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SENT VIA EMAIL

July 20, 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 Second Quarter 2023 Progress Report

Dear Julia:

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

General Activities During the 2023 Second 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.

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.

Overall Settlement Parcels

- The 2023 second quarter compliance monitoring was completed. SPU staff conducted the gas monitoring and the Parametrix team conducted the groundwater monitoring.
- Parametrix reviewed field measurements and completed data management for the 2023 second quarter compliance monitoring events.
- The 2023 annual cap inspection was conducted in April by Parametrix.
- The City of Seattle outreach program cleared the homeless encampment from the right-of-way (ROW) containing gas probe GP-09 and groundwater wells MW-10 and MW-25. The ROW was cleaned of debris and fencing was installed around the perimeter.

Deviations from Samples, Required Tasks, CAP, or Schedule

The Cleanup Action Plan states that *if benzene remains in compliance in MW-25 for 2 years (eight additional quarters), benzene analysis would be terminated.* Benzene has been monitored in compliance well MW-25 for 11 events beginning in the second quarter of 2020 through the second quarter of 2023. All results in that time period (0.24 to 3.99 µg/L) are below the cleanup level (5 µg/L) as depicted in the attached time series plot. Monitoring for benzene will be terminated for benzene beginning in the 3rd quarter of 2023.

Data Summary

The perimeter gas probes were monitored on April 25, 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	0.1%	No	Below trigger values
GP-29	0.1%	No	Below trigger values

The groundwater wells were monitored from May 1 through 3, 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 and updated time-series plots, and the final lab reports for the 2023 second quarter are included as attachments to this progress report.

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

Upcoming Activities

SRDS Property

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

CenterPoint Property

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

Overall Settlement Parcels

- Complete the third quarter 2023 compliance monitoring.
- Investigate replacement of shallow perimeter compliance gas probes that are consistently blocked with water. A work plan for the installation of these gas probes is being prepared by Parametrix and will be submitted to Ecology for approval.

- The 2023 annual cap inspection report will be finalized and submitted to the property owners and Ecology for review.

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

Sincerely,

PARAMETRIX

Laura B. Lee
Project Manager

cc: Ryan Gardiner, Ecology
Mark Jusayan, SPU Solid Waste Capital Planning and Landfill Closure Program Manager
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 and Groundwater Compliance Monitoring Field Sheets, Second Quarter 2023

2 – Groundwater Quality Data Summary, Second Quarter 2023

3 – Groundwater Quality Time Series Plots through Second Quarter 2023

4 – Second Quarter 2023 Groundwater Laboratory Data

Attachment 1

LFG Compliance Monitoring Field Sheets
Second Quarter 2023

Final Probe Report for South Park Landfill

Probe	Date	Technician	CH4 PPM	O2 %	CO2 %	SP In/Wc	Blocked	BPS	Comment
GP03	4/25/2023	TS, WY	0	13.5	4.4	0.1	N	30.34	
GP07	4/25/2023	TS, WY	0	18.7	1.9	0.1	N	30.34	
GP09	4/25/2023	TS, WY	0	12.6	7.5	0.1	N	30.34	
GP11	4/25/2023	TS, WY	0	21.0	0.8	0.0	Y	30.34	
GP13	4/25/2023	TS, WY	0	17.7	2.9	-14.6	Y	30.34	
GP15	4/25/2023	TS, WY	0	20.8	1.2	1.3	N	30.34	
GP16	4/25/2023	TS, WY	0	21.2	0.4	0.0	N	30.34	
GP23	4/25/2023	TS, WY	0	18.8	2.2	0.0	N	30.34	
GP26	4/25/2023	TS, WY	0	19.5	1.7	0.1	N	30.34	
GP27	4/25/2023	TS, WY	1000	0.0	8.5	0.1	N	30.34	
GP28	4/25/2023	TS, WY	0	21.5	0.0	0.1	N	30.34	
GP29	4/25/2023	TS, WY	1000	0.1	12.7	0.1	N	30.34	
GP31	4/25/2023	TS, WY	0	17.4	1.9	0.2	N	30.34	
GP32	4/25/2023	TS, WY	0	13.5	1.1	0.5	Y	30.34	
GP33	4/25/2023	TS, WY	0	20.1	1.1	-0.1	N	30.34	
GP37	4/25/2023	TS, WY	0	6.4	7.7	0.0	N	30.34	
GP38	4/25/2023	TS, WY	0	4.5	11.9	0.1	N	30.34	

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

Water Level Measurement Field Report

DATE 5/1/23	JOB NO. 553-1550-067	
PROJECT: South Park Landfill	CLIENT: Seattle Public Utilities	
LOCATION: Seattle, WA		
WEATHER Overcast	TEMP 50's °at 8:00 AM 50's °at 13:00 PM	
PRESENT AT SITE N. Johnson & C. Bourgeois		

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	1152	5.69		TOC	15.3	10-15	1.52
MW-14	1157	2.52		TOC	21.8	11.5-21.5	0.8
MW-29	1204	6.86		TOC	30	20-30	-0.29
MW-18	12:12	14.70		TOC	40.4	30-40	1.25
MW-25	823	13.25		TOC	27	22-27	2.79
MW-32	1225	10.16		TOC	24	19-24	-0.44
MW-33	1240	10.29		TOC	25	20-25	-0.47
MW-26	1133	9.03		TOC	25	15-25	2.39
MW-27	1140	7.72		TOC	20	10-20	2.04
MW-10	819	12.60'		TOC	45	35-45	1.65
MW-24	1130	8.25		TOC	45.3	35-45	1.56
MW-08	1135	7.72		TOC	45.6	35.5 – 45.5	1.88
* MW-30	1118	9.59		TOC	13	8-13	-0.53
MW-31	1115	10.40		TOC	23	35.5-45.5	-0.46

Comments:

* hundreds of small black sugar ~~ants~~ ants in and around monument. on (but not inside of) well casing. Ants carrying small white material

TOC – top of PVC casing SG – staff gauge

SIGNED: _____

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/2/23 Well ID: MW-08

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

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

Initial Depth of Water (Ft below TOC): 7.70 Purge Water Disposal Method: O/WS

Purge Device peristaltic Pump Intake Depth: 40.0 ft

Begin Purge Time: 1330 End Purge Time: 1440

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate 300	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1335	7.73	2.5	~~350~~	2.00	12.7	1.9	760	6.68	-54.7	6.75	Clear,
1340	7.73	"	"	3.25	12.7	0.6	1039	6.63	-79.2	9.69	turbidity
1345	7.73	"	"	4.50	12.7	0.3	1118	6.67	-89.5	4.47	abundant
1350	7.73	"	"	5.75	12.8	0.2	1126	6.67	-94.9	51.8	
1355	7.73	"	"	7.00	12.7	0.2	1142	6.68	-98.5	22.8	
1400	7.73	2.25	230	8.00	13.0	0.1	1134	6.67	-102.1	30.7	coarse
1405	7.73	"	"	9.00	13.1	0.1	1134	6.66	-103.4	123	turbidity
1410	7.73	"	"	10.00	13.0	0.1	1139	6.67	-104.7	5.57	Clear
1415	7.73	"	"	11.00	13.0	0.1	1136	6.67	-105.5	4.39	
1420	7.73	"	"	12.00	13.0	0.1	1141	6.67	-106.6	11.9	Turbidity
1425	7.73	"	"	13.00	13.0	0.1	1136	6.73	-107.3	8.34	
1430	7.73	"	"	14.00	13.0	0.1	1139	6.73	-107.9	3.60	Clear
1435	7.73	"	"	15.00	13.0	0.1	1142	6.69	-107.1	3.62	
1440	7.73	"	"	16.00	13.0	0.1	1139	6.70	-106.9	4.75	
Stabilization Criteria					3%	10% , or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW08-0523 Time Collected: 1445 Weather: Sunny, warm

Sample Description (Color, Turbidity, Odor, Other): Clear w/ turbidity (very large, orange)

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

sporadic large orange turbidity
used peristaltic and left 43' of ~~tub~~ tubing

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/1/23 Well ID: MW-10

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

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

Initial Depth of Water (Ft below TOC): 12.60 Purge Water Disposal Method: O/WS

Purge Device peristaltic Pump Intake Depth: 40.0 ft

Begin Purge Time: 825 End Purge Time: 940

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (mL/min)	Cum. Vol. Purged (L)	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
830	12.48	2.5	250	1.75	13.6	0.6	1422	2.36	113.8	39.6	Froth in bucket.
835	12.48	"	"	3.0	13.6	0.4	1416	2.92	82.7	10.8	No odor
840	12.47	"	"	4.0	13.6	0.4	1440	3.33	57.3	6.85	
845	12.47	"	"	5.0	13.6	0.3	1460	3.60	39.2	3.34	
850	12.47	"	"	6.25	13.7	0.3	1464	3.94	17.6	2.56	
855	12.47	"	"	6.75	13.7	0.2	1472	4.31	-3.7	2.05	
900	12.47	"	"	7.75	13.7	0.2	1474	4.61	-20.1	2.01	
905	12.47	"	"	10.0	13.7	0.2	1480	4.96	-39.9	1.51	
910	12.47	"	"	11.0	13.7	0.2	1490	5.12	-49.5	1.44	
915	12.47	"	"	12.5	13.7	0.2	1495	5.35	-62.7	1.44	
920	12.47	"	"	13.75	13.7	0.2	1499	5.51	-72.6	1.37	
925	12.47	"	"	14.5	13.7	0.2	1499	5.71	-83.5	1.11	
930	12.47	"	"	15.5	13.7	0.2	1502	5.89	-93.6	1.19	
935	12.47	"	"	16.5	13.7	0.2	1504	5.94	-96.7	0.91	
940	12.47	"	"	17.5	13.7	0.3	1506	6.06	-102.7	0.88	
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW10-0523 Time Collected: 9:50 Weather: Overcast, 50's

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:

MS/MSD Collected: ☐ Yes ■ No

Additional Information/Comments

pH readings very low. calibration was verified by vendor 4/25/23

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/3/2023 Well ID: MW-12

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

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

Initial Depth of Water (Ft below TOC): 5.78 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 12.5 ft

Begin Purge Time: 826 End Purge Time: 910

Time	Depth to Water (feet below MP)	Pump Setting psi	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	5.77	5	225	2.1	11.7	1.8	432.0	6.31	67.7	5.63	slight yellow hue
840	5.77	"	"	3.2	11.2	1.6	436.6	6.30	60.9	6.00	
845	5.77	"	"	4.1	11.2	1.1	439.0	6.31	53.8	4.06	
850	5.77	"	"	5.1	11.3	0.9	439.9	6.31	48.4	2.88	clearer
855	5.77	"	"	6.0	11.3	0.8	441.3	6.32	44.4	2.36	"
900	5.77	"	"	6.9	11.4	0.7	441.3	6.32	43.4	2.60	"
905	5.77	"	"	7.8	11.4	0.7	441.2	6.32	41.5	2.53	"
910	5.77	"	less?	8.2	11.5	0.7	440.7	6.32	40.1	2.02	"
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW12-0523 Time Collected: 928 Weather: Sunny, warm

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

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

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

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

flow noticeably reduced at 910. Increased pump/flow rate to ~250 then sampled

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/3/23 Well ID: MW-14

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

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

Initial Depth of Water (Ft below TOC): 2.56 Purge Water Disposal Method: O/WS

Purge Device dedicated bladder pump Pump Intake Depth: 16.5 ft

Begin Purge Time: 1220 End Purge Time: 1315

Time	Depth to Water (feet below MP)	Pump Setting (psi)	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1225	2.64	9	250	1.8	13.8	1.7	564.9	6.83	-29.2	569	v. turbid
1230	2.64	"	"	3.5	13.4	0.5	509.3	6.69	-47.9	117	↑ less
1235	2.65	"	"	4.2	13.5	0.4	494.4	6.66	-46.1	71.6	
1240	2.65	"	"	5.0	13.4	0.2	486.3	6.64	-45.3	49.3	
1245	2.65	"	"	6.1	13.4	0.2	482.4	6.63	-45.5	25.9	clear, visual
1250	2.64	"	"	7.75	13.4	0.1	479.8	6.62	-46.3	15.4	turbidity
1255	2.64	"	"	8.25	13.4	0.1	479.5	6.62	-46.9	14.3	
1300	2.64	"	"	9.25	13.3	0.1	480.0	6.62	-47.4	11.1	
1305	2.64	"	"	10.20	13.3	0.1	478.0	6.62	-47.9	8.87	
1310	2.64	"	"	11.80	13.3	0.1	478.3	6.62	-48.8	8.61	
1315	2.64	"	"	12.70	13.4	0.1	478.5	6.61	-49.1	8.14	
Stabilization Criteria					3%	10% , or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW14-0523 Time Collected: 1325 Weather: warm, sunny

Sample Description (Color, Turbidity, Odor, Other): clear, very 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: 5/3/23 Well ID: MW-18

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

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

Initial Depth of Water (Ft below TOC): 14.72 Purge Water Disposal Method: O/WS

Purge Device: dedicated bladder pump Pump Intake Depth: 35.0 ft

Begin Purge Time: 9:44 End Purge Time: 1020

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
950	14.73	20	250	1.00	14.5	2.9	815	6.57	28.7	2.94	Clear
955	14.73	"	"	2.00	14.4	1.0	822	6.58	-18.7	4.67	Visual
1000	14.72	"	"	3.20	14.5	0.5	829	6.57	-43.3	3.12	Turbidity
1005	14.72	"	"	4.10	14.6	0.3	830	6.58	-55.6	2.14	clear.
1010	14.72	"	"	5.00	14.6	0.2	830	6.58	-62.1	2.01	
1015	14.72	"	"	6.10	14.7	0.2	830	6.58	-66.4	2.18	
1020	14.72	"	"	7.20	14.7	0.2	831	6.58	-68.2	1.57	

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

Sampling Data

Sample ID: SPL-GW-MW18-0523 Time Collected: 1030 Weather: warm, sunny

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: [struck out]

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

Recommend replacing lock

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/2/23 Well ID: MW-24

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

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

Initial Depth of Water (Ft below TOC): 8.22 Purge Water Disposal Method: O/WS

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

Begin Purge Time: 1028 End Purge Time: 1100

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
10:35	8.24	23	250	2.00	11.8	0.4	894	6.62	-38.6	4.34	Clear
10:40	8.24	"	"	3.25	11.9	0.2	870	6.63	-47.3	8.82	
1045	8.25	"	"	~~5.00~~ 4.50	11.9	0.1	876	6.63	-58.0	5.79	
1050	8.25	"	"	5.75	12.0	0.1	880	6.63	-64.0	5.36	
1055	8.26	"	"	7.00	12.1	0.1	885	6.63	-68.1	5.59	
1100	8.26	"	"	8.25	12.1	0.1	889	6.63	-71.4	~~6.15~~ 5.85	

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

Sampling Data

Sample ID: SPL-GW-MW24-0523 Time Collected: 1105 Weather: 60's, partly cloudy

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:

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

Reccomend replacing lock

Parametrix

South Park Landfill

Project No.: 553-1550-067 Date: 5/1/23 Well ID: MW-25

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

Purge Data Screened Interval (ft bgs): 22.0-27.0 Well Casing/Diameter: PVC/2 in

Initial Depth of Water (Ft below TOC): 13.25 Purge Water Disposal Method: O/WS

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

Begin Purge Time: 10:03 End Purge Time: 1030

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
10:10	13.25	15	230	6.75	13.4	1.3	1173	6.53	-71.6	1.65	clear
10:15	13.25	"	"	8.00	13.5	0.7	1197	6.52	-87.2	1.18	
10:20	13.25	"	"	8.75	13.5	0.4	1208	6.53	-94.1	1.21	
10:25	13.25	"	"	10.00	13.6	0.3	1214	6.53	-100.4	0.80	
10:30	13.25	"	"	11.00	13.6	0.2	1218	6.53	-101.8	0.82	
Stabilization Criteria					3%	10%	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW25-0523 Time Collected: 10:35 Weather: Overcast, 50's

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

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

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

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

6 liters purge volume leftover from MW10

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/12/25 Well ID: MW-26

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

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

Initial Depth of Water (Ft below TOC): 9.00 Purge Water Disposal Method: O/WS

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

Begin Purge Time: 1128 End Purge Time: 1235

Time	Depth to Water (feet below MP)	Pump Setting (psi)	Purge Rate	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1135	8.99	10	250	1.75	11.9	1.5	303.2	6.01	21.6	89.9	Yellow tint
1140	8.99	"	"	2.80	11.8	1.0	302.7	6.00	24.0	73.5	sediment
1145	8.99	"	"	4.00	11.9	0.7	292.2	5.99	25.0	53.2	turbidity
1150	8.99	"	"	5.25	11.8	0.7	283.1	5.98	25.0	34.6	
1155	8.99	"	"	6.75	11.8	0.5	287.5	5.98	25.2	17.4	
1200	8.99	"	"	8.00	11.8	0.4	281.0	5.97	24.7	12.3	much clearer
1205	8.99	"	"	9.75	11.8	0.4	281.8	5.97	24.4	9.81	
1210	8.99	"	"	11.00	11.8	0.4	283.4	5.97	24.2	7.59	
1215	8.99	"	"	12.25	11.9	0.4	284.7	5.97	24.0	5.95	
1220	8.99	"	"	13.50	11.8	0.4	286.0	5.97	24.0	5.70	
1225	8.99	"	"	14.75	11.8	0.4	286.5	5.97	23.9	5.26	
1230	8.99	"	"	16.00	11.9	0.4	286.8	5.97	23.7	4.84	4.98
1235	8.99	"	"	17.25	11.9	0.4	287.1	5.97	23.4	5.41	
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW26-0523 Time Collected: 1240 Weather: sunny & cool

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_MW61-0523 @ 1310

MS/MSD Collected: ☒ Yes ☐ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/2/23 Well ID: MW-27

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

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

Initial Depth of Water (Ft below TOC): 7.69 Purge Water Disposal Method: O/WS

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

Begin Purge Time: 1454 End Purge Time: 1610

Time	Depth to Water (feet below MP)	psi Pump Setting	ml/min. Purge Rate	liters Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1500	7.71	9	300	1.8	11.6	1.2	325.4	6.49	15.8	493	strong orange
1505	7.71	"	"	2.5	11.5	0.8	325.9	6.46	20.1	591	color
1510	7.71	"	"	3.5	11.6	0.4	354.6	6.46	8.5	450	
1515	7.71	"	"	5.0	11.6	0.3	378.6	6.46	-12.0	250	slightly
1520	7.71	"	"	6.0	11.7	0.3	399.7	6.46	-24.2	87.3	clearer
1525	7.71	"	"	7.0	11.6	0.2	411.3	6.46	-34.3	48.9	
1530	7.71	"	"	8.0	11.7	0.2	418.3	6.46	-41.1	39.3	
1535	7.71	"	"	9.1	11.7	0.2	422.1	6.46	-45.8	18.9	
1540	7.71	"	"	10.5	11.7	0.2	427.6	6.47	-51.7	18.7	
1545	7.71	"	"	11.9	11.6	0.1	430.1	6.47	-54.8	21.5	
1550	7.71	"	"	13.0	11.7	0.1	429.9	6.46	-58.2	20.0	
1555	7.71	"	"	14.0	11.6	0.1	431.6	6.47	-60.6	19.1	
1600	7.71	"	"	15.0	11.7	0.1	433.6	6.47	-64.0	13.6	
1605	7.71	"	"	16.0	11.6	0.1	434.5	6.47	-64.2	13.2	
1610	7.71	"	"	17.0	11.6	0.2	435.5	6.49	-64.0	12.3	

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

Sampling Data

Sample ID: SPL-GW-MW27-0523 Time Collected: 1620 Weather: Sunny, warm

Sample Description (Color, Turbidity, Odor, Other): clear, 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: 5/3/23 Well ID: MW-29

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

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

Initial Depth of Water (Ft below TOC): 6.34 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 25.0 ft

Begin Purge Time: 10:54 End Purge Time: 1145

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
1100	7.60	2.5	260	1.50	12.2	0.6	891	6.62	-82.3	17.8	Yellow hue
1105	7.72	"	"	3.00	12.2	0.4	888	6.61	-92.4	9.37	turbidity
1110	7.76	"	"	4.50	12.2	0.8	870	6.62	-94.6	8.44	present
1115	7.76	"	"	6.00	12.2	0.9	848	6.63	-92.3	5.23	
1120	7.76	"	"	7.50	12.2	0.9	840	6.64	-92.1	4.33	
1125	7.76	"	"	9.00	12.2	0.6	840	6.65	-94.6	2.94	
1130	7.76	"	"	10.25	12.2	0.5	843	6.65	-97.7	2.66	
1135	7.76	"	"	11.00	12.3	0.3	840	6.67	-101.8	1.74	
1140	7.76	"	"	12.50	12.2	0.2	832	6.67	-105.3	1.92	
1145	7.76	"	"	14.00	12.3	0.1	820	6.69	-108.7	1.72	
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW29-0523 Time Collected: 11 55 Weather: warm, sunny

Sample Description (Color, Turbidity, Odor, Other): clear, minor yellow hue

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

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/2/23 Well ID: MW-30

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

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

Initial Depth of Water (Ft below TOC): 9.60 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 10.5 ft

Begin Purge Time: 8:22 End Purge Time: 845

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (mL/min)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
825	9.72	2.5	300	1.50	11.3	0.9	996	6.24	72.5	13.8	clear
830	9.73	2.25	260	2.25	11.3	0.5	1008	6.23	61.8	8.53	"
835	9.73	"	"	3.25	11.3	0.4	1009	6.24	55.6	4.89	"
840	9.73	"	"	4.75	11.3	0.4	1001	6.26	51.4	4.01	"
845	9.73	"	"	6.00	11.3	0.4	995	6.27	49.4	2.47	"
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW30-0523 Time Collected: 855 Weather: overcast, low 50's

Sample Description (Color, Turbidity, Odor, Other): no odor, clear, ~~low turbidity~~ trace orange flecks.

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

~~[illegible]~~ fewer ants in monument than on 5/1/23, but there are ants in the well.

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/2/23 Well ID: MW-31

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

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

Initial Depth of Water (Ft below TOC): 10.37 Purge Water Disposal Method: O/WS

Purge Device ~~peristaltic pump~~ Dedicated. Pump Intake Depth: 20.5ft

Begin Purge Time: 9:08 End Purge Time: 955

Time	Depth to Water (feet below MP)	psi Pump Setting	mL/min Purge Rate	liters Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
9:15	10.37	15	350	2.25	13.1	0.3	489.5	6.37	-33.5	42.0	strong
9:20	10.37	13	260	4.00	13.2	0.2	493.8	6.37	-48.8	18.5	orange
9:25	10.37	"	"	4.75	13.2	0.1	494.3	6.37	-50.3		color
9:30	10.37	"	"	5.25	13.1	0.2	494.4	6.36	-51.3		
935	10.37	*2.5	300	5.5	13.1	1.8	492.2	6.37	-52.2	9.94	clear w/
940	10.40	"	300	6.25	13.1	0.2	495.2	6.36	-57.0	5.69	orange flecks
945	10.40	2.25	250	8.00	13.2	0.1	496.7	6.35	-60.6	4.58	
950	10.40	"	"	9.00	13.2	0.1	497.0	6.36	-62.6	3.15	
955	10.40	"	"	10.00	13.2	0.1	495.8	6.35	-64.6	3.59	

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

Sampling Data

Sample ID: SPL-GW_MW31-0523 Time Collected: 1010 Weather: overcast, cool.

Sample Description (Color, Turbidity, Odor, Other): abundant large orange flecks

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

Duplicate Sample Collected: ☐ Yes ☒ No If yes, ID: ~~SPL-GW_MW01-1122~~ 0523

MS/MSD Collected: ☐ Yes ☒ No

Additional Information/Comments

At 9:25, pump stopped inexplicably

Pump shut off again, switched to peristaltic @ 935. Suspect ~~&~~ the problem is from the battery. Finished purge and sampled w/ peristaltic (20.5' pump intake)

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/1/23 Well ID: MW-32

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

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

Initial Depth of Water (Ft below TOC): 10.16 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 21.5 ft

Begin Purge Time: 12:35 End Purge Time: 1310

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
45 ~~1235~~	10.18	2.5	250	1.25	13.2	1.2	520.8	6.68	36.2	5.68	Clear
1250	10.18	"	"	2.5	13.3	0.4	762	6.72	-66.5	3.93	With Turbidity
1255	10.18	"	"	3.75	13.4	0.3	817	6.73	-97.5	1.17	
1300	10.18	"	"	5.75	13.4	0.3	831	6.74	-106.0	1.84	
1305	10.18	"	"	6.75	13.4	0.2	835	6.74	-109.5	0.74	
1310	10.18	"	"	8.00	13.4	0.2	844	6.73	-112.8	0.87	
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW_MW32-0523 Time Collected: 1345 Weather: Overcast, 50's

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_MW60-0523 @ 1320

MS/MSD Collected: ☒ Yes ☐ No

Additional Information/Comments

Parametrix

GROUNDWATER SAMPLE COLLECTION FORM

South Park Landfill

Project No.: 553-1550-067 Date: 5/1/23 Well ID: MW-33

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

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

Initial Depth of Water (Ft below TOC): 10.30 Purge Water Disposal Method: O/WS

Purge Device: peristaltic pump Pump Intake Depth: 22.5ft

Begin Purge Time: 1401 End Purge Time: 1425

Time	Depth to Water (feet below MP)	Pump Setting	Purge Rate (mL/min.)	Cum. Vol. Purged	Temp (°C)	DO (mg/L)	Specific Conductivity (µS/cm)	pH (units)	ORP (mv)	Turbidity (NTU)	Comments
1405	10.30	2.5	44	<1	14.8	0.9	885	6.78	69.3	14.7	pale yellow
1410	10.30	2.5	275	1.8	14.9	0.4	1412	6.69	-97.6	2.37	hue, minor
1415	10.31	"	"	2.9	14.9	0.3	1447	6.68	-111.5	2.30	turbidity
1420	10.31	"	"	4.0	15.0	0.2	1451	6.69	-116.5	3.55	
1425		"	"	5.1	15.0	0.2	1450	6.69	-120.0	3.84	
Stabilization Criteria					3%	10%, or 3<0.5	3%	± 0.1	± 10 mv	10% or 3 <5 NTU	

Sampling Data

Sample ID: SPL-GW-MW33-0523 Time Collected: 1435 Weather: overcast, high 50's

Sample Description (Color, Turbidity, Odor, Other): pale yellow hue (minor), very little 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

One non-preserved VOA cap defective. Will likely have bubble.

Parametrix

Attachment 2

Groundwater Quality Data Summary
Second Quarter 2023

Groundwater Quality Data Summary, Second 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 5/3/23	MW-14 5/3/23	MW-29 5/3/23	MW-30 [1] 5/2/23	MW-25 5/1/23	MW-26 5/2/23	MW-61 (MW-26 Dup) 5/2/23	MW-27 [2] 5/2/23	MW-31 [1] 5/2/23	MW-32 [3] 5/1/23	MW-60 (MW-32 Dup) 5/1/23	MW-33 [3] 5/1/23	MW-08 5/2/23	MW-10 5/1/23	MW-18 [3] 5/3/23	MW-24 5/2/23	MW-80 5/1/23	MW-81 5/3/23
Field Parameters																				
Temperature	C		11.5	13.4	12.3	11.3	13.6	11.9	--	11.6	13.2	13.4	--	15.0	13.0	13.7	14.7	12.1	--	--
Dissolved Oxygen	mg/L		0.7	0.1	0.1	0.4	0.2	0.4	--	0.2	0.1	0.2	--	0.2	0.1	0.3	0.2	0.1	--	--
Specific Conductivity	µS/cm		440.7	478.5	820	995	1218	287.1	--	435.5	495.8	844	--	1450	1139	1506	831	889	--	--
pH	units		6.32	6.61	6.69	6.27	6.53	5.97	--	6.49	6.35	6.73	--	6.69	6.70	6.06	6.58	6.63	--	--
Redox	mv		40.1	-49.1	-108.7	49.4	-101.8	23.4	--	-64.0	-64.6	-112.8	--	-120.0	-106.9	-102.7	-68.2	-71.4	--	--
Turbidity	NTU		2.02	8.14	1.72	2.47	0.82	5.41	--	12.3	3.59	0.87	--	3.84	4.75	0.88	1.57	5.85	--	--
Metals																				
Iron, Total	mg/L	27 A-Zone	2.36	3.90	11.6	1.20	**31.3**	9.40	9.30	12.8	17.2	14.0	13.9	18.8	--	--	--	--	--	--
		31 B-Zone	--	--	--	--	--	--	--	--	--	--	--	--	17.6	**36.6**	13.7	13.3	--	--
Manganese, Total	mg/L	2.2	0.189	0.740	0.291	0.0520	**2.47**	0.117	0.109	0.370	0.711	1.39	1.38	1.89	0.914	**2.26**	1.07	1.29	--	--
Volatile Organic Compounds																				
Vinyl Chloride	µg/L	0.29	0.0200 U	0.0200 U	0.0200 U	0.0667	**0.562**	0.0219	0.0224	0.155	0.576 [1]	**0.339**	**0.348**	0.133	0.0850	0.151	0.0268	0.0425	0.0200 U	0.0200 U
Cis-1,2-Dichloroethene	µg/L	16	0.21	0.20 U	0.20 U	0.33	0.20 U	0.34	0.33	0.20 U	0.20 U	0.48 J	0.49	0.20 U	0.20 U	0.54	0.20 U	0.20 U	0.20 U	0.20 U
Benzene	µg/L	5.0	--	--	--	--	2.49	--	--	--	--	--	--	--	--	--	--	--	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. The associated numerical value is the approximate concentration of the analyte in the sample.

Abbreviations:

µg/L Micrograms per liter

mg/L Milligrams per liter

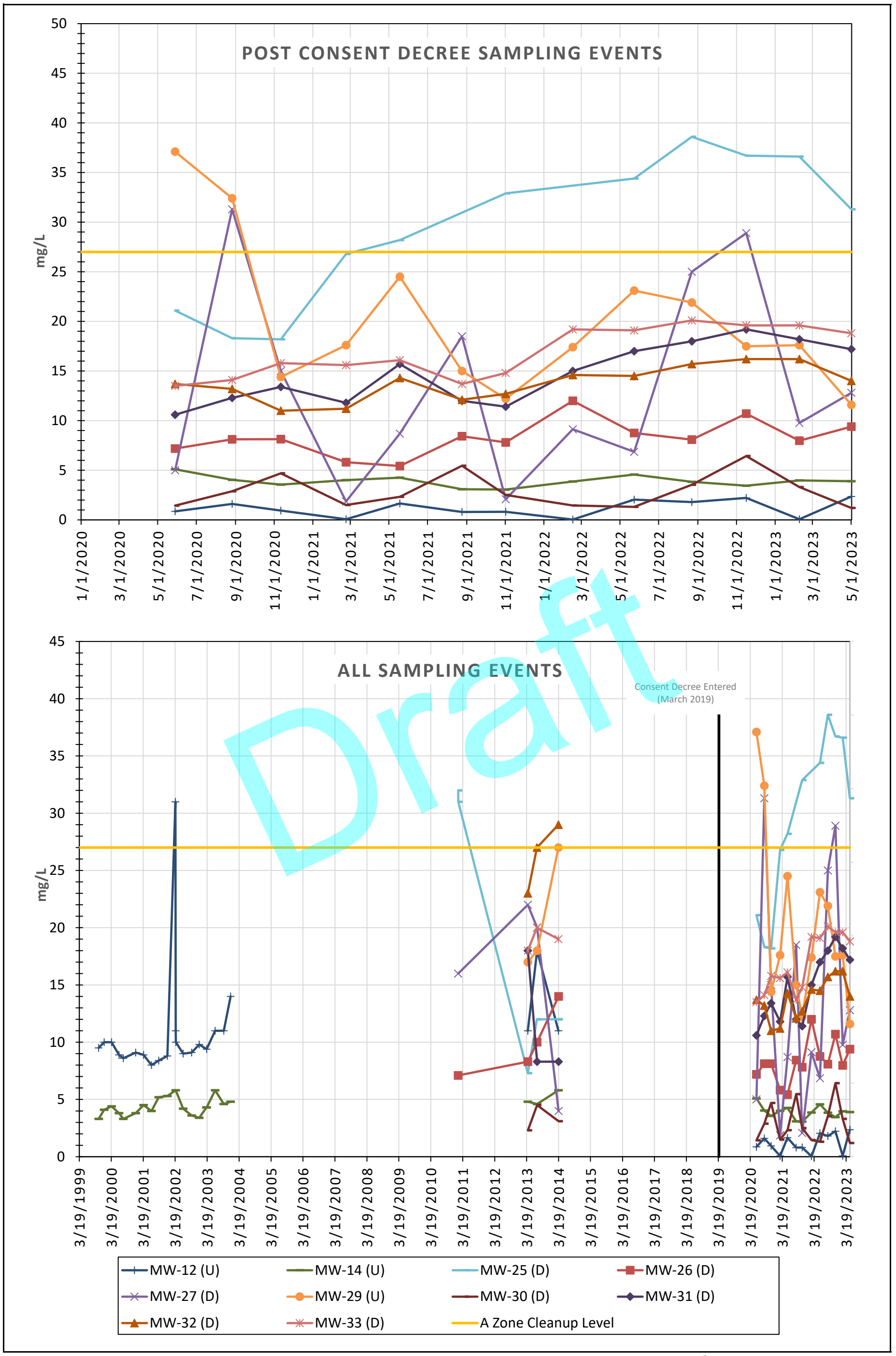
µS/cm Microsiemens per centimeter

NTU Nephelometric Turbidity unit

CPOC Conditional point of compliance

Attachment 3

Groundwater Quality Time Series Plots
through Second Quarter 2023



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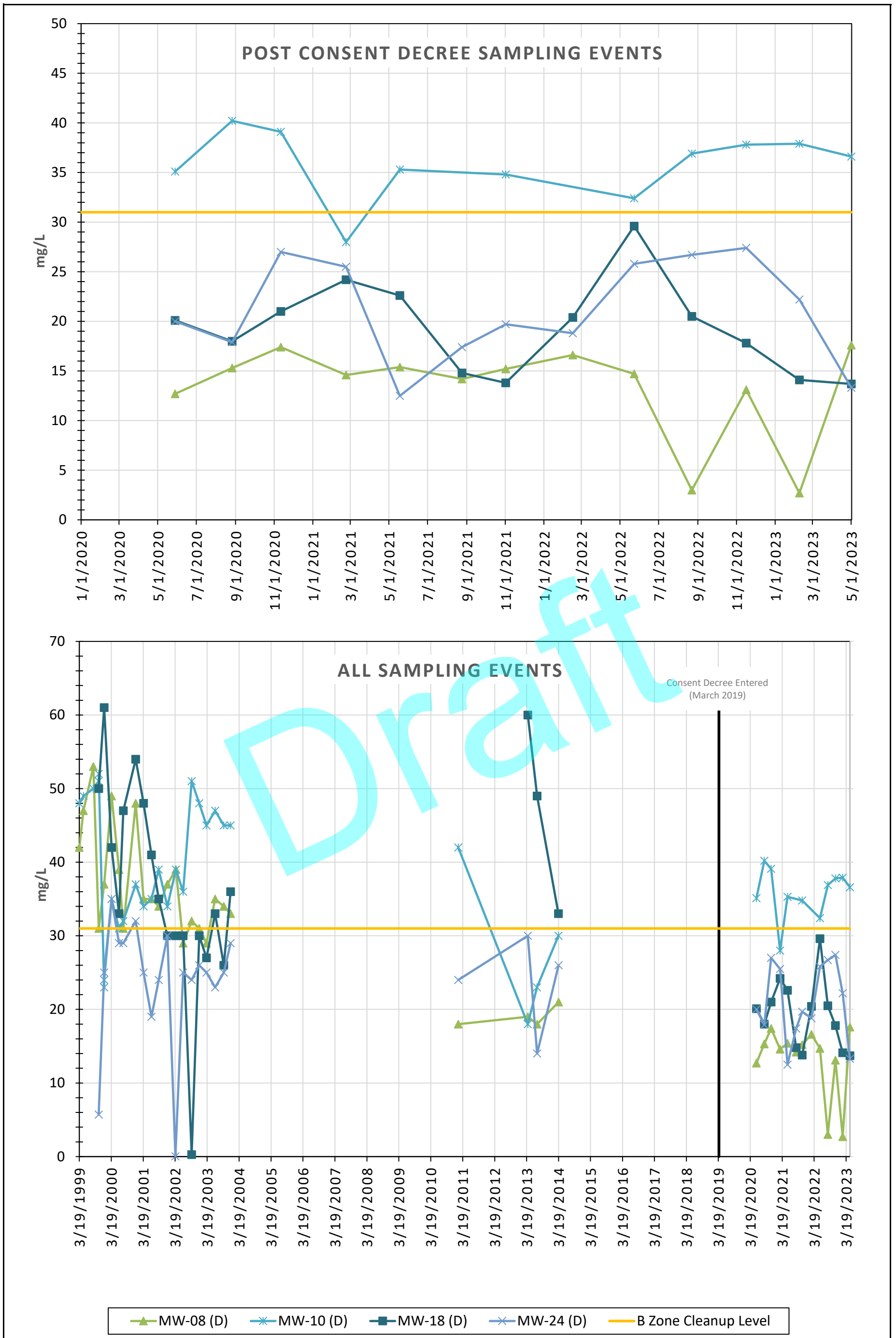
D = Downgradient
U = Upgradient

Total Iron Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
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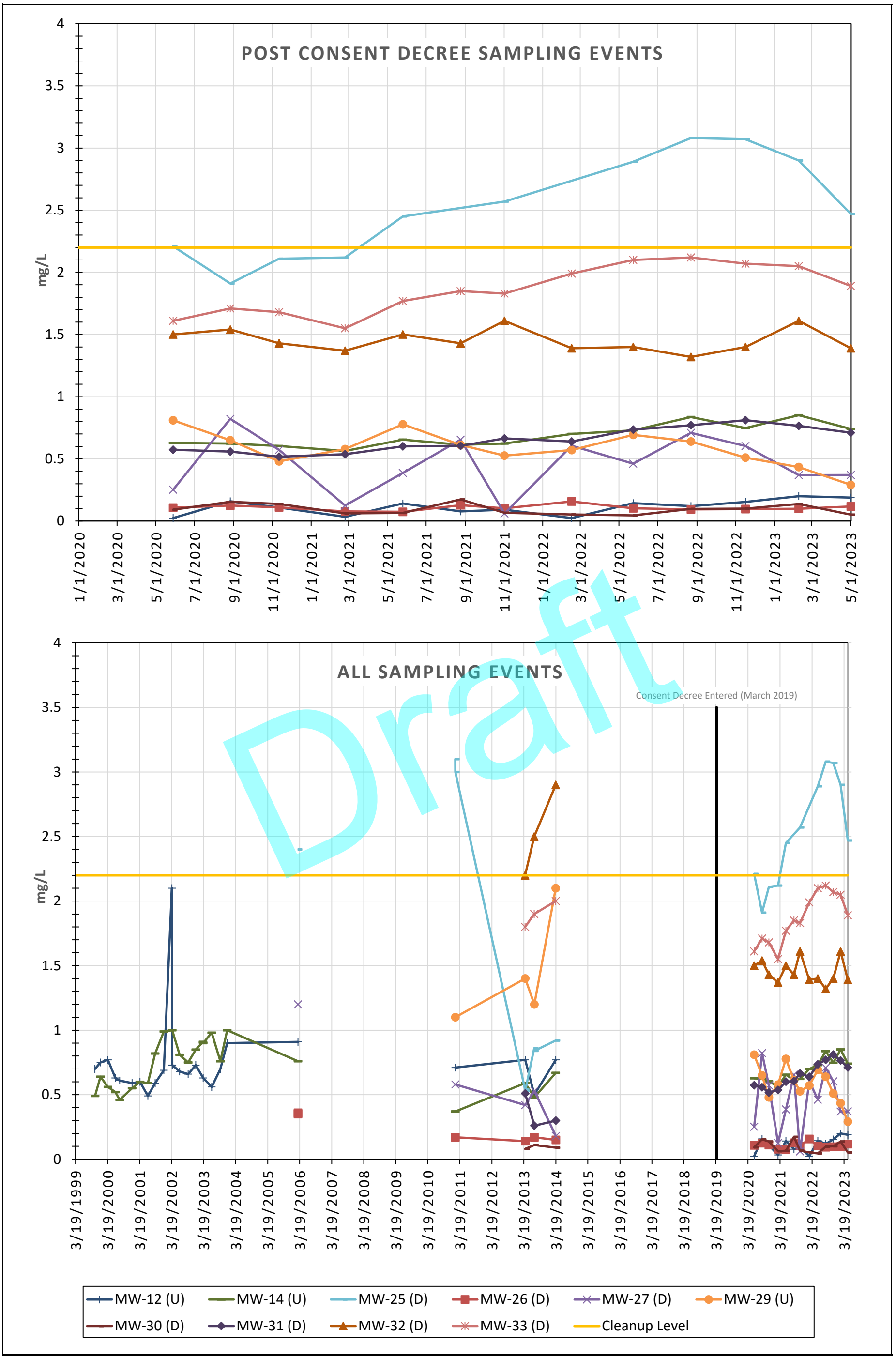
D = Downgradient
U = Upgradient

Total Iron Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
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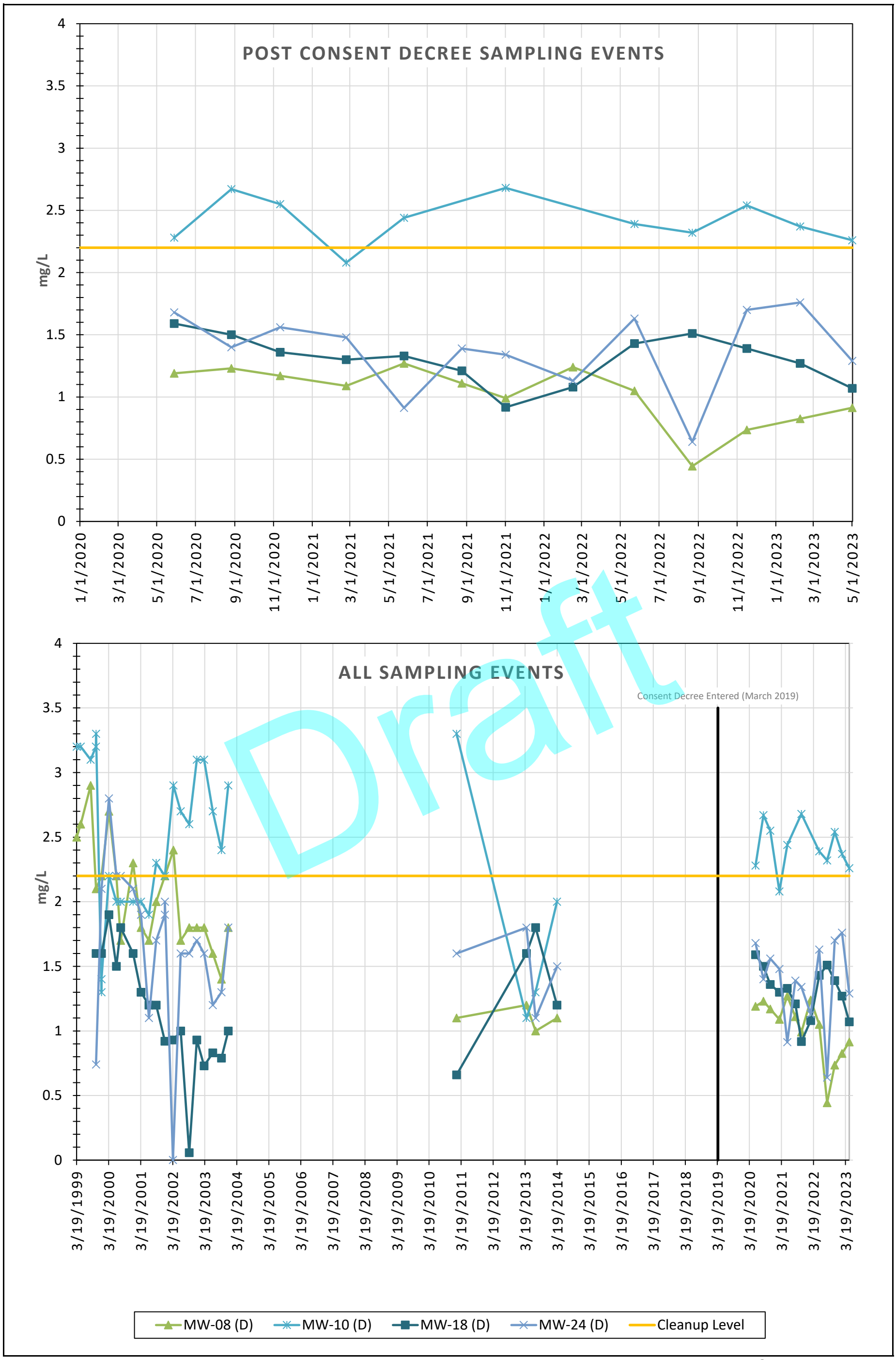
D = Downgradient
U = Upgradient

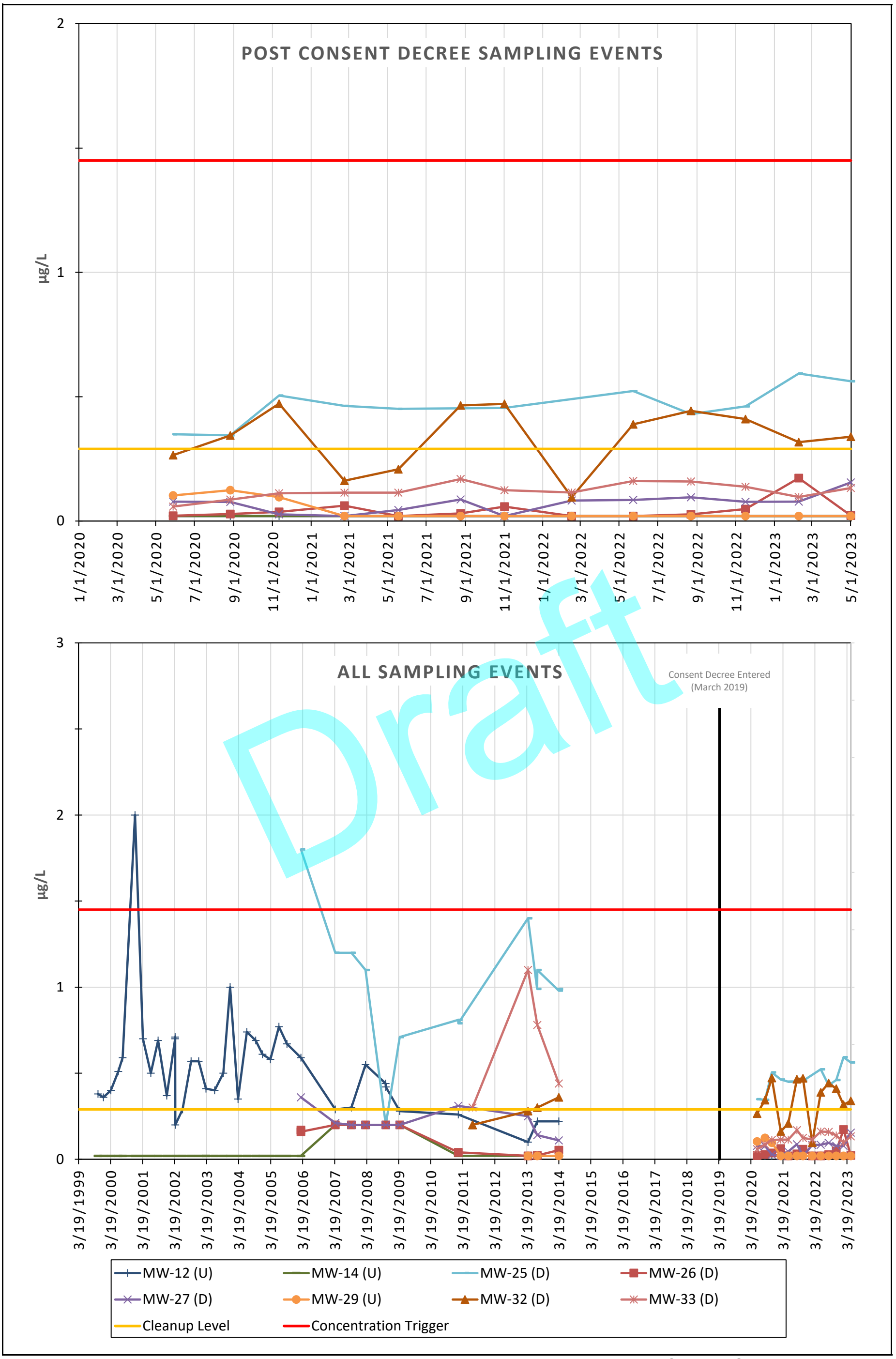
Total Manganese Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

Total Manganese Concentrations
B-Zone CPOC Wells
South Park Landfill



Parametrix
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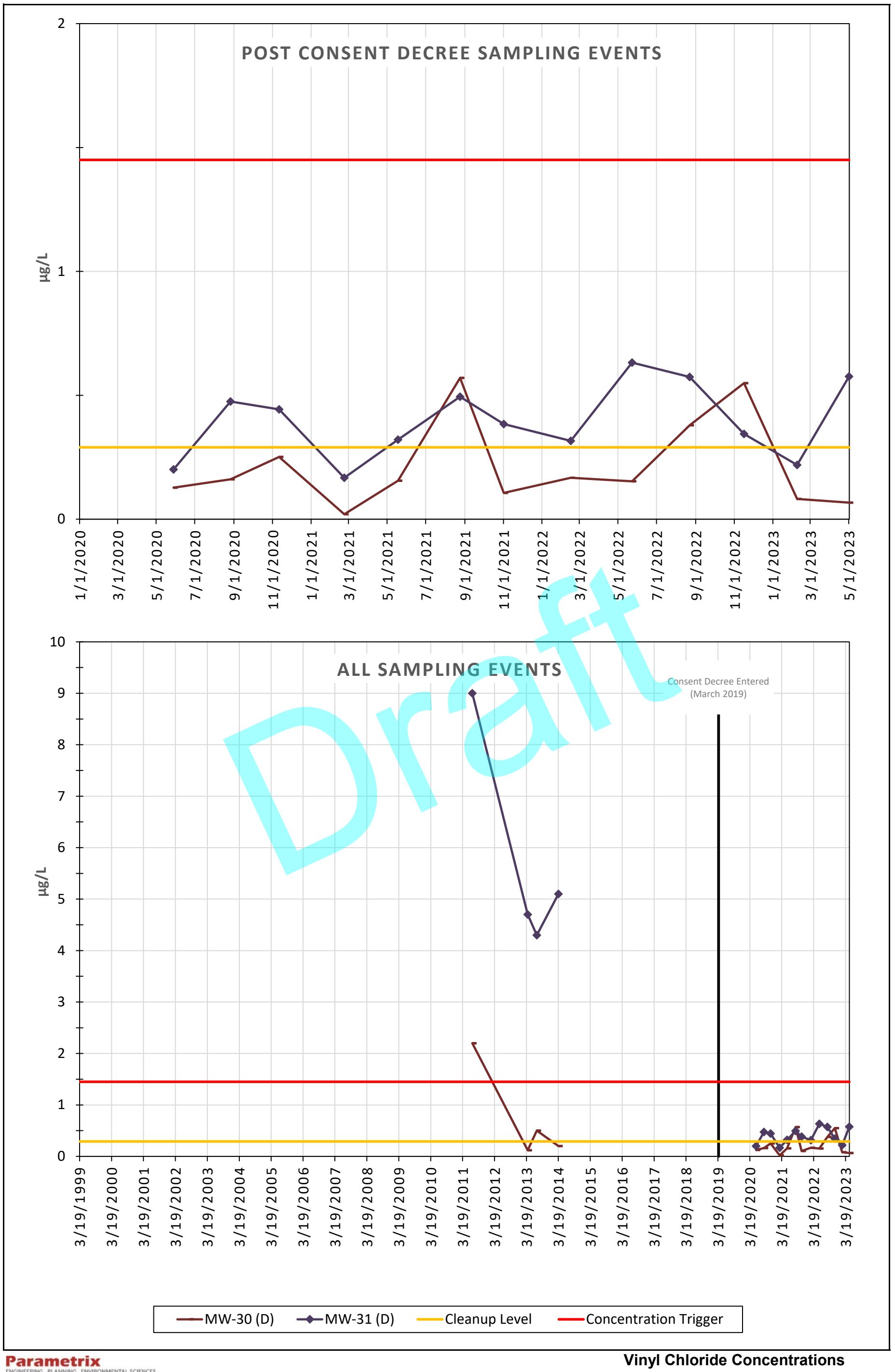
D = Downgradient
U = Upgradient

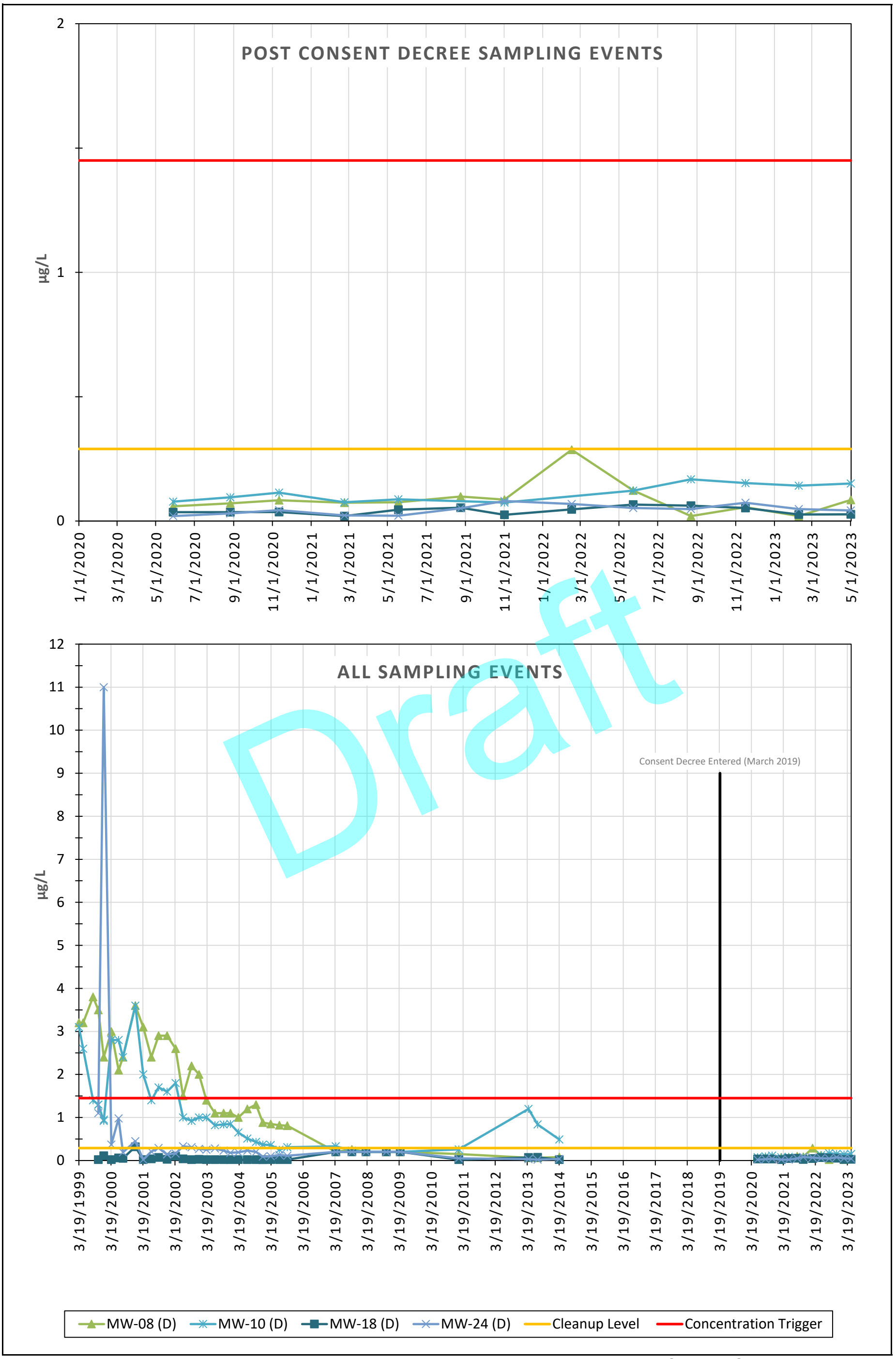
Vinyl Chloride Concentrations
A-Zone CPOC Wells
South Park Landfill



Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

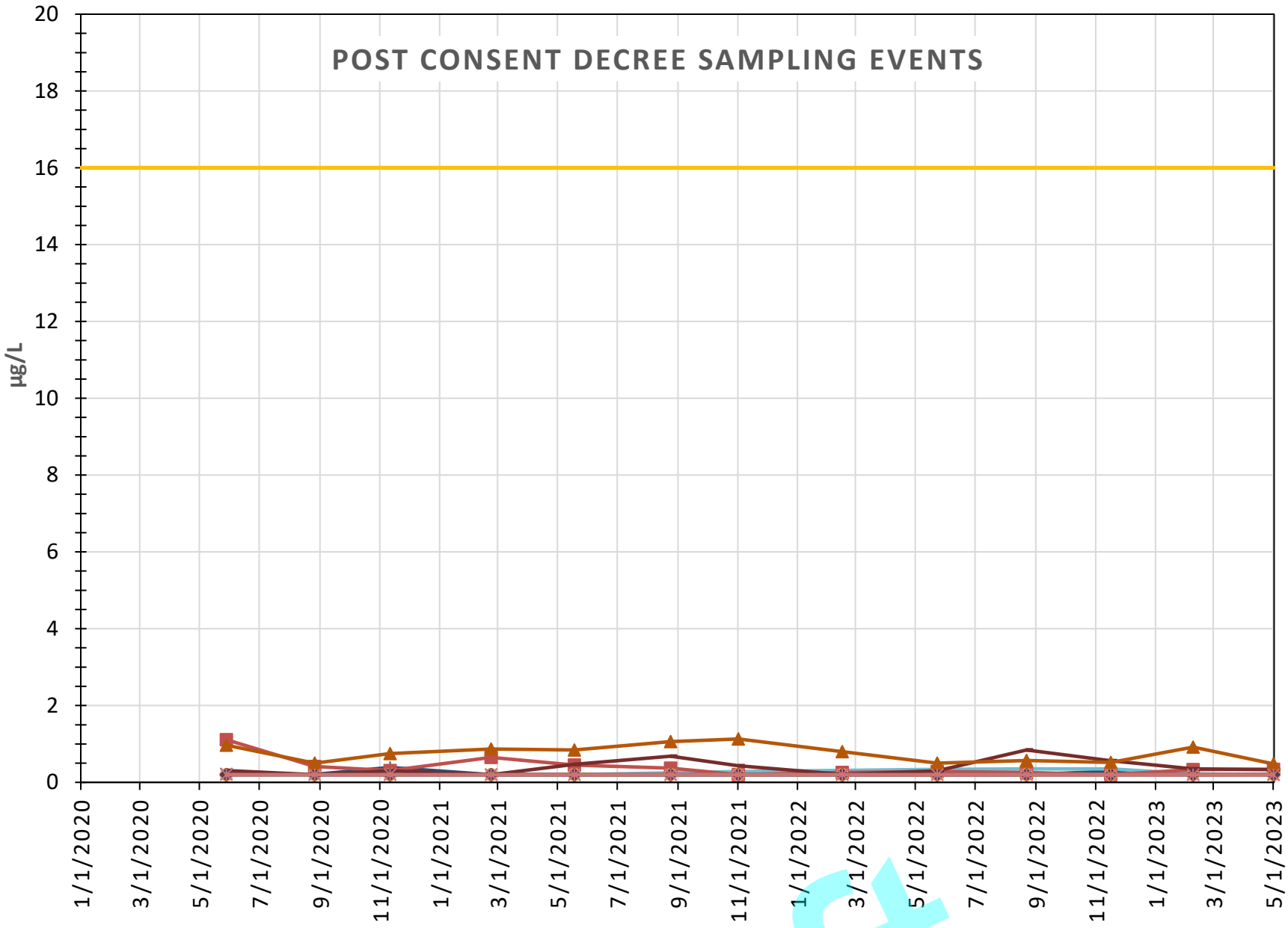
Vinyl Chloride Concentrations
A-Zone Non-CPOC Wells
South Park Landfill

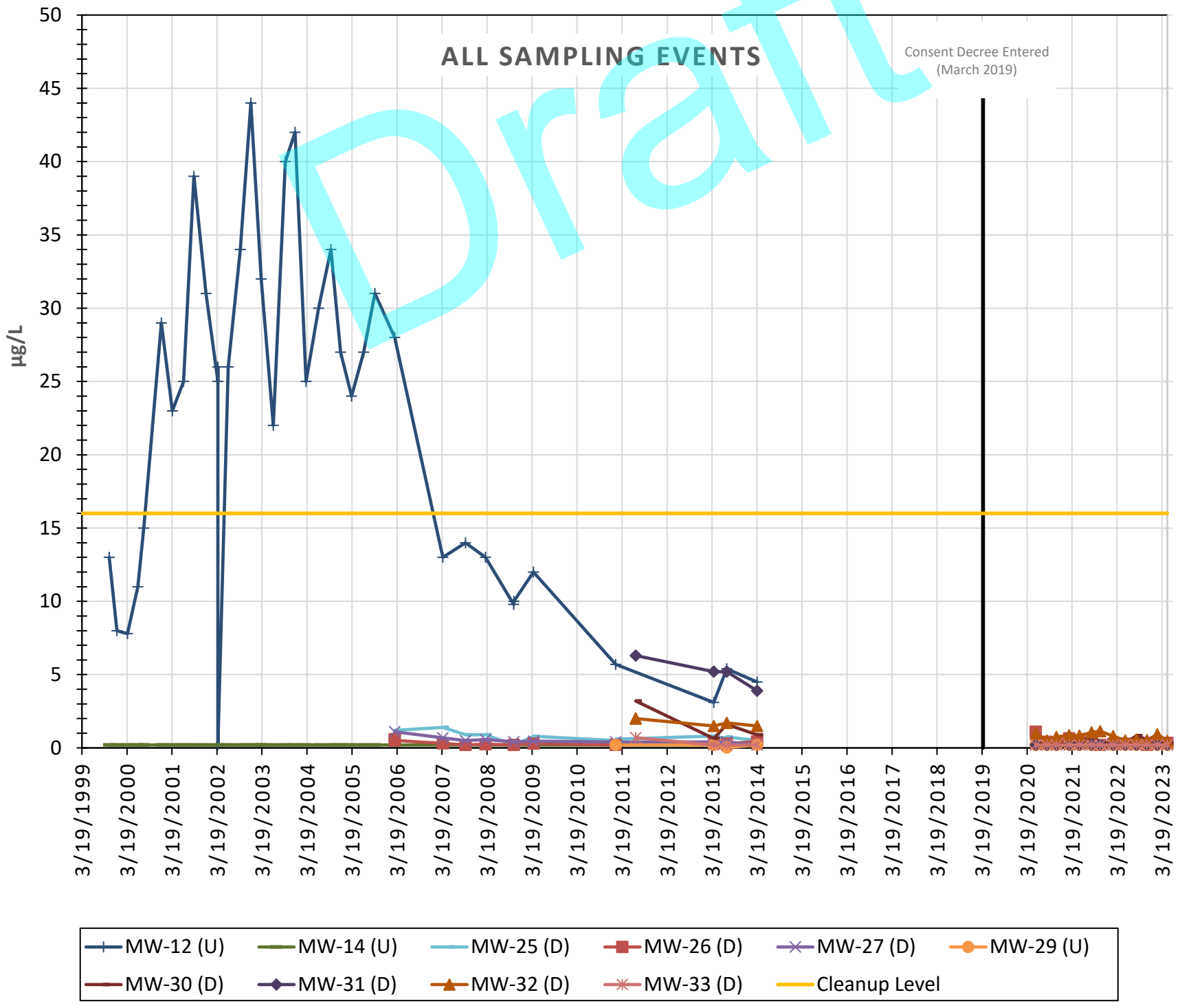


Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

Vinyl Chloride Concentrations
B-Zone CPOC Wells
South Park Landfill

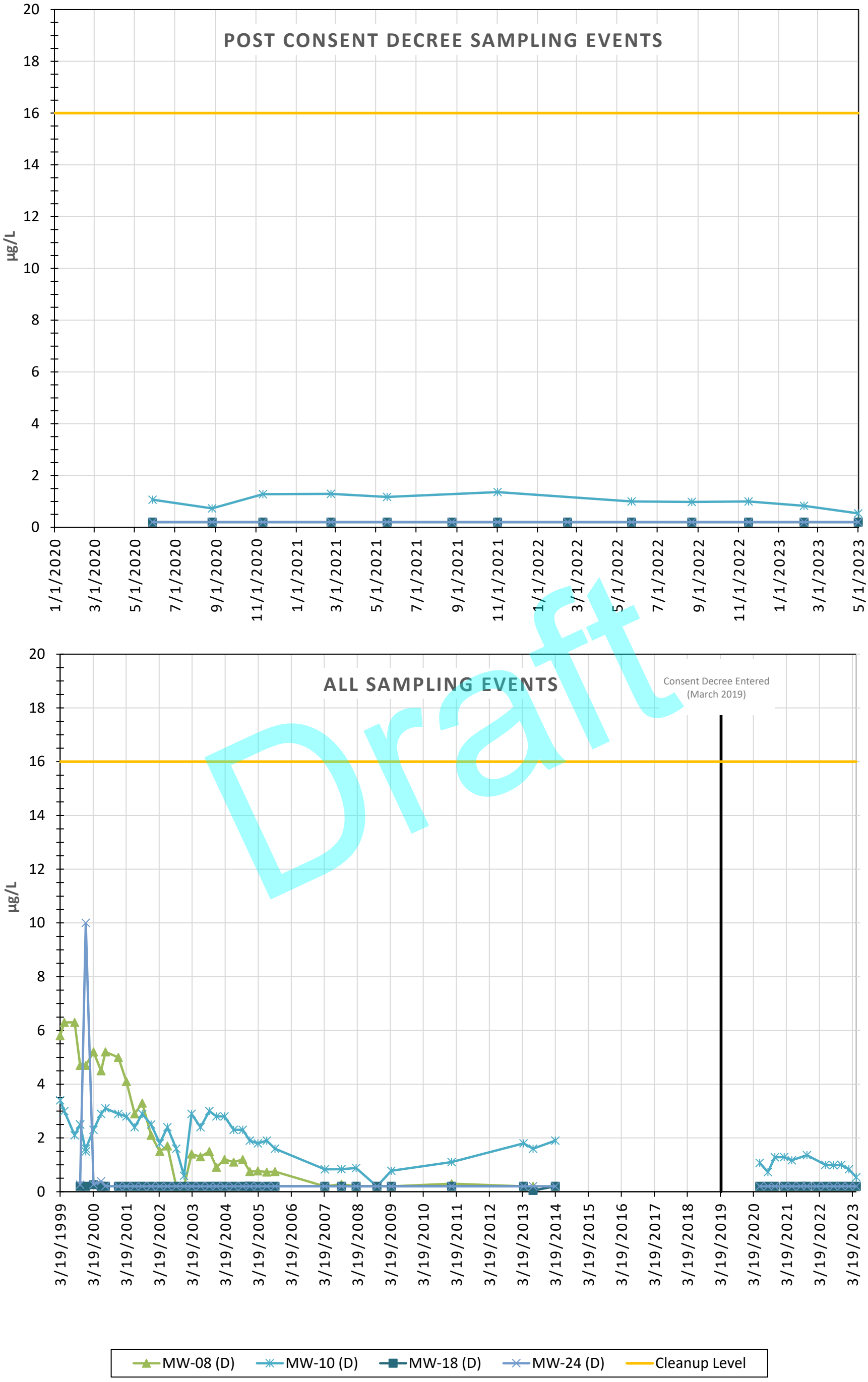




Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

D = Downgradient
U = Upgradient

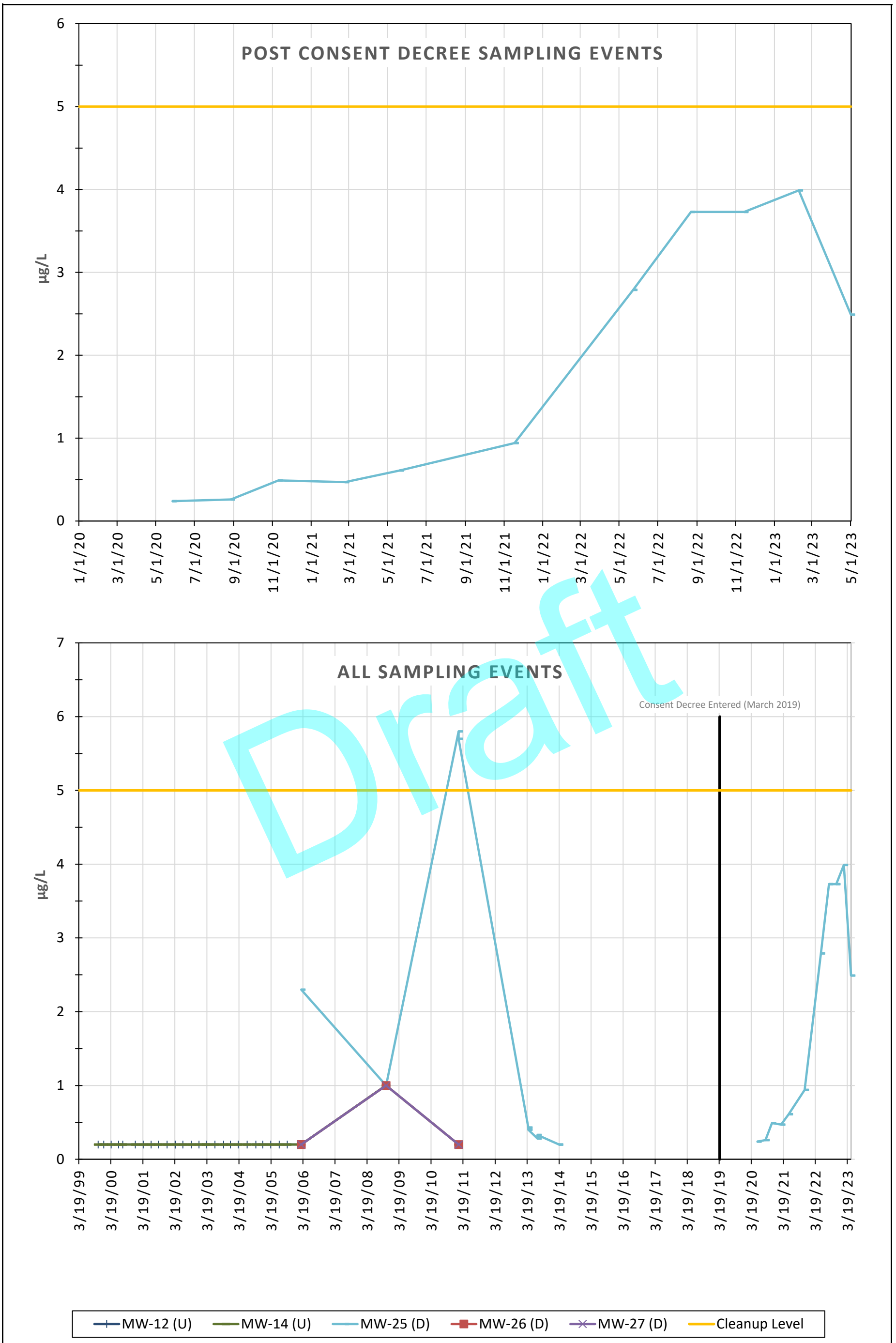
Cis-1,2-Dichloroethene Concentrations
A-Zone CPOC Wells
South Park Landfill



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

Second Quarter 2023 Groundwater Laboratory Data

Analytical Resources, LLC
Analytical Chemists and Consultants
Tukwila, WA

20 May 2023

Min-Soon Yim
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)
23E0018	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

Shelly Fishel, Project Manager

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.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23E0018	Turn-around Requested: 2 weeks	Date: 5/1/2023	
ARI Client Company: Min Soon Yim, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 2	
Client Contact: Laura Lee	Phone: 206 394-3665	No. of Coolers:	Cooler Temps: 4.0°
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							Notes/Comments
~~SPL-GW-MW12-0523~~			water	7	X		X	X							
~~SPL-GW-MW14-0523~~			water	7	X		X	X							
~~SPL-GW-MW29-0523~~			water	7	X		X	X							
~~SPL-GW-MW18-0523~~			water	7	X		X	X							
SPL-GW-MW32-0523	5/1/2023	1345	water	13	X		X	X							MS/MSD
SPL-GW-MW33-0523	5/1/2023	1435	water	7	X		X	X							
SPL-GW-MW10-0523	5/1/2023	950	water	7	X		X	X							
SPL-GW-MW60-0523	5/1/2023	1320	water	7	X		X	X							
SPL-GW-MW80-0523	5/1/2023	—	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: Rowan M.	Printed Name:	Printed Name:
	Company: HWA	Company: ARI	Company:	Company:
	Date & Time: 5/1/2023 1515	Date & Time: 5/1/23 1515	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: 23E0018	Turn-around Requested: 2 weeks	Date: 5/1/2023	
ARI Client Company: Min Soon Yim, Seattle Public Utility	Phone: 206 684-7693	Page: 2 of 2	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers:	Cooler Temps: 4.0°
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							Notes/Comments
SPL-GW-MW25-0523	5/1/2023	1035	water	7		X	X	X							
~~SPL-GW-MW30-0523~~			water	~~7~~	X		X	X							
~~SPL-GW-MW31-0523~~			water	~~7~~	X		X	X							
~~SPL-GW-MW24-0523~~			water	~~7~~	X		X	X							
~~SPL-GW-MW26-0523~~			water	~~13~~	X		X	X							MS/MSD
~~SPL-GW-MW08-0523~~			water	~~7~~	X		X	X							
~~SPL-GW-MW27-0523~~			water	~~7~~	X		X	X							
~~SPL-GW-MW61-0523~~			water	~~7~~	X		X	X							
~~SPL-GW-MW81-0523~~			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: Roman A.	Printed Name:	Printed Name:
	Company: HWA	Company: ARI	Company:	Company:
	Date & Time: 5/1/2023 1515	Date & Time: 5/1/23 1515	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: Min-Soon Yim	20-May-2023 12:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SPL-GW-MW32-0523	23E0018-01	Water	01-May-2023 13:45	01-May-2023 15:15
SPL-GW-MW33-0523	23E0018-02	Water	01-May-2023 14:35	01-May-2023 15:15
SPL-GW-MW10-0523	23E0018-03	Water	01-May-2023 09:50	01-May-2023 15:15
SPL-GW-MW60-0523	23E0018-04	Water	01-May-2023 13:20	01-May-2023 15:15
SPL-GW-MW80-0523	23E0018-05	Water	01-May-2023 00:00	01-May-2023 15:15
SPL-GW-MW25-0523	23E0018-06	Water	01-May-2023 10:35	01-May-2023 15:15

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: Min-Soon Yim	20-May-2023 12:10

Work Order Case Narrative

Client: Seattle Public Utilities
Project: South Park Landfill -Parametrix Water
Project Number: 553-1550-067
Work Order: 23E0018

Sample receipt

Sample(s) as listed on the preceding page were received 01-May-2023 15:15 under ARI work order 23E0018. 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 except as follows. Benzene was out of control low in the MS. cis-1,2-Dichloroethene was out of control low in both the MS and MSD. The deviations have been flagged.

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: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	20-May-2023 12:10

were within control limits.

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

Total 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.

WORK ORDER

23E0018

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	
23E0018-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2	pass (P)
23E0018-01 B	VOA Vial, Clear, 40 mL, HCL		
23E0018-01 C	VOA Vial, Clear, 40 mL, HCL		
23E0018-01 D	VOA Vial, Clear, 40 mL, HCL		
23E0018-01 E	VOA Vial, Clear, 40 mL, HCL		
23E0018-01 F	VOA Vial, Clear, 40 mL, HCL		
23E0018-01 G	VOA Vial, Clear, 40 mL, HCL		
23E0018-01 H	VOA Vial, Clear, 40 mL		
23E0018-01 I	VOA Vial, Clear, 40 mL		
23E0018-01 J	VOA Vial, Clear, 40 mL		
23E0018-01 K	VOA Vial, Clear, 40 mL		
23E0018-01 L	VOA Vial, Clear, 40 mL		
23E0018-01 M	VOA Vial, Clear, 40 mL		
23E0018-02 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
23E0018-02 B	VOA Vial, Clear, 40 mL, HCL		
23E0018-02 C	VOA Vial, Clear, 40 mL, HCL		
23E0018-02 D	VOA Vial, Clear, 40 mL, HCL		
23E0018-02 E	VOA Vial, Clear, 40 mL		
23E0018-02 F	VOA Vial, Clear, 40 mL		
23E0018-02 G	VOA Vial, Clear, 40 mL		
23E0018-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
23E0018-03 B	VOA Vial, Clear, 40 mL, HCL		
23E0018-03 C	VOA Vial, Clear, 40 mL, HCL		
23E0018-03 D	VOA Vial, Clear, 40 mL, HCL		
23E0018-03 E	VOA Vial, Clear, 40 mL		
23E0018-03 F	VOA Vial, Clear, 40 mL		
23E0018-03 G	VOA Vial, Clear, 40 mL		
23E0018-04 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
23E0018-04 B	VOA Vial, Clear, 40 mL, HCL		
23E0018-04 C	VOA Vial, Clear, 40 mL, HCL		
23E0018-04 D	VOA Vial, Clear, 40 mL, HCL		
23E0018-04 E	VOA Vial, Clear, 40 mL		
23E0018-04 F	VOA Vial, Clear, 40 mL		
23E0018-04 G	VOA Vial, Clear, 40 mL		

Reviewed By Date

WORK ORDER

23E0018

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**

23E0018-05 A	VOA Vial, Clear, 40 mL, HCL	
23E0018-05 B	VOA Vial, Clear, 40 mL	
23E0018-06 A	HDPE NM, 500 mL, 1:1 HNO3	C2 P
23E0018-06 B	VOA Vial, Clear, 40 mL, HCL	
23E0018-06 C	VOA Vial, Clear, 40 mL, HCL	
23E0018-06 D	VOA Vial, Clear, 40 mL, HCL	
23E0018-06 E	VOA Vial, Clear, 40 mL	
23E0018-06 F	VOA Vial, Clear, 40 mL	
23E0018-06 G	VOA Vial, Clear, 40 mL	

PIB
Preservation Confirmed By

PIB 5/1/23
Date 5/1/23

Reviewed By

Date

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: SPU

Project Name: South park

COC No(s): NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Assigned ARI Job No: 23E0018

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) 4.0°

Time 1515

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 9708

Cooler Accepted by: [signature] Date: 5/1/23 Time: 1515

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: PEB Date: 5/1/23 Time: 15:31 Labels checked by: PEB

*** 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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW32-0523
23E0018-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/01/2023 13:45
Instrument: NT3 Analyst: PKC — Analyzed: 05/02/2023 23:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-01 B
Preparation Batch: BLE0087 — Sample Size: 10 mL
Prepared: 05/02/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.48	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*111*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW32-0523

23E0018-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/01/2023 13:45
Instrument: NT16 Analyst: PB — Analyzed: 05/02/2023 19:23

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-01 I
Preparation Batch: BLE0081 — Sample Size: 10 mL
Prepared: 05/02/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.339	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*114*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW32-0523

23E0018-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/01/2023 13:45

Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 19:23

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0018-01 A 01

Preparation Batch: BLE0405 — Sample Size: 25 mL

Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	14.0	mg/L	D
Manganese	7439-96-5	50	0.0250	1.39	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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW33-0523

23E0018-02 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/01/2023 14:35

Instrument: NT3 Analyst: PKC — Analyzed: 05/03/2023 00:12

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-02 B

Preparation Batch: BLE0087 — Sample Size: 10 mL

Prepared: 05/02/2023 — 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 %*	*111*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW33-0523

23E0018-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/01/2023 14:35
Instrument: NT16 Analyst: PB — Analyzed: 05/02/2023 19:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-02 G
Preparation Batch: BLE0081 — Sample Size: 10 mL
Prepared: 05/02/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.133	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*114*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW33-0523

23E0018-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/01/2023 14:35
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 19:16

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0018-02 A 01
Preparation Batch: BLE0405 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	18.8	mg/L	D
Manganese	7439-96-5	50	0.0250	1.89	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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW10-0523

23E0018-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/01/2023 09:50

Instrument: NT3 Analyst: PKC — Analyzed: 05/03/2023 00:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-03 B

Preparation Batch: BLE0087 — Sample Size: 10 mL

Prepared: 05/02/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.54	ug/L	
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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW10-0523

23E0018-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/01/2023 09:50
Instrument: NT16 Analyst: PB — Analyzed: 05/02/2023 20:07

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-03 E
Preparation Batch: BLE0081 — Sample Size: 10 mL
Prepared: 05/02/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.151	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*115*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW10-0523

23E0018-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/01/2023 09:50
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 19:21

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0018-03 A 01
Preparation Batch: BLE0405 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	100	3.60	36.6	mg/L	D
Manganese	7439-96-5	100	0.0500	2.26	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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW60-0523

23E0018-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/01/2023 13:20

Instrument: NT3 Analyst: PKC — Analyzed: 05/03/2023 00:57

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-04 B

Preparation Batch: BLE0087 — Sample Size: 10 mL

Prepared: 05/02/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.49	ug/L	
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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW60-0523

23E0018-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/01/2023 13:20
Instrument: NT16 Analyst: PB — Analyzed: 05/02/2023 20:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-04 E
Preparation Batch: BLE0081 — Sample Size: 10 mL
Prepared: 05/02/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.348	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*115*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW60-0523

23E0018-04 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/01/2023 13:20
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 19:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0018-04 A 01
Preparation Batch: BLE0405 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	13.9	mg/L	D
Manganese	7439-96-5	50	0.0250	1.38	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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW80-0523

23E0018-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/01/2023 00:00
Instrument: NT3 Analyst: PKC — Analyzed: 05/03/2023 01:19

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-05 A
Preparation Batch: BLE0087 — Sample Size: 10 mL
Prepared: 05/02/2023 — 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 %*	*105*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*98.2*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW80-0523

23E0018-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/01/2023 00:00
Instrument: NT16 Analyst: PB — Analyzed: 05/02/2023 20:51

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-05 B
Preparation Batch: BLE0081 — Sample Size: 10 mL
Prepared: 05/02/2023 — 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 %*	*112*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW25-0523

23E0018-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/01/2023 10:35

Instrument: NT3 Analyst: PKC — Analyzed: 05/03/2023 01:41

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-06 C

Preparation Batch: BLE0087 — Sample Size: 10 mL

Prepared: 05/02/2023 — 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	2.49	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*115*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*97.1*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW25-0523

23E0018-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/01/2023 10:35
Instrument: NT16 Analyst: PB — Analyzed: 05/02/2023 21:14

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0018-06 E
Preparation Batch: BLE0081 — Sample Size: 10 mL
Prepared: 05/02/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.562	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*109*	*%*	

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: Min-Soon Yim	20-May-2023 12:10

SPL-GW-MW25-0523

23E0018-06 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/01/2023 10:35
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 19:20

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0018-06 A 01
Preparation Batch: BLE0405 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	31.3	mg/L	D
Manganese	7439-96-5	50	0.0250	2.47	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: Min-Soon Yim	20-May-2023 12:10

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLE0087 - 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 (BLE0087-BLK1)				Prepared: 02-May-2023 Analyzed: 02-May-2023 22:44						
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.11		ug/L	*5.00*		*102*	*80-129*			
Surrogate: Toluene-d8	4.86		ug/L	*5.00*		*97.2*	*80-120*			
LCS (BLE0087-BS1)				Prepared: 02-May-2023 Analyzed: 02-May-2023 21:37						
cis-1,2-Dichloroethene	10.1	0.20	ug/L	10.0		101	80-121			
Benzene	11.1	0.20	ug/L	10.0		111	80-120			
Surrogate: 1,2-Dichloroethane-d4	5.01		ug/L	*5.00*		*100*	*80-129*			
Surrogate: Toluene-d8	5.07		ug/L	*5.00*		*101*	*80-120*			
LCS Dup (BLE0087-BSD1)				Prepared: 02-May-2023 Analyzed: 02-May-2023 21:59						
cis-1,2-Dichloroethene	9.75	0.20	ug/L	10.0		97.5	80-121	3.62	30	
Benzene	10.7	0.20	ug/L	10.0		107	80-120	3.76	30	
Surrogate: 1,2-Dichloroethane-d4	4.98		ug/L	*5.00*		*99.6*	*80-129*			
Surrogate: Toluene-d8	4.94		ug/L	*5.00*		*98.7*	*80-120*			
Matrix Spike (BLE0087-MS1)	**Source: 23E0018-01**			Prepared: 02-May-2023 Analyzed: 03-May-2023 09:14						
cis-1,2-Dichloroethene	7.51	0.20	ug/L	10.0	0.48	70.3	80-121			*
Benzene	7.95	0.20	ug/L	10.0	0.08	78.7	80-120			*
Surrogate: 1,2-Dichloroethane-d4	5.21		ug/L	*5.00*	*5.57*	*104*	*80-129*			
Surrogate: Toluene-d8	5.12		ug/L	*5.00*		*102*	*80-120*			

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

Matrix Spike Dup (BLE0087-MSD1)	**Source: 23E0018-01**			Prepared: 02-May-2023 Analyzed: 03-May-2023 09:36						
cis-1,2-Dichloroethene	8.22	0.20	ug/L	10.0	0.48	77.4	80-121	9.00	30	*
Benzene	8.39	0.20	ug/L	10.0	0.08	83.1	80-120	5.39	30	
Surrogate: 1,2-Dichloroethane-d4	5.44		ug/L	*5.00*	*5.57*	*109*	*80-129*			
Surrogate: Toluene-d8	5.02		ug/L	*5.00*		*100*	*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: 553-1550-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	20-May-2023 12:10

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLE0081 - EPA 8260D-SIM

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLE0081-BLK1)				Prepared: 02-May-2023 Analyzed: 02-May-2023 15:49						
Vinyl chloride	ND	0.0200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5550		ug/L	*5000*		*111*	*80-129*			
LCS (BLE0081-BS1)				Prepared: 02-May-2023 Analyzed: 02-May-2023 14:49						
Vinyl chloride	2.24	0.0200	ug/L	2.00		112	62-141			
Surrogate: 1,2-Dichloroethane-d4	5390		ug/L	*5000*		*108*	*80-129*			
LCS Dup (BLE0081-BSD1)				Prepared: 02-May-2023 Analyzed: 02-May-2023 15:27						
Vinyl chloride	2.36	0.0200	ug/L	2.00		118	62-141	5.16	30	
Surrogate: 1,2-Dichloroethane-d4	5360		ug/L	*5000*		*107*	*80-129*			
Matrix Spike (BLE0081-MS1)	**Source: 23E0018-01**			Prepared: 02-May-2023 Analyzed: 02-May-2023 21:36						
Vinyl chloride	2.73	0.0200	ug/L	2.00	0.339	120	62-141			
Surrogate: 1,2-Dichloroethane-d4	5530		ug/L	*5000*	*5680*	*111*	*80-129*			

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

Matrix Spike Dup (BLE0081-MSD1)	**Source: 23E0018-01**			Prepared: 02-May-2023 Analyzed: 02-May-2023 21:58						
Vinyl chloride	2.71	0.0200	ug/L	2.00	0.339	119	62-141	0.65	30	
Surrogate: 1,2-Dichloroethane-d4	5470		ug/L	*5000*	*5680*	*109*	*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: Min-Soon Yim	20-May-2023 12:10

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLE0405 - 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
Blank (BLE0405-BLK1)				Prepared: 12-May-2023 Analyzed: 15-May-2023 15:35							
Iron	54	ND	0.0360	mg/L							U
Manganese	55	ND	0.000500	mg/L							U
LCS (BLE0405-BS1)				Prepared: 12-May-2023 Analyzed: 15-May-2023 15:40							
Iron	54	5.46	0.0360	mg/L	5.00		109	80-120			
Manganese	55	0.0249	0.000500	mg/L	0.0250		99.4	80-120			

Instrument: ICPMS2 Analyst: SKD

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BLE0405-DUP2)		**Source: 23E0018-01**		Prepared: 12-May-2023 Analyzed: 16-May-2023 19:25							
Iron	54	14.0	1.80	mg/L		14.0			0.11	20	D
Manganese	55	1.39	0.0250	mg/L		1.39			0.17	20	D
Matrix Spike (BLE0405-MS2)		**Source: 23E0018-01**		Prepared: 12-May-2023 Analyzed: 16-May-2023 19:26							
Iron	54	19.5	1.80	mg/L	5.00	14.0	110	75-125			D
Manganese	55	1.44	0.0250	mg/L	0.0250	1.39	201	75-125			HC, D

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

Matrix Spike Dup (BLE0405-MSD2)		**Source: 23E0018-01**		Prepared: 12-May-2023 Analyzed: 16-May-2023 19:28							
Iron	54	19.3	1.80	mg/L	5.00	14.0	107	75-125	0.67	20	D
Manganese	55	1.42	0.0250	mg/L	0.0250	1.39	120	75-125	1.42	20	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: Min-Soon Yim	20-May-2023 12:10

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 8260D in Water	
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	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	03/28/2025
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2025
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: Min-Soon Yim	20-May-2023 12:10

Notes and Definitions

*	Flagged value is not within established control limits.
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.
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

20 May 2023

Min-Soon Yim
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)
23E0077	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

Shelly Fishel, Project Manager

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.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 23E0077	Turn-around Requested: 2 weeks	Date: 5/3/2023	
ARI Client Company: Min Soon Yim, Seattle Public Utility	Phone: 206 684-7693	Page: 1 of 2	
Client Contact: Laura Lee	Phone: 206 394-3665	No. of Coolers:	Cooler Temps: 8.0°C
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							Notes/Comments
SPL-GW-MW12-0523	5/3/23	920	water	7	X		X	X							
SPL-GW-MW14-0523	5/3/23	1325	water	7	X		X	X							
SPL-GW-MW29-0523	5/3/23	1155	water	7	X		X	X							
SPL-GW-MW18-0523	5/3/23	1030	water	7	X		X	X							
~~SPL-GW-MW32-0523~~			water	13	X		X	X							MS/MSD
~~SPL-GW-MW33-0523~~			water	7	X		X	X							
~~SPL-GW-MW10-0523~~			water	7	X		X	X							
~~SPL-GW-MW60-0523~~			water	7	X		X	X							
~~SPL-GW-MW80-0523~~			water	2		X	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Nick Johnson	Printed Name: Matthew Parnell	Printed Name:	Printed Name:
	Company: HWA	Company: AKLLC	Company:	Company:
	Date & Time: 5/3/23 1352	Date & Time: 5/3/23 13:52	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: 23E0077	Turn-around Requested: 2 weeks	Date: 5/3/2023	
ARI Client Company: Min Soon Yim, Seattle Public Utility	Phone: 206 684-7693	Page: 2 of 2	
Client Contact: Laura Lee, Parametrix	Phone: 206 394-3665	No. of Coolers:	Cooler Temps: 8.0°C
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							Notes/Comments
SPL-GW-~~MW25-0523~~			water	~~7~~		X	X	X							
SPL-GW-MW30-0523	5/2/23	855	water	7	X		X	X							
SPL-GW-MW31-0523	5/2/23	1010	water	7	X		X	X							
SPL-GW-MW24-0523	5/2/23	1105	water	7	X		X	X							
SPL-GW-MW26-0523	5/2/23	1240	water	13	X		X	X							MS/MSD
SPL-GW-MW08-0523	5/2/23	1445	water	7	X		X	X							
SPL-GW-MW27-0523	5/2/23	1620	water	7	X		X	X							
SPL-GW-MW61-0523	5/2/23	1310	water	7	X		X	X							
SPL-GW-MW81-0523	5/3/23	—	water	2		X	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Nick Johnson	Printed Name: Matthew Patel	Printed Name:	Printed Name:
	Company: HWA	Company: ARLLC	Company:	Company:
	Date & Time: 5/3/23 1352	Date & Time: 5/3/23 13:52	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: Min-Soon Yim	20-May-2023 12:19

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SPL-GW-MW12-0523	23E0077-01	Water	03-May-2023 09:20	03-May-2023 13:52
SPL-GW-MW14-0523	23E0077-02	Water	03-May-2023 13:25	03-May-2023 13:52
SPL-GW-MW29-0523	23E0077-03	Water	03-May-2023 11:55	03-May-2023 13:52
SPL-GW-MW18-0523	23E0077-04	Water	03-May-2023 10:30	03-May-2023 13:52
SPL-GW-MW30-0523	23E0077-05	Water	02-May-2023 08:55	03-May-2023 13:52
SPL-GW-MW31-0523	23E0077-06	Water	02-May-2023 10:10	03-May-2023 13:52
SPL-GW-MW24-0523	23E0077-07	Water	02-May-2023 11:05	03-May-2023 13:52
SPL-GW-MW26-0523	23E0077-08	Water	02-May-2023 12:40	03-May-2023 13:52
SPL-GW-MW08-0523	23E0077-09	Water	02-May-2023 14:45	03-May-2023 13:52
SPL-GW-MW27-0523	23E0077-10	Water	02-May-2023 16:20	03-May-2023 13:52
SPL-GW-MW61-0523	23E0077-11	Water	02-May-2023 13:10	03-May-2023 13:52
SPL-GW-MW81-0523	23E0077-12	Water	03-May-2023 00:00	03-May-2023 13:52

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: Min-Soon Yim	20-May-2023 12:19

Work Order Case Narrative

Client: Seattle Public Utilities
Project: South Park Landfill -Parametrix Water
Project Number: 553-155-067
Work Order: 23E0077

Sample receipt

Sample(s) as listed on the preceding page were received 03-May-2023 13:52 under ARI work order 23E0077. 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: Min-Soon Yim	20-May-2023 12:19

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

Total 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.

WORK ORDER

23E0077

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	
23E0077-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
23E0077-01 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-01 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-01 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-01 E	VOA Vial, Clear, 40 mL		
23E0077-01 F	VOA Vial, Clear, 40 mL		
23E0077-01 G	VOA Vial, Clear, 40 mL		
23E0077-02 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
23E0077-02 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-02 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-02 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-02 E	VOA Vial, Clear, 40 mL		
23E0077-02 F	VOA Vial, Clear, 40 mL		
23E0077-02 G	VOA Vial, Clear, 40 mL		
23E0077-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
23E0077-03 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-03 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-03 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-03 E	VOA Vial, Clear, 40 mL		
23E0077-03 F	VOA Vial, Clear, 40 mL		
23E0077-03 G	VOA Vial, Clear, 40 mL		
23E0077-04 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
23E0077-04 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-04 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-04 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-04 E	VOA Vial, Clear, 40 mL		
23E0077-04 F	VOA Vial, Clear, 40 mL		
23E0077-04 G	VOA Vial, Clear, 40 mL		
23E0077-05 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
23E0077-05 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-05 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-05 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-05 E	VOA Vial, Clear, 40 mL		
23E0077-05 F	VOA Vial, Clear, 40 mL		

Reviewed By _____ Date _____

WORK ORDER

23E0077

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

23E0077-05 G	VOA Vial, Clear, 40 mL		
23E0077-06 A	HDPE NM, 500 mL, 1:1 HNO3	C2	Pass
23E0077-06 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-06 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-06 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-06 E	VOA Vial, Clear, 40 mL		
23E0077-06 F	VOA Vial, Clear, 40 mL		
23E0077-06 G	VOA Vial, Clear, 40 mL		
23E0077-07 A	HDPE NM, 500 mL, 1:1 HNO3	C2	Pass
23E0077-07 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-07 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-07 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-07 E	VOA Vial, Clear, 40 mL		
23E0077-07 F	VOA Vial, Clear, 40 mL		
23E0077-07 G	VOA Vial, Clear, 40 mL		
23E0077-08 A	HDPE NM, 500 mL, 1:1 HNO3	C2	Pass
23E0077-08 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-08 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-08 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-08 E	VOA Vial, Clear, 40 mL, HCL		
23E0077-08 F	VOA Vial, Clear, 40 mL, HCL		
23E0077-08 G	VOA Vial, Clear, 40 mL, HCL		
23E0077-08 H	VOA Vial, Clear, 40 mL		
23E0077-08 I	VOA Vial, Clear, 40 mL		
23E0077-08 J	VOA Vial, Clear, 40 mL		
23E0077-08 K	VOA Vial, Clear, 40 mL		
23E0077-08 L	VOA Vial, Clear, 40 mL		
23E0077-08 M	VOA Vial, Clear, 40 mL		Bubble
23E0077-09 A	HDPE NM, 500 mL, 1:1 HNO3	C2	Pass
23E0077-09 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-09 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-09 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-09 E	VOA Vial, Clear, 40 mL		
23E0077-09 F	VOA Vial, Clear, 40 mL		
23E0077-09 G	VOA Vial, Clear, 40 mL		
23E0077-10 A	HDPE NM, 500 mL, 1:1 HNO3	C2	Pass

Reviewed By

Date

WORK ORDER

23E0077

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**

23E0077-10 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-10 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-10 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-10 E	VOA Vial, Clear, 40 mL		
23E0077-10 F	VOA Vial, Clear, 40 mL		
23E0077-10 G	VOA Vial, Clear, 40 mL		
23E0077-11 A	HDPE NM, 500 mL, 1:1 HNO3	C2	Pass
23E0077-11 B	VOA Vial, Clear, 40 mL, HCL		
23E0077-11 C	VOA Vial, Clear, 40 mL, HCL		
23E0077-11 D	VOA Vial, Clear, 40 mL, HCL		
23E0077-11 E	VOA Vial, Clear, 40 mL		
23E0077-11 F	VOA Vial, Clear, 40 mL		
23E0077-11 G	VOA Vial, Clear, 40 mL		
23E0077-12 A	VOA Vial, Clear, 40 mL, HCL		
23E0077-12 B	VOA Vial, Clear, 40 mL	Bubble	

Preservation Confirmed By

5/3/23
Date

Reviewed By

Date

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Seattle Public Utilities — Project Name: SPU South Park Landfill

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

Assigned ARI Job No: 23E0077 — 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 1352 — 8.0c

If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID#: 10097708

Cooler Accepted by: MP — Date: 05/03/23 — Time: 1352

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 5/3/23
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: 5/3/23 — Time: 1435 — 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:

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Temperature Compliance Form

ARI Work Order: 23E0077

Cooler#: _____ **Temperature(°C):** 8.0°C

Sample ID	Bottle Count	Bottle Type
Samples received above 6.0°C		

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Completed by: MP Date: 05/03/23 Time: 1352

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW12-0523

23E0077-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/03/2023 09:20

Instrument: NT3 Analyst: TWC — Analyzed: 05/04/2023 17:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-01 C

Preparation Batch: BLE0137 — Sample Size: 10 mL

Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.21	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW12-0523

23E0077-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/03/2023 09:20

Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 13:14

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-01 D

Preparation Batch: BLE0140 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*106*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW12-0523

23E0077-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/03/2023 09:20
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 18:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-01 A 01
Preparation Batch: BLE0404 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	5	0.180	2.36	mg/L	D
Manganese	7439-96-5	5	0.00250	0.189	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW14-0523

23E0077-02 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/03/2023 13:25

Instrument: NT3 Analyst: TWC — Analyzed: 05/04/2023 17:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-02 D

Preparation Batch: BLE0137 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW14-0523

23E0077-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/03/2023 13:25

Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 13:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-02 C

Preparation Batch: BLE0140 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*107*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW14-0523

23E0077-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/03/2023 13:25
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 18:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-02 A 01
Preparation Batch: BLE0404 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	3.90	mg/L	D
Manganese	7439-96-5	10	0.00500	0.740	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW29-0523

23E0077-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/03/2023 11:55

Instrument: NT3 Analyst: TWC — Analyzed: 05/04/2023 17:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-03 D

Preparation Batch: BLE0137 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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: 553-155-067	**Reported:**
Seattle WA, 98124-4018	Project Manager: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW29-0523

23E0077-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/03/2023 11:55

Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 13:56

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-03 C

Preparation Batch: BLE0140 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*109*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW29-0523

23E0077-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/03/2023 11:55

Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 18:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-03 A 01

Preparation Batch: BLE0404 — Sample Size: 25 mL

Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	0.360	11.6	mg/L	D
Manganese	7439-96-5	10	0.00500	0.291	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW18-0523

23E0077-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/03/2023 10:30

Instrument: NT3 Analyst: TWC — Analyzed: 05/04/2023 18:16

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-04 D

Preparation Batch: BLE0137 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*109*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW18-0523

23E0077-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/03/2023 10:30
Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 14:17

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-04 C
Preparation Batch: BLE0140 — Sample Size: 10 mL
Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0268	ug/L	M
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*110*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW18-0523

23E0077-04 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/03/2023 10:30
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 18:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-04 A 01
Preparation Batch: BLE0404 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	13.7	mg/L	D
Manganese	7439-96-5	20	0.0100	1.07	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW30-0523

23E0077-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/02/2023 08:55

Instrument: NT3 Analyst: TWC — Analyzed: 05/04/2023 18:38

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-05 D

Preparation Batch: BLE0137 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW30-0523

23E0077-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/02/2023 08:55
Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 14:38

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-05 C
Preparation Batch: BLE0140 — Sample Size: 10 mL
Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0667	ug/L	M
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*110*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW30-0523

23E0077-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/02/2023 08:55

Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 18:44

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-05 A 01

Preparation Batch: BLE0404 — Sample Size: 25 mL

Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	5	0.180	1.20	mg/L	D
Manganese	7439-96-5	5	0.00250	0.0520	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW31-0523

23E0077-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/02/2023 10:10

Instrument: NT3 Analyst: TWC — Analyzed: 05/04/2023 19:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-06 D

Preparation Batch: BLE0137 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW31-0523

23E0077-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/02/2023 10:10
Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 15:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-06 C
Preparation Batch: BLE0140 — Sample Size: 10 mL
Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.576	ug/L	M
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*110*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW31-0523

23E0077-06 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/02/2023 10:10
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 18:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-06 A 01
Preparation Batch: BLE0404 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	17.2	mg/L	D
Manganese	7439-96-5	20	0.0100	0.711	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW24-0523

23E0077-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/02/2023 11:05

Instrument: NT2 Analyst: LH — Analyzed: 05/04/2023 13:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-07 B

Preparation Batch: BLE0129 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW24-0523

23E0077-07 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/02/2023 11:05
Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 15:21

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-07 D
Preparation Batch: BLE0140 — Sample Size: 10 mL
Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0425	ug/L	M
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*110*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW24-0523

23E0077-07 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/02/2023 11:05

Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 18:53

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-07 A 01

Preparation Batch: BLE0404 — Sample Size: 25 mL

Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	13.3	mg/L	D
Manganese	7439-96-5	20	0.0100	1.29	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW26-0523

23E0077-08 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/02/2023 12:40

Instrument: NT2 Analyst: LH — Analyzed: 05/04/2023 13:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-08 B

Preparation Batch: BLE0129 — Sample Size: 10 mL

Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.34	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW26-0523

23E0077-08 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/02/2023 12:40
Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 15:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-08 E
Preparation Batch: BLE0140 — Sample Size: 10 mL
Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0219	ug/L	M
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*109*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW26-0523

23E0077-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/02/2023 12:40
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 19:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-08 A 01
Preparation Batch: BLE0404 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	5	0.180	9.40	mg/L	D
Manganese	7439-96-5	5	0.00250	0.117	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW08-0523

23E0077-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/02/2023 14:45

Instrument: NT2 Analyst: LH — Analyzed: 05/04/2023 13:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-09 B

Preparation Batch: BLE0129 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW08-0523

23E0077-09 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/02/2023 14:45
Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 16:03

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-09 D
Preparation Batch: BLE0140 — Sample Size: 10 mL
Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0850	ug/L	M
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*112*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW08-0523

23E0077-09 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/02/2023 14:45
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 19:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-09 A 01
Preparation Batch: BLE0404 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	20	0.720	17.6	mg/L	D
Manganese	7439-96-5	20	0.0100	0.914	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW27-0523

23E0077-10 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/02/2023 16:20
Instrument: NT2 Analyst: LH — Analyzed: 05/04/2023 14:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-10 B
Preparation Batch: BLE0129 — Sample Size: 10 mL
Prepared: 05/04/2023 — 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 %*	*100*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW27-0523

23E0077-10 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/02/2023 16:20

Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 16:24

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-10 C

Preparation Batch: BLE0140 — Sample Size: 10 mL

Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.155	ug/L	M
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*110*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW27-0523

23E0077-10 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/02/2023 16:20

Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 18:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-10 A 01

Preparation Batch: BLE0404 — Sample Size: 25 mL

Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	5	0.180	12.8	mg/L	D
Manganese	7439-96-5	5	0.00250	0.370	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW61-0523

23E0077-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/02/2023 13:10

Instrument: NT2 Analyst: LH — Analyzed: 05/04/2023 14:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-11 B

Preparation Batch: BLE0129 — Sample Size: 10 mL

Prepared: 05/04/2023 — 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 %*	*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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW61-0523

23E0077-11 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/02/2023 13:10

Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 16:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-11 C

Preparation Batch: BLE0140 — Sample Size: 10 mL

Prepared: 05/04/2023 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	0.0224	ug/L	M
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*110*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW61-0523

23E0077-11 (Water)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 05/02/2023 13:10
Instrument: ICPMS2 Analyst: SKD — Analyzed: 05/16/2023 19:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M — Extract ID: 23E0077-11 A 01
Preparation Batch: BLE0404 — Sample Size: 25 mL
Prepared: 05/12/2023 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	50	1.80	9.30	mg/L	D
Manganese	7439-96-5	50	0.0250	0.109	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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW81-0523

23E0077-12 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 05/03/2023 00:00
Instrument: NT2 Analyst: LH — Analyzed: 05/04/2023 09:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-12 A
Preparation Batch: BLE0129 — Sample Size: 10 mL
Prepared: 05/04/2023 — 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 %*	*93.5*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*97.9*	*%*	

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: Min-Soon Yim	20-May-2023 12:19

SPL-GW-MW81-0523

23E0077-12 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM — Sampled: 05/03/2023 00:00
Instrument: NT16 Analyst: PB — Analyzed: 05/04/2023 12:53

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 23E0077-12 B
Preparation Batch: BLE0140 — Sample Size: 10 mL
Prepared: 05/04/2023 — 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: Min-Soon Yim	20-May-2023 12:19

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLE0129 - 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 (BLE0129-BLK2)				Prepared: 04-May-2023 Analyzed: 04-May-2023 08:46						
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.98		ug/L	*5.00*		*99.7*	*80-129*			
Surrogate: Toluene-d8	4.92		ug/L	*5.00*		*98.3*	*80-120*			
LCS (BLE0129-BS2)				Prepared: 04-May-2023 Analyzed: 04-May-2023 07:45						
cis-1,2-Dichloroethene	9.63	0.20	ug/L	10.0		96.3	80-121			
Benzene	10.2	0.20	ug/L	10.0		102	80-120			
Surrogate: 1,2-Dichloroethane-d4	4.74		ug/L	*5.00*		*94.8*	*80-129*			
Surrogate: Toluene-d8	5.12		ug/L	*5.00*		*102*	*80-120*			
LCS Dup (BLE0129-BSD2)				Prepared: 04-May-2023 Analyzed: 04-May-2023 08:05						
cis-1,2-Dichloroethene	10.2	0.20	ug/L	10.0		102	80-121	5.59	30	
Benzene	10.4	0.20	ug/L	10.0		104	80-120	1.92	30	
Surrogate: 1,2-Dichloroethane-d4	4.89		ug/L	*5.00*		*97.7*	*80-129*			
Surrogate: Toluene-d8	5.10		ug/L	*5.00*		*102*	*80-120*			
Matrix Spike (BLE0129-MS1)	**Source: 23E0077-08**			Prepared: 04-May-2023 Analyzed: 04-May-2023 16:11						
cis-1,2-Dichloroethene	10.7	0.20	ug/L	10.0	0.34	104	80-121			
Benzene	11.0	0.20	ug/L	10.0	ND	110	80-120			
Surrogate: 1,2-Dichloroethane-d4	5.01		ug/L	*5.00*	*5.22*	*100*	*80-129*			
Surrogate: Toluene-d8	4.96		ug/L	*5.00*		*99.1*	*80-120*			

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

Matrix Spike Dup (BLE0129-MSD1)	**Source: 23E0077-08**			Prepared: 04-May-2023 Analyzed: 04-May-2023 16:32						
cis-1,2-Dichloroethene	10.8	0.20	ug/L	10.0	0.34	105	80-121	1.21	30	
Benzene	10.8	0.20	ug/L	10.0	ND	108	80-120	1.19	30	
Surrogate: 1,2-Dichloroethane-d4	4.95		ug/L	*5.00*	*5.22*	*98.9*	*80-129*			
Surrogate: Toluene-d8	5.03		ug/L	*5.00*		*101*	*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: Min-Soon Yim	20-May-2023 12:19

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BLE0137 - EPA 8260D

Instrument: NT3 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLE0137-BLK1)				Prepared: 04-May-2023 Analyzed: 04-May-2023 14:05						
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.23		ug/L	*5.00*		*105*	*80-129*			
LCS (BLE0137-BS1)				Prepared: 04-May-2023 Analyzed: 04-May-2023 12:37						
cis-1,2-Dichloroethene	9.46	0.20	ug/L	10.0		94.6	80-121			
Surrogate: 1,2-Dichloroethane-d4	5.01		ug/L	*5.00*		*100*	*80-129*			
LCS Dup (BLE0137-BSD1)				Prepared: 04-May-2023 Analyzed: 04-May-2023 13:21						
cis-1,2-Dichloroethene	10.4	0.20	ug/L	10.0		104	80-121	9.01	30	
Surrogate: 1,2-Dichloroethane-d4	5.08		ug/L	*5.00*		*102*	*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: Min-Soon Yim	20-May-2023 12:19

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - SIM - Quality Control

Batch BLE0140 - EPA 8260D-SIM

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLE0140-BLK1)				Prepared: 04-May-2023 Analyzed: 04-May-2023 11:29						
Vinyl chloride	ND	0.0200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5260		ug/L	*5000*		*105*	*80-129*			
LCS (BLE0140-BS1)				Prepared: 04-May-2023 Analyzed: 04-May-2023 10:32						
Vinyl chloride	1.82	0.0200	ug/L	2.00		90.8	62-141			
Surrogate: 1,2-Dichloroethane-d4	5070		ug/L	*5000*		*101*	*80-129*			
LCS Dup (BLE0140-BSD1)				Prepared: 04-May-2023 Analyzed: 04-May-2023 11:59						
Vinyl chloride	2.06	0.0200	ug/L	2.00		103	62-141	12.70	30	
Surrogate: 1,2-Dichloroethane-d4	5140		ug/L	*5000*		*103*	*80-129*			
Matrix Spike (BLE0140-MS1)	**Source: 23E0077-08**			Prepared: 04-May-2023 Analyzed: 04-May-2023 17:06						
Vinyl chloride	2.00	0.0200	ug/L	2.00	0.0219	99.1	62-141			
Surrogate: 1,2-Dichloroethane-d4	5330		ug/L	*5000*	*5470*	*107*	*80-129*			

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

Matrix Spike Dup (BLE0140-MSD1)	**Source: 23E0077-08**			Prepared: 04-May-2023 Analyzed: 04-May-2023 17:28						
Vinyl chloride	2.01	0.0200	ug/L	2.00	0.0219	99.3	62-141	0.17	30	
Surrogate: 1,2-Dichloroethane-d4	5360		ug/L	*5000*	*5470*	*107*	*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: Min-Soon Yim	20-May-2023 12:19

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLE0404 - 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
Blank (BLE0404-BLK1)				Prepared: 12-May-2023 Analyzed: 15-May-2023 18:02							
Iron	54	ND	0.0360	mg/L							U
Iron	57	ND	0.0360	mg/L							U
Manganese	55	ND	0.000500	mg/L							U
LCS (BLE0404-BS1)				Prepared: 12-May-2023 Analyzed: 15-May-2023 18:06							
Iron	54	5.54	0.0360	mg/L	5.00		111	80-120			
Iron	57	5.47	0.0360	mg/L	5.00		109	80-120			
Manganese	55	0.0244	0.000500	mg/L	0.0250		97.4	80-120			

Instrument: ICPMS2 Analyst: SKD

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BLE0404-DUP2)		**Source: 23E0077-08**		Prepared: 12-May-2023 Analyzed: 16-May-2023 19:47							
Iron	57	9.11	0.180	mg/L		9.40			3.16	20	D
Manganese	55	0.112	0.00250	mg/L		0.117			3.87	20	D
Matrix Spike (BLE0404-MS2)		**Source: 23E0077-08**		Prepared: 12-May-2023 Analyzed: 16-May-2023 19:48							
Iron	57	14.0	0.180	mg/L	5.00	9.40	92.0	75-125			D
Manganese	55	0.136	0.00250	mg/L	0.0250	0.117	76.9	75-125			D

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

Matrix Spike Dup (BLE0404-MSD2)		**Source: 23E0077-08**		Prepared: 12-May-2023 Analyzed: 16-May-2023 19:50							
Iron	57	14.2	0.180	mg/L	5.00	9.40	95.0	75-125	1.08	20	D
Manganese	55	0.138	0.00250	mg/L	0.0250	0.117	85.4	75-125	1.55	20	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: Min-Soon Yim	20-May-2023 12:19

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 8260D in Water	
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	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	03/28/2025
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2025
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: Min-Soon Yim	20-May-2023 12:19

Notes and Definitions

*	Flagged value is not within established control limits.
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.
M	Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
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.