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719 2ND AVENUE, SUITE 200 | SEATTLE, WA 98104 | P 206.394.3700

SENT VIA EMAIL

April 10, 2023
Parametrix No. 553-1550-067

Julia Schwarz, Project Manager
Washington State Department of Ecology
Toxics Cleanup Program
3190 160th Avenue SE
Bellevue, Washington 98008-5452

Re: South Park Landfill First Quarter 2023 Progress Report

Dear Julia:

This letter report provides an explanation of actions taken during the referenced period.

General Activities During the 2023 First Quarter

SRDS Property

- The old South Transfer Station seep area (compactor shed) is fenced off and locked and all safeguards are still in place.
- Solid Waste Operations and Household Hazardous Waste Collection continues on the SPU old South Transfer Station property.
- Removed obstructions at storm water catch basins identified in the 2022 annual Cap Inspection (locations SRDS SW-1 and SW-2).

CenterPoint South Park LLC Property (former SPPD owned property)

- Ongoing remote monitoring of the landfill gas system blowers. The current tenants First Student and Amazon vehicle parking are active on CenterPoint property.
- Conducted quarterly inspection of the methane alarms in the on-site buildings.
- Conducted quarterly operation and maintenance of the landfill gas system.
- The system's remote monitoring alerted Farallon of a condensate sump high level condition and system shutdown on December 25, 2022. Farallon responded to the alarm and restarted the system on December 29, 2022.
- Gas levels at GP-33 were measured between 1.25% and not in excess of 5% by volume during the first quarter monitoring event on January 31, 2023. Farallon made adjustments to the gas system bringing the gas measurement at GP-33 below 1.25% by volume within one week of notification of the elevated gas level.

Overall Settlement Parcels

- The 2023 first quarter compliance monitoring was completed. SPU staff conducted the gas monitoring and the Parametrix team conducted the groundwater monitoring.

- Reviewed field measurements and completed data management for the 2023 first quarter compliance monitoring events.
- Finalized the mid-year cap inspection report, which was included as an attachment to the 2022 annual report.
- Submitted the 2022 Operations, Maintenance, and Monitoring Annual Report to Ecology on March 31, 2023.

Deviations from Samples, Required Tasks, CAP, or Schedule

Methane at gas probe GP-33 was recorded at 4.9% by volume during the first quarter monitoring event conducted on January 31, 2023. The Cleanup Action Plan Landfill Gas Monitoring and Contingency Plan (Figure A.2.4) has a contingent action trigger for measurements below 5% and above 1.25%. Farallon made adjustments to the system and completed monitoring until GP-33 dropped below 1.25%. On February 6, 2023 the methane concentration at GP-33 was measured at 0.5% by volume. No further action required.

Data Summary

The perimeter gas probes were monitored on January 31, 2023. The results are recorded in the attached gas probe report. All concentrations were less than the 5 percent by volume regulatory action limit. Methane was detected at the following probes:

Probe	CH4 (% by volume)	Blocked	Comments
GP-27	0.4%	No	Below trigger values
GP-29	0.9%	No	Below trigger values
GP-33	4.9%	No	Refer to deviations section above

The groundwater wells were monitored February 6 through 8, 2023. The monitoring samples were analyzed by Analytical Resources, Incorporated. Data validation is complete and a concentration trigger assessment for vinyl chloride was performed. A draft data summary table, the updated time-series plots, and the final lab reports for the 2023 first quarter are included as attachments to this progress report.

Data management is complete for the 2023 first quarter compliance monitoring event.

Upcoming Activities

SRDS Property

- SPU has contracted a new design team and design is proceeding from 30-60% level. Final design will be completed in early 2024.

CenterPoint Property

- Ongoing remote monitoring of the CenterPoint property landfill gas system blowers.
- Complete the second quarter 2023 operation and maintenance of the landfill gas system in June.

Overall Settlement Parcels

- Complete the second quarter 2023 compliance monitoring.
- Gas probe GP-09 and groundwater wells MW-10 and MW-25 are located in a right-of-way that has a homeless encampment creating an unsafe situation for compliance monitoring. SPU is working with SDOT to install fencing around this monitoring location. The encampment is now scheduled for clearing in April and the fencing will be installed once the area is cleared.
- Complete the 2023 annual cap inspection.
- Investigate replacement of shallow perimeter compliance gas probes that are consistently blocked with water. A traffic control plan is being prepared by Parametrix and will be included in a work plan for gas probe installation that will be submitted to Ecology for approval.

If you have any questions regarding this progress report, please do not hesitate to contact me.

Sincerely,

PARAMETRIX

Laura B. Lee
Project Manager

cc: Min Soon Yim, SPU Landfill Manager
Ashley Piatek, CenterPoint Properties
Jeff Fowler, SPU, Solid Waste Line of Business Deputy Director
Susan Fife-Ferris, SPU, Solid Waste Line of Business/Solid Waste Planning Director
Megan J Joplin, SPU, Law Department, Attorney
Hui Yang, SPU, SRDS Redevelopment Project Manager
Anthony Grant, SPU Solid Waste Transfer Station Manager
Lucie Harpster, SPU Solid Waste Transfer Station Manager

Attachments

1 – LFG Compliance Monitoring Field Sheets, First Quarter 2023

2 – Groundwater Quality Data Summary, First Quarter 2023

3 – Groundwater Quality Time Series Plots through First Quarter 2023

4 – First Quarter 2023 Groundwater Laboratory Data

Attachment 1

LFG Compliance Monitoring Field Sheets
First Quarter 2023

Final Probe Report for South Park Landfill

Probe	Date	Technician	CH4 PPM	O2 %	CO2 %	SP In/Wc	Blocked	BPS	Comment
GP03	1/31/2023	TS, WY	0	13.9	4.1	0.0	N	30.21	
GP07	1/31/2023	TS, WY	0	18.1	1.3	-0.1	N	30.19	
GP11	1/31/2023	TS, WY	0	21.1	1.3	0.1	Y	30.21	
GP13	1/31/2023	TS, WY	0	15.5	1.9	-15.4	Y	30.21	
GP15	1/31/2023	TS, WY	0	13.6	3.9	1.1	Y	30.23	
GP16	1/31/2023	TS, WY	0	19.4	1.1	-0.1	N	30.19	
GP23	1/31/2023	TS, WY	0	20.2	0.1	0.0	N	30.17	
GP26	1/31/2023	TS, WY	0	19.2	1.8	-0.1	N	30.23	
GP27	1/31/2023	TS, WY	4000	0.0	9.7	-0.1	N	30.15	
GP28	1/31/2023	TS, WY	0	7.7	3.8	-0.1	N	30.21	
GP29	1/31/2023	TS, WY	9000	0.0	8.1	-0.1	N	30.19	
GP31	1/31/2023	TS, WY	0	7.2	5.8	-0.1	N	30.19	
GP32	1/31/2023	TS, WY	0	20.2	0.3	0.5	Y	30.21	
GP33	1/31/2023	TS, WY	49000	0.0	7.1	0.0	N	30.20	
GP37	1/31/2023	TS, WY	0	4.4	7.4	-0.1	N	30.22	
GP38	1/31/2023	TS, WY	0	4.2	11.8	-0.1	N	30.24	

PARAMETRIX

Form 07-EN-215/Rev. 02/07

Water Level Measurement Field Report

DATE 2/6/23	JOB NO. 553-1550-067		
PROJECT: South Park Landfill	CLIENT: Seattle Public Utilities		
LOCATION: Seattle, WA			
WEATHER overcast	TEMP low 40's	° at 810	AM
	Mid 40's	° at 1210	PM
PRESENT AT SITE L. Bergeois, N. Kapise, officer Chittenden			

THE FOLLOWING WAS NOTED:

WELL NUMBER	Time	Measured Depth to Water (ft from TOC or SG level)	Total Measured Well Depth (ft from TOC)	Measuring Point	Total Well Depth (ft bgs)	Screen Interval (ft bgs)	SU (ft)
MW-12	11:43	~~6.6~~ 5.6		TOC	15.3	10-15	1.52
MW-14	11:47	2.40		TOC	21.8	11.5-21.5	0.8
** MW-29	11:52	7.40*		TOC	30	20-30	-0.29
MW-18	11:38	14.60		TOC	40.4	30-40	1.25
MW-25	8:14	13.13		TOC	27	22-27	2.79
MW-32	12:05	10.03		TOC	24	19-24	-0.44
MW-33	1210	10.17		TOC	25	20-25	-0.47
MW-26	1115	8.84		TOC	25	15-25	2.39
MW-27	1128	7.52		TOC	20	10-20	2.04
* MW-10	818	12.37		TOC	45	35-45	1.65
MW-24	11:18	8.08		TOC	45.3	35-45	1.56
MW-08	11:25	7.56		TOC	45.6	35.5 – 45.5	1.88
MW-30	1100	9.20		TOC	13	8-13	-0.53
MW-31	1105	10.24		TOC	23	35.5-45.5	-0.46

Comments:

TOC – top of PVC casing SG – staff gauge

SIGNED: [signature]

** GW rising; @ 11:55 GW @ 6.80

* added 0.03' because we had to remove cap to fit sounder.

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/7/23 Well ID: MW-08

Sampling Organization: Parametrix Samplers: NK + CB

Purge Data Screened Interval (ft bgs): 5.0-20.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 7.02 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump or peristaltic Pump Intake Depth: 10.5ft

Begin Purge Time: 14:02 End Purge Time: 1430

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged (liters)	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
14:05	7.12	2.33	250	1.0	11.2	0.29	552.6	7.06	49.9	9.97	white turbid.
14:10	7.46	"	"	2.5	11.3	0.20	554.9	7.08	7.6	9.83	"
14:15	7.46	"	"	3.5	11.3	0.20	554.8	7.08	-2.4	7.84	" + orange
14:20	"	"	"	4.75	11.4	0.15	554.7	7.08	-11.3	3.51	"
14:25	"	"	"	6.0	11.5	0.16	554.8	7.07	-16.7	4.41	"
14:30	"	"	"	7.0	11.5	0.11	555.1	7.08	-20.3	3.46	"
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW08-0223 Time Collected: 1435 Weather: Overcast / 40s

Sample Description (Color, Turbidity, Odor, Other): clear

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

Used peristaltic pump

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/6/23 Well ID: MW-10

Sampling Organization: Parametrix Samplers: L. Bourgeois & M. Koppke

Purge Data Screened Interval (ft bgs): 35.0-44.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 12.37 Purge Water Disposal Method: O/WS

Purge Device: peristaltic Pump Intake Depth: 30.0 ft dedicated

Begin Purge Time: 830 End Purge Time: 905

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (mL/min)	Cum. Vol. Purged (liters)	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
835		2.5	250		13.3	6.49	1267	6.88	-92.8	184	dark brown
840	12.36				13.3	0.42	1259	6.85	-98.8	47.6	clearer
845					13.3	~~[illegible]~~ 0.35	1265	6.89	-107.1	25.8	Low turb.
8:50	12.37				13.4	0.30	1271	6.92	-112.0	7.37	
8:55					13.4	0.29	1290	6.95	-115.6	4.80	
9:00	12.41				13.4	0.28	1297	6.92	-118.4	3.35	
9:05				11	13.4	0.27	1299	6.93	-120.1	3.41	Clear
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW10-0223 Time Collected: 910 Weather: overcast

Sample Description (Color, Turbidity, Odor, Other): clear, no odor noted.

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/8/23 Well ID: MW-12

Sampling Organization: Parametrix Samplers: NK + CB

Purge Data Screened Interval (ft bgs): 10.0-15.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 5.44 Purge Water Disposal Method: O/WS

Purge Device dedicated bladder pump Pump Intake Depth: 12.5 ft

Begin Purge Time: 8:20 End Purge Time: 9:10

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
8:30	5.44		350	2.25L	9.6	1.88	364.8	6.57	188.0	3.93	Clear
8:35	5.45	16 psi	200 ML	3.75L	9.7	1.86	362.3	6.53	186.3	1.11	"
8:40	"	"	"	4.75L	9.7	1.73	365.2	6.53	185.7	0.93	"
8:45	"	"	"	5.5L	9.7	1.63	365.9	6.53	185.5	0.67	"
8:50	"	"	"	6L	9.6	1.59	366.5	6.53	185.0	0.67	"
8:55	"	"	"	6.75L*	9.8	1.57	367.2	6.51	185.1	0.71	"
9:00	"	"	"	7.2L	9.7	1.49	368.3	6.50	185.0	0.82	"
9:05	"	"	"	8L	9.7	1.48	368.7	6.51	184.8	0.80	"
9:10	"	"	"	8.75L	9.7	1.47	368.4	6.52	184.6	0.82	"
9:15											
				Stabilization Criteria	3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW12-0223 Time Collected: 9:15 Weather: cold, partly cloudy

Sample Description (Color, Turbidity, Odor, Other): Clear

Sample Analyses: cis-1,3-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID:

MS/MSD Collected: ☐ Yes ● No

Additional Information/Comments

This well head requires use of the surface dedicated tubing, as the others we've used silicon and LDPE to connect.

* took vol reading at end of parameter readings

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/8/23 Well ID: MW-14

Sampling Organization: Parametrix Samplers: NK & CB

Purge Data Screened Interval (ft bgs): 11.5-21.5 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 2.37 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 16.5 ft

Begin Purge Time: 9:50 End Purge Time: 11:02

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
9:55	2.55	10psi	225	3.75	12.8	0.67	477.8	6.91	62.2	93.3	orange tint
10:00	2.55	"	"	4.75	12.5	0.44	477.9	6.91	-0.9	81.7	clearer but still turbid
10:05	"	"	"	5.9	12.6	0.58	473.1	6.89	-20.4	54.4	"
10:10	"	"	"	6.75	12.7	0.35	471.1	6.88	-27.6	54.3	"
10:15	"	"	"	7.9	12.8	0.26	469.2	6.88	-32.7	42.5	"
10:20	"	"	"	8.5	12.9	0.37	469.2	6.87	-34.9	30.8	"
10:25	"	"	"	9.75	13.0	0.34	468.8	6.87	-37.0	16.9	"
10:30	"	"	"	10.75	13.0	0.24	469.1	6.87	-38.3	14.7	"
10:35	"	"	"	11.75	13.0	0.29	468.8	6.87	-39.4	11.2	"
10:40	"	"	"	13.0	13.2	0.28	468.7	6.87	-40.3	8.18	"
10:45	"	"	"	14.0	13.0	0.26	468.9	6.87	-40.6	7.06	less turbid
10:50	"	"	"	15.6	12.9	0.24	469.0	6.87	-41.1	4.96	"
10:55	"	"	"	16.0	12.9	0.26	468.4	6.87	-41.8	4.77	"
11:00	"	"	"	17.0	12.9	0.26	468.4	6.87	-42.2	4.61	"
11:05											

Stabilization Criteria 3% 10%, or 3<0.5 3% ±0.1 ±10 mv 10% or 3 <5 NTU

Sampling Data

Sample ID: SPL-GW-MW14-0223 Time Collected: 1105 Weather: overcast / 40s

Sample Description (Color, Turbidity, Odor, Other): minor turbidity, clear color, no noted odor

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

same well head issue as MW-12. Though, no leaks noted at either. Dedicated surface tube very dirty.

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067　　Date: 2/6/23　　Well ID: MW-18

Sampling Organization: Parametrix　　Samplers: CB + NK

Purge Data　Screened Interval (ft bgs): 30.0-40.0　　Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 14.56　　Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump　　Pump Intake Depth: 20.0 ft

Begin Purge Time: 14:34　　End Purge Time: 1505

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
14:40	14.56	8/4 (psi)	200	1L	13.4	1.06	806	6.82	15.6	2.93	Slight yellow Tint
14:45	14.56	↓	↓	1.75L	13.4	0.40	795	6.79	-39.2	2.81	"
14:50	14.56			2.75L	13.5	0.29	791	6.79	-54.8	1.12	"
14:55	14.56			3.5L	13.5	0.22	787	6.79	-62.5	1.22	clearing up
15:00	14.56	↓	↓	4.0L	13.5	0.19	786	6.78	-66.2	0.76	Clear
15:05	14.59	↓	↓	5L	13.5	0.16	785	6.79	-69.5	0.59	"
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW18-0223　　Time Collected: ~~1325~~ ~~1505~~ 1510　　Weather: Overcast / Mid 40s

Sample Description (Color, Turbidity, Odor, Other): clear, no odor

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ■ Yes ☒ No　　If yes, ID: MW-60 @ 1545

MS/MSD Collected: ● Yes ☐ No

Additional Information/Comments

X

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/7/23 Well ID: MW-24

Sampling Organization: Parametrix Samplers: NK + CB

Purge Data Screened Interval (ft bgs): 35.0-45.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 8.05 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 40.0 ft

Begin Purge Time: 1055 End Purge Time: 11:32

Time	Depth to Water (feet below MP)	PSI Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1100	7.96				9.9	3.33	789	6.99	49.3	6.77	visible turb.
1105	7.97	48	150		10.0	1.76	820	6.85	10.8	6.03	"
1110	7.98	52	250		10.5	0.64	868	6.80	-30.3	3.80	"
1115	7.96	"	"	3.0	11.6	0.31	896	6.79	-53.2	4.15	"
1120	7.95	"	"	4.5	11.5	0.19	908	6.80	-72.1	2.83	"
1125	"	"	"	5.5	11.6	0.16	909	6.80	-76.0	2.21	"
11:30	"	"	"	6.5	11.6	0.16	911	6.80	-80.0	2.27	"
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW24-0223 Time Collected: 11:35 Weather: rainy, cold, windy

Sample Description (Color, Turbidity, Odor, Other): minor turbidity, no odor noted.

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ■ Yes ☒ No If yes, ID: -61

MS/MSD Collected: ● Yes ☐ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/6/23 Well ID: MW-25

Sampling Organization: Parametrix Samplers: L. Bourgeois & N. Kapise

Purge Data Screened Interval (ft bgs): 20.0-27.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 13.11 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 24.5 ft

Begin Purge Time: 937 End Purge Time: 1005

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
9:45	13.11	8/4	325	2 L	13.5	~~7~~ 0.75	1066	6.75	-87.7	2.68	clear
9:50	13.11	↓	200	2.9 L	13.2	0.49	1076	6.76	-92.6	1.16	clear
9:55	13.11	↓	↓	4 L	13.2	0.32	1082	6.76	-98.1	0.66	"
10:00	13.11	↓	↓	4.9 L	13.3	0.31	1085	6.76	-100.6	0.58	"
10:05	13.11	↓	↓	5.9	13.3	0.24	1089	6.77	-103.0	0.56	"
Stabilization Criteria					3%	10%	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW25-0223 Time Collected: 10:10 Weather: cold, overcast.

Sample Description (Color, Turbidity, Odor, Other): clear

Sample Analyses: cis-1,2-DCE, benzene, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

minor sheen on ~~to~~ surface of purge bucket

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/7/23 Well ID: MW-26

Sampling Organization: Parametrix Samplers: NK + CB

Purge Data Screened Interval (ft bgs): 15.0-25.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 8.71* Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 20.0 ft

Begin Purge Time: 12:17 End Purge Time: 13:16

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
12:20	8.71	30psi	300	0.75 L	11.5	2.98	249.1	6.35	33.3	69.8	turbid
12:25	8.71	"	250**	1.75 L	11.6	1.13	232.9	6.27	48.9	64.9	"
12:30	8.71	"	"	2.75 L	11.7	0.57	225.9	6.25	48.3	49.1	"
12:35	8.71	"	"	4 L	11.6	0.46	221.7	6.23	46.8	34.0	"
12:40	8.71	"	"	5 L	11.7	0.28	222.0	6.23	44.7	22.4	Sl. clearer
12:45	"	"	"	6 L	11.7	0.24	224.2	6.23	42.0	13.4	clearer
12:50	"	"	"	6.75	11.8	0.19	224.9	6.23	40.5	12.7	"
12:55	"	"	"	7.75	11.8	0.19	225.9	6.23	38.9	8.82	"
13:00	"	"	"	8.75	11.9	0.17	226.5	6.22	37.7	7.54	"
13:05	"	"	"	9.75	12.0	0.15	227.6	6.22	36.7	6.73	clear
13:10	"	"	"	10.75	12.0	0.16	228.3	6.22	36.0	6.82	"
13:15	"	"	"	11.75	12.0	0.15	227.8	6.22	35.2	6.28	
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW26-0223 Time Collected: 13:20 Weather: Rain / 40s

Sample Description (Color, Turbidity, Odor, Other): clear

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments * reading taken after 1 gal purged; ** reading taken at same pump setting but better time tracking so more accurate than 1st reading

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/7/23 Well ID: MW-27

Sampling Organization: Parametrix Samplers: NK + CB

Purge Data Screened Interval (ft bgs): 10.0-20.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 7.38 Purge Water Disposal Method: O/WS

Purge Device dedicated bladder pump 1500 Pump Intake Depth: 15.0 ft

Begin Purge Time: 1500 End Purge Time: 16:06

Time	Depth to Water (feet below MP)	Pump Setting (PSI)	Purge Rate (mL/min.)	Cum. Vol. Purged (& L:+/-)	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1505	7.42	20	250	2.0	10.4	2.51	288.5	6.72	87.3	581	looks like Tang.
15:10	7.42	"	"	3L	10.8	0.71	266.2	6.68	93.9	459	"
15:15	7.42	"	"	4L	10.8	0.48	281.1	6.68	94.0	375	"
15:20	7.42	"	"	5L	10.9	0.35	307.5	6.68	87.6	542	"
15:25	7.42	"	"	6L	10.9	0.24	338.7	6.68	71.9	306	Little clearer
15:30	7.42	"	"	6.75	11.0	0.20	354.4	6.69	48.6	83.4	sig clearer
15:35	7.42	"	"	8L	11.0	0.20	363.8	6.69	34.2	49.2	semi turbid
15:40	7.42	"	"	9L	11.0	0.20	371.8	6.70	22.4	35.8	"
15:45	7.42	"	"	10L	11.0	0.16	376.3	6.70	10.9	26.6	clearer
15:50	7.42	"	"	11L	11.0	0.15	378.8	6.70	2.9	24.9	pretty clear
15:55	7.42	"	"	12.5L	11.0	0.14	380.6	6.70	-2.9	18.7	"
16:00	7.42	"	"	13.25L	11.0	0.13	382.4	6.71	-7.7	19.5	"
16:05	7.42	"	"	14L	11.0	0.15	384.5	6.71	-12.9	18.7	"
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW27-0223 Time Collected: 1610 Weather: part sun / 40s

Sample Description (Color, Turbidity, Odor, Other): minor turbidity, no odor

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ☐ Yes ■ No If yes, ID:

MS/MSD Collected: ☐ Yes ■ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/6/23 Well ID: MW-29

Sampling Organization: Parametrix Samplers: NK + CB

Purge Data Screened Interval (ft bgs): 20.0-30.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 7.03 Purge Water Disposal Method: O/WS

Purge Device peristaltic pump Pump Intake Depth: 25.0 ft

Begin Purge Time: 16:02 End Purge Time: 16:37

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
16:05	7.03	2.5	250	.75L	11.7	2.16	470.6	6.91	8.8	20.2	clearish
16:10	7.26	"	"	1.5L	11.7	1.79	476.5	6.92	-38.0	8.32	clearer
16:15	7.31	"	"	3L	11.8	0.23	501.6	6.91	-81.4	2.51	"
16:20	7.32	"	"	4L	11.8	0.16	512.2	6.91	-95.7	2.58	
16:25	7.33			5L	11.9	0.12	522.4	6.95	-102.5	3.47	
16:30	7.34			6L	11.9	0.12	526.0	6.94	-106.8	1.07	
16:35	7.34			7L	11.9	0.11	526.4	6.94	-108.5	0.92	
16:40											
16:45											
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW29-0223 Time Collected: 16:40 Weather: Overcast/mid 40s

Sample Description (Color, Turbidity, Odor, Other): ~~Slight~~ NK clear

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☒ Yes ■ No If yes, ID: ~~SPL-GW_MW60-1122~~

MS/MSD Collected: ☒ Yes ■ No

Additional Information/Comments

* Took initial GW measurement right after started purging

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067   Date: 2/7/23   Well ID: MW-30

Sampling Organization: Parametrix   Samplers: C. Bourgeois & N. Kapisn

Purge Data   Screened Interval (ft bgs): 8.0-13.0   Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): ~~[illegible]~~ 9.22   Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump   Pump Intake Depth: 10.5 ft

Begin Purge Time: 839   End Purge Time: 9:27

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
845	9.36	2.5	300	1.75L	11.1	0.46	1166	6.36	18.0	7.35	minor turbidity
8:50	9.36	2.0	250	3L	11.1	0.45	1001	6.37	27.5	6.12	"
8:55	9.36	"	"	3.85L	11.1	0.52	946	6.37	28.7	4.32	"
9:00	9.36	"	"	5.0L	11.1	0.49	880	6.38	30.5	4.77	"
9:05	9.36	"	"	6.5L	11.1	0.48	822	6.37	32.5	3.83	"
9:10	9.36	"	"	7.75L	11.1	0.56	785	6.37	36.4	2.49	"
9:15	"	"	"	8.75L	11.1	0.59	751	6.37	38.9	1.96	"
9:20	"	"	"	9.75L	11.1	0.59	740	6.36	40.0	1.77	"
9:25	"	"	"	11.0L	11.1	0.55	740	6.37	39.9	1.37	"
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW30-0223   Time Collected: 930   Weather: rainy & cold

Sample Description (Color, Turbidity, Odor, Other): minor turbidity

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ☐ Yes ☒ No   If yes, ID:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/7/23 Well ID: MW-31

Sampling Organization: Parametrix Samplers: NK + CB

Purge Data Screened Interval (ft bgs): 18.0-23.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 10.17 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 20.5ft

Begin Purge Time: 934 End Purge Time:

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
940	10.16	10 psi		1L	12.6	9.79	418.8	6.66	-10.7	35.4	fine turbid
9:45	10.16	"	200	2L	12.8	0.39	433.4	6.63	-40.3	11.1	"
9:50	"	"	"	2.75L	12.7	0.27	437.6	6.63	-47.3	8.42	"
9:55	"	"	"	3.25L	12.7	0.22	438.7	6.63	-50.5	6.10	clearing up
10:00	"	"	"	3.75L	12.7	0.24	439.9	6.63	-52.2	4.92	"
10:05	"	"	"	4.25L	12.6	0.31	439.4	6.63	-53.2	3.63	clear
10:10	"	"	"	5L	12.7	0.32	439.4	6.63	-53.8	2.87	clear
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW31-0223 Time Collected: 10:15 Weather: cold & rainy

Sample Description (Color, Turbidity, Odor, Other): Clear

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese

Duplicate Sample Collected: ~~☒ Yes~~ ☒ No If yes, ID: ~~SPL-GW_MW61-1122~~

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/6/23 Well ID: MW-32

Sampling Organization: Parametrix Samplers: C. Bourgeois & N. Kapise

Purge Data Screened Interval (ft bgs): 19.0-24.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 10.03 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 21.5 ft

Begin Purge Time: 1220 End Purge Time: 1250

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1225	10.03	2.5	260		13.3	1.17	710	6.98	-90.5	10.04	clear
12:30	"	"	"	2.9L	13.4	0.22	779	7.01	-105.3	9.95	orange flecks
12:35	"	"	"	3.9L	13.3	0.19	760	7.01	-110.7	8.05	"
12:40	"	"	"	5.2L	13.4	0.17	761	6.99	-113.4	3.18	"
12:45	"	"	"	7L	13.4	0.17	756	7.00	-114.3	4.03	"
12:50	"	"	"	8L	13.4	0.14	754	6.99	-115.2	1.43	Sl. clearer
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW32-0223 Time Collected: 1255 Weather: cold, drizzle

Sample Description (Color, Turbidity, Odor, Other): sparse orange flecks, earth odor?

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 2/6/23 Well ID: MW-33

Sampling Organization: Parametrix Samplers: CB & NK

Purge Data Screened Interval (ft bgs): 20.0-25.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 10.17 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: ~~22.5ft~~ 17.5, See comments

Begin Purge Time: 1324 End Purge Time: 1350

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1330	10.17	2.6	300	1.75L	14.6	0.29	1106	6.91	-85.2	6.02	yellow tint
13:35	10.17	2.5	260	3 L	14.6	0.21	1272	6.89	-104.7	4.58	"
13:40	10.18	"	"	4 L	14.6	0.20	1308	6.89	-109.8	2.96	clearer/still tint
13:45	"	"	"	5 L	14.6	0.18	1311	6.89	-112.5	2.33	
13:50	"	"	"	6L	14.6	0.20	1306	6.89	-114.4	3.49	Still yellowish tint
13:55											
14:00											
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW33-0223 Time Collected: 1355 Weather: rain / mid 40s

Sample Description (Color, Turbidity, Odor, Other): yellow tint, no odor noted.

Sample Analyses: cis-1,2-DCE, vinyl chloride, total iron, total manganese, dissolved arsenic

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

* Couldn't advance tubing more than 17.5 ft
* Fizzy reaction in VOA purgewater orange brown in bucket

Parametrix

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23P0111	Turn-around Requested: 2 weeks	Date: 2/6/23	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of ~~2~~ NK 1	
Client Contact: Laura Lee	Phone: 206 394-3665	No. of Coolers:	Cooler Temps:
Client Project Name: SPU South Park Landfill			
	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**					Notes/Comments
~~SPL-GW-MW12-0223~~			water	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW14-0223~~			water	7	X		X	X						
SPL-GW-MW29-0223	2/6/23	16:40	water	7	X		X	X						
SPL-GW-MW18-0223	2/6/23	15:10	water	14	X		X	X	X					MS/MSD
SPL-GW-MW32-0223	2/6/23	12:55	water	8	X		X	X	X					
SPL-GW-MW33-0223	2/6/23	13:55	water	8	X		X	X	X					
SPL-GW-MW10-0223	2/6/23	9:10	water	8	X		X	X	X					
~~SPL-GW-MW60-0223~~	2/6/23	15:45	water	8	X		X	X	X					
SPL-GW-MW80-0223	2/6/23	NA	water	2		X	X							

Comments/Special Instructions

Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
Printed Name: Nicole Kepner	Printed Name: Shelly L Fisher	Printed Name:	Printed Name:
Company: HWA	Company: ARI	Company:	Company:
Date & Time: 2/6/23 17:12	Date & Time: 02/06/2023 ~~1715~~ 1712	Date & Time: SLF 02/06/2023	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 238111	Turn-around Requested: 2 weeks	Date: 2/6/23	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 1	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers:	Cooler Temps:
Client Project Name: SPU South Park Landfill			
Client Project #: 553-1550-067	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**						Notes/Comments
SPL-GW-MW25-0223	2/6/23	10:10	water	8		X	X	X	X						**Field-filtered
~~SPL-GW-MW30-0223~~			water	7	X		X	X							
~~SPL-GW-MW31-0223~~			water	7	X		X	X							
~~SPL-GW-MW24-0223~~			water	14	X		X	X	X						~~MS/MSD~~
~~SPL-GW-MW26-0223~~			water	8	X		X	X	X						
~~SPL-GW-MW08-0223~~			water	8	X		X	X	X						
~~SPL-GW-MW27-0223~~			water	8	X		X	X	X						
~~SPL-GW-MW61-0223~~			water	8	X		X	X	X						
~~SPL-GW-MW81-0223~~			water	2		X	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Nicole Kapise	Printed Name: Shelly L Fisher	Printed Name:	Printed Name:
	Company: HWA	Company: ARI	Company:	Company:
	Date & Time: 2/6/23 17:12	Date & Time: 02/06/2023 1712	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 2360160	Turn-around Requested: 2 weeks	Date: 2/7/2023	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 1	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers: 1	Cooler Temps: 2.6
Client Project Name: SPU South Park Landfill			
Client Project #: 553-1550-067	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**					Notes/Comments
~~SPL-GW-MW25-0223~~			~~water~~	8		X	X	X	X					**Field-filtered
SPL-GW-MW30-0223	2/7/23	930	water	7	X		X	X						
SPL-GW-MW31-0223	2/7/23	1015	water	7	X		X	X						
SPL-GW-MW24-0223	2/7/23	1135	water	14	X		X	X	X					MS/MSD
SPL-GW-MW26-0223	2/7/23	1320	water	8	X		X	X	X					
SPL-GW-MW08-0223	2/7/23	1485	water	8	X		X	X	X					
SPL-GW-MW27-0223	2/7/23	1610	water	8	X		X	X	X					
SPL-GW-MW61-0223	2/7/23	1200	water	8	X		X	X	X					
~~SPL-GW-MW81-0223~~			~~water~~	2		X	X							

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Chris Bourgeois	Printed Name: Jacob Haffe	Printed Name:	Printed Name:
	Company: HWA	Company: ARI, LLC	Company:	Company:
	Date & Time: 2/7/23 1651	Date & Time: 2/7/23 1651	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23B0182	Turn-around Requested: 2 weeks	Date: 2/8/23	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 1	
Client Contact: Laura Lee	Phone: 206 394-3665	No. of Coolers: Cooler Temps: 5 8	
Client Project Name: SPU South Park Landfill			
	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**					Notes/Comments
	Analysis Requested													**Field-filtered
SPL-GW-MW12-0223	2/8/23	915	water	8	X		X	X	X					
SPL-GW-MW14-0223	2/8/23	1165	water	7	X		X	X						
~~SPL-GW-MW29-0223~~			~~water~~	~~7~~	~~X~~		~~X~~	~~X~~						
~~SPL-GW-MW18-0223~~			~~water~~	~~14~~	~~X~~		~~X~~	~~X~~	~~X~~					~~MS/MSD~~
~~SPL-GW-MW32-0223~~			~~water~~	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW33-0223~~			~~water~~	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW10-0223~~			~~water~~	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW60-0223~~			~~water~~	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW80-0223~~			~~water~~	~~2~~		~~X~~	~~X~~							

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	(Signature) Nicole Kapise	(Signature) Phillip Bates	(Signature)	(Signature)
	Printed Name: Nicole Kapise	Printed Name: Phillip Bates	Printed Name:	Printed Name:
	Company: HWA	Company: AR	Company:	Company:
	Date & Time: 2/8/23 13:43	Date & Time: 2/8/23 13:43	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23D0193	Turn-around Requested: 2 weeks	Date: 2/8/2023	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 1	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers:	Cooler Temps: 5; 8
Client Project Name: SPU South Park Landfill			
Client Project #: 553-1550-067	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**						Notes/Comments
SPL-GW-MW25-0223			water	8		X	X	X	X						**Field-filtered
SPL-GW-MW30-0223			water	7	X		X	X							
SPL-GW-MW31-0223			water	7	X		X	X							
SPL-GW-MW24-0223			water	14	X		X	X	X						MS/MSD
SPL-GW-MW26-0223			water	8	X		X	X	X						
SPL-GW-MW08-0223			water	8	X		X	X	X						
SPL-GW-MW27-0223			water	8	X		X	X	X						
SPL-GW-MW61-0223			water	8	X		X	X	X						
SPL-GW-MW81-0223	2/8/23		water	2		X	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Nicole Kapise	Printed Name: Phillip Bates	Printed Name:	Printed Name:
	Company: HWA	Company: AR	Company:	Company:
	Date & Time: 2/8/23 13:43	Date & Time: 2/8/23 13:43	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

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Attachment 2

Groundwater Quality Data Summary
First Quarter 2023

Groundwater Quality Data Summary, First Quarter 2023, South Park Landfill

			Upgradient Wells			Downgradient Wells												Trip Blanks	
			A-Zone			Perched Zone	A-Zone						B-Zone						
Parameter	Units	Cleanup Level	MW-12 2/8/23	MW-14 2/8/23	MW-29 2/6/23	MW-30 [1] 2/7/23	MW-25 2/6/23	MW-26 2/7/23	MW-27 [2] 2/7/23	MW-31 [1] 2/7/23	MW-32 [3] 2/6/23	MW-33 [3] 2/6/23	MW-08 2/7/23	MW-10 2/6/23	MW-18 [3] 2/6/23	MW-60 (MW-18 Dup) 2/6/23	MW-24 2/7/23	MW-61 (MW-24 Dup) 2/7/23	MW-80 2/6/23	MW-81 2/8/23
Field Parameters																				
Temperature	C		9.7	12.9	11.9	11.1	13.3	12.0	11.0	12.7	13.4	14.6	11.5	13.4	13.5	--	11.6	--	--	--
Dissolved Oxygen	mg/L		1.47	0.26	0.11	0.55	0.24	0.15	0.15	0.32	0.14	0.20	0.11	0.27	0.16	--	0.16	--	--	--
Specific Conductivity	µS/cm		368.4	468.4	526.4	740	1089	227.8	384.5	439.4	754	1306	555.1	1299	785	--	911	--	--	--
pH	units		6.52	6.87	6.94	6.37	6.77	6.22	6.71	6.63	6.99	6.89	7.08	6.93	6.79	--	6.80	--	--	--
Redox	mv		184.6	-42.2	-108.5	39.9	-103.0	35.2	-12.9	-53.8	-115.2	-114.4	-20.3	-120.1	-69.5	--	-80.0	--	--	--
Turbidity	NTU		0.82	4.61	0.92	1.37	0.56	6.28	18.7	2.87	1.43	3.49	3.46	3.41	0.55	--	2.27	--	--	--
Metals																				
Arsenic, Dissolved	µg/L	5.0	0.287	--	--	--	0.308	0.647	3.70	--	0.992	1.07	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	--	--
Iron, Total	mg/L	27 A-Zone	0.0720 U	3.97	17.6	3.31	**36.6**	7.98	9.77	18.2	16.2	19.6	--	--	--	--	--	--	--	--
		31 B-Zone	--	--	--	--	--	--	--	--	--	--	2.70	**37.9**	14.1 J-	15.9	22.2	26.8	--	--
Manganese, Total	mg/L	2.2	0.0200	0.851	0.434	0.138	**2.90**	0.0982	0.369	0.765	1.61	2.05	0.825	**2.37**	1.27	1.20	1.76	1.77	--	--
Volatile Organic Compounds																				
Vinyl Chloride	µg/L	0.29	0.0200 U	0.0200 U	0.0200 U	0.0816	**0.593**	0.173	0.0778	0.219	**0.317**	0.0967	0.0200 U	0.142	0.0264	0.0253	0.0484	0.0482	0.0200 U	0.0200 U
Cis-1,2-Dichloroethene	µg/L	16	0.20 U	0.20 U	0.20 U	0.35	0.22	0.33	0.20 U	0.20 U	0.92	0.20 U	0.20 U	0.83	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzene	µg/L	5.0	--	--	--	--	3.99	--	--	--	--	--	--	--	--	--	--		0.20 U	0.20 U

Notes:

[1] MW-30 and MW-31 monitor the former Glitsa property and are not CPOC wells.

[2] MW-27, a downgradient A-Zone well across SR 99 consistently has arsenic at concentrations greater than the CUL due to a cement kiln dust deposit that is across the street from the Settlement Area. MW-27 is not a CPOC well for arsenic.

[3] MW-18 is completed in refuse along the downgradient edge of the Landfill; MW-32 and MW-33 are completed beneath refuse along the downgradient edge.

= Exceeds cleanup level for CPOC wells

-- = Not analyzed

U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.

J- = The result is an estimated quantity, but the result may be biased low.

Abbreviations:

µg/L Micrograms per liter

mg/L Milligrams per liter

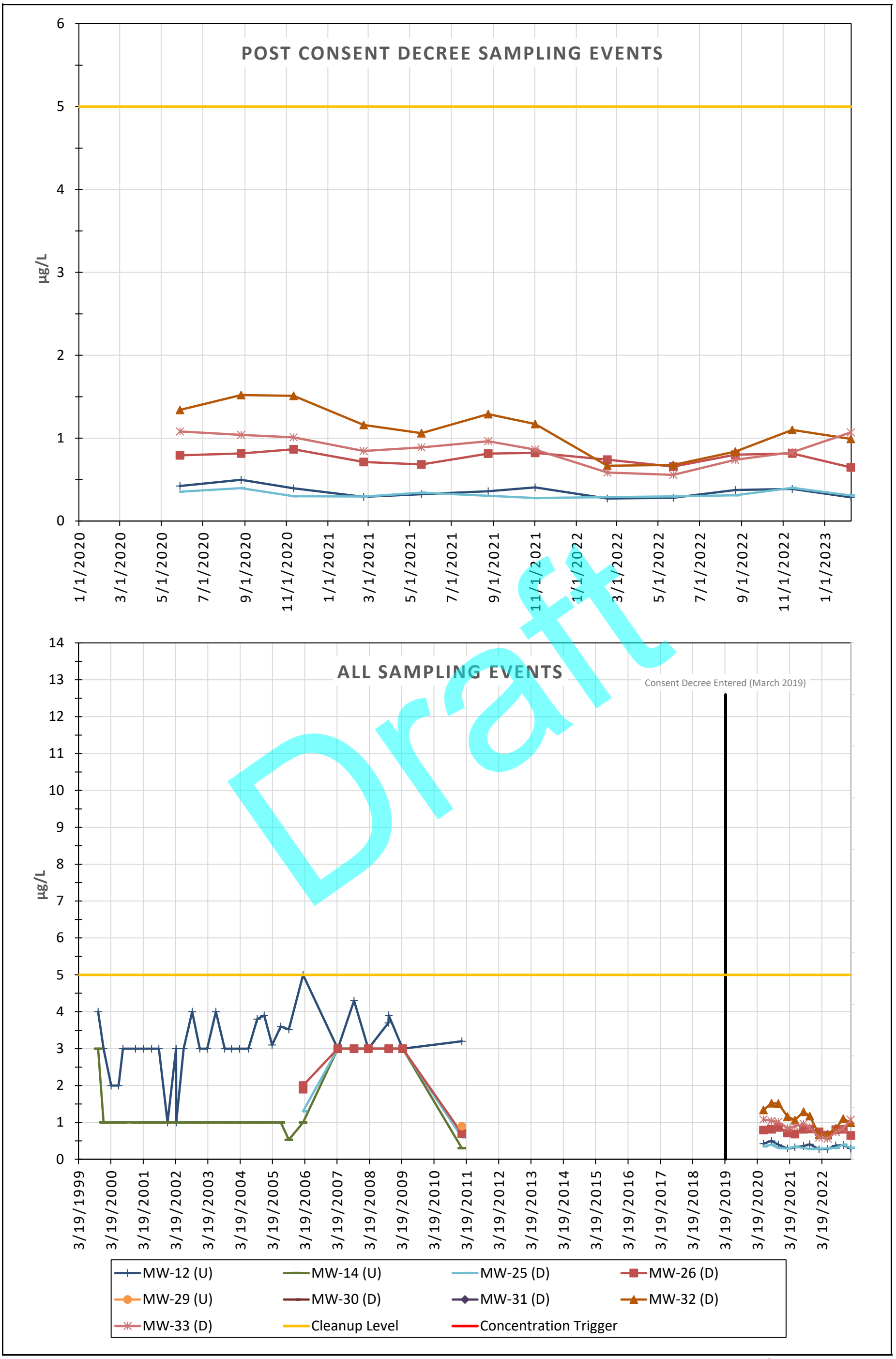
µS/cm Microsiemens per centimeter

NTU Nephelometric Turbidity unit

CPOC Conditional point of compliance

Attachment 3

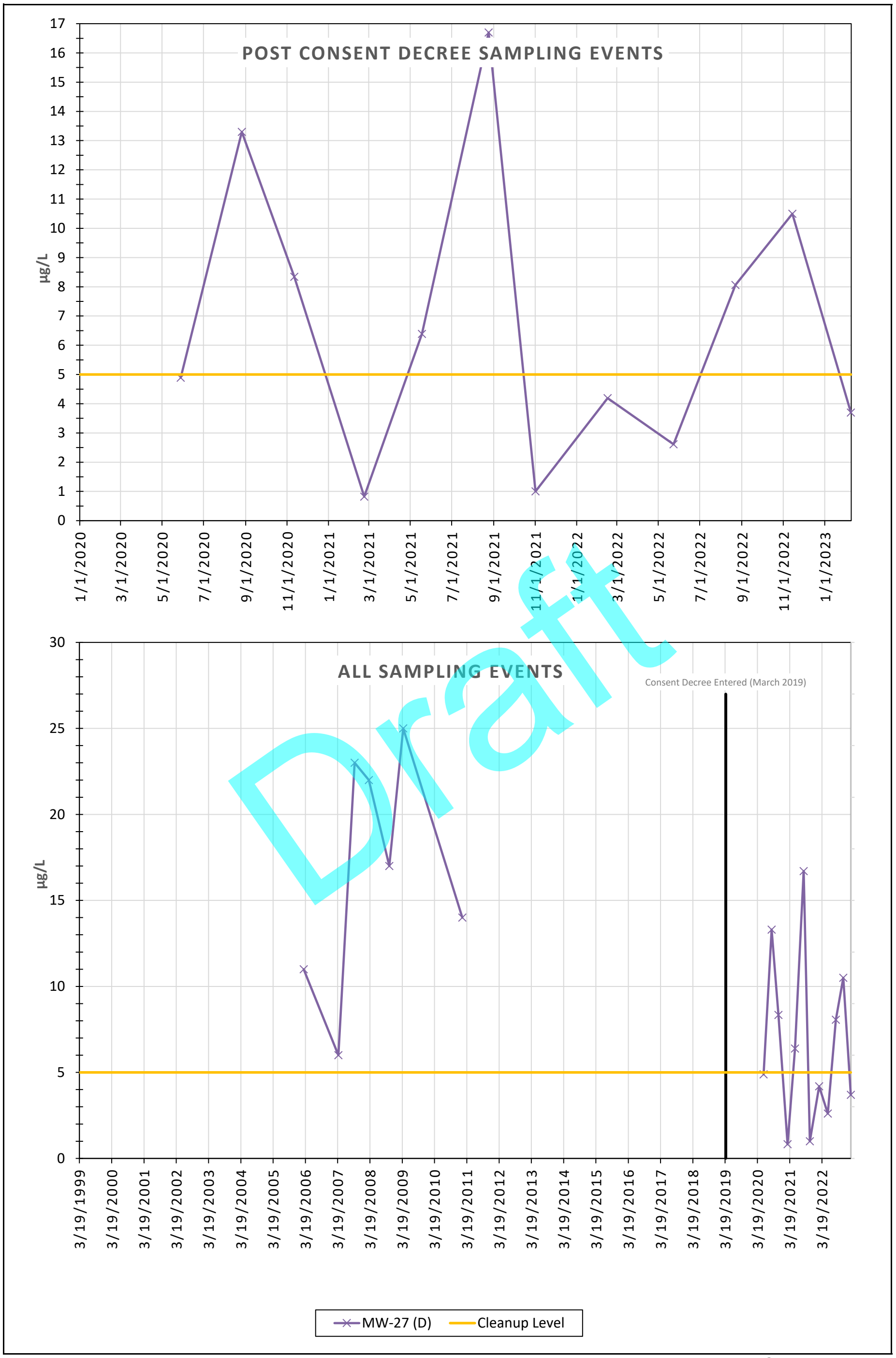
Groundwater Quality Time Series Plots
through First Quarter 2023



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

Dissolved Arsenic Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
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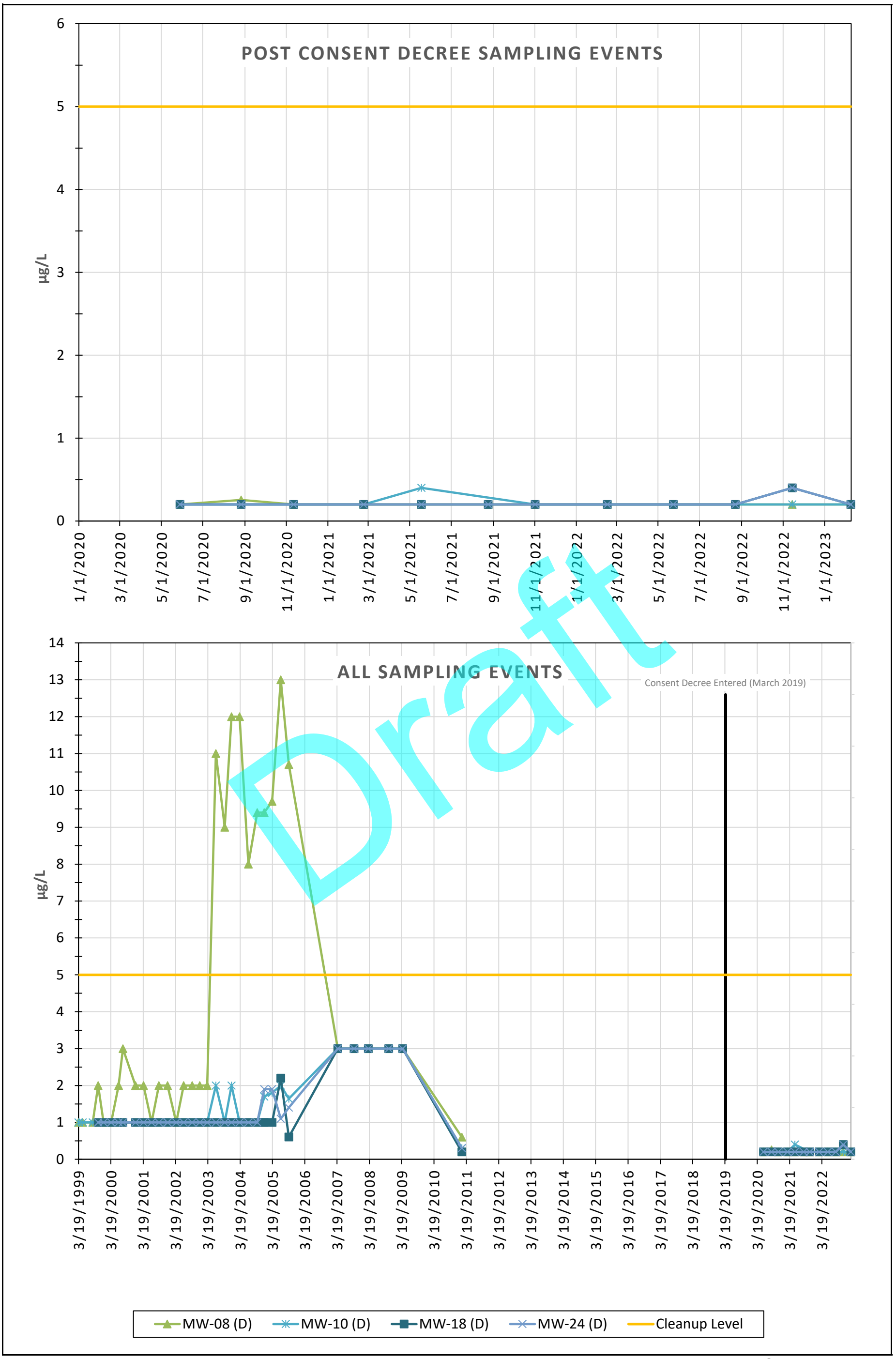
D = Downgradient
U = Upgradient

Dissolved Arsenic Concentrations
A-Zone Non-CPOC Wells
South Park Landfill



Parametrix
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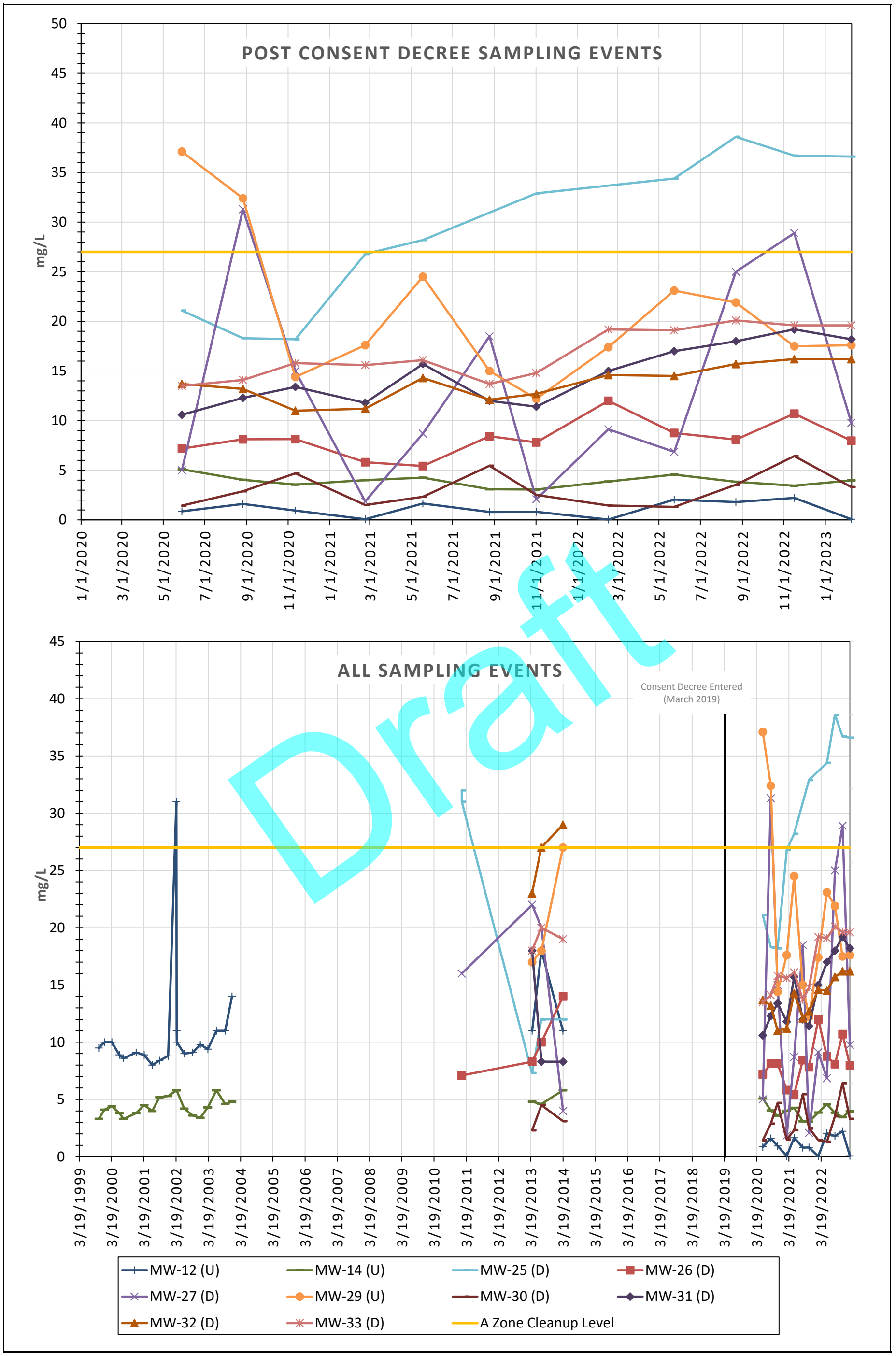
D = Downgradient
U = Upgradient

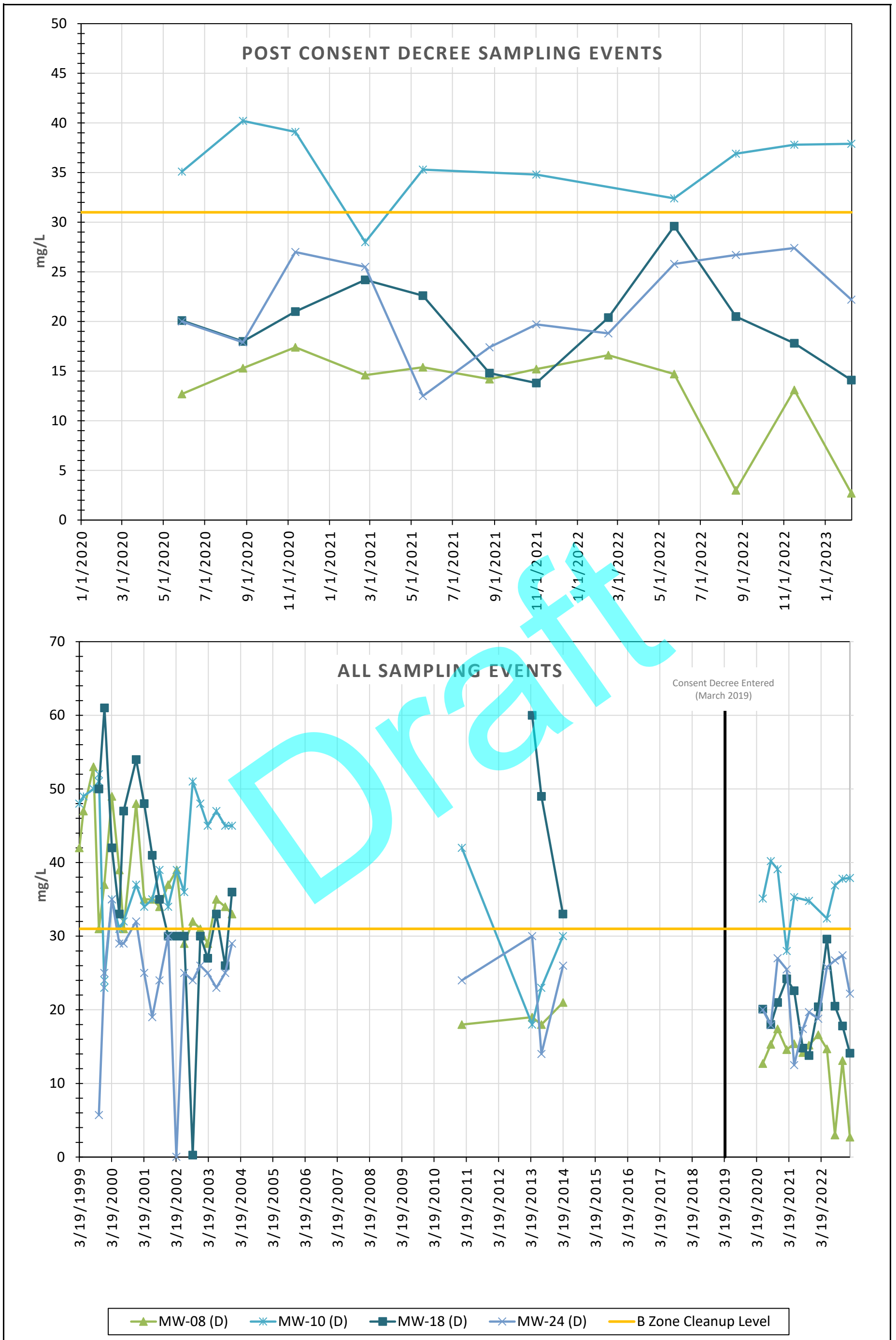
Dissolved Arsenic Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

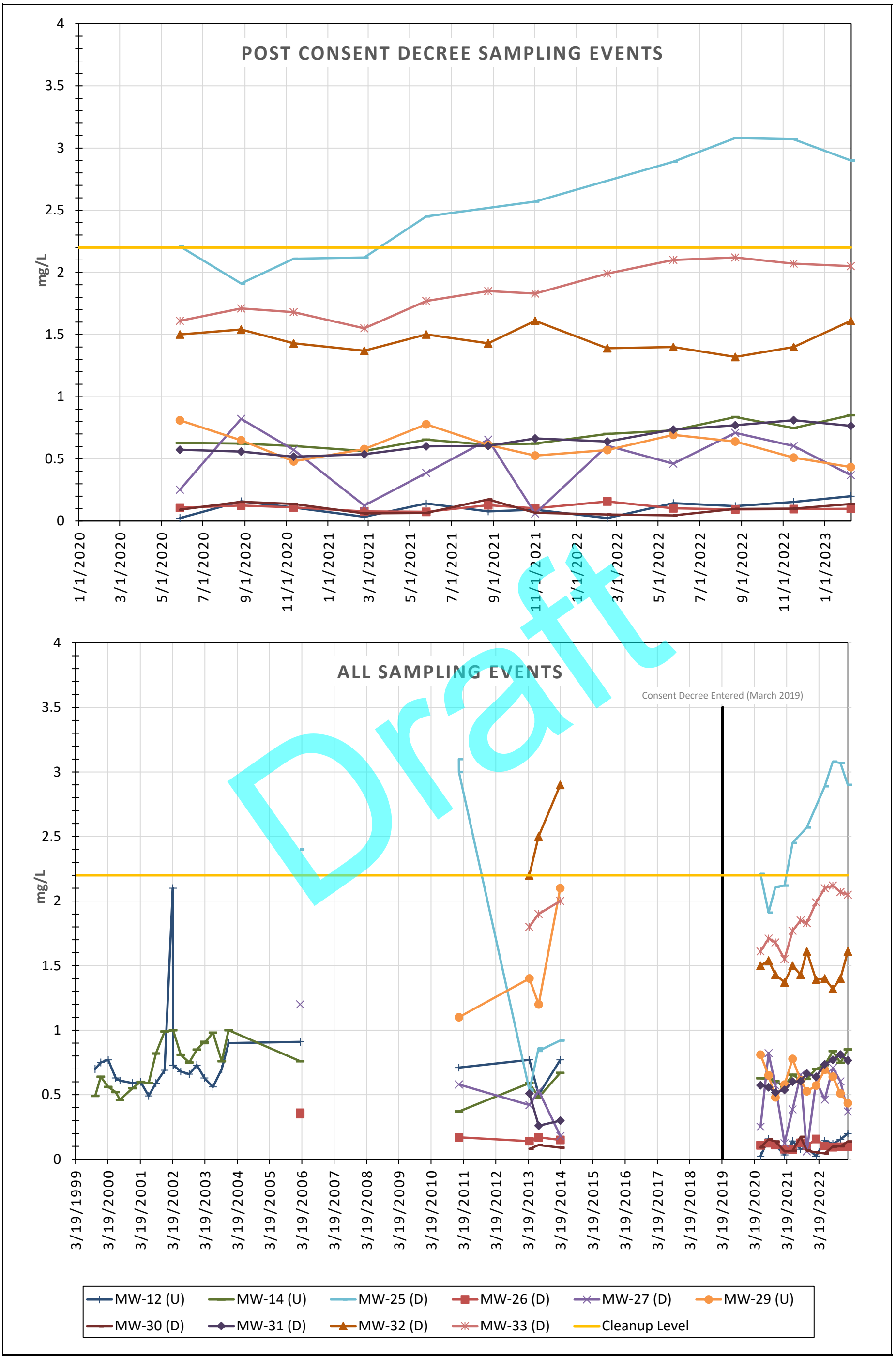
Total Iron Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

Total Iron Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
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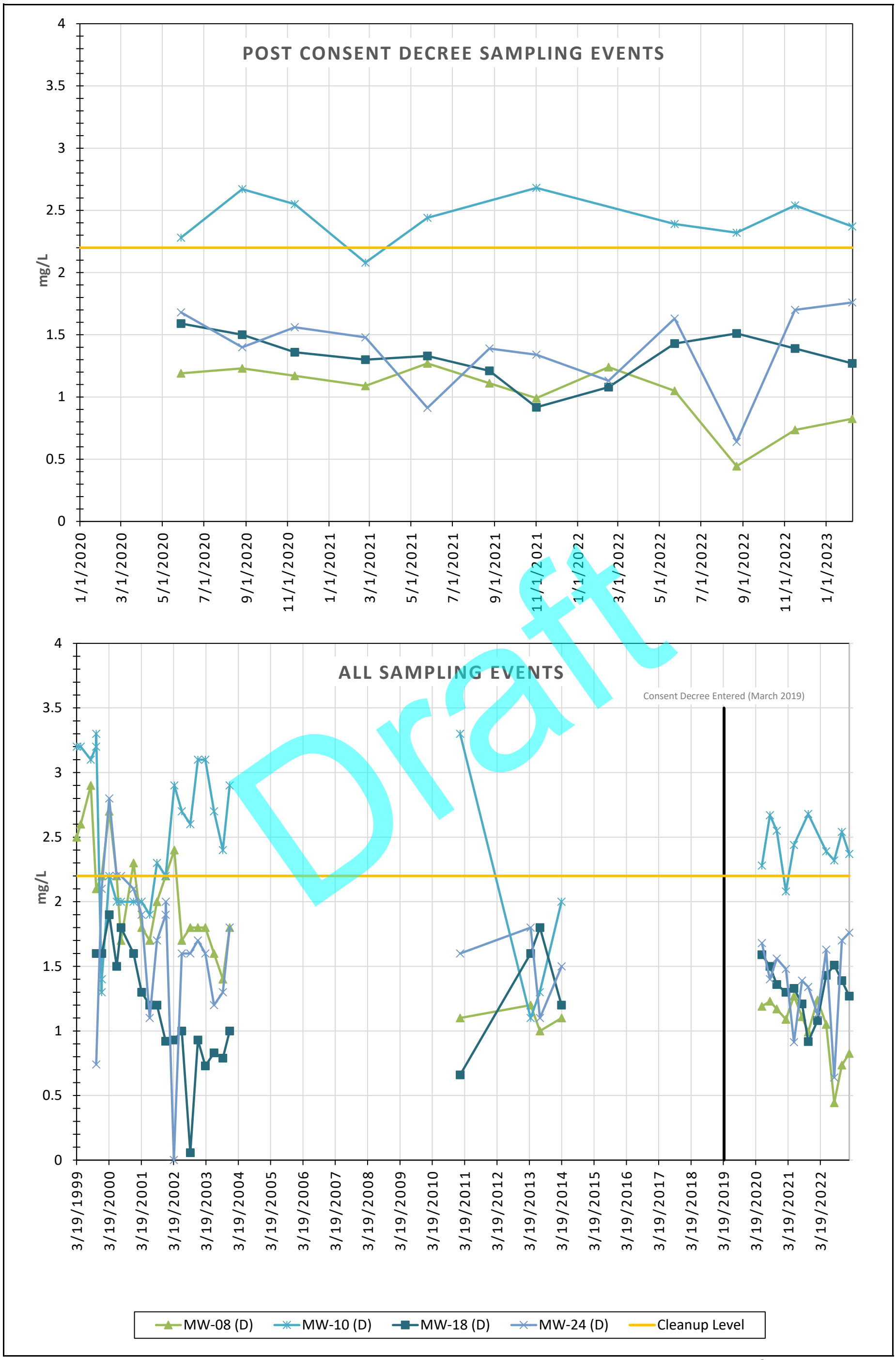
D = Downgradient
U = Upgradient

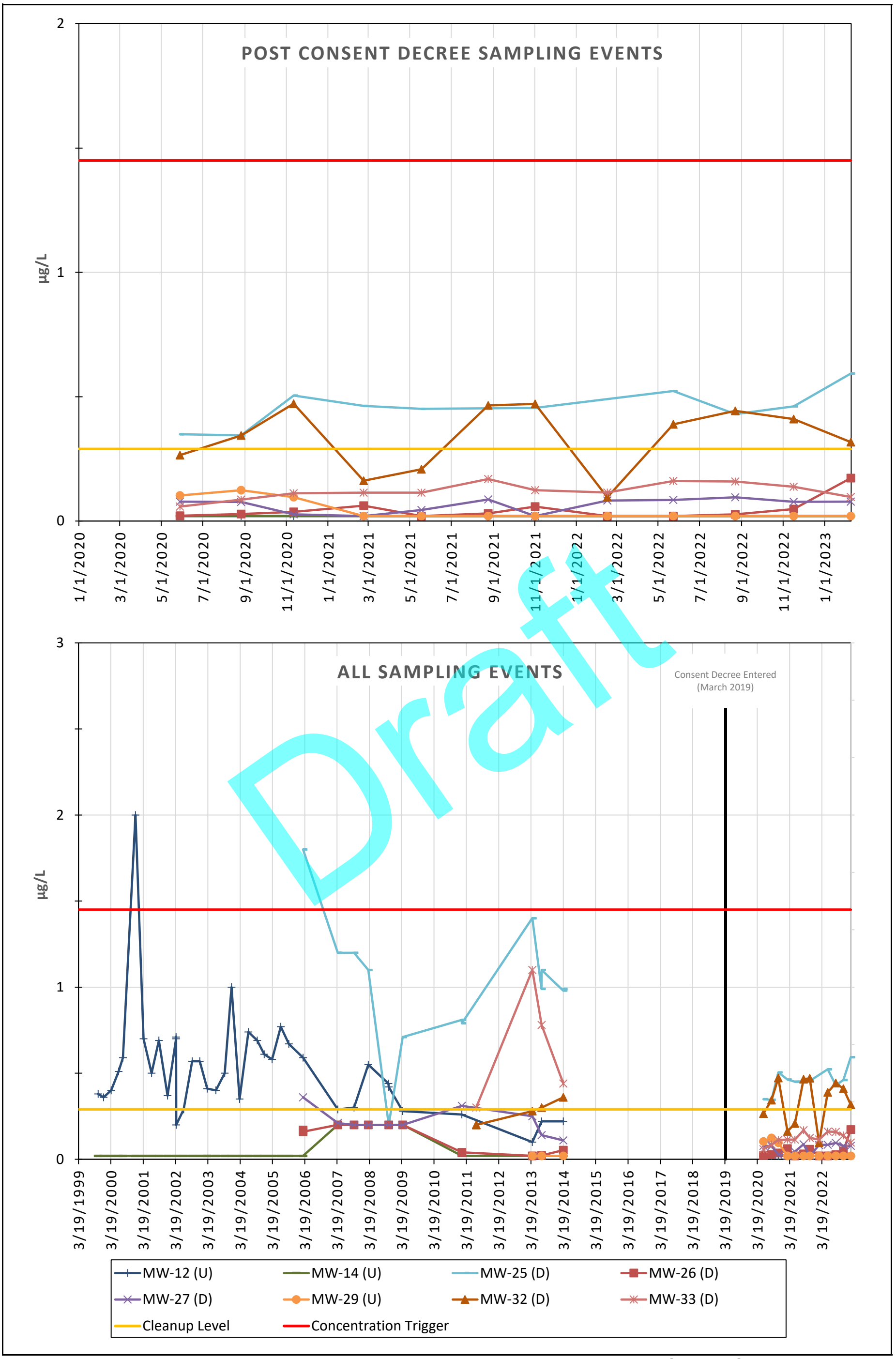
Total Manganese Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

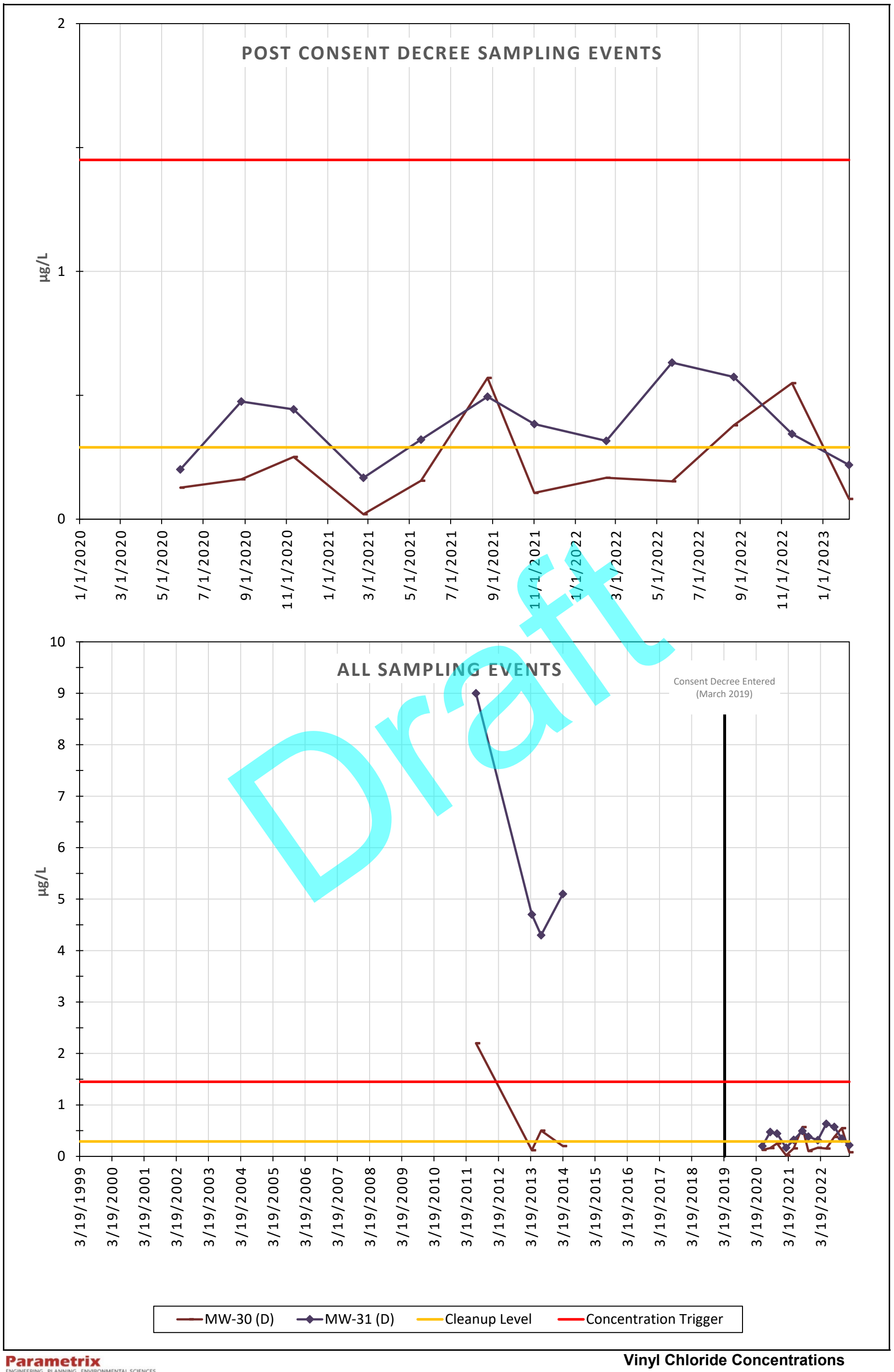
Total Manganese Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

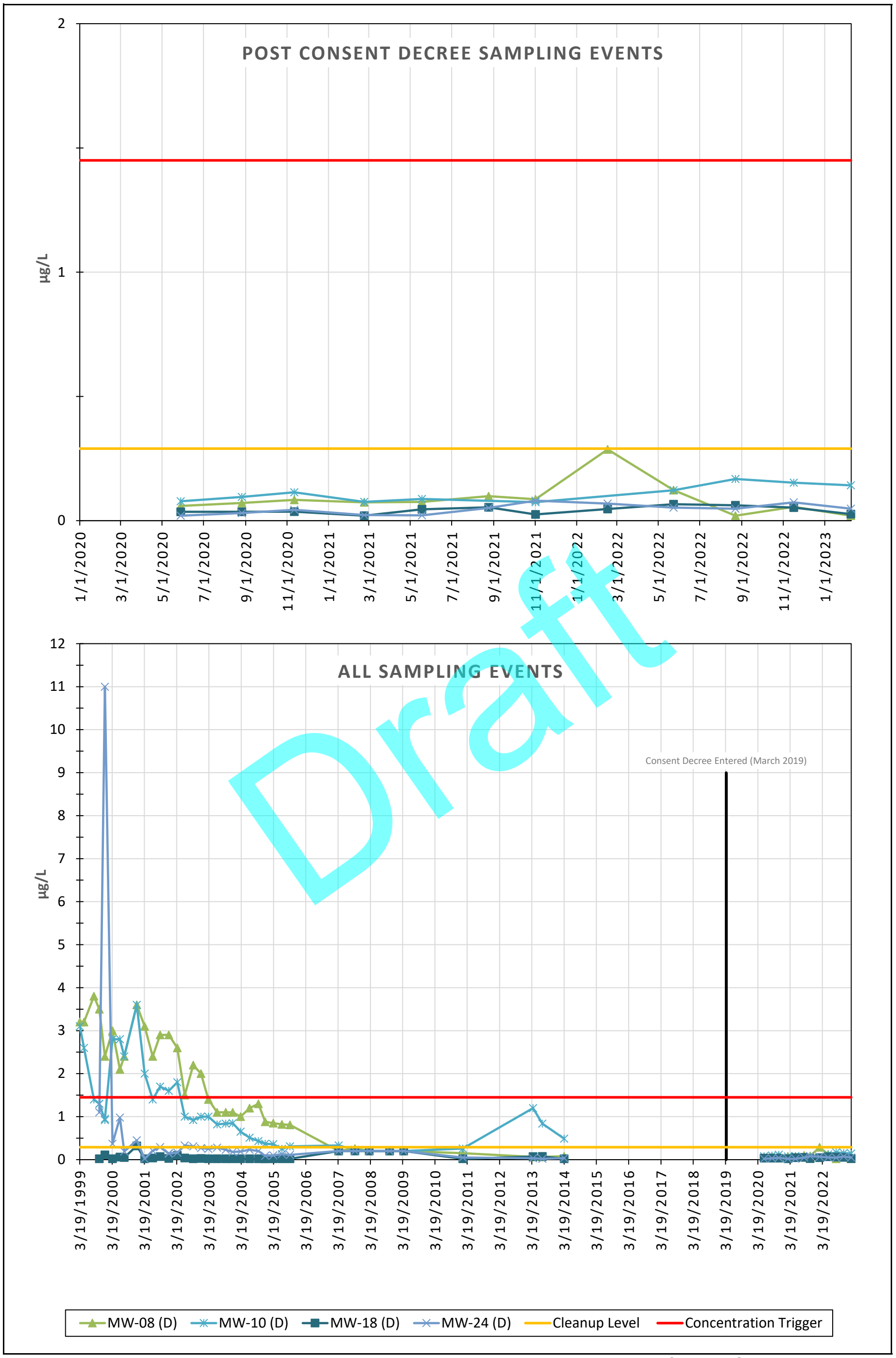
Vinyl Chloride Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

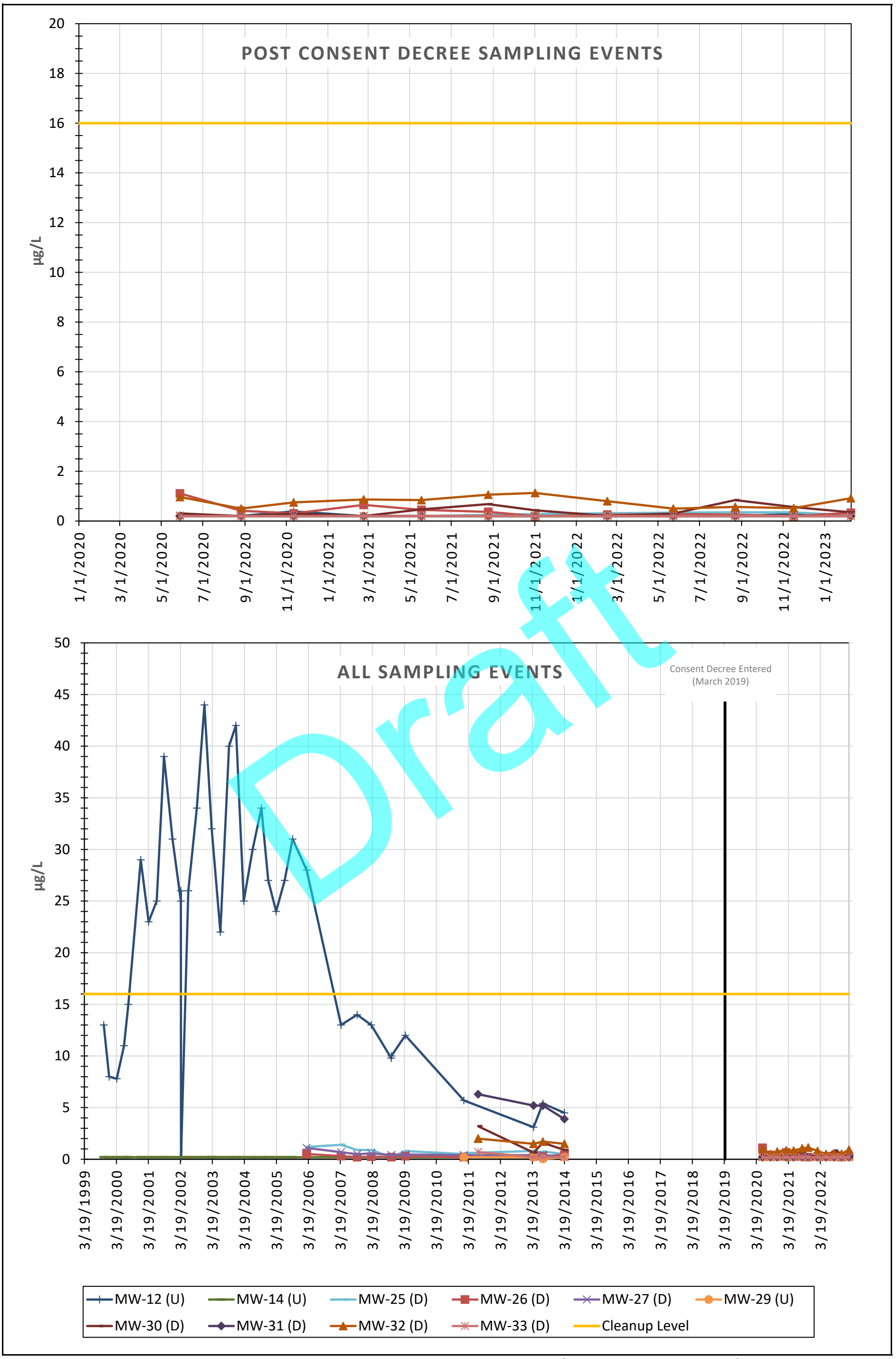
Vinyl Chloride Concentrations
A-Zone Non-CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

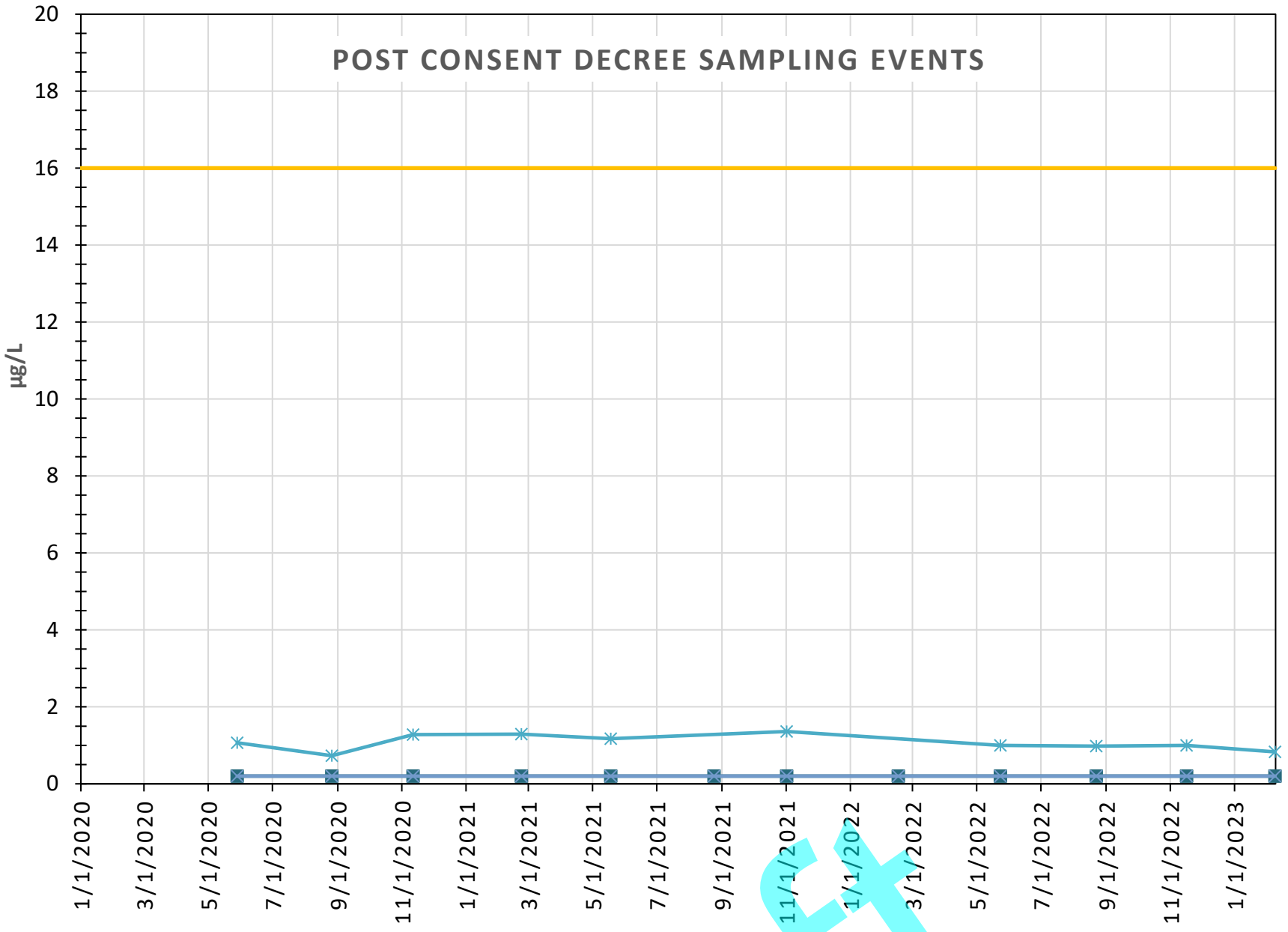
Vinyl Chloride Concentrations
B-Zone CPOC Wells
South Park Landfill

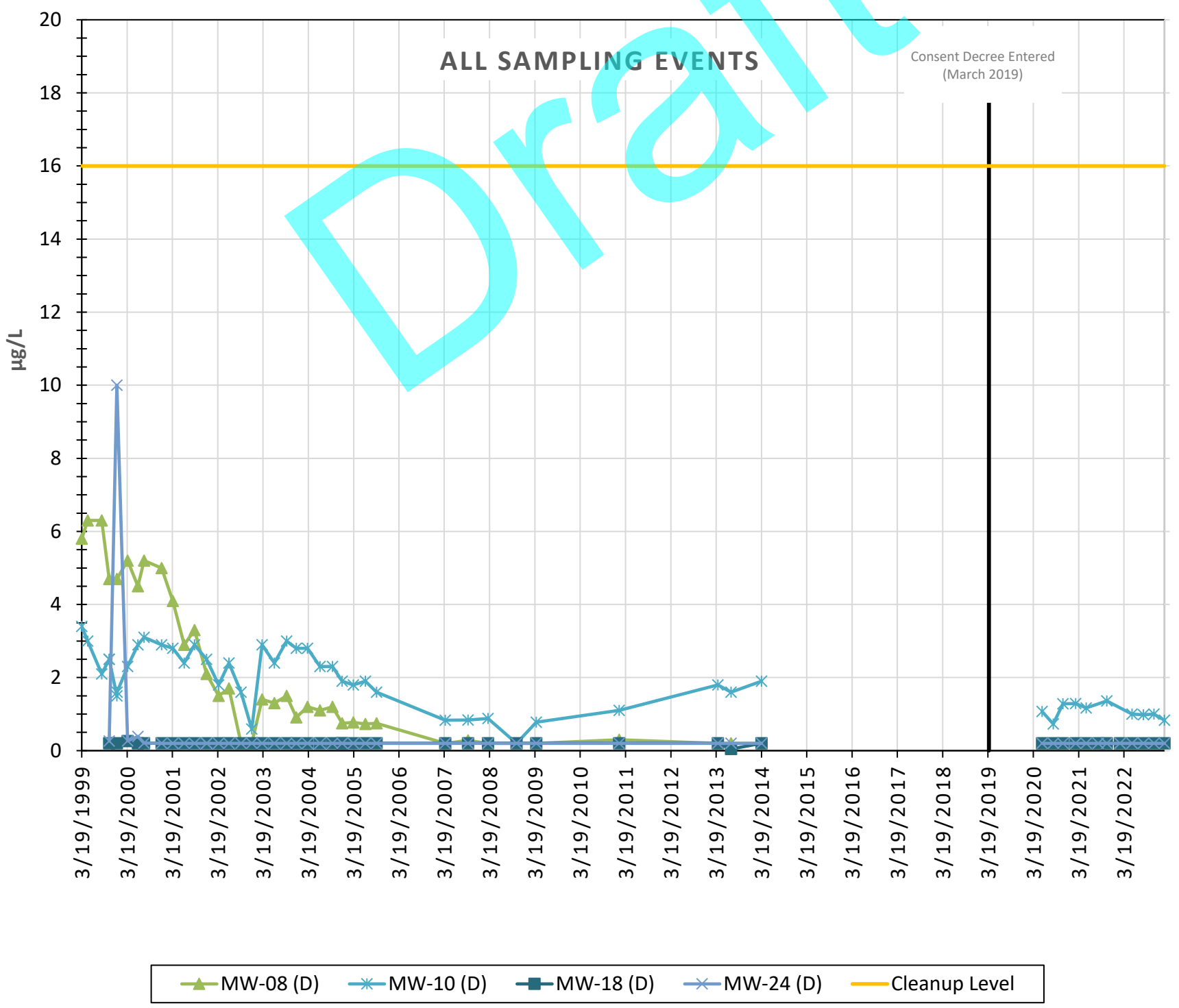


Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

Cis-1,2-Dichloroethene Concentrations
A-Zone CPOC Wells
South Park Landfill

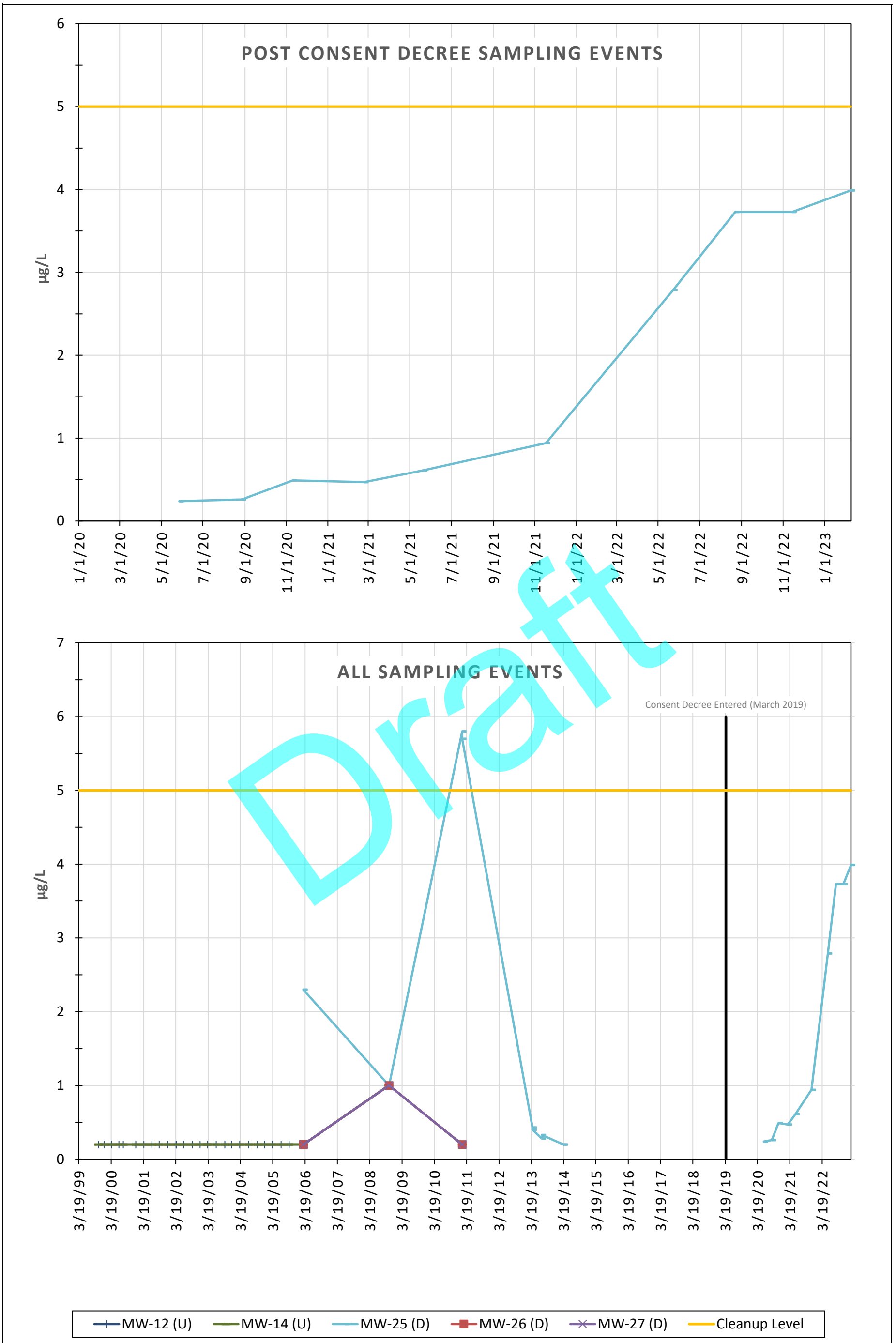




Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

Cis-1,2-Dichloroethene Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

Benzene Concentrations
A-Zone CPOC Wells
South Park Landfill

Attachment 4

First Quarter 2023 Groundwater Laboratory Data

Analytical Resources, LLC
Analytical Chemists and Consultants

28 February 2023

Jeff Neuner
Seattle Public Utilities
700-5th Ave, Ste 4900, Box 34018
Seattle, WA 98124-4018

RE: South Park Landfill -Parametrix Water (553-155-067)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
23B0111	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Shelly Fishel, Project Manager

Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23B0111	Turn-around Requested: 2 weeks	Date: 2/6/23	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of ~~2~~ NK 1	
Client Contact: Laura Lee	Phone: 206 394-3665	No. of Coolers:	Cooler Temps:
Client Project Name: SPU South Park Landfill			
	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**					Notes/Comments
~~SPL-GW-MW12-0223~~			water	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW14-0223~~			water	7	X		X	X						
SPL-GW-MW29-0223	2/6/23	16:40	water	7	X		X	X						
SPL-GW-MW18-0223	2/6/23	15:10	water	14	X		X	X	X					MS/MSD
SPL-GW-MW32-0223	2/6/23	12:55	water	8	X		X	X	X					
SPL-GW-MW33-0223	2/6/23	13:55	water	8	X		X	X	X					
SPL-GW-MW10-0223	2/6/23	9:10	water	8	X		X	X	X					
~~SPL-GW-MW60-0223~~	2/6/23	15:45	water	8	X		X	X	X					
SPL-GW-MW80-0223	2/6/23	NA	water	2		X	X							

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Nicole Kepra	Printed Name: Shelly L Fisher	Printed Name:	Printed Name:
	Company: HWA	Company: ARI	Company:	Company:
	Date & Time: 2/6/23 17:12	Date & Time: 02/06/2023 ~~1715~~ 1712	Date & Time: SLF 02/06/2023	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23B0111	Turn-around Requested: 2 weeks	Date: 2/6/23	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 1	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers:	Cooler Temps:
Client Project Name: SPU South Park Landfill			
Client Project #: 553-1550-067	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**	Notes/Comments
SPL-GW-MW25-0223	2/6/23	10:10	water	8		X	X	X	X	
~~SPL-GW-MW30-0223~~			water	7	X		X	X		
~~SPL-GW-MW31-0223~~			water	7	X		X	X		
~~SPL-GW-MW24-0223~~			water	14	X		X	X	X	~~MS/MSD~~
~~SPL-GW-MW26-0223~~			water	8	X		X	X	X	
~~SPL-GW-MW08-0223~~			water	8	X		X	X	X	
~~SPL-GW-MW27-0223~~			water	8	X		X	X	X	
~~SPL-GW-MW61-0223~~			water	8	X		X	X	X	
~~SPL-GW-MW81-0223~~			water	2		X	X			

Comments/Special Instructions

	Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature)	Nicole Kapise	Shelly L Fisher		
Printed Name:	Nicole Kapise	Shelly L Fisher		
Company:	HWA	ARI		
Date & Time:	2/6/23 17:12	02/06/2023 1712		

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

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Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SPL-GW-MW29-0223	23B0111-01	Water	06-Feb-2023 16:40	06-Feb-2023 17:12
SPL-GW-MW18-0223	23B0111-02	Water	06-Feb-2023 15:10	06-Feb-2023 17:12
SPL-GW-MW18-0223	23B0111-03	Water	06-Feb-2023 15:10	06-Feb-2023 17:12
SPL-GW-MW32-0223	23B0111-04	Water	06-Feb-2023 12:55	06-Feb-2023 17:12
SPL-GW-MW32-0223	23B0111-05	Water	06-Feb-2023 12:55	06-Feb-2023 17:12
SPL-GW-MW33-0223	23B0111-06	Water	06-Feb-2023 13:55	06-Feb-2023 17:12
SPL-GW-MW33-0223	23B0111-07	Water	06-Feb-2023 13:55	06-Feb-2023 17:12
SPL-GW-MW10-0223	23B0111-08	Water	06-Feb-2023 09:10	06-Feb-2023 17:12
SPL-GW-MW10-0223	23B0111-09	Water	06-Feb-2023 09:10	06-Feb-2023 17:12
SPL-GW-MW60-0223	23B0111-10	Water	06-Feb-2023 15:45	06-Feb-2023 17:12
SPL-GW-MW60-0223	23B0111-11	Water	06-Feb-2023 15:45	06-Feb-2023 17:12
SLP-GW-MW80-0223	23B0111-12	Water	06-Feb-2023 00:00	06-Feb-2023 17:12
SPL-GW-MW25-0223	23B0111-13	Water	06-Feb-2023 10:10	06-Feb-2023 17:12
SPL-GW-MW25-0223	23B0111-14	Water	06-Feb-2023 10:10	06-Feb-2023 17:12

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Work Order Case Narrative

Client: Seattle Public Utilities
Project: South Park Landfill -Parametrix Water
Project Number: 553-155-067
Work Order: 23B0111

Sample receipt

Sample(s) as listed on the preceding page were received 06-Feb-2023 17:12 under ARI work order 23B0111. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits except Iron which was out of control low in the MS. The deviation has been flagged.

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: SPU / Parametrix / HWA Project Name: South Park Landfill

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 23B0111 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? SLF 02/06/2023 YES NO

Were custody papers included with the cooler? ..... YES NO

Were custody papers properly filled out (ink, signed, etc.) ..... YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.9

Time 1714

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: K008117

Cooler Accepted by: _____ Date: 02/06/2023 Time: 1712

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? ..... YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? ..... NA YES NO

How were bottles sealed in plastic bags? ..... Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? ..... YES NO

Were all bottle labels complete and legible? ..... YES NO

Did the number of containers listed on COC match with the number of containers received? ..... YES NO

Did all bottle labels and tags agree with custody papers? ..... YES NO

Were all bottles used correct for the requested analyses? ..... YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... NA YES NO

Were all VOC vials free of air bubbles? ..... NA YES NO

Was sufficient amount of sample sent in each bottle? ..... YES NO

Date VOC Trip Blank was made at ARI..... NA _____

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: _____ Date: 02/07/23 Time: 8:19 Labels checked by: TCS

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

WORK ORDER

23B0111

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities **Project Manager:** Shelly Fishel

Project: South Park Landfill -Parametrix Water **Project Number:** 553-155-067

Preservation Confirmation

Container ID	Container Type	pH
23B0111-01 A	VOA Vial, Clear, 40 mL, HCL	
23B0111-01 B	VOA Vial, Clear, 40 mL, HCL	
23B0111-01 C	VOA Vial, Clear, 40 mL, HCL	
23B0111-01 D	VOA Vial, Clear, 40 mL	
23B0111-01 E	VOA Vial, Clear, 40 mL	
23B0111-01 F	VOA Vial, Clear, 40 mL	
23B0111-01 G	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0111-02 A	VOA Vial, Clear, 40 mL, HCL	
23B0111-02 B	VOA Vial, Clear, 40 mL, HCL	
23B0111-02 C	VOA Vial, Clear, 40 mL, HCL	
23B0111-02 D	VOA Vial, Clear, 40 mL, HCL	
23B0111-02 E	VOA Vial, Clear, 40 mL, HCL	
23B0111-02 F	VOA Vial, Clear, 40 mL, HCL	
23B0111-02 G	VOA Vial, Clear, 40 mL	
23B0111-02 H	VOA Vial, Clear, 40 mL	
23B0111-02 I	VOA Vial, Clear, 40 mL	
23B0111-02 J	VOA Vial, Clear, 40 mL	
23B0111-02 K	VOA Vial, Clear, 40 mL	
23B0111-02 L	VOA Vial, Clear, 40 mL	
23B0111-02 M	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0111-03 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<< 2 P
23B0111-04 A	VOA Vial, Clear, 40 mL, HCL	
23B0111-04 B	VOA Vial, Clear, 40 mL, HCL	
23B0111-04 C	VOA Vial, Clear, 40 mL, HCL	
23B0111-04 D	VOA Vial, Clear, 40 mL	
23B0111-04 E	VOA Vial, Clear, 40 mL	
23B0111-04 F	VOA Vial, Clear, 40 mL	
23B0111-04 G	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0111-05 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 P
23B0111-06 A	VOA Vial, Clear, 40 mL, HCL	
23B0111-06 B	VOA Vial, Clear, 40 mL, HCL	
23B0111-06 C	VOA Vial, Clear, 40 mL, HCL	
23B0111-06 D	VOA Vial, Clear, 40 mL	
23B0111-06 E	VOA Vial, Clear, 40 mL	

Reviewed By Date

WORK ORDER

23B0111

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities **Project Manager: Shelly Fishel**

Project: South Park Landfill -Parametrix Water **Project Number: 553-155-067**

23B0111-06 F	VOA Vial, Clear, 40 mL	
23B0111-06 G	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0111-07 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 P
23B0111-08 A	VOA Vial, Clear, 40 mL, HCL	
23B0111-08 B	VOA Vial, Clear, 40 mL, HCL	
23B0111-08 C	VOA Vial, Clear, 40 mL, HCL	
23B0111-08 D	VOA Vial, Clear, 40 mL	
23B0111-08 E	VOA Vial, Clear, 40 mL	
23B0111-08 F	VOA Vial, Clear, 40 mL	
23B0111-08 G	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0111-09 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 P
23B0111-10 A	VOA Vial, Clear, 40 mL, HCL	
23B0111-10 B	VOA Vial, Clear, 40 mL, HCL	
23B0111-10 C	VOA Vial, Clear, 40 mL, HCL	
23B0111-10 D	VOA Vial, Clear, 40 mL	
23B0111-10 E	VOA Vial, Clear, 40 mL	
23B0111-10 F	VOA Vial, Clear, 40 mL	
23B0111-10 G	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0111-11 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 P
23B0111-12 A	VOA Vial, Clear, 40 mL, HCL	
23B0111-12 B	VOA Vial, Clear, 40 mL	
23B0111-13 A	VOA Vial, Clear, 40 mL, HCL	
23B0111-13 B	VOA Vial, Clear, 40 mL, HCL	
23B0111-13 C	VOA Vial, Clear, 40 mL, HCL	
23B0111-13 D	VOA Vial, Clear, 40 mL	
23B0111-13 E	VOA Vial, Clear, 40 mL	
23B0111-13 F	VOA Vial, Clear, 40 mL	
23B0111-13 G	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0111-14 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 P

Preservation Confirmed By

02/07/23
Date

Reviewed By

Date

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW29-0223

23B0111-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/06/2023 16:40

Instrument: NT3 Analyst: PKC — Analyzed: 02/07/2023 12:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-01 A

Preparation Batch: BLB0143 — Sample Size: 10 mL

Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.7*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW29-0223

23B0111-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/06/2023 16:40

Instrument: NT16 Analyst: KOTT — Analyzed: 02/07/2023 11:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-01 D

Preparation Batch: BLB0159 — Sample Size: 10 mL

Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*102*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW29-0223

23B0111-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/06/2023 16:40

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 19:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-01 G 01

Preparation Batch: BLB0481 — Sample Size: 25 mL

Prepared: 02/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	17.6	mg/L	D
Manganese	7439-96-5	10	0.00500	0.434	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW18-0223

23B0111-02 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/06/2023 15:10

Instrument: NT3 Analyst: PKC — Analyzed: 02/07/2023 13:14

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-02 A

Preparation Batch: BLB0143 — Sample Size: 10 mL

Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*101*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW18-0223

23B0111-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/06/2023 15:10
Instrument: NT16 Analyst: KOTT — Analyzed: 02/07/2023 12:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-02 G
Preparation Batch: BLB0159 — Sample Size: 10 mL
Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0264	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*102*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW18-0223

23B0111-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/06/2023 15:10
Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/22/2023 16:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-02 M 01
Preparation Batch: BLB0481 — Sample Size: 25 mL
Prepared: 02/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	0.0720	14.1	mg/L	D
Manganese	7439-96-5	20	0.0100	1.27	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW18-0223

23B0111-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/06/2023 15:10

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 18:37

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-03 A 01

Preparation Batch: BLB0447 — Sample Size: 25 mL

Prepared: 02/16/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	ND	ug/L	U

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW32-0223

23B0111-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/06/2023 12:55

Instrument: NT3 Analyst: PKC — Analyzed: 02/07/2023 13:36

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-04 A

Preparation Batch: BLB0143 — Sample Size: 10 mL

Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.92	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*98.1*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW32-0223

23B0111-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/06/2023 12:55
Instrument: NT16 Analyst: KOTT — Analyzed: 02/07/2023 13:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-04 D
Preparation Batch: BLB0159 — Sample Size: 10 mL
Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.317	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*98.5*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW32-0223

23B0111-04 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/06/2023 12:55

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-04 G 01

Preparation Batch: BLB0481 — Sample Size: 25 mL

Prepared: 02/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	16.2	mg/L	D
Manganese	7439-96-5	20	0.0100	1.61	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW32-0223

23B0111-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/06/2023 12:55

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 15:56

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-05 A 01

Preparation Batch: BLB0447 — Sample Size: 25 mL

Prepared: 02/16/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.992	ug/L	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW33-0223

23B0111-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/06/2023 13:55

Instrument: NT3 Analyst: PKC — Analyzed: 02/07/2023 13:58

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-06 A

Preparation Batch: BLB0143 — Sample Size: 10 mL

Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*108*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW33-0223

23B0111-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/06/2023 13:55
Instrument: NT16 Analyst: KOTT — Analyzed: 02/07/2023 14:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-06 D
Preparation Batch: BLB0159 — Sample Size: 10 mL
Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0967	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*103*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW33-0223

23B0111-06 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/06/2023 13:55

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:51

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-06 G 01

Preparation Batch: BLB0481 — Sample Size: 25 mL

Prepared: 02/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	19.6	mg/L	D
Manganese	7439-96-5	20	0.0100	2.05	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW33-0223

23B0111-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/06/2023 13:55

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 16:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-07 A 01

Preparation Batch: BLB0447 — Sample Size: 25 mL

Prepared: 02/16/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	1.07	ug/L	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW10-0223

23B0111-08 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/06/2023 09:10

Instrument: NT3 Analyst: PKC — Analyzed: 02/07/2023 14:20

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-08 A

Preparation Batch: BLB0143 — Sample Size: 10 mL

Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.83	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*101*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW10-0223

23B0111-08 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/06/2023 09:10
Instrument: NT16 Analyst: KOTT — Analyzed: 02/07/2023 14:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-08 D
Preparation Batch: BLB0159 — Sample Size: 10 mL
Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.142	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*103*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW10-0223

23B0111-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/06/2023 09:10
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 19:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-08 G 01
Preparation Batch: BLB0481 — Sample Size: 25 mL
Prepared: 02/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	37.9	mg/L	D
Manganese	7439-96-5	50	0.0250	2.37	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW10-0223

23B0111-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/06/2023 09:10

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 16:03

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-09 A 01

Preparation Batch: BLB0447 — Sample Size: 25 mL

Prepared: 02/16/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	ND	ug/L	U

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW60-0223

23B0111-10 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/06/2023 15:45

Instrument: NT3 Analyst: PKC — Analyzed: 02/07/2023 14:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-10 A

Preparation Batch: BLB0143 — Sample Size: 10 mL

Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*97.4*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW60-0223

23B0111-10 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/06/2023 15:45
Instrument: NT16 Analyst: KOTT — Analyzed: 02/07/2023 14:53

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-10 D
Preparation Batch: BLB0159 — Sample Size: 10 mL
Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0253	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*104*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW60-0223

23B0111-10 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/06/2023 15:45

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:56

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-10 G 01

Preparation Batch: BLB0481 — Sample Size: 25 mL

Prepared: 02/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	15.9	mg/L	D
Manganese	7439-96-5	20	0.0100	1.20	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW60-0223

23B0111-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/06/2023 15:45

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 16:07

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-11 A 01

Preparation Batch: BLB0447 — Sample Size: 25 mL

Prepared: 02/16/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	ND	ug/L	U

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SLP-GW-MW80-0223

23B0111-12 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/06/2023 00:00
Instrument: NT3 Analyst: PKC — Analyzed: 02/07/2023 12:07

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-12 A
Preparation Batch: BLB0143 — Sample Size: 10 mL
Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*94.2*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*93.8*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SLP-GW-MW80-0223

23B0111-12 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/06/2023 00:00
Instrument: NT16 Analyst: KOTT — Analyzed: 02/07/2023 15:14

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-12 B
Preparation Batch: BLB0159 — Sample Size: 10 mL
Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*101*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW25-0223

23B0111-13 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/06/2023 10:10

Instrument: NT3 Analyst: PKC — Analyzed: 02/07/2023 15:04

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-13 A

Preparation Batch: BLB0143 — Sample Size: 10 mL

Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.22	ug/L	
Benzene	71-43-2	1	0.20	3.99	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*98.7*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*94.7*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW25-0223

23B0111-13 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/06/2023 10:10
Instrument: NT16 Analyst: KOTT — Analyzed: 02/07/2023 15:36

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0111-13 D
Preparation Batch: BLB0159 — Sample Size: 10 mL
Prepared: 02/07/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.593	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*101*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW25-0223

23B0111-13 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/06/2023 10:10
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 19:39

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-13 G 01
Preparation Batch: BLB0481 — Sample Size: 25 mL
Prepared: 02/17/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	36.6	mg/L	D
Manganese	7439-96-5	50	0.0250	2.90	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

SPL-GW-MW25-0223

23B0111-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/06/2023 10:10

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0111-14 A 01

Preparation Batch: BLB0447 — Sample Size: 25 mL

Prepared: 02/16/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.308	ug/L	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLB0143 - EPA 8260D

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0143-BLK2)				Prepared: 07-Feb-2023		Analyzed: 07-Feb-2023 11:45				
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.69		ug/L	*5.00*		*93.9*	*80-129*			
Surrogate: Toluene-d8	4.75		ug/L	*5.00*		*94.9*	*80-120*			
LCS (BLB0143-BS2)				Prepared: 07-Feb-2023		Analyzed: 07-Feb-2023 10:17				
cis-1,2-Dichloroethene	9.48	0.20	ug/L	10.0		94.8	80-121			
Benzene	9.62	0.20	ug/L	10.0		96.2	80-120			
Surrogate: 1,2-Dichloroethane-d4	4.68		ug/L	*5.00*		*93.6*	*80-129*			
Surrogate: Toluene-d8	4.86		ug/L	*5.00*		*97.3*	*80-120*			
LCS Dup (BLB0143-BSD2)				Prepared: 07-Feb-2023		Analyzed: 07-Feb-2023 11:01				
cis-1,2-Dichloroethene	9.77	0.20	ug/L	10.0		97.7	80-121	3.06	30	
Benzene	9.76	0.20	ug/L	10.0		97.6	80-120	1.52	30	
Surrogate: 1,2-Dichloroethane-d4	4.95		ug/L	*5.00*		*98.9*	*80-129*			
Surrogate: Toluene-d8	4.95		ug/L	*5.00*		*99.0*	*80-120*			
Matrix Spike (BLB0143-MS1)	**Source: 23B0111-02**			Prepared: 07-Feb-2023		Analyzed: 07-Feb-2023 16:55				
cis-1,2-Dichloroethene	10.1	0.20	ug/L	10.0	ND	101	80-121			
Benzene	10.1	0.20	ug/L	10.0	ND	101	80-120			
Surrogate: 1,2-Dichloroethane-d4	4.81		ug/L	*5.00*	*5.04*	*96.1*	*80-129*			
Surrogate: Toluene-d8	4.84		ug/L	*5.00*		*96.9*	*80-120*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BLB0143-MSD1)	**Source: 23B0111-02**			Prepared: 07-Feb-2023		Analyzed: 07-Feb-2023 17:17				
cis-1,2-Dichloroethene	10.1	0.20	ug/L	10.0	ND	101	80-121	0.05	30	
Benzene	10.2	0.20	ug/L	10.0	ND	102	80-120	1.76	30	
Surrogate: 1,2-Dichloroethane-d4	4.83		ug/L	*5.00*	*5.04*	*96.5*	*80-129*			
Surrogate: Toluene-d8	4.92		ug/L	*5.00*		*98.4*	*80-120*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLB0159 - EPA 8260D-SIM

Instrument: NT16 Analyst: KOTT

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0159-BLK1)				Prepared: 07-Feb-2023 Analyzed: 07-Feb-2023 11:31						
Vinyl chloride	ND	0.0200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5010		ug/L	*5000*		*100*	*80-129*			
LCS (BLB0159-BS1)				Prepared: 07-Feb-2023 Analyzed: 07-Feb-2023 09:37						
Vinyl chloride	2.18	0.0200	ug/L	2.00		109	62-141			
Surrogate: 1,2-Dichloroethane-d4	4910		ug/L	*5000*		*98.2*	*80-129*			
LCS Dup (BLB0159-BSD1)				Prepared: 07-Feb-2023 Analyzed: 07-Feb-2023 10:25						
Vinyl chloride	2.13	0.0200	ug/L	2.00		107	62-141	2.21	30	
Surrogate: 1,2-Dichloroethane-d4	4990		ug/L	*5000*		*99.8*	*80-129*			
Matrix Spike (BLB0159-MS1)	**Source: 23B0111-02**			Prepared: 07-Feb-2023 Analyzed: 07-Feb-2023 12:34						
Vinyl chloride	1.98	0.0200	ug/L	2.00	0.0264	97.5	62-141			
Surrogate: 1,2-Dichloroethane-d4	5140		ug/L	*5000*	*5090*	*103*	*80-129*			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike Dup (BLB0159-MSD1)	**Source: 23B0111-02**			Prepared: 07-Feb-2023 Analyzed: 07-Feb-2023 12:55						
Vinyl chloride	1.95	0.0200	ug/L	2.00	0.0264	95.9	62-141	1.55	30	
Surrogate: 1,2-Dichloroethane-d4	4940		ug/L	*5000*	*5090*	*98.9*	*80-129*			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLB0481 - EPA 6020B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0481-BLK1)				Prepared: 17-Feb-2023 Analyzed: 20-Feb-2023 19:57							
Manganese	55	ND	0.000500	mg/L							U
Blank (BLB0481-BLK3)				Prepared: 17-Feb-2023 Analyzed: 22-Feb-2023 16:23							
Iron	54	ND	0.0360	mg/L							U
Iron	57	ND	0.0360	mg/L							U
LCS (BLB0481-BS1)				Prepared: 17-Feb-2023 Analyzed: 20-Feb-2023 20:01							
Manganese	55	0.0273	0.000500	mg/L	0.0250		109	80-120			
LCS (BLB0481-BS3)				Prepared: 17-Feb-2023 Analyzed: 22-Feb-2023 16:28							
Iron	54	4.98	0.0360	mg/L	5.00		99.7	80-120			
Iron	57	5.14	0.0360	mg/L	5.00		103	80-120			
Duplicate (BLB0481-DUP3)			**Source: 23B0111-02**	Prepared: 17-Feb-2023 Analyzed: 22-Feb-2023 16:56							
Iron	54	13.4	0.0720	mg/L		14.1			4.91	20	D
Duplicate (BLB0481-DUP4)			**Source: 23B0111-02**	Prepared: 17-Feb-2023 Analyzed: 23-Feb-2023 22:20							
Manganese	55	1.24	0.0100	mg/L		1.27			2.23	20	D
Matrix Spike (BLB0481-MS3)			**Source: 23B0111-02**	Prepared: 17-Feb-2023 Analyzed: 22-Feb-2023 17:01							
Iron	54	17.7	0.0720	mg/L	5.00	14.1	73.7	75-125			*, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BLB0481-MS4)			**Source: 23B0111-02**	Prepared: 17-Feb-2023 Analyzed: 23-Feb-2023 22:24							
Manganese	55	1.26	0.0100	mg/L	0.0250	1.27	-22.7	75-125			HC, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BLB0447 - EPA 6020B UCT-KED

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BLB0447-DUP1)		**Source: 23B0111-03**		Prepared: 16-Feb-2023		Analyzed: 23-Feb-2023 18:41					
Arsenic, Dissolved	75a	ND	0.200	ug/L		ND					U
Matrix Spike (BLB0447-MS1)		**Source: 23B0111-03**		Prepared: 16-Feb-2023		Analyzed: 23-Feb-2023 18:44					
Arsenic, Dissolved	75a	25.2	0.200	ug/L	25.0	ND	100	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BLB0447-MSD1)		**Source: 23B0111-03**		Prepared: 16-Feb-2023		Analyzed: 23-Feb-2023 18:48					
Arsenic, Dissolved	75a	25.4	0.200	ug/L	25.0	ND	101	75-125	0.89	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0447-BLK1)				Prepared: 16-Feb-2023		Analyzed: 20-Feb-2023 19:01					
Arsenic, Dissolved	75a	ND	0.200	ug/L							U
LCS (BLB0447-BS1)				Prepared: 16-Feb-2023		Analyzed: 20-Feb-2023 19:05					
Arsenic, Dissolved	75a	22.7	0.200	ug/L	25.0		90.7	80-120			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
EPA 6020B UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC
EPA 8260D in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE
1,2-Dichloroethane	NELAP,WADOE
Benzene	NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:11

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, LLC
Analytical Chemists and Consultants

28 February 2023

Jeff Neuner
Seattle Public Utilities
700-5th Ave, Ste 4900, Box 34018
Seattle, WA 98124-4018

RE: South Park Landfill -Parametrix Water (553-1550-067)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
23B0160	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Shelly Fishel, Project Manager

Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23B0160	Turn-around Requested: 2 weeks	Date: 2/7/2023	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 1	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers: 1 Cooler Temps: 2.6	
Client Project Name: SPU South Park Landfill			
Client Project #: 553-1550-067	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**					Notes/Comments
					Analysis Requested									**Field-filtered
~~SPL-GW-MW25-0223~~			~~water~~	~~8~~		X	X	X	X					
SPL-GW-MW30-0223	2/7/23	930	water	7	X		X	X						
SPL-GW-MW31-0223	2/7/23	1015	water	7	X		X	X						
SPL-GW-MW24-0223	2/7/23	1135	water	14	X		X	X	X					MS/MSD
SPL-GW-MW26-0223	2/7/23	1320	water	8	X		X	X	X					
SPL-GW-MW08-0223	2/7/23	1485	water	8	X		X	X	X					
SPL-GW-MW27-0223	2/7/23	1610	water	8	X		X	X	X					
SPL-GW-MW61-0223	2/7/23	1200	water	8	X		X	X	X					
~~SPL-GW-MW81-0223~~			~~water~~	~~2~~		X	X							

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Chris Bourgeois	Printed Name: [illegible]	Printed Name:	Printed Name:
	Company: HWA	Company: AR, LLC	Company:	Company:
	Date & Time: 2/7/23 1651	Date & Time: 2/8/23 1651	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SPL-GW-MW30-0223	23B0160-01	Water	07-Feb-2023 09:30	07-Feb-2023 16:51
SPL-GW-MW31-0223	23B0160-02	Water	07-Feb-2023 10:15	07-Feb-2023 16:51
SPL-GW-MW24-0223	23B0160-03	Water	07-Feb-2023 11:35	07-Feb-2023 16:51
SPL-GW-MW24-0223	23B0160-04	Water	07-Feb-2023 11:35	07-Feb-2023 16:51
SPL-GW-MW26-0223	23B0160-05	Water	07-Feb-2023 13:20	07-Feb-2023 16:51
SPL-GW-MW26-0223	23B0160-06	Water	07-Feb-2023 13:20	07-Feb-2023 16:51
SPL-GW-MW08-0223	23B0160-07	Water	07-Feb-2023 14:35	07-Feb-2023 16:51
SPL-GW-MW08-0223	23B0160-08	Water	07-Feb-2023 14:35	07-Feb-2023 16:51
SPL-GW-MW27-0223	23B0160-09	Water	07-Feb-2023 16:10	07-Feb-2023 16:51
SPL-GW-MW27-0223	23B0160-10	Water	07-Feb-2023 16:10	07-Feb-2023 16:51
SPL-GW-MW61-0223	23B0160-11	Water	07-Feb-2023 12:00	07-Feb-2023 16:51
SPL-GW-MW61-0223	23B0160-12	Water	07-Feb-2023 12:00	07-Feb-2023 16:51

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Work Order Case Narrative

Client: Seattle Public Utilities
Project: South Park Landfill -Parametrix Water
Project Number: 553-1550-067
Work Order: 23B0160

Sample receipt

Sample(s) as listed on the preceding page were received 07-Feb-2023 16:51 under ARI work order 23B0160. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

WORK ORDER

23B0160

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities **Project Manager:** Shelly Fishel

Project: South Park Landfill -Parametrix Water **Project Number:** 553-1550-067

Preservation Confirmation

Container ID	Container Type	pH
23B0160-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass (P)
23B0160-01 B	VOA Vial, Clear, 40 mL, HCL	
23B0160-01 C	VOA Vial, Clear, 40 mL, HCL	
23B0160-01 D	VOA Vial, Clear, 40 mL, HCL	
23B0160-01 E	VOA Vial, Clear, 40 mL	
23B0160-01 F	VOA Vial, Clear, 40 mL	
23B0160-01 G	VOA Vial, Clear, 40 mL	
23B0160-02 A	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0160-02 B	VOA Vial, Clear, 40 mL, HCL	
23B0160-02 C	VOA Vial, Clear, 40 mL, HCL	
23B0160-02 D	VOA Vial, Clear, 40 mL, HCL	
23B0160-02 E	VOA Vial, Clear, 40 mL	
23B0160-02 F	VOA Vial, Clear, 40 mL	
23B0160-02 G	VOA Vial, Clear, 40 mL	
23B0160-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0160-03 B	VOA Vial, Clear, 40 mL, HCL	
23B0160-03 C	VOA Vial, Clear, 40 mL, HCL	
23B0160-03 D	VOA Vial, Clear, 40 mL, HCL	
23B0160-03 E	VOA Vial, Clear, 40 mL, HCL	
23B0160-03 F	VOA Vial, Clear, 40 mL, HCL	
23B0160-03 G	VOA Vial, Clear, 40 mL, HCL	
23B0160-03 H	VOA Vial, Clear, 40 mL	
23B0160-03 I	VOA Vial, Clear, 40 mL	
23B0160-03 J	VOA Vial, Clear, 40 mL	
23B0160-03 K	VOA Vial, Clear, 40 mL	
23B0160-03 L	VOA Vial, Clear, 40 mL	
23B0160-03 M	VOA Vial, Clear, 40 mL	
23B0160-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 P
23B0160-05 A	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23B0160-05 B	VOA Vial, Clear, 40 mL, HCL	
23B0160-05 C	VOA Vial, Clear, 40 mL, HCL	
23B0160-05 D	VOA Vial, Clear, 40 mL, HCL	
23B0160-05 E	VOA Vial, Clear, 40 mL	
23B0160-05 F	VOA Vial, Clear, 40 mL	

Reviewed By Date

WORK ORDER

23B0160

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities | **Project Manager:** Shelly Fishel

Project: South Park Landfill -Parametrix Water | **Project Number:** 553-1550-067

23B0160-05 G	VOA Vial, Clear, 40 mL	
23B0160-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	LZ P
23B0160-07 A	HDPE NM, 500 mL, 1:1 HNO3	LZ P
23B0160-07 B	VOA Vial, Clear, 40 mL, HCL	
23B0160-07 C	VOA Vial, Clear, 40 mL, HCL	
23B0160-07 D	VOA Vial, Clear, 40 mL, HCL	
23B0160-07 E	VOA Vial, Clear, 40 mL	
23B0160-07 F	VOA Vial, Clear, 40 mL	
23B0160-07 G	VOA Vial, Clear, 40 mL	
23B0160-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	LZ P
23B0160-09 A	HDPE NM, 500 mL, 1:1 HNO3	LZ P
23B0160-09 B	VOA Vial, Clear, 40 mL, HCL	
23B0160-09 C	VOA Vial, Clear, 40 mL, HCL	
23B0160-09 D	VOA Vial, Clear, 40 mL, HCL	
23B0160-09 E	VOA Vial, Clear, 40 mL	
23B0160-09 F	VOA Vial, Clear, 40 mL	
23B0160-09 G	VOA Vial, Clear, 40 mL	
23B0160-10 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	LZ P
23B0160-11 A	HDPE NM, 500 mL, 1:1 HNO3	LZ P
23B0160-11 B	VOA Vial, Clear, 40 mL, HCL	
23B0160-11 C	VOA Vial, Clear, 40 mL, HCL	
23B0160-11 D	VOA Vial, Clear, 40 mL, HCL	
23B0160-11 E	VOA Vial, Clear, 40 mL	
23B0160-11 F	VOA Vial, Clear, 40 mL	
23B0160-11 G	VOA Vial, Clear, 40 mL	
23B0160-12 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	LZ P

PTB

Preservation Confirmed By

PLB 218
~~217~~ 2/8/23

Date

Reviewed By

Date

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: SPU / HWA Project Name: South Park Landfill

COC No(s): NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Assigned ARI Job No: 23B0160 Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1651 2.6

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: IR09708

Cooler Accepted by: JG Date: 02/07/23 Time: 1651

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: DTB Date: 2/8/23 Time: 9:25 Labels checked by: _____

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW30-0223

23B0160-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/07/2023 09:30

Instrument: NT2 Analyst: LH — Analyzed: 02/08/2023 13:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-01 B

Preparation Batch: BLB0184 — Sample Size: 10 mL

Prepared: 02/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.35	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*99.5*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW30-0223

23B0160-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/07/2023 09:30

Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 13:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-01 E

Preparation Batch: BLB0244 — Sample Size: 10 mL

Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0816	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*94.5*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW30-0223

23B0160-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/07/2023 09:30

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-01 A 01

Preparation Batch: BLB0482 — Sample Size: 25 mL

Prepared: 02/20/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	0.0720	3.31	mg/L	D
Manganese	7439-96-5	2	0.00100	0.138	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW31-0223

23B0160-02 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/07/2023 10:15

Instrument: NT2 Analyst: LH — Analyzed: 02/08/2023 13:39

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-02 B

Preparation Batch: BLB0184 — Sample Size: 10 mL

Prepared: 02/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*106*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW31-0223

23B0160-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/07/2023 10:15
Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 13:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-02 E
Preparation Batch: BLB0244 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.219	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*98.0*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW31-0223

23B0160-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/07/2023 10:15
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:33

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-02 A 01
Preparation Batch: BLB0482 — Sample Size: 25 mL
Prepared: 02/20/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	18.2	mg/L	D
Manganese	7439-96-5	10	0.00500	0.765	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW24-0223

23B0160-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/07/2023 11:35

Instrument: NT2 Analyst: LH — Analyzed: 02/08/2023 13:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-03 B

Preparation Batch: BLB0184 — Sample Size: 10 mL

Prepared: 02/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*107*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW24-0223

23B0160-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/07/2023 11:35
Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 12:02

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-03 H
Preparation Batch: BLB0244 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0484	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*99.2*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW24-0223

23B0160-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/07/2023 11:35
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 19:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-03 A 01
Preparation Batch: BLB0482 — Sample Size: 25 mL
Prepared: 02/20/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Manganese	7439-96-5	20	0.0100	1.76	mg/L	D

Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/22/2023 18:34

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-03 A 01
Preparation Batch: BLB0482 — Sample Size: 25 mL
Prepared: 02/20/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	0.0720	22.2	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW24-0223

23B0160-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/07/2023 11:35

Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/22/2023 08:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-04 A 02

Preparation Batch: BLB0537 — Sample Size: 25 mL

Prepared: 02/21/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	ND	ug/L	U

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW26-0223

23B0160-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/07/2023 13:20

Instrument: NT2 Analyst: LH — Analyzed: 02/08/2023 14:20

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-05 B

Preparation Batch: BLB0184 — Sample Size: 10 mL

Prepared: 02/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.33	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*102*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW26-0223

23B0160-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/07/2023 13:20
Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 14:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-05 E
Preparation Batch: BLB0244 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.173	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*99.6*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW26-0223

23B0160-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/07/2023 13:20
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:23

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-05 A 01
Preparation Batch: BLB0482 — Sample Size: 25 mL
Prepared: 02/20/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	0.0720	7.98	mg/L	D
Manganese	7439-96-5	2	0.00100	0.0982	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW26-0223

23B0160-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/07/2023 13:20

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 20:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-06 A 02

Preparation Batch: BLB0537 — Sample Size: 25 mL

Prepared: 02/21/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.647	ug/L	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW08-0223

23B0160-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/07/2023 14:35
Instrument: NT2 Analyst: LH — Analyzed: 02/08/2023 14:40

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-07 B
Preparation Batch: BLB0184 — Sample Size: 10 mL
Prepared: 02/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*105*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW08-0223

23B0160-07 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/07/2023 14:35
Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 14:34

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-07 E
Preparation Batch: BLB0244 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*99.5*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW08-0223

23B0160-07 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/07/2023 14:35
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:37

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-07 A 01
Preparation Batch: BLB0482 — Sample Size: 25 mL
Prepared: 02/20/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	2.70	mg/L	D
Manganese	7439-96-5	20	0.0100	0.825	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW08-0223

23B0160-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/07/2023 14:35

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 20:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-08 A 02

Preparation Batch: BLB0537 — Sample Size: 25 mL

Prepared: 02/21/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	ND	ug/L	U

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW27-0223

23B0160-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/07/2023 16:10

Instrument: NT2 Analyst: LH — Analyzed: 02/08/2023 15:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-09 B

Preparation Batch: BLB0184 — Sample Size: 10 mL

Prepared: 02/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*104*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW27-0223

23B0160-09 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/07/2023 16:10
Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 14:55

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-09 E
Preparation Batch: BLB0244 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0778	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*101*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW27-0223

23B0160-09 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/07/2023 16:10

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-09 A 01

Preparation Batch: BLB0482 — Sample Size: 25 mL

Prepared: 02/20/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	5	0.180	9.77	mg/L	D
Manganese	7439-96-5	5	0.00250	0.369	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW27-0223

23B0160-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/07/2023 16:10

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 20:22

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-10 A 02

Preparation Batch: BLB0537 — Sample Size: 25 mL

Prepared: 02/21/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	3.70	ug/L	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW61-0223

23B0160-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/07/2023 12:00
Instrument: NT2 Analyst: LH — Analyzed: 02/08/2023 15:21

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-11 B
Preparation Batch: BLB0184 — Sample Size: 10 mL
Prepared: 02/08/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*108*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW61-0223

23B0160-11 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/07/2023 12:00
Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 15:17

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0160-11 E
Preparation Batch: BLB0244 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0482	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*100*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW61-0223

23B0160-11 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/07/2023 12:00
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 18:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-11 A 01
Preparation Batch: BLB0482 — Sample Size: 25 mL
Prepared: 02/20/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	26.8	mg/L	D
Manganese	7439-96-5	20	0.0100	1.77	mg/L	D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

SPL-GW-MW61-0223

23B0160-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/07/2023 12:00

Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 20:36

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0160-12 A

Preparation Batch: BLB0537 — Sample Size: 25 mL

Prepared: 02/21/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	ND	ug/L	U

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLB0184 - EPA 8260D

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0184-BLK2)				Prepared: 08-Feb-2023		Analyzed: 08-Feb-2023 08:49				
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.96		ug/L	*5.00*		*99.2*	*80-129*			
LCS (BLB0184-BS2)				Prepared: 08-Feb-2023		Analyzed: 08-Feb-2023 07:05				
cis-1,2-Dichloroethene	10.7	0.20	ug/L	10.0		107	80-121			
Surrogate: 1,2-Dichloroethane-d4	4.96		ug/L	*5.00*		*99.3*	*80-129*			
LCS Dup (BLB0184-BSD2)				Prepared: 08-Feb-2023		Analyzed: 08-Feb-2023 07:46				
cis-1,2-Dichloroethene	10.7	0.20	ug/L	10.0		107	80-121	0.01	30	
Surrogate: 1,2-Dichloroethane-d4	4.93		ug/L	*5.00*		*98.6*	*80-129*			
Matrix Spike (BLB0184-MS1)	**Source: 23B0160-03**			Prepared: 08-Feb-2023		Analyzed: 08-Feb-2023 17:28				
cis-1,2-Dichloroethene	12.0	0.20	ug/L	10.0	ND	120	80-121			
Surrogate: 1,2-Dichloroethane-d4	5.10		ug/L	*5.00*	*5.37*	*102*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BLB0184-MSD1)	**Source: 23B0160-03**			Prepared: 08-Feb-2023		Analyzed: 08-Feb-2023 17:48				
cis-1,2-Dichloroethene	11.6	0.20	ug/L	10.0	ND	116	80-121	3.62	30	
Surrogate: 1,2-Dichloroethane-d4	5.10		ug/L	*5.00*	*5.37*	*102*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLB0244 - EPA 8260D-SIM

Instrument: NT16 Analyst: KOTT

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0244-BLK1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 11:41						
Vinyl chloride	ND	0.0200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5020		ug/L	*5000*		*100*	*80-129*			
LCS (BLB0244-BS1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 09:46						
Vinyl chloride	2.07	0.0200	ug/L	2.00		103	62-141			
Surrogate: 1,2-Dichloroethane-d4	4920		ug/L	*5000*		*98.4*	*80-129*			
LCS Dup (BLB0244-BSD1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 10:29						
Vinyl chloride	1.92	0.0200	ug/L	2.00		96.2	62-141	7.32	30	
Surrogate: 1,2-Dichloroethane-d4	4820		ug/L	*5000*		*96.4*	*80-129*			
Matrix Spike (BLB0244-MS1)	**Source: 23B0160-03**			Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 12:23						
Vinyl chloride	1.96	0.0200	ug/L	2.00	0.0484	95.4	62-141			
Surrogate: 1,2-Dichloroethane-d4	4870		ug/L	*5000*	*4960*	*97.4*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BLB0244-MSD1)	**Source: 23B0160-03**			Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 12:44						
Vinyl chloride	2.01	0.0200	ug/L	2.00	0.0484	98.1	62-141	2.66	30	
Surrogate: 1,2-Dichloroethane-d4	4870		ug/L	*5000*	*4960*	*97.4*	*80-129*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLB0482 - EPA 6020B

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BLB0482-DUP3)		**Source: 23B0160-03**			Prepared: 20-Feb-2023	Analyzed: 24-Feb-2023 19:50					
Manganese	55	1.69	0.0100	mg/L		1.76			3.82	20	D
Matrix Spike (BLB0482-MS3)		**Source: 23B0160-03**			Prepared: 20-Feb-2023	Analyzed: 24-Feb-2023 19:54					
Manganese	55	1.63	0.0100	mg/L	0.0250	1.76	-529	75-125			HC, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0482-BLK1)					Prepared: 20-Feb-2023	Analyzed: 20-Feb-2023 16:53					
Manganese	55	ND	0.000500	mg/L							U
Blank (BLB0482-BLK2)					Prepared: 20-Feb-2023	Analyzed: 22-Feb-2023 17:25					
Iron	54	ND	0.0360	mg/L							U
Iron	57	ND	0.0360	mg/L							U
LCS (BLB0482-BS1)					Prepared: 20-Feb-2023	Analyzed: 20-Feb-2023 16:57					
Manganese	55	0.0265	0.000500	mg/L	0.0250		106	80-120			
LCS (BLB0482-BS2)					Prepared: 20-Feb-2023	Analyzed: 22-Feb-2023 17:30					
Iron	54	5.08	0.0360	mg/L	5.00		102	80-120			
Iron	57	5.22	0.0360	mg/L	5.00		104	80-120			
Duplicate (BLB0482-DUP2)		**Source: 23B0160-03**			Prepared: 20-Feb-2023	Analyzed: 22-Feb-2023 18:40					
Iron	54	22.0	0.0720	mg/L		22.2			0.88	20	D
Matrix Spike (BLB0482-MS2)		**Source: 23B0160-03**			Prepared: 20-Feb-2023	Analyzed: 22-Feb-2023 18:45					
Iron	54	25.1	0.0720	mg/L	5.00	22.2	58.3	75-125			HC, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BLB0537 - EPA 6020B UCT-KED

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0537-BLK1)					Prepared: 21-Feb-2023 Analyzed: 21-Feb-2023 21:22						
Arsenic, Dissolved	75a	ND	0.200	ug/L							U
LCS (BLB0537-BS1)					Prepared: 21-Feb-2023 Analyzed: 21-Feb-2023 21:27						
Arsenic, Dissolved	75a	24.5	0.200	ug/L	25.0		97.9	80-120			
Duplicate (BLB0537-DUP1)		**Source: 23B0160-04**			Prepared: 21-Feb-2023 Analyzed: 22-Feb-2023 08:06						
Arsenic, Dissolved	75a	ND	0.200	ug/L		ND					L, U
Matrix Spike (BLB0537-MS1)		**Source: 23B0160-04**			Prepared: 21-Feb-2023 Analyzed: 22-Feb-2023 08:12						
Arsenic, Dissolved	75a	24.7	0.200	ug/L	25.0	ND	98.7	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
EPA 6020B UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC
EPA 8260D in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE
1,2-Dichloroethane	NELAP,WADOE
Benzene	NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	28-Feb-2023 11:16

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, LLC
Analytical Chemists and Consultants
Tukwila, WA

16 March 2023

Jeff Neuner
Seattle Public Utilities
700-5th Ave, Ste 4900, Box 34018
Seattle, WA 98124-4018

RE: South Park Landfill -Parametrix Water (553-155-067)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
23B0182	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Shelly Fishel, Project Manager

Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23B0182	Turn-around Requested: 2 weeks	Date: 2/8/23	
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 1	
Client Contact: Laura Lee	Phone: 206 394-3665	No. of Coolers: Cooler Temps: 5 8	
Client Project Name: SPU South Park Landfill			
	Samplers: Chris Bourgeois HWA		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**					Notes/Comments
					Analysis Requested									
SPL-GW-MW12-0223	2/8/23	915	water	8	X		X	X	X					
SPL-GW-MW14-0223	2/8/23	1165	water	7	X		X	X						
~~SPL-GW-MW29-0223~~			~~water~~	~~7~~	~~X~~		~~X~~	~~X~~						
~~SPL-GW-MW18-0223~~			~~water~~	~~14~~	~~X~~		~~X~~	~~X~~	~~X~~					~~MS/MSD~~
~~SPL-GW-MW32-0223~~			~~water~~	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW33-0223~~			~~water~~	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW10-0223~~			~~water~~	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW60-0223~~			~~water~~	~~8~~	~~X~~		~~X~~	~~X~~	~~X~~					
~~SPL-GW-MW80-0223~~			~~water~~	~~2~~		~~X~~	~~X~~							

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Nicole Kapise	Printed Name: Phillip Bates	Printed Name:	Printed Name:
	Company: HWA	Company: AR	Company:	Company:
	Date & Time: 2/8/23 13:43	Date & Time: 2/8/23 13:43	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SPL-GW-MW12-0223	23B0182-01	Water	08-Feb-2023 09:15	08-Feb-2023 13:43
SPL-GW-MW12-0223	23B0182-02	Water	08-Feb-2023 09:15	08-Feb-2023 13:43
SPL-GW-MW14-0223	23B0182-03	Water	08-Feb-2023 11:05	08-Feb-2023 13:43

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

Work Order Case Narrative

Client: Seattle Public Utilities
Project: South Park Landfill -Parametrix Water
Project Number: 553-155-067
Work Order: 23B0182

Revised Report - March 16, 2023

This report was revised to clarify the Manganese method blank detection.

Sample receipt

Sample(s) as listed on the preceding page were received 08-Feb-2023 13:43 under ARI work order 23B0182. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD)

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

were within control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits. Manganese was detected between 1/2 the reporting limit and the reporting limit. As the samples are reported to the reporting limit, the method blank result is reported as a non-detect at the reporting limit. The sample concentrations are greater than 10X the blank detection and is therefore the method blank detection is considered insignificant. All samples which contain analyte have been flagged with a "B" qualifier.

The blank spike (BS/LCS) percent recoveries were within control limits.

WORK ORDER

23B0182

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Seattle Public Utilities **Project Manager:** Shelly Fishel

Project: South Park Landfill -Parametrix Water **Project Number:** 553-155-067

Preservation Confirmation

Container ID	Container Type	pH
23B0182-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
23B0182-01 B	VOA Vial, Clear, 40 mL, HCL	
23B0182-01 C	VOA Vial, Clear, 40 mL, HCL	
23B0182-01 D	VOA Vial, Clear, 40 mL, HCL	
23B0182-01 E	VOA Vial, Clear, 40 mL	
23B0182-01 F	VOA Vial, Clear, 40 mL	
23B0182-01 G	VOA Vial, Clear, 40 mL	
23B0182-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass
23B0182-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
23B0182-03 B	VOA Vial, Clear, 40 mL, HCL	
23B0182-03 C	VOA Vial, Clear, 40 mL, HCL	
23B0182-03 D	VOA Vial, Clear, 40 mL, HCL	
23B0182-03 E	VOA Vial, Clear, 40 mL	
23B0182-03 F	VOA Vial, Clear, 40 mL	
23B0182-03 G	VOA Vial, Clear, 40 mL	

IB
Preservation Confirmed By

2/8/23
Date

Reviewed By

Date

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Seattle Public Utilities

Project Name: South Park landfill W/ Parametrix

COC No(s): ______ NA

Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: ______

Assigned ARI Job No: 23B0182

Tracking No: ______ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 13:43 — 5.8

If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID#: 30097708

Cooler Accepted by: PIB Date: 2/8/23 Time: 13:43

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other: ______			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
How were bottles sealed in plastic bags?	Individually	(Grouped)	Not
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	(YES)	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)	______	

Were the sample(s) split by ARI? (NA) YES Date/Time: ______ Equipment: ______ Split by: ______

Samples Logged by: PIB Date: 2/8/23 Time: 16:03 Labels checked by: ______

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

0016F
01/17/2018

Cooler Receipt Form

Revision 014A

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

SPL-GW-MW12-0223
23B0182-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/08/2023 09:15
Instrument: NT2 Analyst: LH — Analyzed: 02/09/2023 11:02

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0182-01 B
Preparation Batch: BLB0229 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*104*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

SPL-GW-MW12-0223

23B0182-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/08/2023 09:15

Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 15:38

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0182-01 E

Preparation Batch: BLB0244 — Sample Size: 10 mL

Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*103*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

SPL-GW-MW12-0223

23B0182-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/08/2023 09:15
Instrument: ICPMS2 Analyst: MCB — Analyzed: 02/22/2023 17:51

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0182-01 A 01
Preparation Batch: BLB0530 — Sample Size: 25 mL
Prepared: 02/21/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	0.0720	ND	mg/L	U
Manganese	7439-96-5	1	0.000500	0.0200	mg/L	B

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

SPL-GW-MW12-0223

23B0182-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED — Sampled: 02/08/2023 09:15
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/23/2023 15:53

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0182-02 A 01
Preparation Batch: BLB0447 — Sample Size: 25 mL
Prepared: 02/16/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.287	ug/L	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

SPL-GW-MW14-0223

23B0182-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/08/2023 11:05
Instrument: NT2 Analyst: LH — Analyzed: 02/09/2023 11:22

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0182-03 B
Preparation Batch: BLB0229 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*105*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

SPL-GW-MW14-0223

23B0182-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/08/2023 11:05
Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 15:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0182-03 E
Preparation Batch: BLB0244 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*103*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

SPL-GW-MW14-0223

23B0182-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 02/08/2023 11:05
Instrument: ICPMS1 Analyst: MCB — Analyzed: 02/24/2023 19:26

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23B0182-03 A 01
Preparation Batch: BLB0530 — Sample Size: 25 mL
Prepared: 02/21/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	3.97	mg/L	D
Manganese	7439-96-5	10	0.00500	0.851	mg/L	B, D

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLB0229 - EPA 8260D

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0229-BLK1)				Prepared: 09-Feb-2023	Analyzed: 09-Feb-2023 08:58					
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.95		ug/L	*5.00*		*98.9*	*80-129*			
LCS (BLB0229-BS1)				Prepared: 09-Feb-2023	Analyzed: 09-Feb-2023 06:54					
cis-1,2-Dichloroethene	11.2	0.20	ug/L	10.0		112	80-121			
Surrogate: 1,2-Dichloroethane-d4	5.10		ug/L	*5.00*		*102*	*80-129*			
LCS Dup (BLB0229-BSD1)				Prepared: 09-Feb-2023	Analyzed: 09-Feb-2023 08:16					
cis-1,2-Dichloroethene	11.2	0.20	ug/L	10.0		112	80-121	0.28	30	
Surrogate: 1,2-Dichloroethane-d4	5.16		ug/L	*5.00*		*103*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLB0244 - EPA 8260D-SIM

Instrument: NT16 Analyst: KOTT

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0244-BLK1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 11:41						
Vinyl chloride	ND	0.0200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5020		ug/L	*5000*		*100*	*80-129*			
LCS (BLB0244-BS1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 09:46						
Vinyl chloride	2.07	0.0200	ug/L	2.00		103	62-141			
Surrogate: 1,2-Dichloroethane-d4	4920		ug/L	*5000*		*98.4*	*80-129*			
LCS Dup (BLB0244-BSD1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 10:29						
Vinyl chloride	1.92	0.0200	ug/L	2.00		96.2	62-141	7.32	30	
Surrogate: 1,2-Dichloroethane-d4	4820		ug/L	*5000*		*96.4*	*80-129*			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLB0530 - EPA 6020B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0530-BLK1)				Prepared: 21-Feb-2023 Analyzed: 21-Feb-2023 17:30							
Manganese	55	ND	0.000500	mg/L							U
Blank (BLB0530-BLK2)				Prepared: 21-Feb-2023 Analyzed: 22-Feb-2023 17:35							
Iron	54	ND	0.0360	mg/L							U
LCS (BLB0530-BS1)				Prepared: 21-Feb-2023 Analyzed: 21-Feb-2023 17:35							
Manganese	55	0.0257	0.000500	mg/L	0.0250		103	80-120			B
LCS (BLB0530-BS2)				Prepared: 21-Feb-2023 Analyzed: 22-Feb-2023 17:40							
Iron	54	5.17	0.0360	mg/L	5.00		103	80-120			
Duplicate (BLB0530-DUP1)			**Source: 23B0182-01**	Prepared: 21-Feb-2023 Analyzed: 21-Feb-2023 22:59							
Manganese	55	0.0196	0.000500	mg/L		0.0200			2.18	20	B
Duplicate (BLB0530-DUP2)			**Source: 23B0182-01**	Prepared: 21-Feb-2023 Analyzed: 22-Feb-2023 17:57							
Iron	54	ND	0.0720	mg/L		ND					U, D
Matrix Spike (BLB0530-MS1)			**Source: 23B0182-01**	Prepared: 21-Feb-2023 Analyzed: 21-Feb-2023 23:05							
Manganese	55	0.0406	0.000500	mg/L	0.0250	0.0200	82.2	75-125			B

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BLB0530-MS2)			**Source: 23B0182-01**	Prepared: 21-Feb-2023 Analyzed: 22-Feb-2023 18:02							
Iron	54	4.84	0.0720	mg/L	5.00	ND	95.9	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BLB0447 - EPA 6020B UCT-KED

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0447-BLK1)				Prepared: 16-Feb-2023 Analyzed: 20-Feb-2023 19:01							
Arsenic, Dissolved	75a	ND	0.200	ug/L							U
LCS (BLB0447-BS1)				Prepared: 16-Feb-2023 Analyzed: 20-Feb-2023 19:05							
Arsenic, Dissolved	75a	22.7	0.200	ug/L	25.0		90.7	80-120			

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
EPA 6020B UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC
EPA 8260D in Water	
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
EPA 8260D-SIM in Water	
Vinyl chloride	NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	16-Mar-2023 14:35

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, LLC
Analytical Chemists and Consultants

14 February 2023

Jeff Neuner
Seattle Public Utilities
700-5th Ave, Ste 4900, Box 34018
Seattle, WA 98124-4018

RE: South Park Landfill -Parametrix Water (553-155-067)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
23B0183	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Shelly Fishel, Project Manager

Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23B0183	Turn-around Requested: 2 weeks	Date: 2/8/2023
ARI Client Company: Jeff Neuner, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 1
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers: Cooler Temps: 5; 8
Client Project Name: SPU South Park Landfill		
Client Project #: 553-1550-067	Samplers: Chris Bourgeois HWA	

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	Number of Containers	Analysis Requested: cis-1,2-DCE	cis-1,2-DCE, benzene	Vinyl Chloride	Total Fe, Mn	Dissolved As**					Notes/Comments
SPL-GW-MW25-0223			water	8		X	X	X	X					**Field-filtered
SPL-GW-MW30-0223			water	7	X		X	X						
SPL-GW-MW31-0223			water	7	X		X	X						
SPL-GW-MW24-0223			water	14	X		X	X	X					MS/MSD
SPL-GW-MW26-0223			water	8	X		X	X	X					
SPL-GW-MW08-0223			water	8	X		X	X	X					
SPL-GW-MW27-0223			water	8	X		X	X	X					
SPL-GW-MW61-0223			water	8	X		X	X	X					
SPL-GW-MW81-0223	2/8/23		water	2		X	X							

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Nicole Kapise	Printed Name: Phillip Bates	Printed Name:	Printed Name:
	Company: HWA	Company: AR	Company:	Company:
	Date & Time: 2/8/23 13:43	Date & Time: 2/8/23 13:43	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by work order or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	14-Feb-2023 10:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SPL-GW-MW81-0223	23B0183-01	Water	08-Feb-2023 00:00	08-Feb-2023 13:43

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	14-Feb-2023 10:52

Work Order Case Narrative

Client: Seattle Public Utilities
Project: South Park Landfill -Parametrix Water
Work Order: 23B0183

Sample receipt

One sample as listed on the preceding page was received 08-Feb-2023 13:43 under ARI work order 23B0183. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Seattle Public Utilities Project Name: South Park Landfill W/ Leachate Mix

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 23B0183 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 13:43 5.8

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 70070703

Cooler Accepted by: PIB Date: 2/8/23 Time: 13:43

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		_____

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: PIB Date: 2/8/23 Time: 1621 Labels checked by: _____

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

no sampling time provided

By: PIB Date: 2/8/23

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
700-5th Ave, Ste 4900, Box 34018	Project Number: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Jeff Neuner	14-Feb-2023 10:52

SPL-GW-MW81-0223

23B0183-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 02/08/2023 00:00

Instrument: NT2 Analyst: LH — Analyzed: 02/09/2023 11:43

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0183-01 A

Preparation Batch: BLB0229 — Sample Size: 10 mL

Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*106*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*97.1*	*%*	

Seattle Public Utilities	Project: South Park Landfill -Parametrix Water	
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Seattle WA, 98124-4018	Project Manager: Jeff Neuner	14-Feb-2023 10:52

SPL-GW-MW81-0223

23B0183-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 02/08/2023 00:00
Instrument: NT16 Analyst: KOTT — Analyzed: 02/09/2023 16:21

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23B0183-01 B
Preparation Batch: BLB0244 — Sample Size: 10 mL
Prepared: 02/09/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*102*	*%*	

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Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLB0229 - EPA 8260D

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0229-BLK1)				Prepared: 09-Feb-2023	Analyzed: 09-Feb-2023 08:58					
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.95		ug/L	*5.00*		*98.9*	*80-129*			
Surrogate: Toluene-d8	4.88		ug/L	*5.00*		*97.7*	*80-120*			
LCS (BLB0229-BS1)				Prepared: 09-Feb-2023	Analyzed: 09-Feb-2023 06:54					
cis-1,2-Dichloroethene	11.2	0.20	ug/L	10.0		112	80-121			
Benzene	11.4	0.20	ug/L	10.0		114	80-120			
Surrogate: 1,2-Dichloroethane-d4	5.10		ug/L	*5.00*		*102*	*80-129*			
Surrogate: Toluene-d8	4.97		ug/L	*5.00*		*99.3*	*80-120*			
LCS Dup (BLB0229-BSD1)				Prepared: 09-Feb-2023	Analyzed: 09-Feb-2023 08:16					
cis-1,2-Dichloroethene	11.2	0.20	ug/L	10.0		112	80-121	0.28	30	
Benzene	11.6	0.20	ug/L	10.0		116	80-120	1.86	30	
Surrogate: 1,2-Dichloroethane-d4	5.16		ug/L	*5.00*		*103*	*80-129*			
Surrogate: Toluene-d8	4.98		ug/L	*5.00*		*99.6*	*80-120*			

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Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLB0244 - EPA 8260D-SIM

Instrument: NT16 Analyst: KOTT

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0244-BLK1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 11:41						
Vinyl chloride	ND	0.0200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5020		ug/L	*5000*		*100*	*80-129*			
LCS (BLB0244-BS1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 09:46						
Vinyl chloride	2.07	0.0200	ug/L	2.00		103	62-141			
Surrogate: 1,2-Dichloroethane-d4	4920		ug/L	*5000*		*98.4*	*80-129*			
LCS Dup (BLB0244-BSD1)				Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 10:29						
Vinyl chloride	1.92	0.0200	ug/L	2.00		96.2	62-141	7.32	30	
Surrogate: 1,2-Dichloroethane-d4	4820		ug/L	*5000*		*96.4*	*80-129*			

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Certified Analyses included in this Report

Analyte	Certifications
EPA 8260D in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE

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2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

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EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE
1,2-Dichloroethane	NELAP,WADOE
Benzene	NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023

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Notes and Definitions

*	Flagged value is not within established control limits.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.