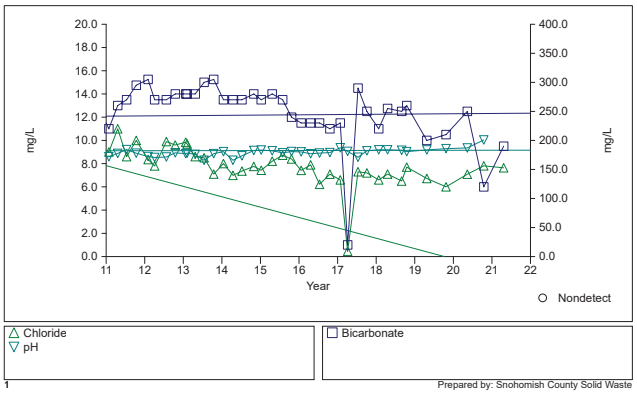
Time Series



Graph 294

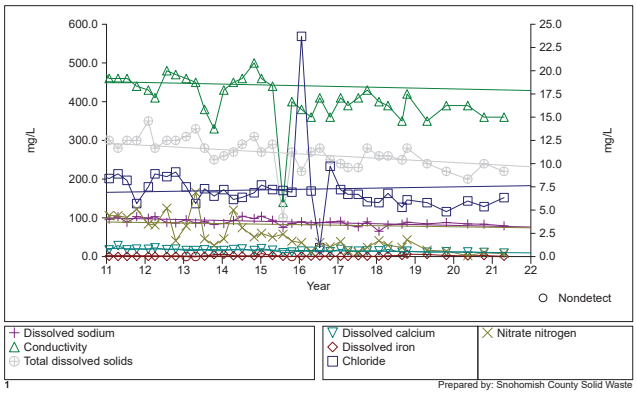
Cathcart Landfill

Time Series Plot for G-01D



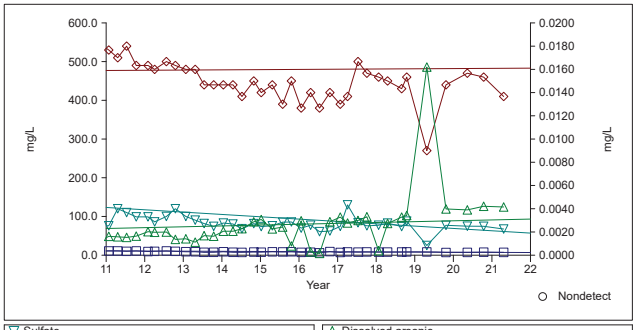
Cathcart Landfill

Time Series Plot for G-02D



Cathcart Landfill

Time Series Plot for G-06B



1

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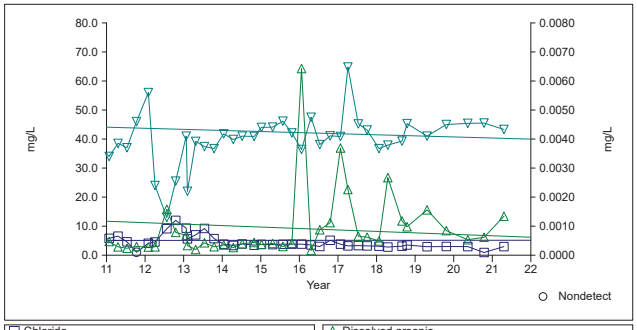
Cathcart Landfill

Time Series Plot for G-08D2



1

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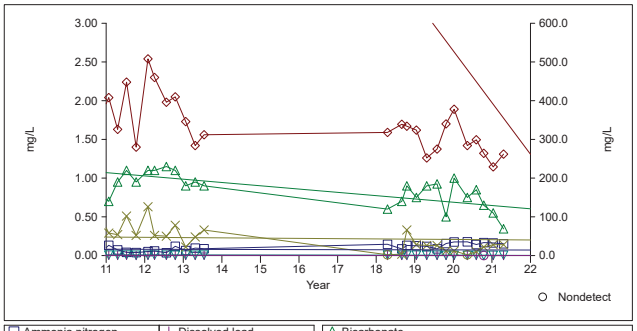
Cathcart Landfill

Time Series Plot for G-09D



1

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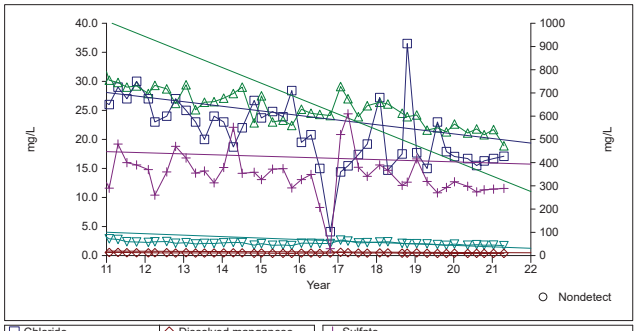
Cathcart Landfill

Time Series Plot for G-10D



1

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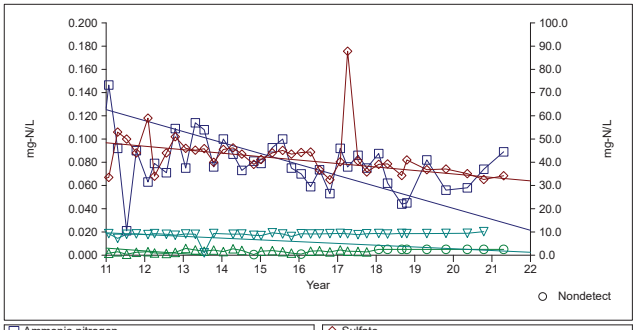
Cathcart Landfill

Time Series Plot for G-13D



□ Ammonia nitrogen
△ Dissolved manganese
◇ Sulfate
▽ pH

1

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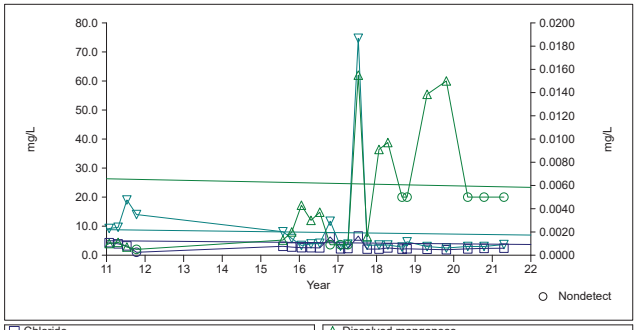
Cathcart Landfill

Time Series Plot for G-14D



□ Chloride
▽ Sulfate
△ Dissolved manganese

1

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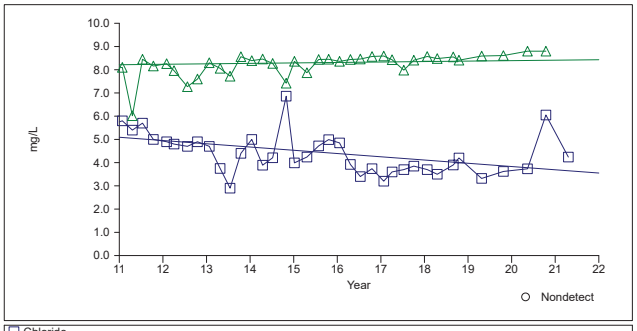
Cathcart Landfill

Time Series Plot for G-24D



□ Chloride
△ pH

1

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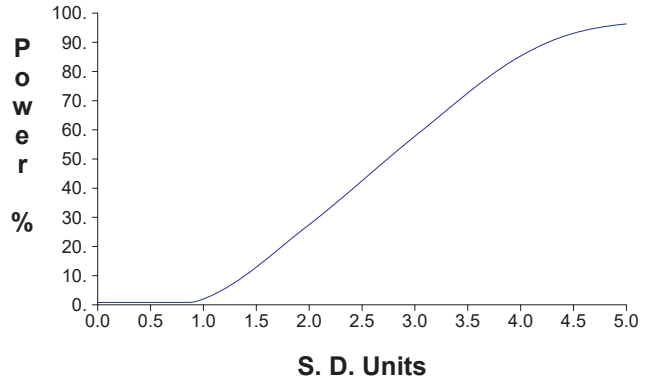
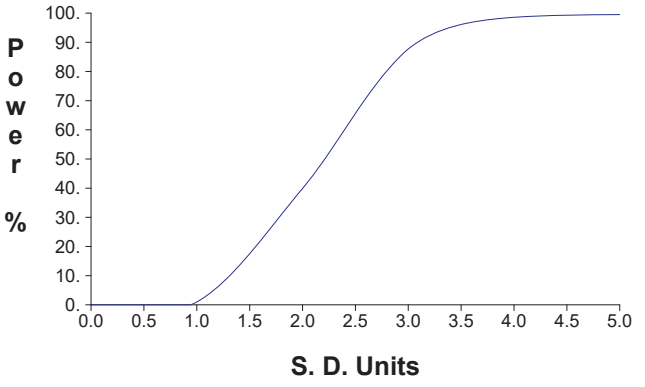
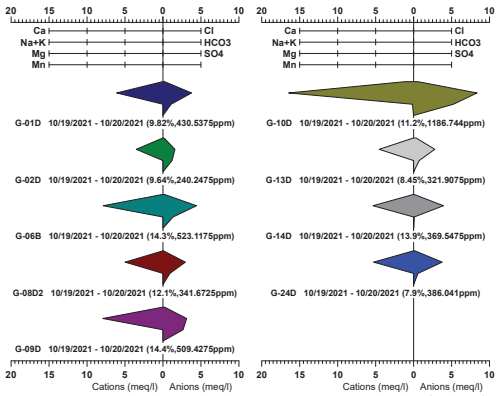
False Positive and False Negative Rates for Current Intra-Well Prediction Limits Monitoring Program



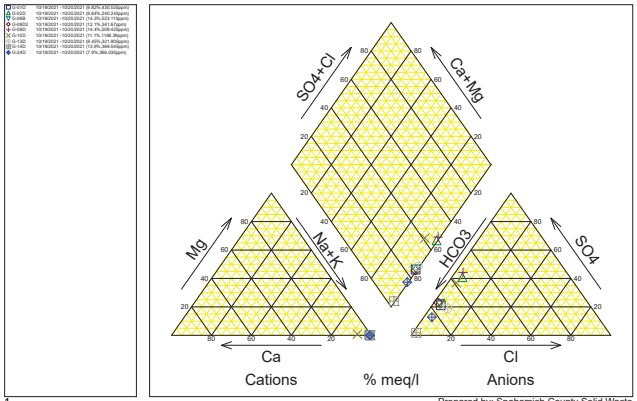
False Positive and False Negative Rates for Current Upgradient vs. Downgradient Monitoring Program



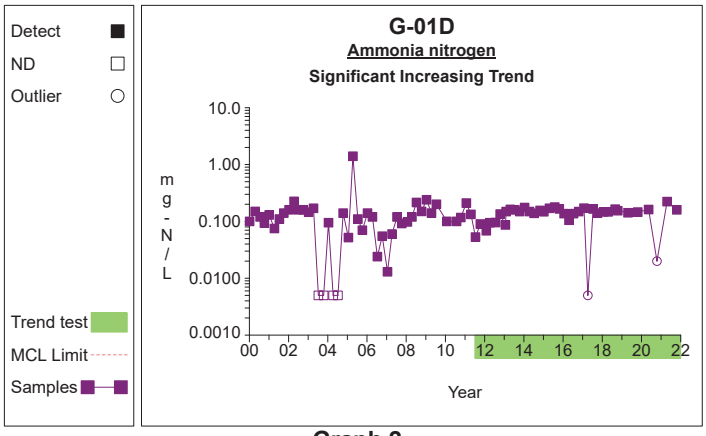
Cathcart Landfill



Cathcart Landfill

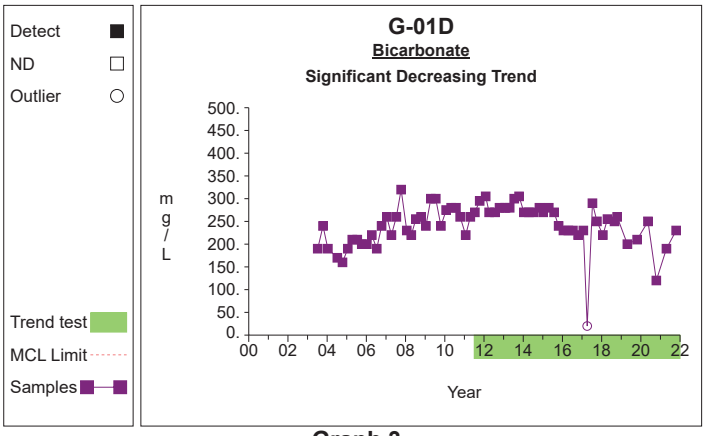


Time Series



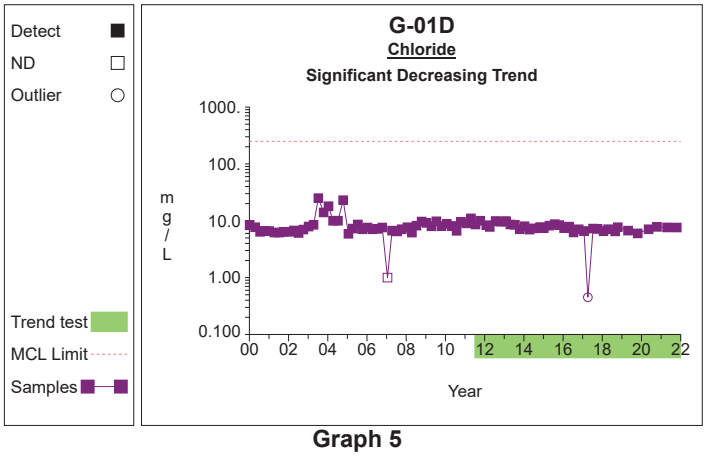
Graph 2

Time Series



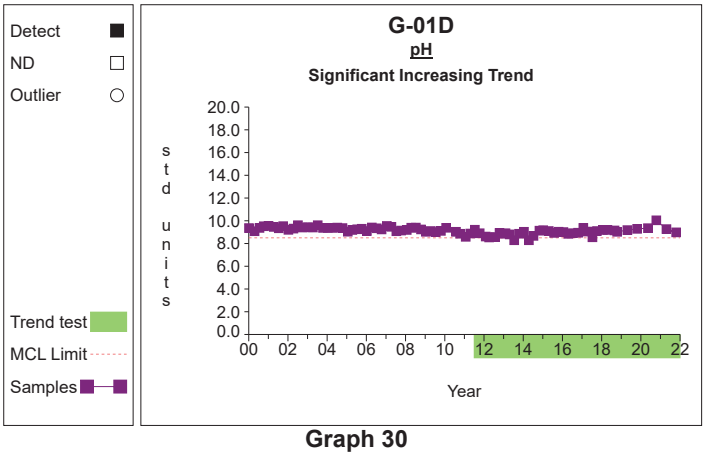
Graph 3

Time Series



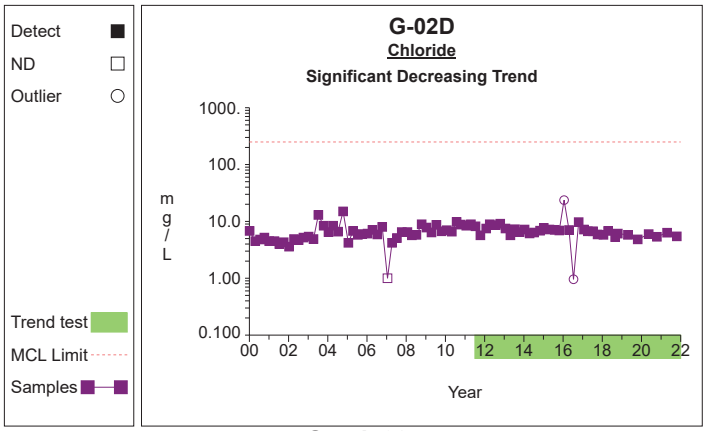
Graph 5

Time Series



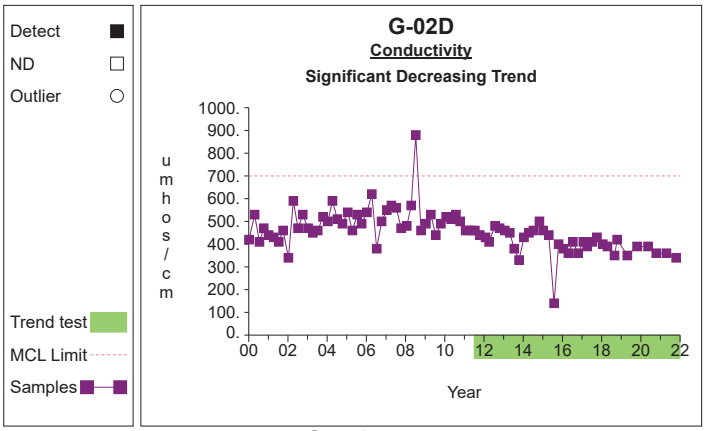
Graph 30

Time Series



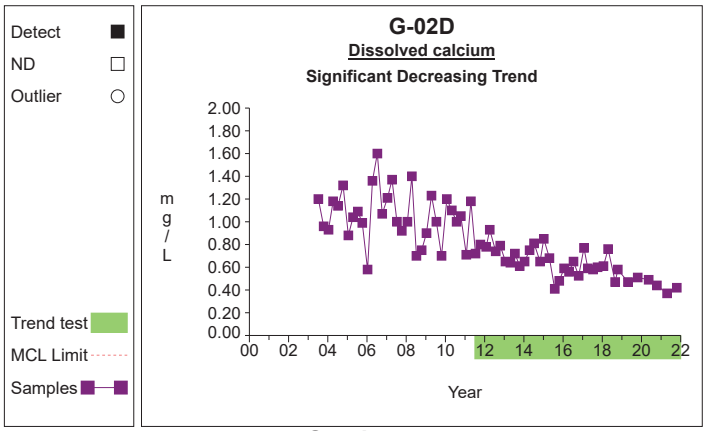
Graph 38

Time Series



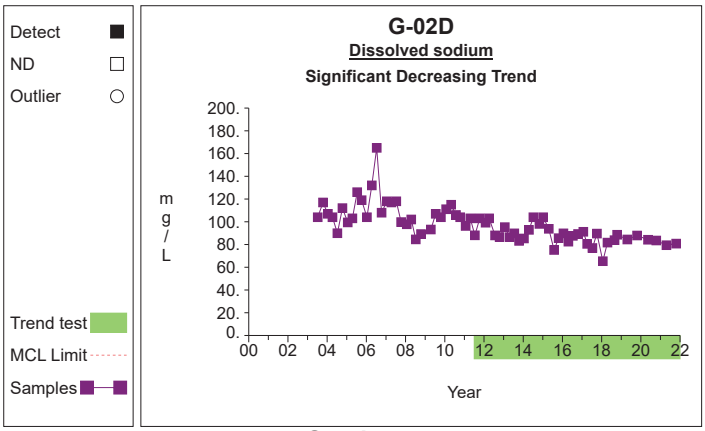
Graph 39

Time Series



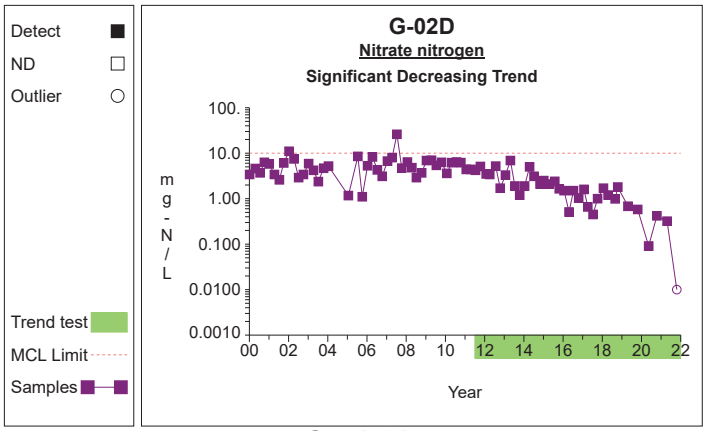
Graph 45

Time Series



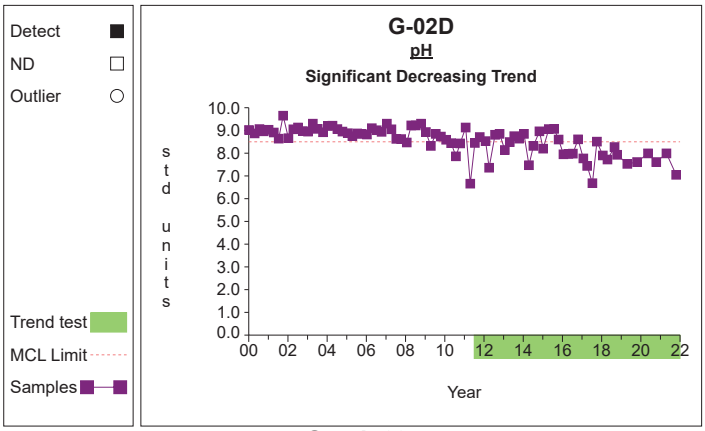
Graph 57

Time Series



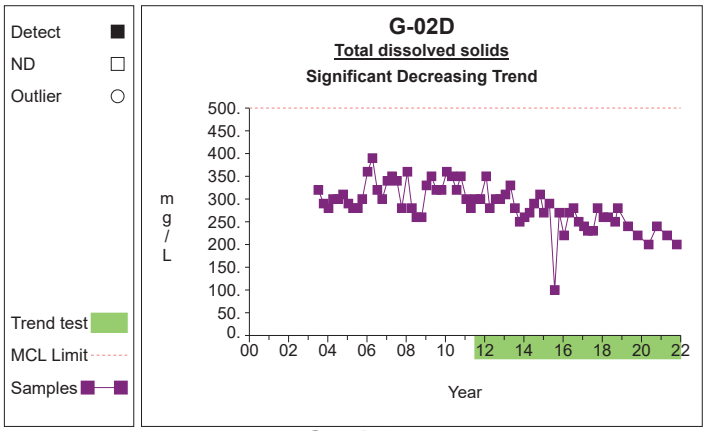
Graph 61

Time Series



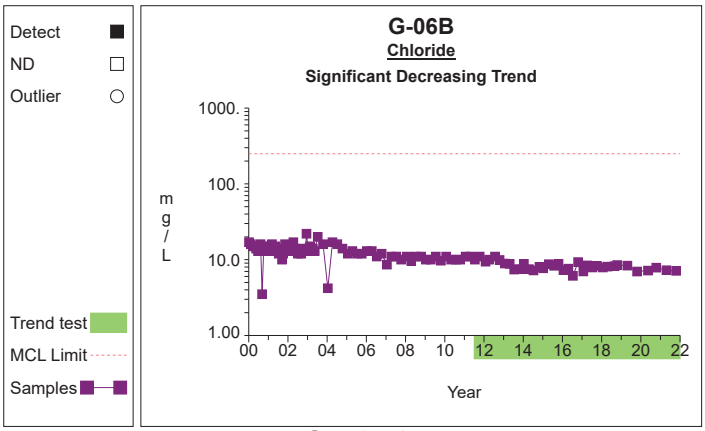
Graph 63

Time Series



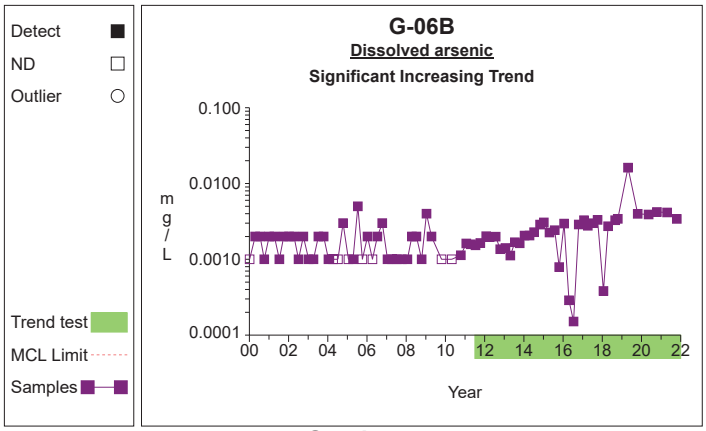
Graph 65

Time Series



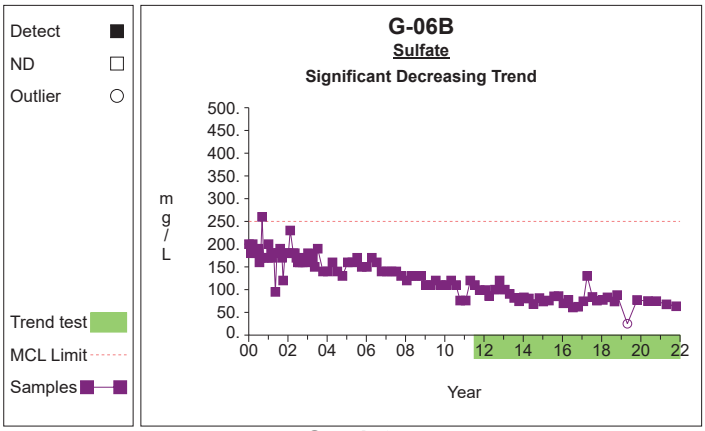
Graph 71

Time Series



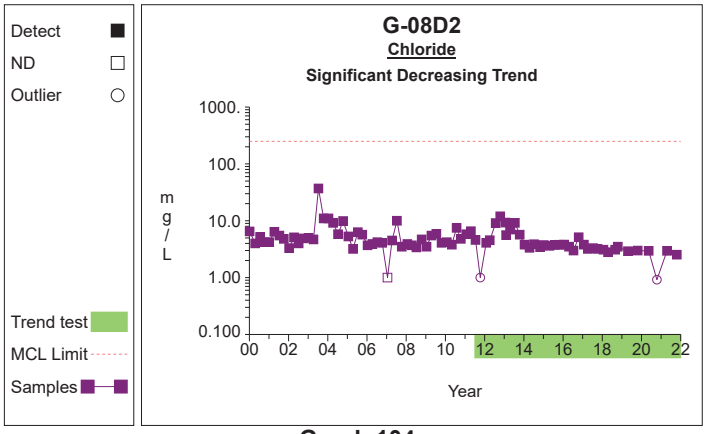
Graph 74

Time Series



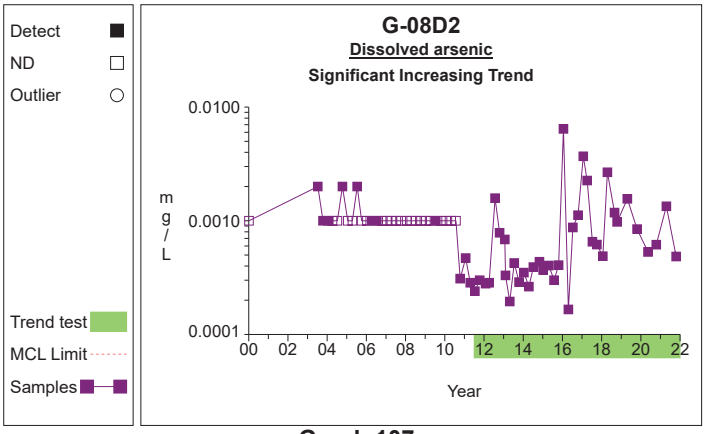
Graph 97

Time Series



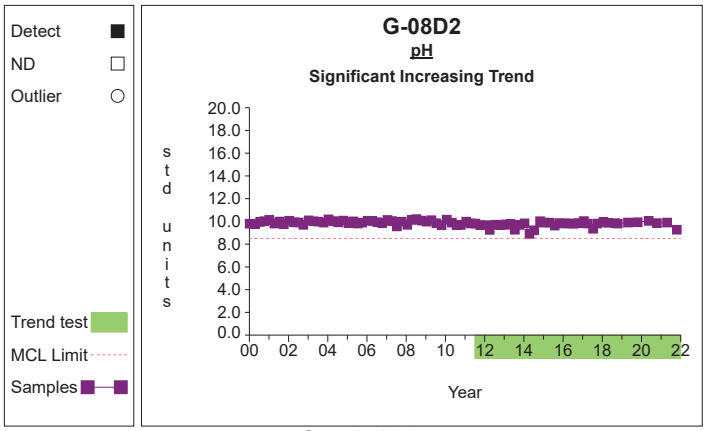
Graph 104

Time Series



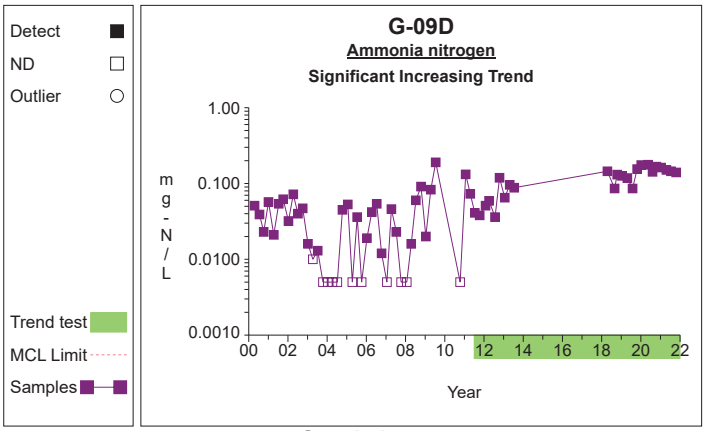
Graph 107

Time Series



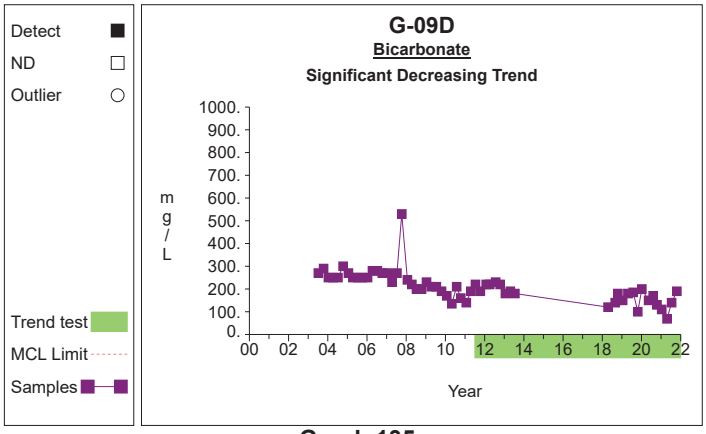
Graph 129

Time Series



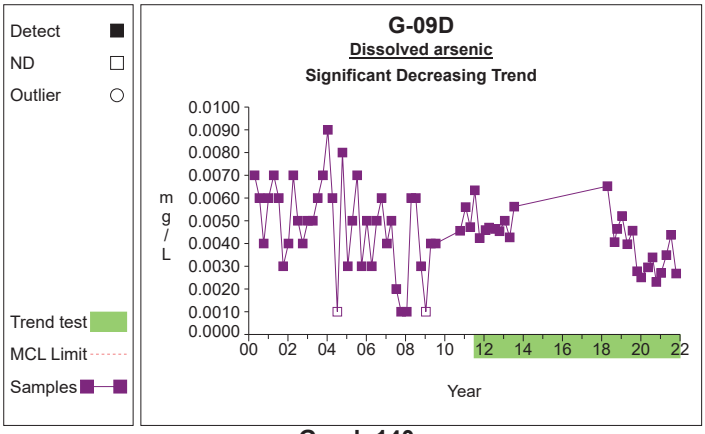
Graph 134

Time Series



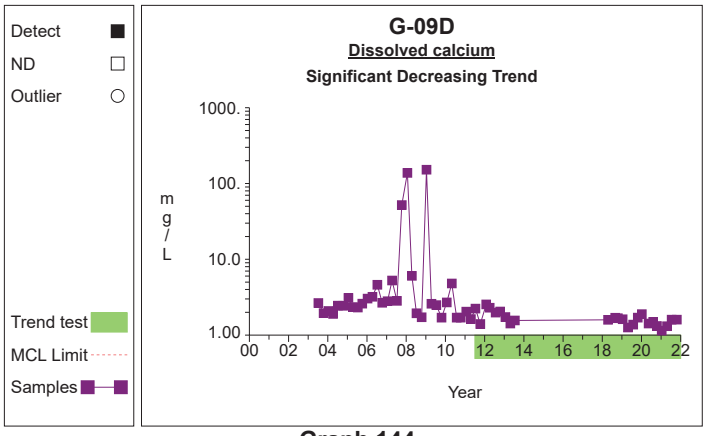
Graph 135

Time Series



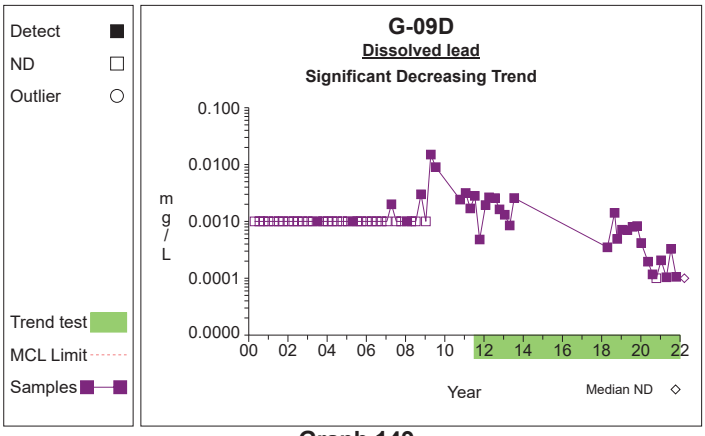
Graph 140

Time Series



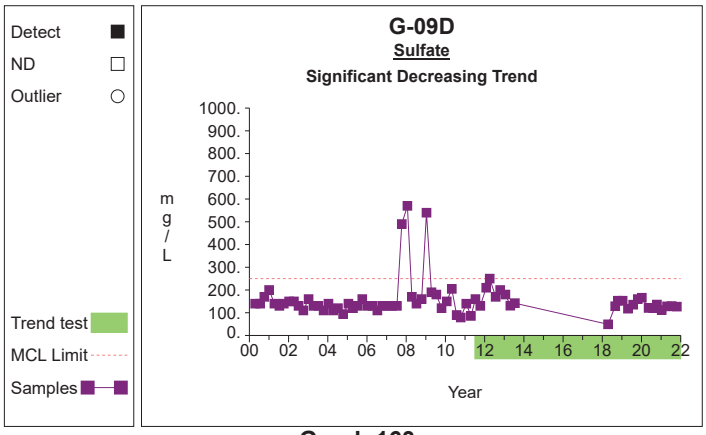
Graph 144

Time Series



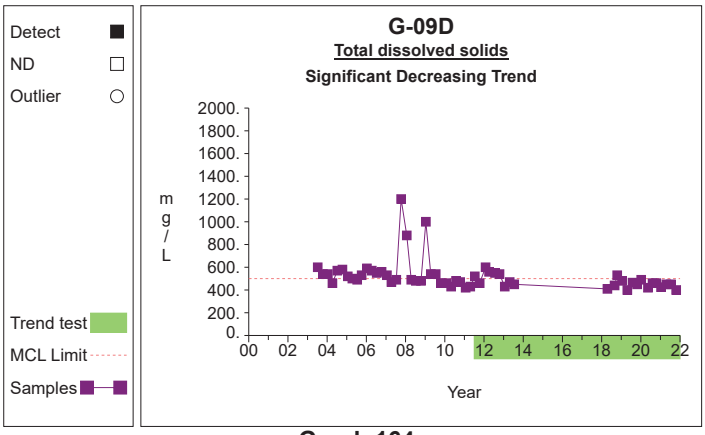
Graph 149

Time Series



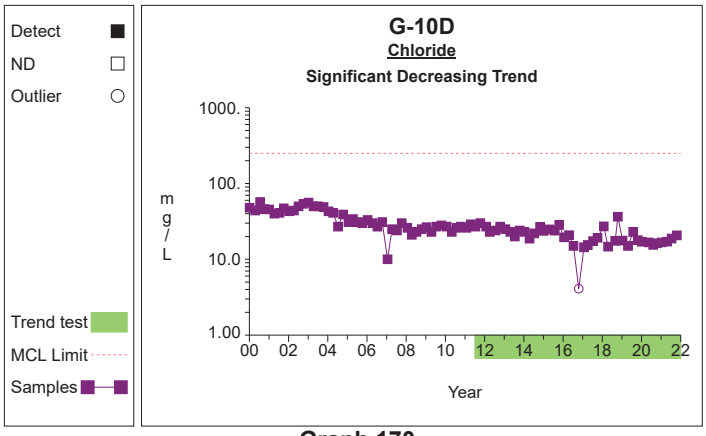
Graph 163

Time Series



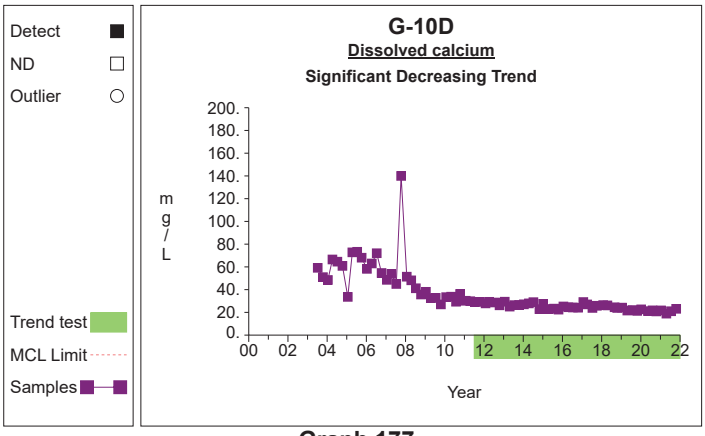
Graph 164

Time Series



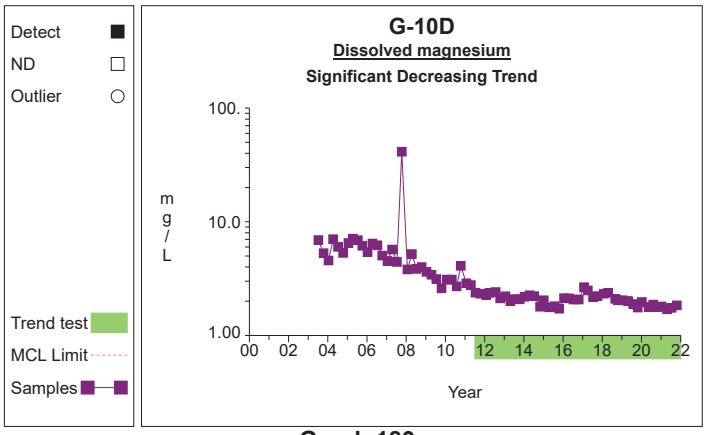
Graph 170

Time Series



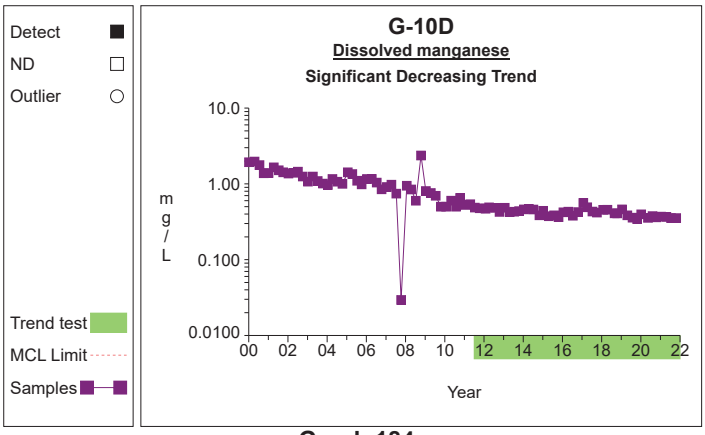
Graph 177

Time Series



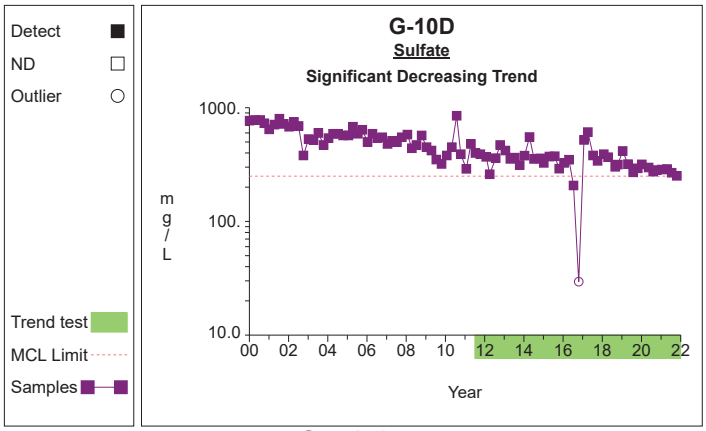
Graph 183

Time Series



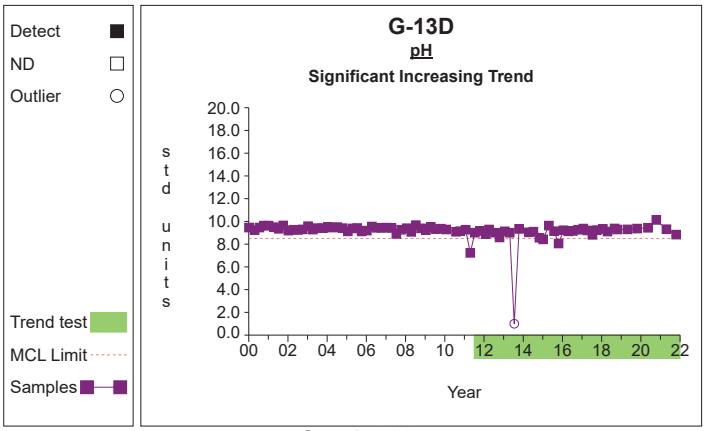
Graph 184

Time Series



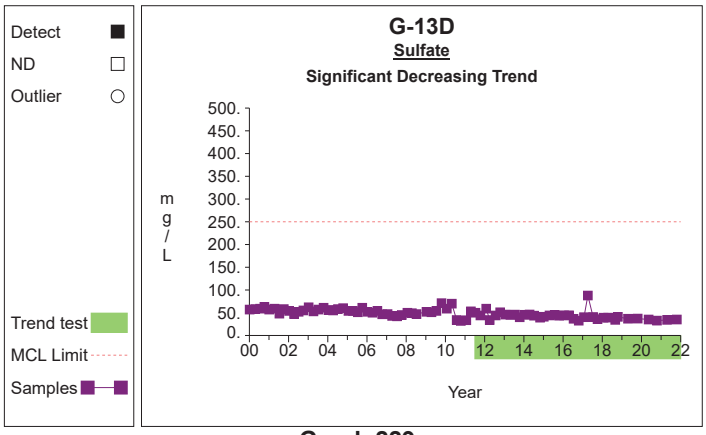
Graph 196

Time Series



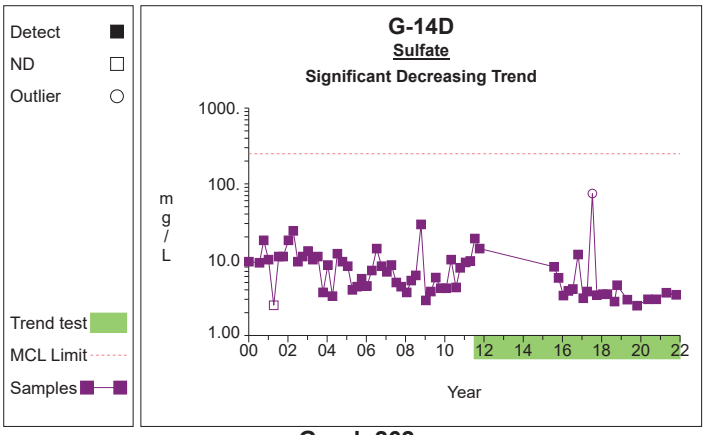
Graph 228

Time Series



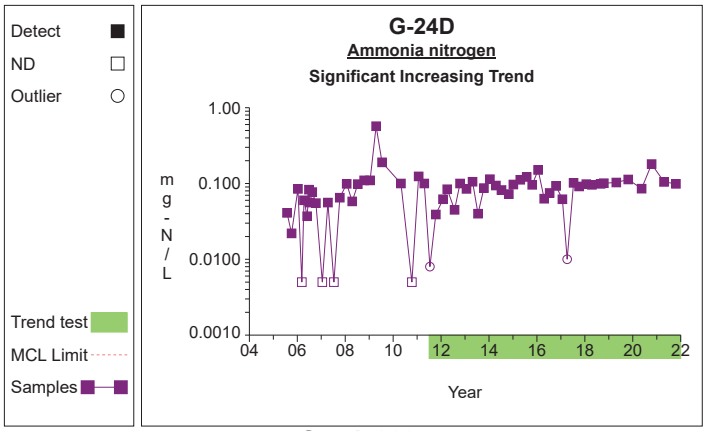
Graph 229

Time Series



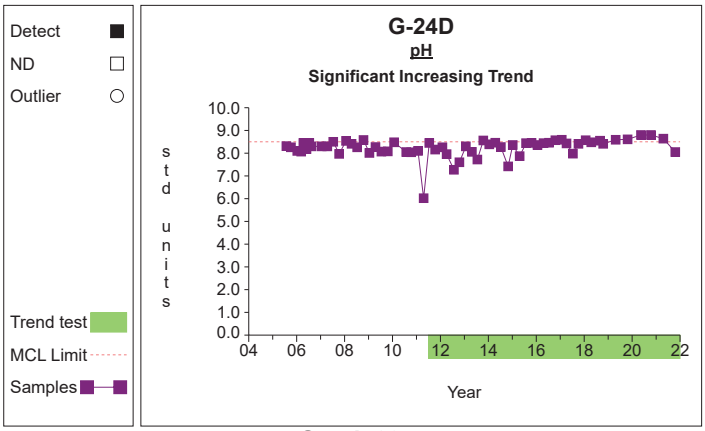
Graph 262

Time Series



Graph 266

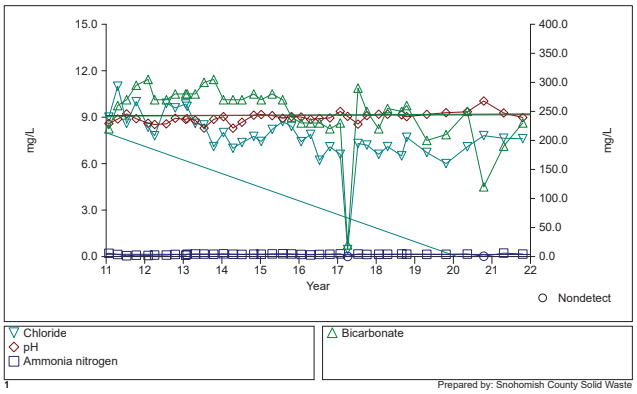
Time Series



Graph 294

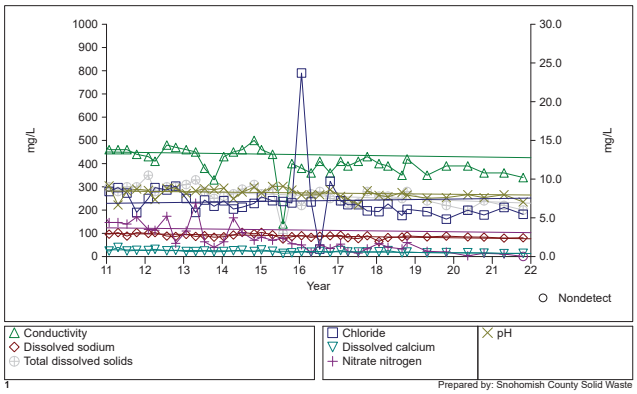
Cathcart Landfill

Time Series Plot for G-01D



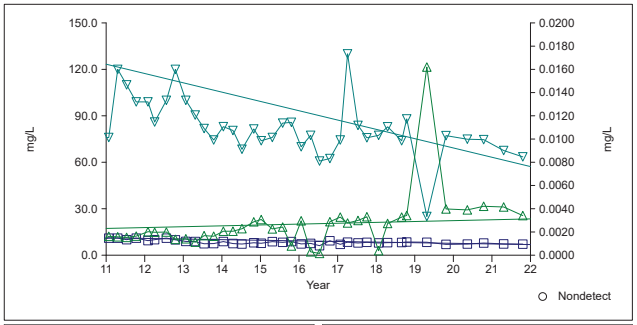
Cathcart Landfill

Time Series Plot for G-02D



Cathcart Landfill

Time Series Plot for G-06B



Sulfate
Chloride
Dissolved arsenic

1

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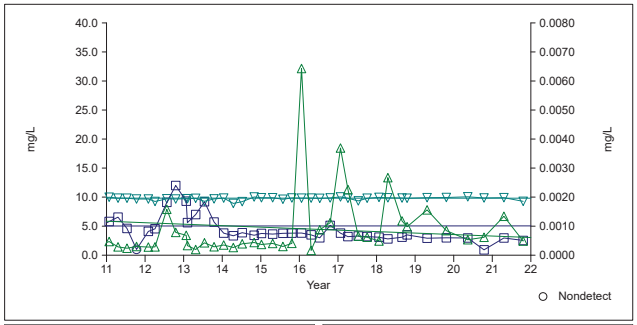
Cathcart Landfill

Time Series Plot for G-08D2



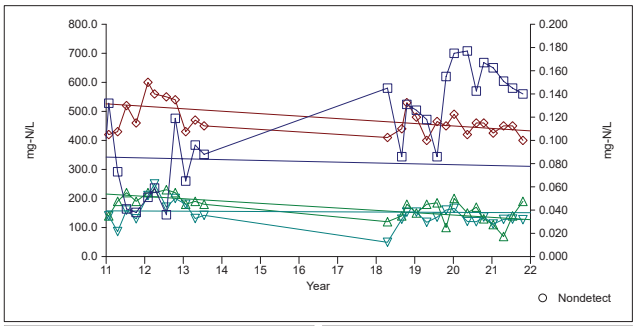
Chloride
pH
Dissolved arsenic

1

Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-09D



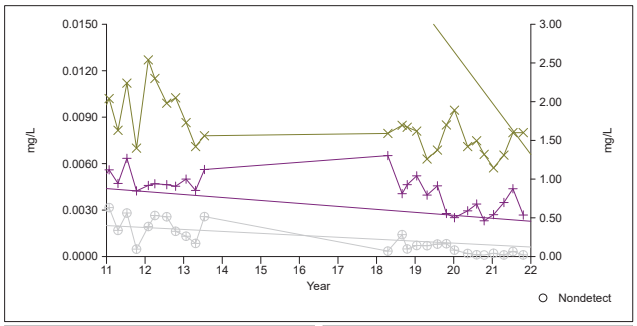
Bicarbonate
Sulfate
Total dissolved solids
Ammonia nitrogen

1

Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-09D



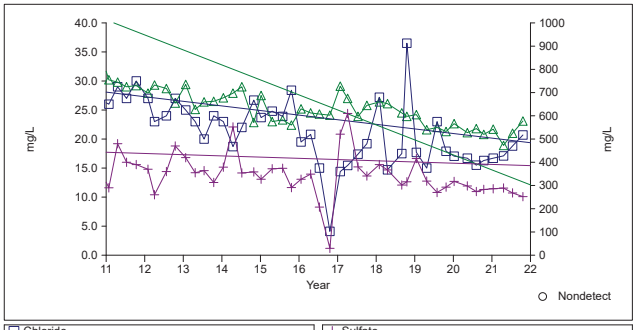
Dissolved lead
Dissolved arsenic
Dissolved calcium

1

Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-10D

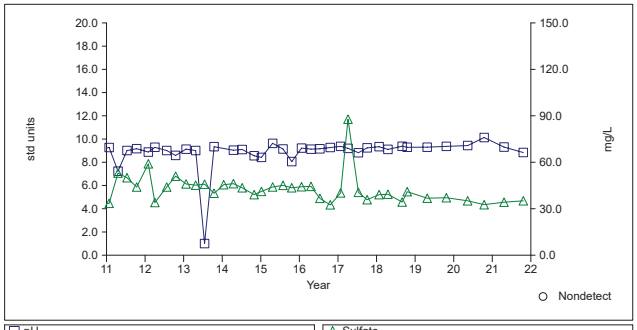


1

Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-13D

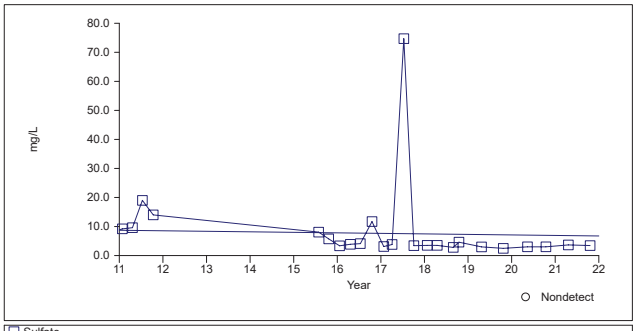


1

Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-14D

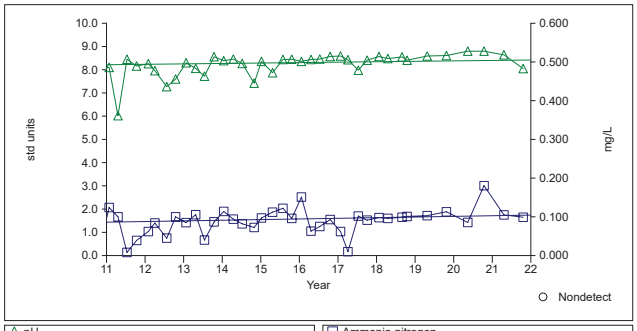


1

Prepared by: Snohomish County Solid Waste

Cathcart Landfill

Time Series Plot for G-24D



1

Prepared by: Snohomish County Solid Waste

Appendix D

Field Monitoring Forms

- **Groundwater Monitoring**
- **Quarterly Landfill Gas Monitoring**
- **Monthly Vault Inspections**

Groundwater Monitoring Forms

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21405 **Conditions:** Precip - rain
Date: 1/12/2021 **Site:** Cathcart
Time: 11:40 **Location:** G-09S

Well Information:

Well Depth: 51.5 ft **Water Depth:** 29.15 ft

Surface Measurements:

Flow Rate: **Measure Method:** [Undefined]

Field Chemistry Tests:

Purge Volume: 3.58 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.43	995	13.6	Clear	Very Fine				

Sampling:

Sample Depth: 51.5 ft **Sample Type:** Standard Ground - Water
Sample Time: 11:50

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry after first purge.

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Trina Arnold**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number:	21404	**Conditions:**	Precip - rain
Date:	1/12/2021	**Site:**	Cathcart
Time:	11:30	**Location:**	G-09D

Well Information:

Well Depth: **Water Depth:**

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume:

Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time

Sampling:

Sample Depth: 81 ft **Sample Type:** Standard Ground - Water

Sample Time: 11:45

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split sample. See field data on 21403.

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Matt Lawless**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21403 **Conditions:** Precip - rain
Date: 1/12/2021 **Site:** Cathcart
Time: 11:30 **Location:** G-09D

Well Information:

Well Depth: 81 ft **Water Depth:** 50.38 ft

Surface Measurements:

Flow Rate: **Measure Method:** [Undefined]

Field Chemistry Tests:

Purge Volume: 4.9 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	9.05	742	13.1	Clear	Fine				
Test 2	Grab	9.35	717	13.6	Clear	Fine				

Sampling:

Sample Depth: 81 ft **Sample Type:** Standard Ground - Water
Sample Time: 11:45

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split sample with 21404. Dry after second purge.

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Trina Arnold**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21402 **Conditions:** Precip - rain
Date: 1/12/2021 **Site:** Cathcart
Time: 10:55 **Location:** G-10S

Well Information:

Well Depth: 44 ft **Water Depth:** 21.64 ft

Surface Measurements:

Flow Rate: **Measure Method:** [Undefined]

Field Chemistry Tests:

Purge Volume: 3.58 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.71	1451	12.4	Clear	Very Fine				
Test 2	Grab	6.77	1427	12.6	Clear	Very Fine				
Test 3	Grab	6.7	1422	12.7	Clear	Very Fine				

Sampling:

Sample Depth: 22.63 ft **Sample Type:** Standard Ground - Water
Sample Time: 11:05

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Trina Arnold**

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Environmental Services Section
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Field Sampling Data

Sample Number: 21401 **Conditions:** Precip - rain
Date: 1/12/2021 **Site:** Cathcart
Time: 10:45 **Location:** G-10D

Well Information:

Well Depth: 82 ft **Water Depth:** 29.71 ft

Surface Measurements:

Flow Rate: **Measure Method:** [Undefined]

Field Chemistry Tests:

Purge Volume: 8.37 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.11	1561	12.2	Clear	Very Fine				

Sampling:

Sample Depth: 34.2 ft **Sample Type:** Standard Ground - Water
Sample Time: 11:25

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Trina Arnold**

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Environmental Services Section
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Field Sampling Data

Sample Number:	21501	**Conditions:**	Sunny
Date:	4/21/2021	**Site:**	Cathcart
Time:	10:08	**Location:**	G-04A

Well information:

WellDepth: 20 **Water Depth:**

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol:

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0										
Test 1										
Test 2										

Sampling:

SampDepth: **Sample Type:**

SampTime:

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1					
Bottle 2					
Bottle 3					
Bottle 4					
Bottle 5					
Bottle 6					
Bottle 7					
Bottle 8					
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Not enough water to sample.

NumbBot: 0

Witness: Trina Arnold **Signature:** Scott Wells

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Field Sampling Data

Sample Number: 21500 **Conditions:** Sunny
Date: 4/21/2021 **Site:** Cathcart
Time: 9:50 **Location:** G-13D

Well information:

WellDepth: 44.9 **Water Depth:** 11.04

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 5.42

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	9.35	447	11.5	Clear	Fine				
Test 1	Grab	9.34	446	11.2	Clear	Medium				
Test 2	Grab	9.31	445	11.2	Clear	Medium				

Sampling:

SampDepth: 16.04 **Sample Type:** Standard Ground - Water

SampTime: 10:05

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes:

NumbBot: 8

Witness: Trina Arnold **Signature:** Scott Wells

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Field Sampling Data

Sample Number: 21499 **Conditions:** Sunny
Date: 4/21/2021 **Site:** Cathcart
Time: 9:30 **Location:** G-11S

Well information:

WellDepth: 41.2 **Water Depth:** 20.94

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 3.24

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	6.64	185	12.1	Clear	Very Fine				
Test 1	Grab	6.85	207	11.8	Clear	Very Fine				
Test 2										

Sampling:

SampDepth: 41.2 **Sample Type:** Standard Ground - Water

SampTime: 9:45

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry after second purge.

NumbBot: 8

Witness: Trina Arnold **Signature:** Scott Wells

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Field Sampling Data

Sample Number: 21498 **Conditions:** Sunny
Date: 4/21/2021 **Site:** Cathcart
Time: 9:00 **Location:** G-01D

Well information:

WellDepth: 67.2 **Water Depth:** 24.58

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 6.82

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	9.4	569	12.4	Clear	Fine				
Test 1	Grab	9.4	571	11.6	Clear	Medium				
Test 2	Grab	9.27	651	11.5	Clear	Heavy				

Sampling:

SampDepth: 45.01 **Sample Type:** Standard Ground - Water

SampTime: 9:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes:

NumbBot: 8

Witness: Trina Arnold **Signature:** Scott Wells

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Environmental Services Section
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Field Sampling Data

Sample Number: 21497 **Conditions:** Sunny
Date: 4/21/2021 **Site:** Cathcart
Time: 8:56 **Location:** G-01A

Well information:

WellDepth: 15.65 **Water Depth:** 10.17

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 0.88

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	6.36	124	10.7	Clear	Very Fine				
Test 1	Grab	6.34	122	11.5	Clear	Very Fine				
Test 2										

Sampling:

SampDepth: 15.65 **Sample Type:** Standard Ground - Water

SampTime: 10:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry after second purge.

NumbBot: 8

Witness: Trina Arnold **Signature:** Scott Wells

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Field Sampling Data

Sample Number:	21496	**Conditions:**	Sunny
Date:	4/21/2021	**Site:**	Cathcart
Time:	8:33	**Location:**	G-06B

Well information:

WellDepth: 88 **Water Depth:** 36.09

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 8.31

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	7.76	407	12.9	Clear	Very Fine				
Test 1	Grab	8.35	658	12.3	Clear	Very Fine				
Test 2										

Sampling:

SampDepth: 88 **Sample Type:** Standard Ground - Water

SampTime: 8:50

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry after second purge.

NumbBot: 8

Witness: Trina Arnold **Signature:** Scott Wells

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Field Sampling Data

Sample Number: 21495 **Conditions:** Sunny
Date: 4/21/2021 **Site:** Cathcart
Time: 8:15 **Location:** G-02D

Well information:

WellDepth: 56.5 **Water Depth:** 29.24

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 4.36

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	7.99	361	11.8	Clear	Fine				
Test 1										
Test 2										

Sampling:

SampDepth: 56.5 **Sample Type:** Standard Ground - Water

SampTime: 8:30

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry after first purge.

NumbBot: 8

Witness: Trina Arnold **Signature:** Scott Wells

Snohomish County Solid Waste
Environmental Services Section
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Field Sampling Data

Sample Number: 21494 **Conditions:** Sunny
Date: 4/20/2021 **Site:** Cathcart
Time: 12:00 **Location:** G-08D1

Well information:

WellDepth: 56.4 **Water Depth:** 23.72

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 5.23

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	9.06	428	12.7	Clear	Fine				
Test 1	Grab	9.47	442	11.7	Clear	Fine				
Test 2	Grab	9.59	436	11.4	Clear	Medium				

Sampling:

SampDepth: 56.4 **Sample Type:** Standard Ground - Water

SampTime: 12:10

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry after 4 gal of 3rd purge.

NumbBot: 8

Witness: Trina Arnold **Signature:** Scott Wells

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Field Sampling Data

Sample Number: 21493 **Conditions:** Sunny
Date: 4/20/2021 **Site:** Cathcart
Time: 11:30 **Location:** G-08D2

Well information:

WellDepth: 112.5 **Water Depth:** 6.04

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 17.03

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	9.96	462	12.1	Clear	Medium				
Test 1	Grab	9.92	457	11.5	Clear	Medium				
Test 2	Grab	9.9	456	11.7	Clear	Medium				

Sampling:

SampDepth: 47.2 **Sample Type:** Standard Ground - Water

SampTime: 11:45

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes:

NumbBot: 8

Witness: Trina Arnold **Signature:** Scott Wells

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Environmental Services Section
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Field Sampling Data

Sample Number: 21492 **Conditions:** Sunny
Date: 4/20/2021 **Site:** Cathcart
Time: 11:10 **Location:** G-10S

Well information:

WellDepth: 44 **Water Depth:** 23.34

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 3.31

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	6.51	1383	14.7	Clear	Very Fine				
Test 1	Grab	6.65	1409	13.2	Clear	Very Fine				
Test 2	Grab	6.62	1409	13.1	Clear	Very Fine				

Sampling:

SampDepth: 24.36 **Sample Type:** Standard Ground - Water

SampTime: 11:20

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes:

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

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Field Sampling Data

Sample Number: 21491 **Conditions:** Sunny
Date: 4/20/2021 **Site:** Cathcart
Time: 11:05 **Location:** G-10D

Well information:

WellDepth: 82 **Water Depth:** 30.82

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 8.19

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	7.34	1548	14.3	Clear	Very Fine				
Test 1										
Test 2										

Sampling:

SampDepth: 34.97 **Sample Type:** Standard Ground - Water
SampTime: 11:40

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes:

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

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Environmental Services Section
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Field Sampling Data

Sample Number: 21490 **Conditions:** Sunny
Date: 4/20/2021 **Site:** Cathcart
Time: 10:50 **Location:** G-09S

Well information:

WellDepth: 51.5 **Water Depth:** 29.9

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 3.46

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	6.27	950	14.2	Clear	Very Fine				
Test 1	Grab	6.42	966	14.3	Clear	Very Fine				
Test 2										

Sampling:

SampDepth: 51.5 **Sample Type:** Standard Ground - Water

SampTime: 11:00

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry after second purge.

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

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Field Sampling Data

Sample Number: 21489 **Conditions:** Sunny
Date: 4/20/2021 **Site:** Cathcart
Time: 10:40 **Location:** G-09D

Well information:

WellDepth: 81 **Water Depth:** 51.91

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 4.65

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	8.58	699	14.9	Clear	Fine				
Test 1										
Test 2										

Sampling:

SampDepth: 81 **Sample Type:** Standard Ground - Water

SampTime: 10:55

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry after first purge.

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

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Field Sampling Data

Sample Number:	21488	**Conditions:**	Sunny
Date:	4/20/2021	**Site:**	Cathcart
Time:	10:20	**Location:**	G-14S

Well information:

WellDepth: 68.5 **Water Depth:** 9.41

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 9.45

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	9.3	364	11.6	Clear	Very Fine				
Test 1	Grab	9.25	366	11.2	Clear	Very Fine				
Test 2										

Sampling:

SampDepth: 68.5 **Sample Type:** Standard Ground - Water

SampTime: 10:40

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry 1 gallon second purge.

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296 Tel: (360) 668-6595

Field Sampling Data

Sample Number:	21487	**Conditions:**	Sunny
Date:	4/20/2021	**Site:**	Cathcart
Time:	10:05	**Location:**	G-14D

Well information:

WellDepth: 110 **Water Depth:** 30.63

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 12.70

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0										
Test 1										
Test 2										

Sampling:

SampDepth: 110 **Sample Type:** Standard Ground - Water

SampTime: 10:25

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Split sample. See field data on 21486. Dry after 11 gal of second purge

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

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Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296 Tel: (360) 668-6595

Field Sampling Data

Sample Number: 21486 **Conditions:** Sunny
Date: 4/20/2021 **Site:** Cathcart
Time: 10:05 **Location:** G-14D

Well information:

WellDepth: 110 **Water Depth:** 30.63

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 12.70

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	9.42	465	12.1	Clear	Medium				
Test 1	Grab	9.72	471	11.9	Clear	Heavy				
Test 2										

Sampling:

SampDepth: 110 **Sample Type:** Standard Ground - Water
SampTime: 10:25

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Split sample with 21487. Dry after 11 gal. of second purge.

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

Snohomish County Solid Waste
Environmental Services Section
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Field Sampling Data

Sample Number:	21485	**Conditions:**	Sunny
Date:	4/20/2021	**Site:**	Cathcart
Time:	9:50	**Location:**	G-24S

Well information:

WellDepth: 26.5 **Water Depth:** 13.7

Surface Measurments:

FlowRate: **Measure Meth:**

Field Chemistry Tests:

PurgeVol: 2.05

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	7.24	418	12.4	Clear	Very Fine				
Test 1	Grab	7.34	429	11.2	Clear	Very Fine				
Test 2										

Sampling:

SampDepth: 23.47 **Sample Type:** Standard Ground - Water

SampTime: 13:30

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes: Dry after second purge.

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

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Field Sampling Data

Sample Number:	21484	**Conditions:**	Sunny
Date:	4/20/2021	**Site:**	Cathcart
Time:	9:20	**Location:**	G-24D

Well information:

WellDepth:	85	**Water Depth:**	18.1

Surface Measurments:

FlowRate:	**Measure Meth:**

Field Chemistry Tests:

PurgeVol: 10.70

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 0	Grab	8.45	500	12.7	Clear	Very Fine				
Test 1	Grab	8.69	503	12.1	Clear	Very Fine				
Test 2	Grab	8.64	496	12.4	Clear	Very Fine				

Sampling:

SampDepth: 34.65 **Sample Type:** Standard Ground - Water

SampTime: 9:40

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL
Bottle 9					
Bottle 10					
Bottle 11					
Bottle 12					

Notes:

NumbBot: 8

Witness: Matt Lawless **Signature:** Scott Wells

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Field Sampling Data

Sample Number: 21571 **Conditions:** Sunny
Date: 7/14/2021 **Site:** Cathcart
Time: 10:00 **Location:** G-10D

Well Information:

Well Depth: 82 ft **Water Depth:** 31.52 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 8.08 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.3	1541	15.2	Clear	Fine				

Sampling:

Sample Depth: 35.96 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:40

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Scott Wells**

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Field Sampling Data

Sample Number:	21570	**Conditions:**	Sunny
Date:	7/14/2021	**Site:**	Cathcart
Time:	10:15	**Location:**	G-10S

Well Information:

Well Depth: **Water Depth:**

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume:

Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time

Sampling:

Sample Depth: 44 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:25

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split sample with 21569. See sheet 21569 for field chemistry.

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Scott Wells**

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Field Sampling Data

Sample Number: 21569 **Conditions:** Sunny
Date: 7/14/2021 **Site:** Cathcart
Time: 10:15 **Location:** G-10S

Well Information:

Well Depth: 44 ft **Water Depth:** 23.95 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 3.21 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.32	1354	14.2	Clear	Fine				
Test 2	Grab	6.41	1403	13.2	Clear	Fine				
Test 3	Grab	6.51	1410	12.5	Clear	Fine				

Sampling:

Sample Depth: 44 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:25

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split sample with 21570

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Scott Wells**

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Field Sampling Data

Sample Number: 21568 **Conditions:** Sunny
Date: 7/14/2021 **Site:** Cathcart
Time: 10:00 **Location:** G-09S

Well Information:

Well Depth: 51.5 ft **Water Depth:** 31.29 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 3.23 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.01	930	16.6	Clear	Fine				
Test 2	Grab	6.15	962	14.9	Clear	Fine				

Sampling:

Sample Depth: 51.5 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:10

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Well is dry after 1/2 gallon into 2nd purge

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Scott Wells**

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Field Sampling Data

Sample Number: 21567 **Conditions:** Sunny
Date: 7/14/2021 **Site:** Cathcart
Time: 09:45 **Location:** G-09D

Well Information:

Well Depth: 81 ft **Water Depth:** 53.68 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 4.37 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	8.73	694	15.8	Clear	Fine				

Sampling:

Sample Depth: 81 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:00

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Well is dry after 1 purge

Number of Bottles: 8

Operator/Witness: Matt Lawless **Sampler: Scott Wells**

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Field Sampling Data

Sample Number: 21663 **Conditions:** Precip - rain
Date: 10/20/2021 **Site:** Cathcart
Time: 09:35 **Location:** G-13D

Well Information:

Well Depth: 44.9 ft **Water Depth:** 10.82 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 5.45 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	8.86	442	11.1	Clear	Fine				
Test 2	Grab	8.88	442	10.9	Clear	Fine				
Test 3	Grab	8.84	441	10.8	Clear	Fine				

Sampling:

Sample Depth: 15.75 ft **Sample Type:** Standard Ground - Water
Sample Time: 09:55

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Matt Lawless**

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Field Sampling Data

Sample Number: 21662 **Conditions:** Precip - rain
Date: 10/20/2021 **Site:** Cathcart
Time: 09:05 **Location:** G-10D

Well Information:

Well Depth: 82 ft **Water Depth:** 30.4 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 8.26 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.83	1521	12.7	Clear	Very Fine				

Sampling:

Sample Depth: 36.01 ft **Sample Type:** Standard Ground - Water
Sample Time: 09:55

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Matt Lawless**

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Field Sampling Data

Sample Number: 21661 **Conditions:** Precip - rain
Date: 10/20/2021 **Site:** Cathcart
Time: 09:05 **Location:** G-10S

Well Information:

Well Depth: 44 ft **Water Depth:** 22.62 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 3.42 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.37	1408	12.5	Clear	Very Fine				

Sampling:

Sample Depth: 44 ft **Sample Type:** Standard Ground - Water
Sample Time: 09:20

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry after first purge.

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Matt Lawless**

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Field Sampling Data

Sample Number: 21660 **Conditions:** Precip - rain
Date: 10/20/2021 **Site:** Cathcart
Time: 08:40 **Location:** G-09D

Well Information:

Well Depth: 81 ft **Water Depth:** 54.8 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 4.19 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	8.69	7.03	13.8	Clear	Fine				
Test 2	Grab	8.97	714	13.6	Clear	Fine				

Sampling:

Sample Depth: 81 ft **Sample Type:** Standard Ground - Water
Sample Time: 08:55

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry one gallon into second purge

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Matt Lawless**

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Field Sampling Data

Sample Number: 21659 **Conditions:** Precip - rain
Date: 10/20/2021 **Site:** Cathcart
Time: 08:30 **Location:** G-09S

Well Information:

Well Depth: 51.5 ft **Water Depth:** 32.51 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 3.04 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.06	972	13.7	Clear	Very Fine				

Sampling:

Sample Depth: 51.5 ft **Sample Type:** Standard Ground - Water
Sample Time: 09:00

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry after first purge.

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Matt Lawless**

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Field Sampling Data

Sample Number: 21658 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 01:35 **Location:** G-06B

Well Information:

Well Depth: 88 ft **Water Depth:** 34.03 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 8.64 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.52	640	13.2	Clear	Very Fine				
Test 2	Grab	7.67	686	12.8	Clear	Very Fine				

Sampling:

Sample Depth: 88 ft **Sample Type:** Standard Ground - Water
Sample Time: 01:50

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry after second purge

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

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Field Sampling Data

Sample Number: 21657 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 01:00 **Location:** G-01A

Well Information:

Well Depth: 15.65 ft **Water Depth:** 7.11 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.37 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	5.3	156	13.4	Clear	Very Fine				
Test 2	Grab	5.52	173	13.3	Clear	Very Fine				
Test 3	Grab	5.58	180	13.1	Clear	Very Fine				

Sampling:

Sample Depth: 14.6 ft **Sample Type:** Standard Ground - Water
Sample Time: 01:20

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 8	Grab	P-pump	40	Glass	HCL
Bottle 8	Grab	P-pump	40	Glass	HCL
Bottle 8	Grab	P-pump	40	Glass	HCL
Bottle 8	Grab	P-pump	40	Glass	HCL
Bottle 8	Grab	P-pump	40	Glass	HCL
Bottle 8	Grab	P-pump	40	Glass	HCL
Bottle 8	Grab	P-pump	40	Glass	HCL
Bottle 8	Grab	P-pump	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

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Field Sampling Data

Sample Number: 21656 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 01:00 **Location:** G-01D

Well Information:

Well Depth: 67.2 ft **Water Depth:** 23.2 ft

Surface Measurements:

Flow Rate: 0 **Measure Method:**

Field Chemistry Tests:

Purge Volume: 7.04 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	9.06	569	11.8	Clear	Medium				
Test 2	Grab	9.02	570	11.7	Clear	Medium				
Test 3	Grab	8.98	571	11.5	Clear	Medium				

Sampling:

Sample Depth: 45.25 ft **Sample Type:** Standard Ground - Water
Sample Time: 01:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

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Field Sampling Data

Sample Number: 21655 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 12:45 **Location:** G-04A

Well Information:

Well Depth: **Water Depth:**

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume:

Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time

Sampling:

Sample Depth: **Sample Type:**

Sample Time:

Sample Type	Sample Method	Volume	Bottle Type	Preservative

Notes: No water to sample

Number of Bottles:

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21654 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 11:25 **Location:** G-11S

Well Information:

Well Depth: 41.2 ft **Water Depth:** 18.55 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 3.62 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	5.88	270	11.3	Clear	Very Fine				
Test 2	Grab	6.14	263	11.2	Clear	Very Fine				
Test 3	Grab	6.26	271	11.2	Clear	Very Fine				

Sampling:

Sample Depth: 41.2 ft **Sample Type:** Standard Ground - Water
Sample Time: 11:40

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry 1 gallon into third purge

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21653 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 11:15 **Location:** G-02D

Well Information:

Well Depth: 56.5 ft **Water Depth:** 31.33 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 4.03 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.05	338	10.4	Clear	Very Fine				

Sampling:

Sample Depth: 56.5 ft **Sample Type:** Standard Ground - Water
Sample Time: 11:25

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry after one purge.

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21652 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 11:00 **Location:** G-08D1

Well Information:

Well Depth: 56.4 ft **Water Depth:** 29.35 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 4.33 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	8.56	448	10.7	Clear	Very Fine				
Test 2	Grab	9.14	476	10.6	Clear	Medium				

Sampling:

Sample Depth: 56.4 ft **Sample Type:** Standard Ground - Water
Sample Time: 11:10

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21651 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 10:30 **Location:** G-08D2

Well Information:

Well Depth: 112.5 ft **Water Depth:** 9.47 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 16.48 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	9.23	476	10.8	Clear	Medium				
Test 2	Grab	9.28	468	10.6	Clear	Medium				
Test 3	Grab	9.27	464	10.6	Clear	Medium				

Sampling:

Sample Depth: 30.73 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:50

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split Sample with 21650

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21650 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 10:30 **Location:** G-08D2

Well Information:

Well Depth: 112.5 ft **Water Depth:** 9.47 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 16.48 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	9.23	476	10.8	Clear	Medium				
Test 2	Grab	9.28	468	10.6	Clear	Medium				
Test 3	Grab	9.27	464	10.6	Clear	Medium				

Sampling:

Sample Depth: 30.73 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:50

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split Sample with 21651

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21649 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 10:10 **Location:** G-14S

Well Information:

Well Depth: 68.5 ft **Water Depth:** 16.98 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 8.24 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	8.48	371	11.6	Clear	Very Fine				

Sampling:

Sample Depth: 68.5 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:25

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry after first purge.

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21648 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 09:55 **Location:** G-14D

Well Information:

Well Depth: 110 ft **Water Depth:** 31.9 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 12.5 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	9.07	476	11.5	Clear	Very Fine				
Test 2	Grab	9.11	479	11.6	Lt Brown	Very Heavy				

Sampling:

Sample Depth: 110 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry after 11 gallons of second purge

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21647 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 09:40 **Location:** G-24S

Well Information:

Well Depth: 26.5 ft **Water Depth:** 14.66 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.89 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.47	415	11.5	Clear	Very Fine				
Test 2	Grab	6.75	434	11.3	Clear	Very Fine				

Sampling:

Sample Depth: 22.82 ft **Sample Type:** Standard Ground - Water
Sample Time: 12:55

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Dry after second purge.

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Snohomish County Solid Waste
Environmental Services Section
8915 Cathcart Way
Snohomish, WA 98296

Field Sampling Data

Sample Number: 21646 **Conditions:** Sunny
Date: 10/19/2021 **Site:** Cathcart
Time: 09:10 **Location:** G-24D

Well Information:

Well Depth: 85 ft **Water Depth:** 19.51 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 10.48 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.93	516	11.8	Clear	Very Fine				
Test 2	Grab	8.07	510	11.4	Clear	Very Fine				
Test 3	Grab	8.05	508	11.2	Clear	Very Fine				

Sampling:

Sample Depth: 26.66 ft **Sample Type:** Standard Ground - Water
Sample Time: 09:20

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold **Sampler: Scott Wells**

Landfill Gas Monitoring Forms

Snohomish County Department of Public Works

Solid Waste Division

Gas Probe Monitoring Data

QUARTERLY GAS ROUND
DATE: 03/19/21

Site	Location: Probe	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	GP-4	1410	0%	20%	0%		29.54	
	GP-5(1)	1450	0%	5%	15%		"	
	GP-5(2)	1450	0%	12%	5%		"	
	GP-1(1)	1420	0%	20%	0%		"	
	GP-1(2)	1420	0%	20%	0%		"	
	GP-2(1)	1445	0%	21%	0%		"	
	GP-2(2)	1445	0%	21%	0%		"	
	GP-3	1500	0%	21%	1%		"	
	GP-6	1455	0%	20%	0%		"	
	Main Man	1400	31%	8%	17%	260	"	
Site	**Location: Barhole**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	BH-3	1415	0%	20%	0%		29.54	
	BH-4	1425	0%	21%	1%		"	
	BH-5	1430	0%	21%	0%		"	
	BH-6	1440	0%	21%	1%		"	
	BH-7	1445	0%	21%	1%		"	
	BH-8	1435	0%	21%	0%		"	
Site	**Location: Structure**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	SP-4	1505	0%	21%	0%		29.54	
	C-FV-1`	1505	0%	21%	0%		"	
	C-COV-2	1505	0%	21%	0%		"	
	C-VV-2	1506	0%	21%	0%		"	
	SP-1	1506	0%	21%	0%		"	
	C-VV-3	1506	0%	21%	0%		"	
	Grit Chamber	1506	0%	21%	0%		"	
	C-FV-2	1507	0%	21%	0%		"	
	C-VV-5	1507	0%	21%	0%		"	

Methane/Oxygen Meter Used =	GEM 5000
Technician Name =	ML
Page =	**2 of 2**

Snohomish County Department of Public Works

Solid Waste Division

Gas Probe Monitoring Data

QUARTERLY GAS ROUND	
DATE:	**06/08/21**

Site	Location: Probe	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	GP-4	1247	0%	21%	0%		29.56	
	GP-5(1)	1256	0%	21%	0%		"	
	GP-5(2)	1256	0%	21%	0%		"	
	GP-1(1)	1316	0%	21%	0%		"	
	GP-1(2)	1316	0%	21%	0%		"	
	GP-2(1)	1344	0%	21%	0%		"	
	GP-2(2)	1345	0%	14%	3%		"	
	GP-3	1445	0%	21%	0%		"	
	GP-6	1440	0%	21%	0%		"	
	Main Man	1240	30%	7%	16%	585	"	
Site	**Location: Barhole**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	BH-3	1250	0%	21%	0%		29.56	
	BH-4	1253	0%	20%	1%		"	
	BH-5	1307	0%	21%	0%		"	
	BH-6	1310	0%	19%	2%		"	
	BH-7	1315	0%	20%	1%		"	
	BH-8	1309	0%	21%	0%		"	
Site	**Location: Structure**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	SP-4	1346	0%	21%	0%		29.56	
	C-FV-1`	1347	0%	21%	0%		"	
	C-COV-2	1348	0%	21%	0%		"	
	C-VV-2	1349	0%	21%	0%		"	
	SP-1	1350	0%	21%	0%		"	
	C-VV-3	1351	0%	21%	0%		"	
	Grit Chamber	1352	0%	21%	0%		"	
	C-FV-2	1353	0%	21%	0%		"	
	C-VV-5	1354	0%	21%	0%		"	

Methane/Oxygen Meter Used =	GEM 5000
Technician Name =	SW/ML
Page =	**2 of 2**

Snohomish County Department of Public Works

Solid Waste Division

Gas Probe Monitoring Data

QUARTERLY GAS ROUND	
DATE:	**08/18/21**

Site	Location: Probe	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	GP-4	1040	0%	21%	0%		29.72	
	GP-5(1)	1058	0%	21%	0%		"	
	GP-5(2)	1058	0%	21%	0%		"	
	GP-1(1)	1112	0%	21%	0%		"	
	GP-1(2)	1112	0%	21%	0%		"	
	GP-2(1)	1116	0%	21%	0%		"	
	GP-2(2)	1116	0%	21%	0%		"	
	GP-3	1130	0%	21%	0%		"	
	GP-6	1125	0%	21%	0%		"	
	Main Man	1135	26%	7%	17%	530	"	
Site	**Location: Barhole**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	BH-3	1055	0%	21%	0%		29.72	
	BH-4	1057	0%	21%	0%		"	
	BH-5	1101	0%	21%	0%		"	
	BH-6	1105	0%	21%	0%		"	
	BH-7	1113	0%	21%	0%		"	
	BH-8	1109	0%	21%	0%		"	
Site	**Location: Structure**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	SP-4	1118	0%	21%	0%		29.72	
	C-FV-1`	1118	0%	21%	0%		"	
	C-COV-2	1118	0%	21%	0%		"	
	C-VV-2	1119	0%	21%	0%		"	
	SP-1	1119	0%	21%	0%		"	
	C-VV-3	1120	0%	21%	0%		"	
	Grit Chamber	1120	0%	21%	0%		"	
	C-FV-2	1121	0%	21%	0%		"	
	C-VV-5	1121	0%	21%	0%		"	

Methane/Oxygen Meter Used =	GEM 5000
Technician Name =	SW/ML
Page =	**2 of 2**

Snohomish County Department of Public Works

Solid Waste Division

Gas Probe Monitoring Data

QUARTERLY GAS ROUND	
DATE:	**10/06/21**

Site	Location: Probe	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Pressure	Comments
CATHCART	GP-4	0744	0%	21%	0%		29.64	
	GP-5(1)	0752	0%	20%	0%		"	
	GP-5(2)	0751	0%	21%	2%		"	
	GP-1(1)	0759	0%	21%	0%		"	
	GP-1(2)	0759	0%	21%	1%		"	
	GP-2(1)	0802	0%	20%	5%		"	
	GP-2(2)	0803	0%	18%	7%		"	
	GP-3	0815	0%	21%	1%		"	
	GP-6	0817	0%	21%	0%		"	
	Main Man	0825	19%	12%	12%	761	"	
Site	**Location: Barhole**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	BH-3	0746	0%	20%	1%		29.64	
	BH-4	0750	0%	20%	1%		"	
	BH-5	0752	0%	21%	0%		"	
	BH-6	0756	0%	20%	1%		"	
	BH-7	0758	0%	21%	1%		"	
	BH-8	0754	0%	21%	0%		"	
Site	**Location: Structure**	**Time (Military)**	**Methane (% VOL)**	**Oxygen (% VOL, % LEL, PPM)**	**Carbon Diox. (% VOL)**	**Velocity**	**Pressure**	**Comments**
CATHCART	SP-4	0804	0%	21%	0%		29.64	
	C-FV-1`	0805	0%	21%	0%		"	
	C-COV-2	0806	0%	21%	0%		"	
	C-VV-2	0807	0%	21%	0%		"	
	SP-1	0806	0%	21%	1%		"	
	C-VV-3	0808	0%	21%	0%		"	
	Grit Chamber	0807	0%	21%	1%		"	
	C-FV-2	0808	0%	21%	0%		"	
	C-VV-5	0809	0%	21%	0%		"	

Methane/Oxygen Meter Used =	GEM 5000
Technician Name =	SW/ML
Page =	**2 of 2**

Monthly Vault Inspection Forms

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: January 20, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	?	No	NONE	—	—	How should we label this it is the flash mixer?
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	3'-4'	NO	YES	—	------	**Needs Vactoring**
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: February 23, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	Full	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	Over Pipes	NO	YES	—	------	**Needs Vactoring**
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: March 22, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	Full	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	-------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	-------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-9	VALVE VAULT	Over Pipes	NO	YES	—	-------	Needs Vactoring
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: April 28, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	Full	No	NONE	---	---	
P-BV-1	BLOWER VAULT	0"	NO	NONE	---	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	---	---	---	---	---	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	---	---	---	---	---	Clarifier - Leak Detection
P-MH-7	MAN HOLE	---	---	---	---	---	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	---	---	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	---	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	---	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	---	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	---	------	
P-VV-9	VALVE VAULT	Over Pipes	NO	YES	---	------	**Needs Vactoring**
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: May 17, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	Full	No	NONE	—	—	
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	0"	NO	NONE	—	------	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: June 29, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	Empty	No	NONE	—	—	PVV-10 is closed
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	-------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	-------	
P-VV-9	VALVE VAULT	?'	NO	NONE	—	-------	Half-way past the bottom Wheel crank
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: July 21, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	Empty	No	NONE	___	___	PVV-10 is closed.
P-BV-1	BLOWER VAULT	0"	NO	NONE	___	-------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	___	___	___	___	___	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	___	___	___	___	___	Clarifier - Leak Detection
P-MH-7	MAN HOLE	___	___	___	___	___	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	___	___	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	___	-------	
P-VV-10	VALVE VAULT	0"	NO	NONE	___	-------	
P-VV-11	VALVE VAULT	0"	NO	NONE	___	-------	
P-VV-12	VALVE VAULT	0"	NO	NONE	___	-------	
P-VV-9	VALVE VAULT	?'	NO	NONE	___	-------	**Half-way past the bottom Wheel crank**
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: August 24, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	Empty	No	NONE	---	---	PVV-10 is closed.
P-BV-1	BLOWER VAULT	0"	NO	NONE	---	-------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	---	---	---	---	---	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	---	---	---	---	---	Clarifier - Leak Detection
P-MH-7	MAN HOLE	---	---	---	---	---	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	---	---	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	---	-------	
P-VV-10	VALVE VAULT	0"	NO	NONE	---	-------	
P-VV-11	VALVE VAULT	0"	NO	NONE	---	--------	
P-VV-12	VALVE VAULT	0"	NO	NONE	---	--------	
P-VV-9	VALVE VAULT	?'	NO	NONE	---	--------	**Half-way past the bottom Wheel crank**
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: September 28, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	Full	No	NONE	—	—	P-VV-10 open
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~15"	NO	NONE	—	------	
P-VV-10	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	------	
P-VV-9	VALVE VAULT	10"	NO	NONE	—	------	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: October 27, 2021 **INSPECTOR(S):** ML

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION:		SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
			ODORS	DEFECTS			
FD-1	Flow Distribution	Full	No	NONE	___	___	P-VV-10 open
P-BV-1	BLOWER VAULT	0"	NO	NONE	___	-------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	___	___	___	___	___	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	___	___	___	___	___	Clarifier - Leak Detection
P-MH-7	MAN HOLE	___	___	___	___	___	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	___	___	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~5'	NO	NONE	___	--------	Vault level appears higher. Need to investigate for potential blockage or other problem
P-VV-10	VALVE VAULT	0"	NO	NONE	___	--------	
P-VV-11	VALVE VAULT	0"	NO	NONE	___	--------	
P-VV-12	VALVE VAULT	0"	NO	NONE	___	--------	
P-VV-9	VALVE VAULT	10"	NO	NONE	___	--------	
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: November 29, 2021 **INSPECTOR(S):** TA

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	Full	No	NONE	—	—	P-VV-10 open
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~5'	NO	NONE	—	--------	Vault level appears higher. Need to investigate for potential blockage or other problem
P-VV-10	VALVE VAULT	0"	NO	NONE	—	--------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	--------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	--------	
P-VV-9	VALVE VAULT	?'	NO	NONE	—	--------	**Above half of Valve on bottom pipe.**
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS:

LEACHATE PRETREATMENT FACILITY
CLARIFIER LEVEL
MONTHLY INSPECTION:

DATE: December 29, 2021 **INSPECTOR(S):** ML

LOCATION:	CONFINED SPACE (TYPE)	FLUID DEPTH (INCHES)	CONDITION: ODORS	CONDITION: DEFECTS	SUMP PUMP?	SUMP PUMP WORKING?	COMMENTS:
FD-1	Flow Distribution	Full	No	NONE	—	—	P-VV-10 open
P-BV-1	BLOWER VAULT	0"	NO	NONE	—	-------	
P-FV-2	FLOW METER VAULT	0"	NO	NONE	YES	YES	
P-MH-3	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-4	MAN HOLE	0"	NO	NONE	YES	YES	
P-MH-5	MAN HOLE	—	—	—	—	—	Sludge Storage - Leak Detection
P-MH-6	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-7	MAN HOLE	—	—	—	—	—	Clarifier - Leak Detection
P-MH-8	MAN HOLE	0-1 Sediment	NO	NONE	—	—	Overflow to SP 7- (Inspect twice a year March & Aug)
P-MH-9	MAN HOLE	~5'	NO	NONE	—	--------	Vault level appears higher. Need to investigate for potential blockage or other problem
P-VV-10	VALVE VAULT	0"	NO	NONE	—	--------	
P-VV-11	VALVE VAULT	0"	NO	NONE	—	--------	
P-VV-12	VALVE VAULT	0"	NO	NONE	—	--------	
P-VV-9	VALVE VAULT	3'	NO	NONE	—	--------	Needs to be vactored
SP-7	SUMP PUMP	~12"	NO	NONE	YES	YES	
SP-8	SUMP PUMP	~12"	NO	NONE	YES	YES	

COMMENTS: