2019 ANNUAL GROUNDWATER MONITORING, CORRECTIVE ACTION REPORT, AND STATISTICAL EVALUATION OF DETECTION MONITORING RESULTS

General Waste & Recycling, LLC

Coal Combustion Residual Landfill

PREPARED BY:

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JANUARY 2020

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PURPOSE

The purpose of this document is to meet U.S. Code of Federal Regulation (CFR) requirements for General Waste & Recycling, LLC's (General Waste's) Keewatin, Minnesota, Coal Combustion Residual (CCR) landfill (the Facility) for preparation of an "Annual Groundwater Monitoring and Corrective Action Report" per CFR §257.90 (e).

INTRODUCTION

General Waste's Keewatin Facility consists of a composite lined industrial landfill (CCR Unit) and an unlined demolition debris disposal cell. The Facility is located on approximately 70 acres of land in: Township 57 North, Range 22 West, Section 25 of Itasca County, as shown on Figure 1, Site Vicinity Map and Figure 2, Site Location Map. The location of the active CCR Units (Cell A and Cell B), and CCR groundwater monitoring system is shown on Figure 3, Site Detail Map.

HYDROGEOLOGIC CONCEPTUAL MODEL

Hydrogeologic conditions were investigated while conducting permitting activities for the Facility during 2013. An extensive investigation was completed at that time to refine the hydrologic model of the Facility in preparation of the installation of a groundwater monitoring system. The hydrogeologic investigation and groundwater monitoring system has been certified by a licensed professional engineer (PE) as meeting CRF 257.91 requirements and the certification has been posted on a CCR Website for the Facility per CFR 257.105(h)(3).

Geologic Units

Three (3) stratigraphic units have been identified for the hydrogeological conceptual model as follows:

1. Mine overburden stockpile unit that varies across the landfill footprint in depths ranging from 5 to 80 feet and consists of sand, silty-clayey sand, and sandy silty clay.

2. Native soil unit which consists of fine sand and silty sand near the top of the unit and generally grades to a silty medium grained sand with abundant gravel.

3. Mine tailings unit which consists of interlayered grey and black silt and fine sand sized taconite tailings. The mine tailings are approximately range from 10 to 26 feet thick and were placed in the tailings basin constructed directly to the west of the mine overburden stockpile.

The location of the mine overburden stockpile and the mine tailings (i.e., the Tailings Basin) are shown on Figure 2.

Hydrogeologic Setting

An unconfined aquifer exists below the Facility with the water table present within the mine overburden stockpile near the contact of the mine overburden stockpile unit with the native soil unit, except on the western edge of the permitted landfill boundary near MW-7 where the water table is within the tailings. Groundwater flow is generally to the east and southeast towards a ditch (Welcome Creek) located east

adjacent to the Facility. Welcome Creek is considered a groundwater divide and is a discharge point for shallow unconfined groundwater.

ENVIRONMENTAL MONITORING SYSTEM

The CCR Groundwater Monitoring System (GMS) consists of four (4) water table monitoring wells as follows:

- MW-7 is an up-gradient (with respect to general groundwater flow direction) monitoring well; and,
- MW-3R, MW-8 and MW-9 are down-gradient (with respect to general groundwater flow direction) monitoring wells.

The groundwater monitoring system and active CCR Units (Cell A and Cell B) are shown on Figure 3. Groundwater monitoring well details are summarized in Table 1, including static water level and potentiometric surface data (i.e., groundwater elevation data). MW-3R was abandoned during landfill expansion activities prior to the Fall groundwater monitoring event.

GROUNDWATER MONITORING SUMMARY

CCR groundwater monitoring has been conducted semi-annually during the Spring and Fall of each year (i.e., during April and October, respectively). Groundwater monitoring was performed on April 25, 2019 and October 21, 2019 for CCR Appendix III parameters (Table 2) with the exception of MW-3R that was abandoned prior to the Fall monitoring event. Static water levels were obtained and groundwater elevations calculated for both groundwater monitoring events (Table 1), with the exception of MW-3R as indicated above. CCR groundwater monitoring will continue through the active life of the CCR Unit and post closure. CCR Unit post closure monitoring will be conducted for 30 years.

Groundwater Elevations and General Groundwater Flow Direction

Groundwater elevations summarized in Table 1 were graphed (see Figure 4 Hydrograph). Potentiometric surface (groundwater elevation) contour maps were created and general groundwater flow direction evaluated (Figures 5 and 6). Groundwater elevations fluctuated the most in the upgradient monitoring well MW-7, most likely due to MW-7 being more susceptible to precipitation events affecting surface water within the tailings basin and therefore within groundwater in the area. MW-7 is a relatively shallow well (i.e., screened depth 16.6 to 26.6 feet below the ground surface) installed within the tailings basin (Figure 3).

Based on evaluation of the groundwater data, the general direction of groundwater flow is east-southeast (Figures 5, and 6) towards the ditch (Welcome Creek) and is consistent with historical groundwater flow. As indicated above, MW-3R was abandoned prior to the Fall monitoring event and was not used to evaluate general groundwater flow direction during October 2019 (Figure 6). Evaluation of groundwater elevation trends will continue throughout the active life of the CCR Unit and post closure.

Quality Assurance and Data Validation

Quality control (QC) samples were included for the CCR monitoring events. QC samples include field blanks and field duplicates analyzed for the same parameters as the respective monitoring well. The QC samples are used to determine the integrity of the field sampling procedures and the validity of the analytical results.

Groundwater Monitoring Results

Groundwater monitoring results are summarized in Table 3 (CCR Appendix III Lab Results Summary). Statistical analysis of the groundwater monitoring results, including determination of whether or not a Statistically Significant Increase (SSI) has been observed is presented below.

STATISTICAL ANALYSIS

Statistical Analysis was performed using the laboratory analysis results from the April 25, 2019 and October 21, 2019 groundwater monitoring events based on the Statistical Analysis Plan (SAP) written for the facility, with the exception of MW-3R that was abandoned during landfill expansion prior to October 2019. No SSIs were determined to have occurred based on the statistical evaluation of 2019 groundwater monitoring results. The statistical analyses completed for the April and October events are presented in Appendix B.

Additionally, following the SAP, the detection monitoring data collected in 2018 and 2019 was assessed and incorporated into the background dataset. After assessing the detection monitoring data, it was determined that intrawell assessment for MW-8 and MW-9 is more appropriate and will provide a higher statistical power than an interwell analysis (comparing upgradient well MW-7 parameters to downgradient wells MW-8 and MW-9 data). The groundwater monitored in MW-7 is very distinct from the groundwater monitored in MW-8 and MW-9, with much higher concentrations of Calcium, Chloride, Sulfate, and Total Dissolved Solids (TDS) observed in the upgradient well MW-7.

The rationale and workflow utilized to update the background dataset and adjust Upper Prediction Limits (UPLs) for 2020 and 2021 monitoring can be found in Appendix C. The updated UPLs can be seen in Table 4.

CONCLUSIONS AND RECOMMENDATIONS

Review of the collected data indicates that a SSI of CCR Appendix III parameter concentrations has not occurred in the downgradient monitoring wells (see Appendix B). Detection monitoring should continue as described in the Statistical Analysis Plan. MW-3R should be replaced to ensure the GMS meets CRF 257.91 requirements during future monitoring events.

FIGURES

N

0 3,000 6,000 12,000

Feet

1 Inch = 6,000 Feet

Legend

Location

Notes:

-Background image has been provided by MNGEO Web Services

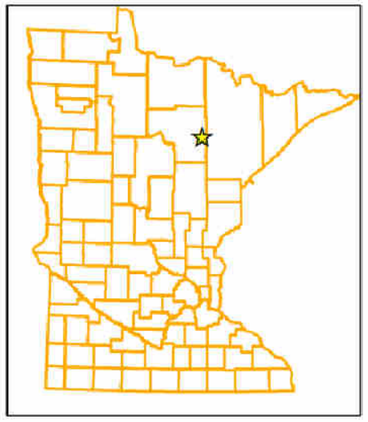
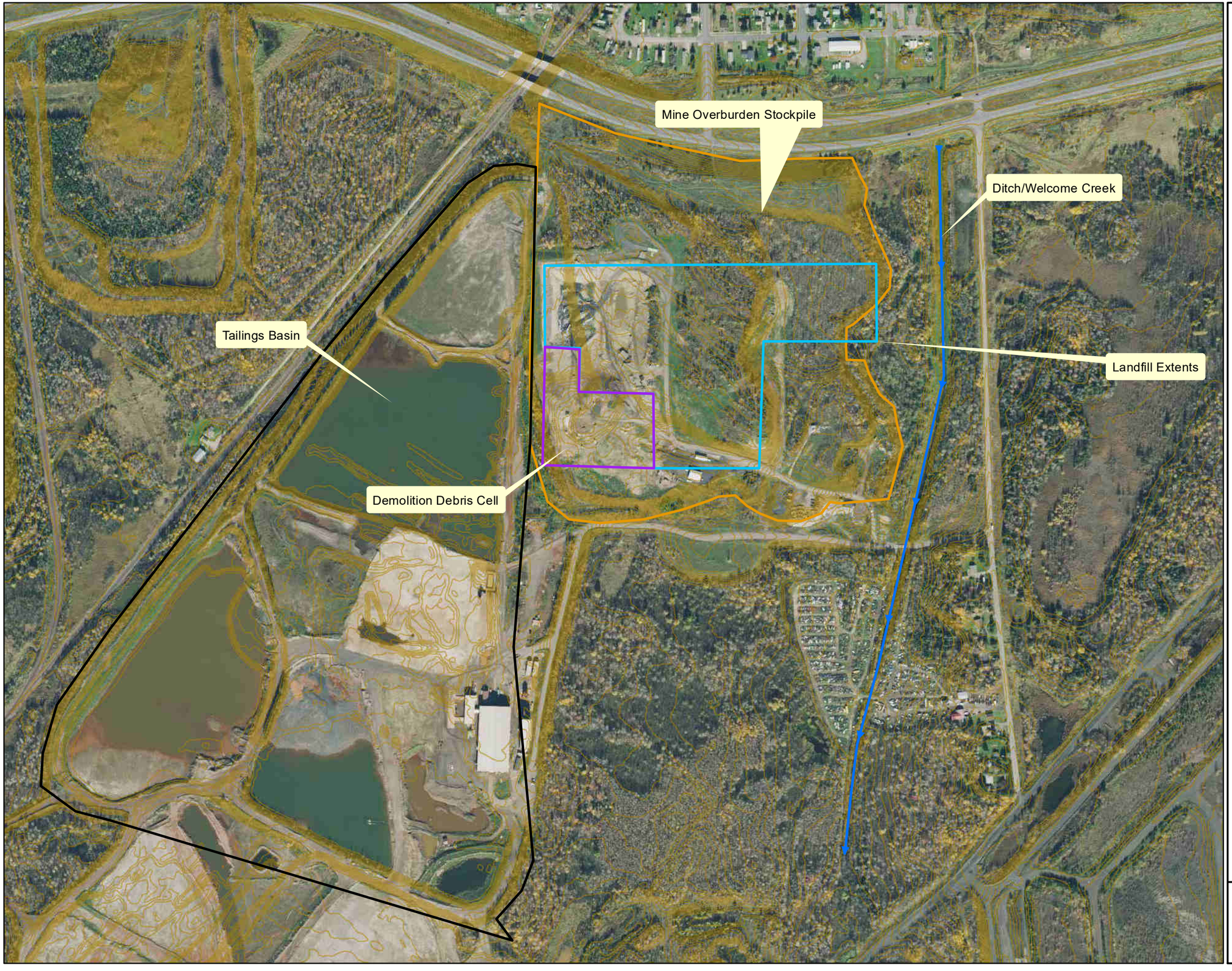


Figure 1
Site Vicinity Map

General Waste & Recycling, LLC
CCR Landfill
Keewatin, MN

Environmental Science & Engineering
www.netechnical.com

Date Drawn : 20 January 2020	
Drawn By : CRH	1
NTS Project #: 6385CC	



N

0 250 500 1,000

Feet

1 Inch = 500 Feet

Legend

- Demolition Debris Cell
- CCR Landfill Footprint
- Tailings Basin
- Mine Overburden Stockpile
- Ditch/Welcome Creek
- Contours

Notes:

-Background image has been provided by MNGEO Web Services, Image Date 2013

Figure 2
Site Location Map

General Waste & Recycling, LLC
CCR Landfill
Keewatin, MN

Environmental Science & Engineering
www.netechnical.com

Date Drawn : 20 January 2020

Drawn By : CRH

NTS Project #: 6385CC

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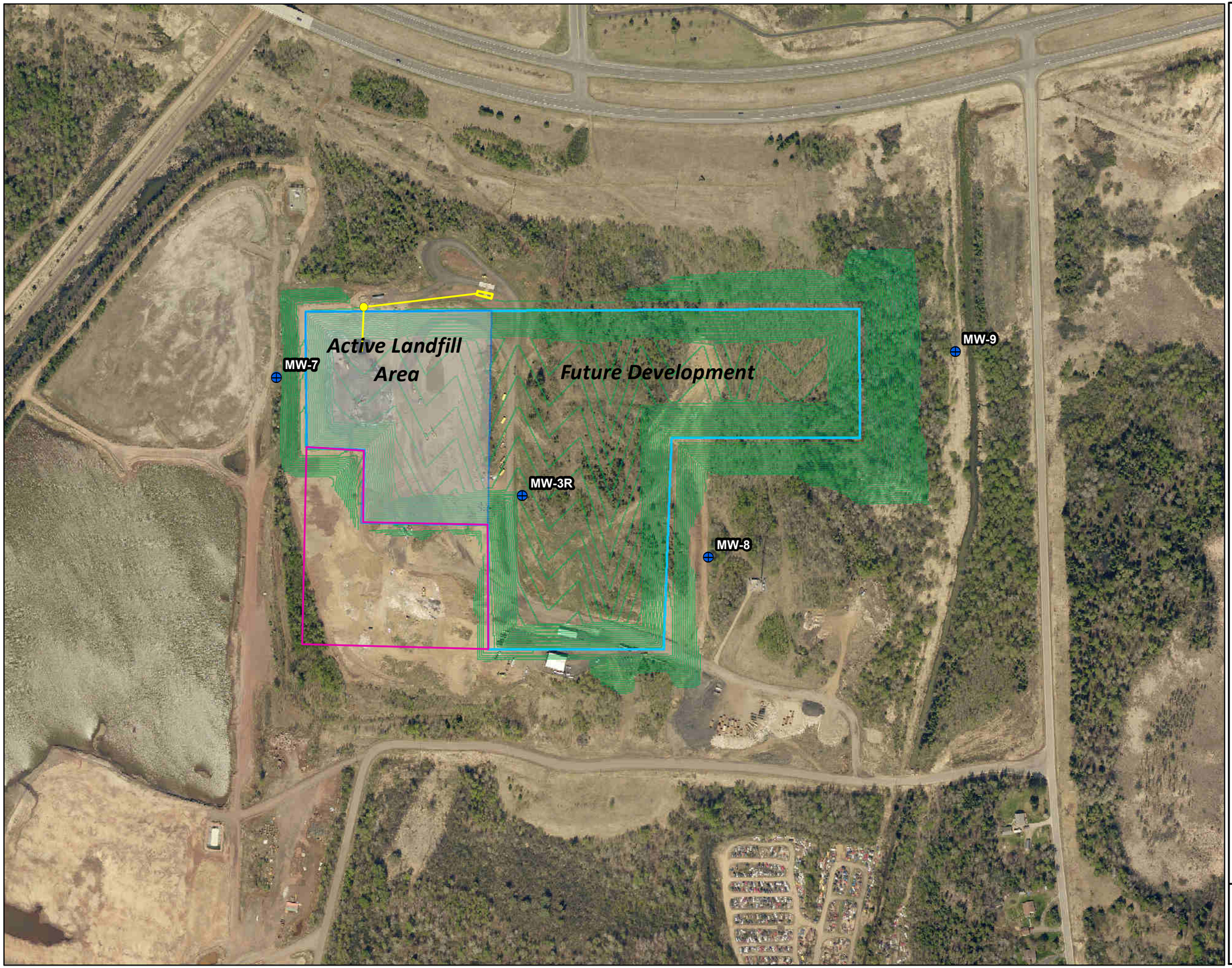


N

0 150 300 600

Feet

1 Inch = 300 Feet

Legend

- Groundwater Monitoring Well
- Leachate Pump Access Vault
- Leachate Collection Pipe
- Leachate Collection Pad
- Demolition Debris Cell
- Landfill Footprint
- Landfill Base Grade Contours
- Ditch

Notes:

-Background image has been provided by St. Louis County Web Services, App Image Date: May, 2016

-MW-3R was abandoned prior to October 2019 during the expansion of the landfill.

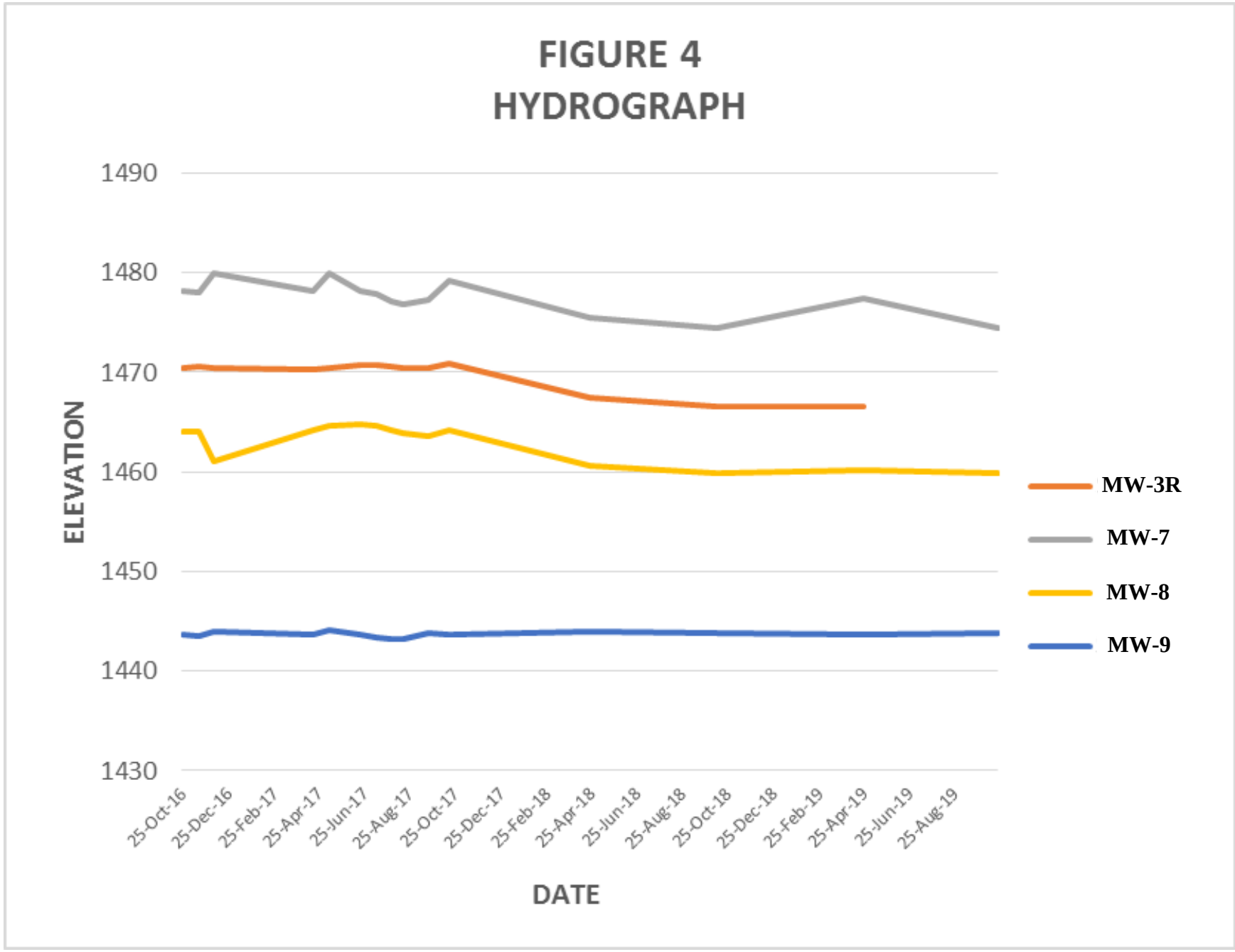
Figure 3
Site Detail Map

General Waste Industrial Landfill
CCR Groundwater Monitoring System
Keewatin, MN (Itasca)

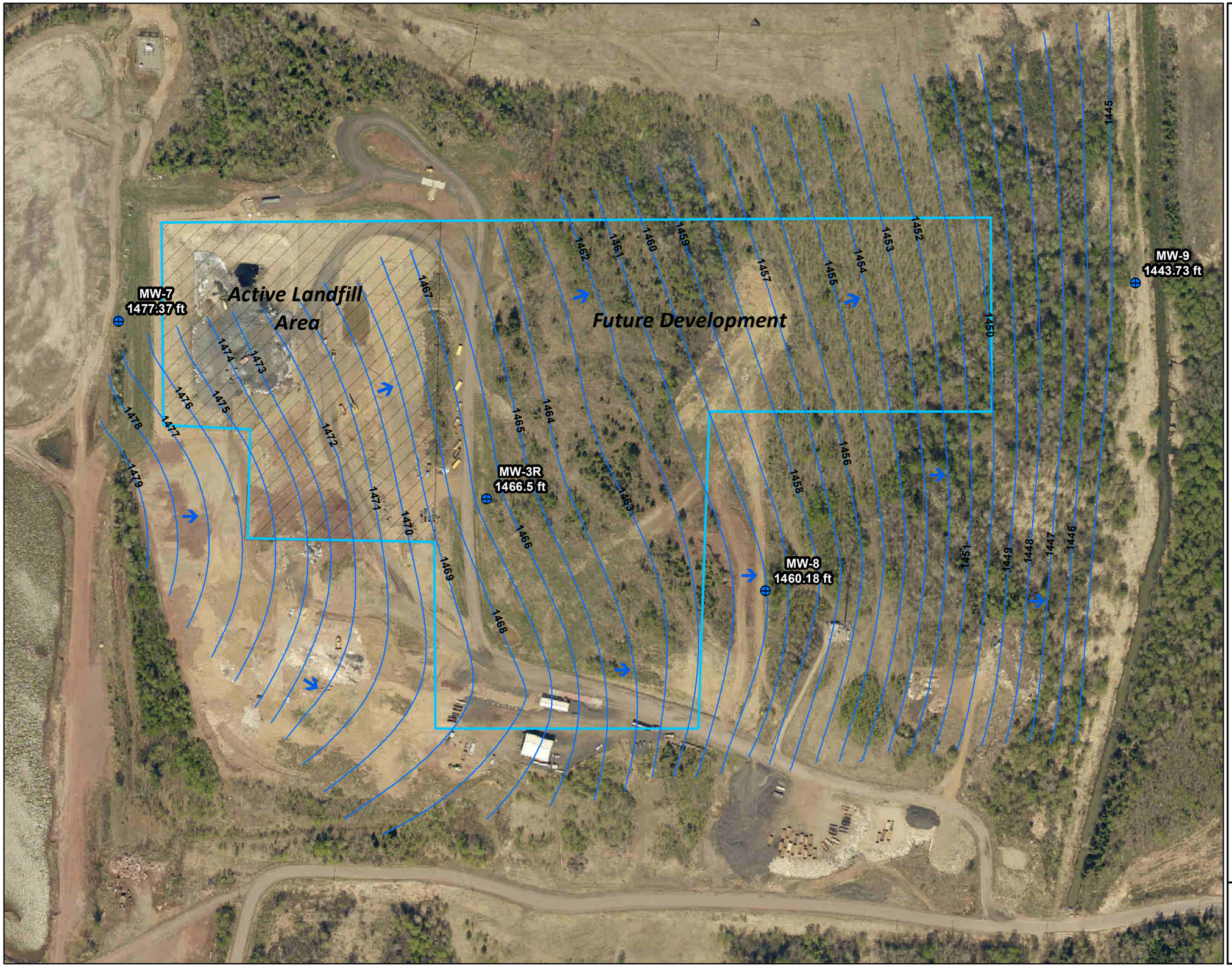
NTS Environmental Science & Engineering
www.netechnical.com

Date Drawn :	20 January 2020
Drawn By :	CRH
NTS Project #:	6385CC

3



MW-3R was abandoned prior to the October 2019 monitoring event.



N

0 100 200 400

Feet

1 Inch = 200 Feet

Legend

- Groundwater Monitoring Wells
- April, 2019 Contours
- Landfill Footprint
- Ditch

Approximate Groundwater Flow Direction

- East
- Northeast
- Southeast

Notes:

-Background image has been provided by St. Louis County Web Services, App Image Date: May, 2016

Figure 5

April 25, 2019 Groundwater Flow Map

General Waste Industrial Landfill
CCR Groundwater Monitoring System
Keewatin, MN (Itasca)

Environmental Science & Engineering
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Date Drawn :	20 January 2020
Drawn By :	CRH
NTS Project #:	6385CC

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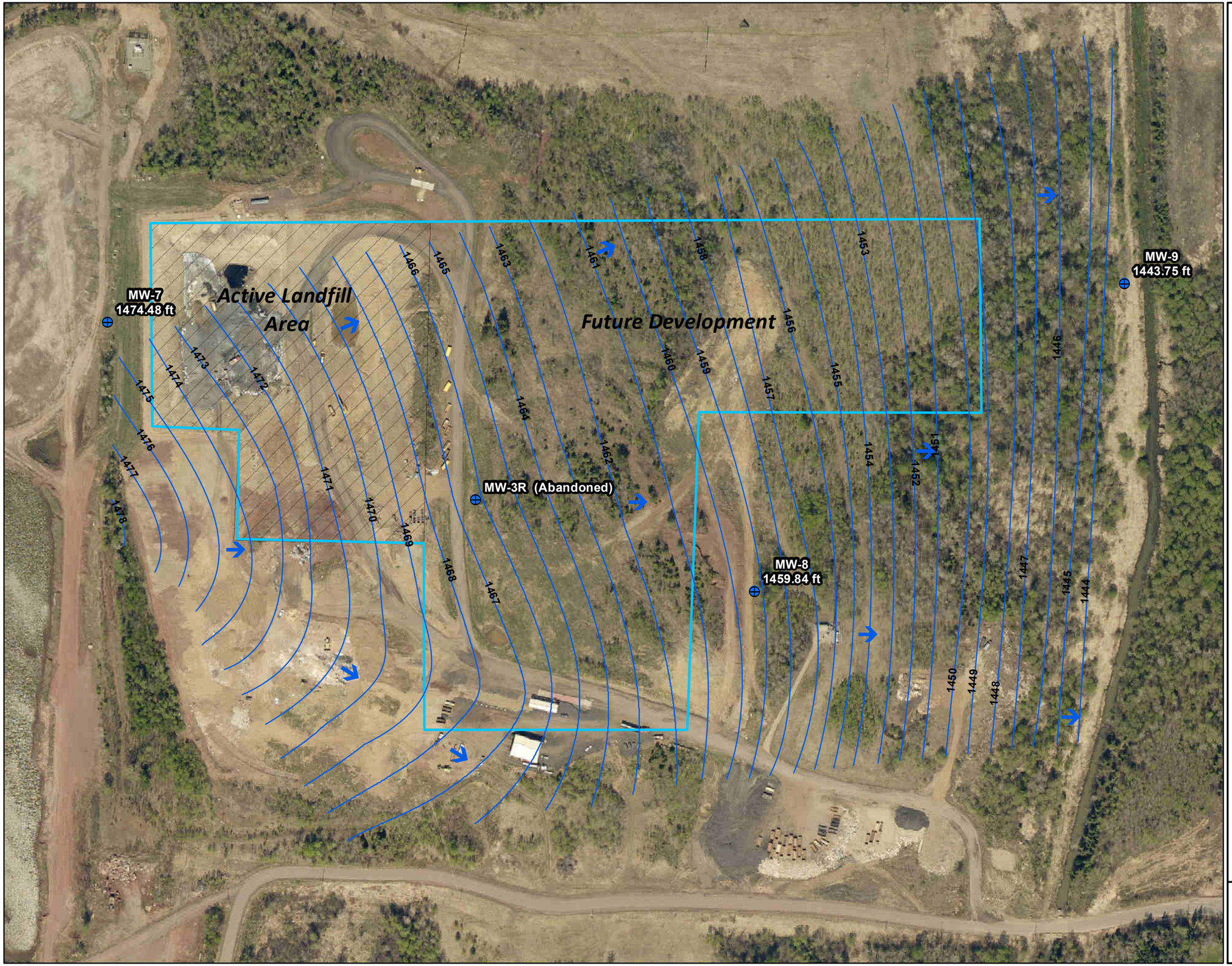

N

0 100 200 400

Feet

1 Inch = 200 Feet

Legend

- Groundwater Monitoring Wells
- October, 2019 contours
- Landfill Footprint
- Ditch

Approximate Groundwater Flow Direction

- East
- Northeast
- Southeast

Notes:

-Background image has been provided by St. Louis County Web Services, App Image Date: May, 2016

-MW-3R was abandonded prior to October 2019 during the expansion of the landfill

Figure 6

October 21, 2019 Groundwater Flow Map

General Waste Industrial Landfill
CCR Groundwater Monitoring System
Keewatin, MN (Itasca)

Environmental Science & Engineering
www.netechnical.com

Date Drawn :	20 January 2020
Drawn By :	CRH
NTS Project #:	6385CC

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TABLES

TABLE 1
GROUNDWATER MONITORING WELL DETAILS
GENERAL WASTE AND RECYCLING CCR LANDFILL

	MW-3R		MW-7		MW-8		MW-9	
MDH Unique Well #	797239		817979		817978		817980	
Northing (UTM NAD83)	5248332.87		5248449.356		5248271.719		5248474.904	
Easting (Zone 15 Meters)	494267.27		494024.588		494451.676		494695.922	
Installation Date	7/9/15		9/30/2016		9/29/2016		9/30/2016	
Ground Elev. (ft)	1530.10		1493.62		1491.63		1452.93	
Riser Top Elev. (ft)	1532.29		1496.13		1494.41		1454.72	
Total Depth (ft)	75.0		26.6		41.3		18.9	
Screened Interval (ft)	65 - 75		16.6 - 26.6		31.3 - 41.3		8.9 - 18.9	
Screened Elevation	1465.10 - 1455.10		1477.02 - 1467.02		1460.33 - 1450.33		1444.03 - 1434.03	
Date of Measurement	**Static Level**	**GW Elev.**	**Static Level**	**GW Elev.**	**Static Level**	**GW Elev.**	**Static Level**	**GW Elev.**
25-Oct-16	61.90	1470.39	17.92	1478.21	30.42	1463.99	11.07	1443.65
15-Nov-16	61.75	1470.54	18.11	1478.02	30.31	1464.10	11.16	1443.56
5-Dec-16	61.90	1470.39	16.22	1479.91	33.40	1461.01	10.69	1444.03
17-Apr-17	61.95	1470.34	17.93	1478.20	30.18	1464.23	10.98	1443.74
8-May-17	61.82	1470.47	16.16	1479.97	29.72	1464.69	10.62	1444.10
20-Jun-17	61.56	1470.73	17.97	1478.16	29.60	1464.81	11.11	1443.61
11-Jul-17	61.57	1470.72	18.32	1477.81	29.84	1464.57	11.40	1443.32
1-Aug-17	61.74	1470.55	18.95	1477.18	30.21	1464.20	11.50	1443.22
16-Aug-17	61.90	1470.39	19.34	1476.79	30.53	1463.88	11.53	1443.19
18-Sep-17	61.89	1470.40	18.85	1477.28	30.74	1463.67	10.84	1443.88
16-Oct-17	61.47	1470.82	16.97	1479.16	30.18	1464.23	11.00	1443.72
23-Apr-18	64.84	1467.45	20.64	1475.49	33.81	1460.60	10.71	1444.01
11-Oct-18	65.65	1466.64	21.65	1474.48	34.57	1459.84	10.97	1443.75
25-Apr-19	65.79	1466.50	18.76	1477.37	34.23	1460.18	10.99	1443.73
*10/21/2019			21.65	1474.48	34.57	1459.84	10.97	1443.75

* MW-3R was abandoned during landfill expansion prior to the October 2019 monitoring event.

TABLE 2
CCR APPENDIX III PARAMETERS

Parameter	MCL
Boron	NA
Calcium	NA
Chloride	NA
Fluoride	4.0 mg/L
pH	NA
Sulfate	NA
Total Dissolved Solids (TDS)	NA

TABLE 3
CCR APPENDIX III LAB RESULTS SUMMARY
GENERAL WASTE AND RECYCLING, LLC

PARAMETER	UNITS	DATE	MW-3R	MW-7	MW-8	MW-9	Field Dup	Field Blank
Boron	µg/L	17-Apr-17	<160	<160	<160	<160	<160	<40.0
		8-May-17	<160	<160	<160	<160	<160	<40.0
		20-Jun-17	<160	<160	<160	<160	<160	<40.0
		11-Jul-17	124	76.4	70.7	<40.0	<40.0	<40.0
		1-Aug-17	123	75.9	69.5	<40.0	<40.0	<40.0
		16-Aug-17	114	<80.0	<80.0	<80.0	<80.0	<40.0
		18-Sep-17	122	<80.0	<80.0	<80.0	<80.0	<40.0
		16-Oct-17	126	87.8	<80.0	<80.0	<80.0	<40.0
		23-Apr-18	123	73.8	79.5	43.3	39.7	39.3
		11-Oct-18	103	70.8	64.7	<40.0	<40.0	<40.0
		25-Apr-19	96	69.7	75.8	<50.0	<50.0	<10.0
		21-Oct-19	*No Sample	66.9	70.5	<40.0	<50.0	<40.0
Calcium	mg/L	17-Apr-17	563	350	384	197	192	<0.50
		8-May-17	588	404	402	203	209	<1.0
		20-Jun-17	607	524	373	211	207	<0.50
		11-Jul-17	628	355	387	199	199	<0.50
		1-Aug-17	650	375	415	189	185	<0.50
		16-Aug-17	609	341	388	179	178	<0.50
		18-Sep-17	538	316	369	192	191	<100
		16-Oct-17	585	357	448	197	197	<100
		23-Apr-18	551	371	371	229	222	<0.50
		11-Oct-18	532	400	331	193	192	<1.0
		25-Apr-19	484	481	343	206	203	<0.50
		21-Oct-19	*No Sample	539	364	217	219	<0.50

***MW-3R abandoned prior to October monitoring event.**

TABLE 3
CCR APPENDIX III LAB RESULTS SUMMARY
GENERAL WASTE AND RECYCLING, LLC

PARAMETER	UNITS	DATE	MW-3R	MW-7	MW-8	MW-9	Field Dup	Field Blank
Chloride	**mg/L**	25-Oct-16	1.1	109	1	606	606	<1.0
		15-Nov-16	2.2	105	1.2	4.1	4.3	<1.0
		5-Dec-16	1.6	102	1.2	5.8	5.8	<1.0
		17-Apr-17	1.1	63.8	1.1	6.6	7.6	<1.0
		8-May-17	1.1	52.2	<1.0	14.9	13.9	<1.0
		20-Jun-17	1.1	52.5	1	8.9	9	<1.0
		11-Jul-17	1.1	55.6	1	17.6	17.5	<1.0
		1-Aug-17	1.2	61.0	1.3	20.8	20.3	<1.0
		16-Aug-17	1.2	67.5	1.2	19	19.8	<1.0
		18-Sep-17	1.2	82.4	1	10.4	10.7	<1.0
		16-Oct-17	1.1	52.0	1.2	8.7	8.8	<1.0
		23-Apr-18	1.5	124	<1.2	2.8	2.5	<1.2
		11-Oct-18	2.0	91.4	1.4	8.4	8.4	<1.0
		25-Apr-19	2.8	61.4	1.3	2.9	2.8	<1.0
		21-Oct-19	*No Sample	37.4	1.4	6	5.9	<1.0

***MW-3R abandoned prior to October monitoring event.**

TABLE 3
CCR APPENDIX III LAB RESULTS SUMMARY
GENERAL WASTE AND RECYCLING, LLC

PARAMETER	UNITS	DATE	MW-3R	MW-7	MW-8	MW-9	Field Dup	Field Blank
Fluoride	**mg/L**	25-Oct-16	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		15-Nov-16	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		5-Dec-16	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		17-Apr-17	0.11	0.11	<0.10	<0.10	<0.10	<0.10
		8-May-17	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		20-Jun-17	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		11-Jul-17	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		1-Aug-17	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		16-Aug-17	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		18-Sep-17	0.1	<0.10	<0.10	<0.10	<0.10	<0.10
		16-Oct-17	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		23-Apr-18	0.086	0.080	0.053	0.075	0.068	<0.050
		11-Oct-18	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		25-Apr-19	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
		21-Oct-19	*No Sample	<0.10	<0.10	<0.10	<0.10	<0.10

***MW-3R abandoned prior to October monitoring event.**

TABLE 3
CCR APPENDIX III LAB RESULTS SUMMARY
GENERAL WASTE AND RECYCLING, LLC

PARAMETER	UNITS	DATE	MW-3R	MW-7	MW-8	MW-9	Field Dup	Field Blank
pH, Lab	**mg/L**	25-Oct-16	7.3	7.4	7.4	7.4	7.3	6.3
		15-Nov-16	7.3	7.2	7.2	7.2	7.2	6.0
		5-Dec-16	6.8	6.6	6.6	6.9	6.8	7.1
		17-Apr-17	7.3	7.4	7.3	7.3	7.3	6.1
		8-May-17	7.2	7.1	7.1	7.2	7.2	6.2
		20-Jun-17	7.1	7.1	7.2	7.2	7.2	5.9
		11-Jul-17	7.1	7.1	7.1	7.2	7.2	6.0
		1-Aug-17	7.1	7.1	7.2	7.2	7.2	6.0
		16-Aug-17	7.1	7.2	7.2	7.2	7.2	5.8
		18-Sep-17	7.2	7.1	7.2	7.2	7.2	5.8
		16-Oct-17	7.3	7.2	7.2	7.3	7.3	6.0
		23-Apr-18	6.8	7.0	7.0	6.3	6.6	8.6
		11-Oct-18	7.2	7.2	7.2	7.2	7.2	6.1
		25-Apr-19	7.4	7.4	7.2	7.5	7.3	6.2
		21-Oct-19	*No Sample	7.2	7.1	7.2	7.2	5.7

***MW-3R abandoned prior to October monitoring event.**

TABLE 3
CCR APPENDIX III LAB RESULTS SUMMARY
GENERAL WASTE AND RECYCLING, LLC

PARAMETER	UNITS	DATE	MW-3R	MW-7	MW-8	MW-9	Field Dup	Field Blank
Sulfate	**mg/L**	25-Oct-16	1980	937	823	462	458	<2.0
		15-Nov-16	1820	929	764	475	470	<2.0
		5-Dec-16	1840	903	778	460	460	<2.0
		17-Apr-17	1710	551	780	454	441	<2.0
		8-May-17	1760	712	731	438	433	<2.0
		20-Jun-17	1810	746	672	459	458	<2.0
		11-Jul-17	1870	548	707	406	412	<2.0
		1-Aug-17	1830	511	700	339	342	<2.0
		16-Aug-17	1840	447	703	354	348	<2.0
		18-Sep-17	1890	441	719	432	436	<2.0
		16-Oct-17	1840	675	1010	443	432	<2.0
		23-Apr-18	1520	488	617	481	464	<1.2
		11-Oct-18	1550	695	589	460	461	<2.0
		25-Apr-19	1300	988	562	423	441	<2.0
		21-Oct-19	*No Sample	1120	630	437	434	<2.0

***MW-3R abandoned prior to October monitoring event.**

TABLE 3
CCR APPENDIX III LAB RESULTS SUMMARY
GENERAL WASTE AND RECYCLING, LLC

PARAMETER	UNITS	DATE	MW-3R	MW-7	MW-8	MW-9	Field Dup	Field Blank
Total Dissolved Solids (TDS)	**mg/L**	25-Oct-16	3300	2070	1740	1070	1090	<10.0
		15-Nov-16	3130	2090	1710	1190	1140	<10.0
		5-Dec-16	3110	1940	1710	1100	1110	<10.0
		17-Apr-17	3160	1500	1760	1180	1120	<10.0
		8-May-17	3010	1610	1630	1050	1040	<10.0
		20-Jun-17	3190	1700	1510	1090	1120	<10.0
		11-Jul-17	3040	1380	1550	1010	1020	<10.0
		1-Aug-17	3290	1300	1560	864	888	12
		16-Aug-17	3360	1300	1610	979	957	32
		18-Sep-17	2580	1310	1580	1100	1000	<10.0
		16-Oct-17	3110	1380	1800	993	1010	<10.0
		23-Apr-18	2870	1420	1400	1080	1080	<10.0
		11-Oct-18	2850	1600	1350	1100	1120	<10.0
		25-Apr-19	2560	1970	1380	1020	1050	<10.0
		21-Oct-19	*No Sample	2250	1490	1100	1090	<10.0

***MW-3R abandoned prior to October monitoring event.**

TABLE 4
UPDATED UPLs BASED ON UNIFIED GUIDANCE TABLE 19
GENERAL WASTE AND RECYCLING, LLC

PARAMETER	MW-7	MW-3R	MW-8	MW-9
Boron (ug/L)	110.01	n/a	119.29	50
Calcium (mg/L)	579.98	n/a	438.4	233.23
Chloride (mg/L)	132.82	n/a	1.52	22.65
Fluoride (mg/L)	0.11	n/a	0.1	0.1
pH (SU)	6.12 - 6.79	n/a	6.23-7.13	6.23-7.13
Sulfate (mg/L)	1197.73	n/a	865.08	527.68
Total Dissolved Solids (mg/L)	2391.34	n/a	1863.13	1243.1

APPENDICES

APPENDIX A

ANALYTICAL LABORATORY REPORTS & FIELD REPORTS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

May 13, 2019

Dennis Schubbe
Northeast Technical Services
526 Chestnut Street
Virginia, MN 55792

RE: Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Dear Dennis Schubbe:
Enclosed are the analytical results for sample(s) received by the laboratory on April 25, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised to remove the D3 flag on the Field Blank sample.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carrie Jensen
carrie.jensen@pacelabs.com
(218)742-1042
Project Manager

Enclosures

cc: Sample Data, Northeast Technical Services
Scott Seeley, NTS
Karissa Vosen, NTS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

CERTIFICATIONS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
Alaska Certification UST-107
Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification # : 998027470
WA Department of Ecology Lab ID# C1007

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

SAMPLE SUMMARY

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Lab ID	Sample ID	Matrix	Date Collected	Date Received
12124076001	**Field Blank**	Water	04/25/19 11:50	04/25/19 15:50
12124076002	**Field Duplicate**	Water	04/25/19 14:35	04/25/19 15:50
12124076003	**MW3R**	Water	04/25/19 12:05	04/25/19 15:50
12124076004	**MW7**	Water	04/25/19 10:52	04/25/19 15:50
12124076005	**MW8**	Water	04/25/19 13:24	04/25/19 15:50
12124076006	**MW9**	Water	04/25/19 14:34	04/25/19 15:50

Pace Analytical Services, LLC
315 Chestnut Street
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(218) 742-1042

SAMPLE ANALYTE COUNT

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
12124076001	**Field Blank**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076002	**Field Duplicate**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076003	**MW3R**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076004	**MW7**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076005	**MW8**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076006	**MW9**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Sample: Field Blank **Lab ID: 12124076001** Collected: 04/25/19 11:50 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	ND	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:38	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	10.0	1	05/01/19 10:08	05/03/19 20:03	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	ND	mg/L	10.0	1		04/30/19 17:01		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.2**	Std. Units	0.10	1		04/30/19 18:04		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		05/01/19 07:13	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 07:13	16984-48-8	
Sulfate	ND	mg/L	2.0	1		05/01/19 07:13	14808-79-8	

Sample: Field Duplicate **Lab ID: 12124076002** Collected: 04/25/19 14:35 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**203**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:45	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:15	7440-42-8	D3
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1050**	mg/L	20.0	1		04/30/19 17:00		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		04/30/19 17:51		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**2.8**	mg/L	1.0	1		05/01/19 05:29	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 05:29	16984-48-8	
Sulfate	**441**	mg/L	8.0	4		05/01/19 12:06	14808-79-8	

Sample: MW3R **Lab ID: 12124076003** Collected: 04/25/19 12:05 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**484**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:40	7440-70-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Sample: MW3R **Lab ID: 12124076003** Collected: 04/25/19 12:05 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**96.0**	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:06	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**2560**	mg/L	20.0	1		04/30/19 16:59		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		04/30/19 18:07		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**2.8**	mg/L	1.0	1		05/01/19 04:26	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 04:26	16984-48-8	
Sulfate	**1300**	mg/L	20.0	10		05/01/19 04:47	14808-79-8	

Sample: MW7 **Lab ID: 12124076004** Collected: 04/25/19 10:52 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**481**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:37	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**69.7**	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:00	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1970**	mg/L	20.0	1		04/30/19 16:56		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		04/30/19 17:55		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**61.4**	mg/L	1.0	1		05/01/19 06:31	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 06:31	16984-48-8	
Sulfate	**988**	mg/L	20.0	10		05/01/19 12:27	14808-79-8	

Sample: MW8 **Lab ID: 12124076005** Collected: 04/25/19 13:24 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**343**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:42	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**75.8**	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:09	7440-42-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Sample: MW8 **Lab ID: 12124076005** Collected: 04/25/19 13:24 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1380**	mg/L	20.0	1		04/30/19 16:59		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		04/30/19 17:48		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**1.3**	mg/L	1.0	1		05/01/19 05:08	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 05:08	16984-48-8	
Sulfate	**562**	mg/L	12.0	6		05/01/19 11:45	14808-79-8	

Sample: MW9 **Lab ID: 12124076006** Collected: 04/25/19 14:34 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**206**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:43	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:12	7440-42-8	D3
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1020**	mg/L	20.0	1		04/30/19 17:00		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.5**	Std. Units	0.10	1		04/30/19 17:58		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**2.9**	mg/L	1.0	1		05/01/19 06:52	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 06:52	16984-48-8	
Sulfate	**423**	mg/L	8.0	4		05/01/19 12:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 602602 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

METHOD BLANK: 3258183 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	mg/L	ND	0.50	05/02/19 16:17	

LABORATORY CONTROL SAMPLE: 3258184

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	20	20.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3258185 3258186

Parameter	Units	12123992003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	mg/L	20.3	20	20	40.9	40.7	103	102	70-130	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 602622 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

METHOD BLANK: 3258262 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	10.0	05/03/19 19:30	

LABORATORY CONTROL SAMPLE: 3258263

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	92.5	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3258264 3258265

Parameter	Units	12124033020 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	94.0	100	100	192	189	98	95	70-130	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 165113 Analysis Method: SM 2540C (1997)
QC Batch Method: SM 2540C (1997) Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

METHOD BLANK: 650643 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	04/30/19 16:55	

METHOD BLANK: 650647 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	04/30/19 17:02	

LABORATORY CONTROL SAMPLE: 650644

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	255	234	92	80-120	

SAMPLE DUPLICATE: 650645

Parameter	Units	12124120004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	930	908	2	5	H3

SAMPLE DUPLICATE: 650646

Parameter	Units	12124119002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	356	374	5	5	H1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 165071 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

LABORATORY CONTROL SAMPLE: 650392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	7	7.0	101	98-102	H6

SAMPLE DUPLICATE: 650393

Parameter	Units	12123914004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	0	10	H6

SAMPLE DUPLICATE: 650394

Parameter	Units	12124076003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	10	H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 165097 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

METHOD BLANK: 650540 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/01/19 00:15	
Fluoride	mg/L	ND	0.10	05/01/19 00:15	
Sulfate	mg/L	ND	2.0	05/01/19 00:15	

LABORATORY CONTROL SAMPLE: 650541

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	51.1	102	90-110	
Fluoride	mg/L	5	5.0	100	90-110	
Sulfate	mg/L	50	50.9	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 650542 650543

Parameter	Units	12124074001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	0.66J	50	50	53.2	53.3	105	105	90-110	0	20	
Fluoride	mg/L	0.099J	5	5	5.1	5.2	100	101	90-110	1	20	
Sulfate	mg/L	0.63J	50	50	52.5	52.6	104	104	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 650544 650545

Parameter	Units	12124119002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	75.2	250	250	340	339	106	105	90-110	0	20	
Fluoride	mg/L	3.4	25	25	28.3	28.3	100	100	90-110	0	20	
Sulfate	mg/L	106	250	250	369	367	105	104	90-110	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALIFIERS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-V	Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H1	Analysis conducted outside the recognized method holding time.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
12124076001	**Field Blank**	EPA 200.7	602602	EPA 200.7	603271
12124076002	**Field Duplicate**	EPA 200.7	602602	EPA 200.7	603271
12124076003	**MW3R**	EPA 200.7	602602	EPA 200.7	603271
12124076004	**MW7**	EPA 200.7	602602	EPA 200.7	603271
12124076005	**MW8**	EPA 200.7	602602	EPA 200.7	603271
12124076006	**MW9**	EPA 200.7	602602	EPA 200.7	603271
12124076001	**Field Blank**	EPA 200.8	602622	EPA 200.8	603644
12124076002	**Field Duplicate**	EPA 200.8	602622	EPA 200.8	603644
12124076003	**MW3R**	EPA 200.8	602622	EPA 200.8	603644
12124076004	**MW7**	EPA 200.8	602622	EPA 200.8	603644
12124076005	**MW8**	EPA 200.8	602622	EPA 200.8	603644
12124076006	**MW9**	EPA 200.8	602622	EPA 200.8	603644
12124076001	**Field Blank**	SM 2540C (1997)	165113		
12124076002	**Field Duplicate**	SM 2540C (1997)	165113		
12124076003	**MW3R**	SM 2540C (1997)	165113		
12124076004	**MW7**	SM 2540C (1997)	165113		
12124076005	**MW8**	SM 2540C (1997)	165113		
12124076006	**MW9**	SM 2540C (1997)	165113		
12124076001	**Field Blank**	SM 4500-H+B	165071		
12124076002	**Field Duplicate**	SM 4500-H+B	165071		
12124076003	**MW3R**	SM 4500-H+B	165071		
12124076004	**MW7**	SM 4500-H+B	165071		
12124076005	**MW8**	SM 4500-H+B	165071		
12124076006	**MW9**	SM 4500-H+B	165071		
12124076001	**Field Blank**	EPA 300.0	165097		
12124076002	**Field Duplicate**	EPA 300.0	165097		
12124076003	**MW3R**	EPA 300.0	165097		
12124076004	**MW7**	EPA 300.0	165097		
12124076005	**MW8**	EPA 300.0	165097		
12124076006	**MW9**	EPA 300.0	165097		

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Comments:

TAT: Standard

PM: Dennis Schubbe

Report To: sampledata@netechnical.com

Project#: 6385CC_2019

Event Key:
6385CC_2019 Apr(1 of 1)

WO# : 12124076

12124076

Environmental Science & Engineering

Sample ID:	Sample Location:	Date:	Time:	Mx:	ST:	Nitric, Metals	Unpreserved Generals						Required Analyses:
	Field Blank	4/25/19	1150	W	G	X	X						List #1
	Field Duplicate	"	1435	W	G	X	X						List #1
	MW3R	"	1205	W	G	X	X						List #1
	MW7	"	1052	W	G	X	X						List #1
	MW8	"	1324	W	G	X	X						List #1
	MW9	"	1434	W	G	X	X						List #1

Sampled by: Corey Andrews		**Relinquished by:**	**Date:** 4/25/19
			Time: 1550
Received by:	**Date:**	**Relinquished by:**	**Date:**
	Time:		**Time:**
Received at Lab by:	**Date:** 4/25/19	**Temperature at Receipt:** 5.8	
	Time: 15:50		

List #1 **6385CC_2019 Apr(1 of 1)**

Field Blank,Field Duplicate,MW3R,MW7,MW8,MW9

Method:	Parameter:	NTS Limit:	J-Flag:
EPA 200.7			
	Calcium		☐
EPA 200.8			
	Boron		☐
EPA 300.0			
	Chloride		☐
	Fluoride		☐
	Sulfate		☐
SM 2540C			
	Solids, Total Dissolved (TDS)		☐
SM 4500-H+B			
	pH		☐

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 03Apr2019 Page 1 of 1
	Document No.: F-VM-C-001-Rev.12	Issuing Authority: Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: NTS

Project #: WO# : 12124076

PM: CLJ Due Date: 05/09/19

CLIENT: NTS-Dennis

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☐ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other: Temp Blank? ☑ Yes ☐ No

Thermometer Used: ☑ 140792808 Type of Ice: ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.5 Cooler Temp Corrected °C: 5.8 Biological Tissue Frozen? ☐ Yes ☐ No ☑ NA

Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: ZH 4/25/19

Comments:

Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5. If Fecal: ☐ <8 hours ☐ >8, <24 hours ☐ >24 hours
Short Hold Time Analysis (<72 hr)?	☑ Yes	☐ No	☐ N/A	6. pH
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation will be checked and documented in the pH logbook.	☑ Yes	☐ No	☐ N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	☐ Yes	☐ No	☑ N/A	13.
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Carrie Jean Date: 4/25/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Field Report Cover Sheet

Event Key: 6385CC_2019 Apr(1 of 1)

Field Date: 4/25/2019

Report Created: 5/3/2019 3:08:42 PM

Client:
General Waste Disposal & Recovery

NTS Project Name:
CCR Landfill Monitoring 2019

NTS Project Manager:
Dennis Schubbe

NTS Field Personnel:
Corey Andrews

Summary of Services Performed:

Prepped and went to General Waste to conduct April 2019 CCR well monitoring. The following wells were sampled via the low flow method with submersible pumps: MW3R, MW7, MW8, and MW9. Dup obtained at MW9. Considered turbidity stable if three consecutive readings were under 5 NTU.

Samples ceded to PACE Analytical in Virginia, MN.

For additional details see stabilization sheets and fields notes.

I,Corey Andrews, certify that the information in this report is true and correct to the best of my knowledge.

MW3R

SECTION #1: DATA COLLECTIO ☑ **Sample Collected** **Field Blank:** Field Blank

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
12:04	6.35	0.00	2983	1.5	144	11.08

65.79 Static Water Level in Water by Field Measurement, ft

1466.5 Elevation, GW (MSL) in Water by Calculation, ft

SECTION #2: OBSERVATIONS **Time:** 11:15

Turbidity less than 5 NTU. Considered well stable.

Air Temperature: 51°F to 60°F
Wind Speed: 5-10 mph
Wind Direction: W-NW
Precipitation: None
Cloud Cover: Mostly Sunny
Airborne Particulate: Dust

Color, Purge: Gray/Black
Appearance, Purge: Clear
Odor, Purge: Definite
Color, Sample: Colorless
Appearance, Sample: Clear
Odor, Sample: Definite

Well Depth (ft): 77.58
SWL (ft): 65.79
Pump Rate (gpm): 0.33
Interval (min): 5.83
Pump Start (HH:MM): 11:23
Pump Stop (HH:MM): 12:12
Purge Volume (gal): 16.17
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 77.58ft - Static Water Level 65.79ft = Water Column 11.79ft
Water Column 11.79ft x *Conversion Factor 0.163gal/ft = Well Volume 1.924gal
Well Volume 1.924gal ÷ Pump Rate 0.33gpm = Well Volume Interval 5.83min

*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48

Pump Start Time 11:23 - Pump End Time 12:12 = Pump Duration 49min
Pump Duration 49min x Pump Rate 0.33gpm = Volume Purged 16.17gal

Top of Casing Elevation 1532.29 - Static Water Level 65.79 = 1466.5ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 5.83 **Pump Rate (gpm):** 0.33

MW3R (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	+/- 1.0 NTU	+/- 20 mV	+/- 0.10 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
11:34	6.36	0.19	3019	27.3	216	10.99	66.61
11:40	6.36	0.00	3031	16.6	184	10.93	66.52
11:46	6.35	0.00	3012	9.0	167	10.95	66.52
11:52	6.35	0.00	2997	4.5	155	11.04	66.52
11:58	6.35	0.00	2988	2.6	149	11.11	66.52
12:04	6.35	0.00	2983	1.5	144	11.08	66.52

Stabilization Passes NTS Criteria: ☐

MW7

SECTION #1: DATA COLLECTIO ☑ **Sample Collected** **Field Blank:**

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
10:51	6.29	0.00	2501	13.7	458	11.39

1477.37 Elevation, GW (MSL) in Water by Calculation, ft

18.76 Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS **Time:** 09:39

Air Temperature: 51°F to 60°F
Wind Speed: 5-10 mph
Wind Direction: W-NW
Precipitation: None
Cloud Cover: Mostly Sunny
Airborne Particulate: None

Color, Purge: Orange
Appearance, Purge: Turbid
Odor, Purge: None
Color, Sample: Colorless
Appearance, Sample: Clear
Odor, Sample: None

Well Depth (ft): 26.77
SWL (ft): 18.76
Pump Rate (gpm): 0.15
Interval (min): 8.71
Pump Start (HH:MM): 9:45
Pump Stop (HH:MM): 10:55
Purge Volume (gal): 10.50
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 26.77ft - Static Water Level 18.76ft = Water Column 8.01ft
Water Column 8.01ft x *Conversion Factor 0.163gal/ft = Well Volume 1.307gal
Well Volume 1.307gal ÷ Pump Rate 0.15gpm = Well Volume Interval 8.714min

*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48

Pump Start Time 09:45 - Pump End Time 10:55 = Pump Duration 70min
Pump Duration 70min x Pump Rate 0.15gpm = Volume Purged 10.5gal

Top of Casing Elevation 1496.13 - Static Water Level 18.76 = 1477.37ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 8.71 **Pump Rate (gpm):** 0.15

MW7 (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	+/- 1.0 NTU	+/- 20 mV	+/- 0.10 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
9:58	6.03	1.82	2596	49.3	637	10.09	20.36
10:07	6.22	1.16	2631	20.5	636	11.66	20.37
10:16	6.24	0.00	2575	12.4	613	11.10	20.33
10:25	6.26	0.00	2540	7.6	566	11.98	20.26
10:34	6.29	0.00	2526	20.5	511	10.55	20.30
10:43	6.28	0.00	2510	18.7	489	11.79	20.31
10:51	6.29	0.00	2501	13.7	458	11.39	20.31
10:50	6.29	0.05	2493	14.2	461	11.49	

Stabilization Passes NTS Criteria: ☐

MW8

SECTION #1: DATA COLLECTIO ☑ **Sample Collected** **Field Blank:**

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
13:23	6.30	0.00	1821	75.3	215	11.36

1460.18 Elevation, GW (MSL) in Water by Calculation, ft

34.23 Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS **Time:** 12:28

unable to stabilize turbidity. Bounces up and down during stabilization. Purged well dry after sampling.

Air Temperature: 61°F to 70°F
Wind Speed: 5-10 mph
Wind Direction: W-NW
Precipitation: Drizzle
Cloud Cover: Mostly Sunny
Airborne Particulate: None

Color, Purge: Orange
Appearance, Purge: Turbid
Odor, Purge: None
Color, Sample: Orange
Appearance, Sample: Turbid
Odor, Sample: None

Well Depth (ft): 41.40
SWL (ft): 34.23
Pump Rate (gpm): 0.25
Interval (min): 4.68
Pump Start (HH:MM): 12:40
Pump Stop (HH:MM): 13:30
Purge Volume (gal): 12.50
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 41.40ft - Static Water Level 34.23ft = Water Column 7.17ft
Water Column 7.17ft x *Conversion Factor 0.163gal/ft = Well Volume 1.17gal
Well Volume 1.17gal ÷ Pump Rate 0.25gpm = Well Volume Interval 4.68min

*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48

Pump Start Time 12:40 - Pump End Time 13:30 = Pump Duration 50min
Pump Duration 50min x Pump Rate 0.25gpm = Volume Purged 12.5gal

Top of Casing Elevation 1494.41 - Static Water Level 34.23 = 1460.18ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 4.68 **Pump Rate (gpm):** 0.25

MW8 (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	+/- 1.0 NTU	+/- 20 mV	+/- 0.10 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
12:53	6.24	0.00	1837	371.4	247	11.47	37.45
12:58	6.25	0.00	1812	383.2	231	11.03	37.45
13:03	6.26	0.00	1825	200.2	224	11.38	37.45
13:08	6.28	0.00	1837	152.0	221	11.45	37.45
13:13	6.28	0.00	1833	64.1	217	11.40	37.40
13:18	6.31	0.00	1793	69.8	215	11.44	37.40
13:23	6.30	0.00	1821	75.3	215	11.36	37.40

Stabilization Passes NTS Criteria: ☐

MW9

SECTION #1: DATA COLLECTIO ☑ **Sample Collected** **Field Blank:**

Field Duplicate: Field Duplicate **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
14:33	6.52	0.00	1522	1.2	129	7.65

1443.73 Elevation, GW (MSL) in Water by Calculation, ft

10.99 Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS **Time:** 14:03

Turbidity less than 5 NTU, considered stable.

Air Temperature: 61°F to 70°F
Wind Speed: 5-10 mph
Wind Direction: W-NW
Precipitation: None
Cloud Cover: Mostly Sunny
Airborne Particulate: None

Color, Purge: Colorless
Appearance, Purge: Clear
Odor, Purge: None
Color, Sample: Colorless
Appearance, Sample: Clear
Odor, Sample: None

Well Depth (ft): 18.95
SWL (ft): 10.99
Pump Rate (gpm): 0.33
Interval (min): 3.94
Pump Start (HH:MM): 14:00
Pump Stop (HH:MM): 14:40
Purge Volume (gal): 13.20
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 18.95ft - Static Water Level 10.99ft = Water Column 7.96ft
Water Column 7.96ft x *Conversion Factor 0.163gal/ft = Well Volume 1.299gal
Well Volume 1.299gal ÷ Pump Rate 0.33gpm = Well Volume Interval 3.936min

*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48

Pump Start Time 14:00 - Pump End Time 14:40 = Pump Duration 40min
Pump Duration 40min x Pump Rate 0.33gpm = Volume Purged 13.2gal

Top of Casing Elevation 1454.72 - Static Water Level 10.99 = 1443.73ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 3.94 **Pump Rate (gpm):** 0.33

MW9 (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	+/- 1.0 NTU	+/- 20 mV	+/- 0.10 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
14:05	6.51	0.00	1590	135.8	141	7.46	11.38
14:09	6.46	0.00	1606	81.4	136	7.63	11.38
14:13	6.47	0.00	1573	15.7	134	7.92	11.38
14:17	6.48	0.00	1556	9.5	132	7.70	11.40
14:21	6.50	0.00	1543	6.0	131	7.75	11.40
14:25	6.51	0.00	1539	3.5	130	7.73	11.40
14:29	6.52	0.00	1527	2.1	129	7.68	11.40
14:33	6.52	0.00	1522	1.2	129	7.65	11.40

Stabilization Passes NTS Criteria: ☐

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Calibration Report

Event Key: 6385CC_2019 Apr(1 of 1)

Environmental Science & Engineering

Staff: Corey Andrews **Date:** 4/25/2019 **Post Cal Check:** ☑

Comments:

Sonde: R04-B	**PreCal (HH:MM):**	**PostCal (HH:MM):**	**PostEvent (HH:MM):**	
Last Temp Check: 1/7/2019				
Temp Specification: +/-0.1 ˚C	7:50	7:50	16:45	**Specifications:**
pH:	4.07	4.0	3.87	+/-0.2 SU
Standard (SU):	4.0	4.0	4.0	
Temperature (°C):	19.5	19.5	20.25	
pH:	7.10	7.0	6.90	+/-0.2 SU
Standard (SU):	7.0	7.0	7.0	
Temperature (°C):	19.03	19.03	19.83	
pH:	10.03	10.0	9.89	+/-0.2 SU
Standard (SU):	10.0	10.0	10.0	
Temperature (°C):	19.36	19.36	19.74	
Conductance, Specific:	0	0	0	Sum of +/-1 µmhos/cm AND +/-0.5%
Standard (µmhos/cm):	0	0	0	
Temperature (°C):	19.0	19.0	16.74	
Conductance, Specific:	993	1000	1004	Sum of +/-1 µmhos/cm AND +/-0.5%
Standard (µmhos/cm):	1000	1000	1000	
Temperature (°C):	19.33	19.27	21.27	
Turbidity:	0	0	0.4	<100 +/-1 NTU >100 AND <400 +/-12 NTU >400 AND <3000 +/-150 NTU
Standard (NTU):	0	0	0	
Temperature (°C):	19.3	19.3	19.72	
Turbidity:	106.6	106	107.4	<100 +/-1 NTU >100 AND <400 +/-12 NTU >400 AND <3000 +/-150 NTU
Standard (NTU):	106	106	106	
Temperature (°C):	19.75	19.75	19.68	

Calibration Report (cont'd)

Sonde:	R04-B	PreCal (HH:MM):	PostCal (HH:MM):	PostEvent (HH:MM):	
Last Temp Check:	1/7/2019				
Temp Specification:	+/-0.1 ˚C	7:50	7:50	16:45	Specifications:
Oxygen, Dissolved:		8.63	8.73	8.69	<8 +/-0.1 mg/L >8 AND <20 +/-0.2 mg/L >20 +/-10%
100% Oxygen Saturation:		8.77	8.77	8.61	
Temperature (°C):		19.0	19.0	19.8	
Bar.Pressure (mmHg):		719	719	718	
ORP:		427	445	440	+/-20 mV
Standard (mV):		445.8	445.8	442.8	
Temperature (°C):		18.9	18.9	20.1	

3385CC | Gen Waste CCR Monitoring | 4/25/19

Corey Andrews | V#60 | 62 miles

59°F | Sunny | wind WNW 10-20

0700-0845 Prep/Cal/load

0845 Depart NTS office

0935 **MW-7** Begin pumping well @ 0945 Sample @ 1052

SWL	TWD	WC	Vol	pump rate
18.76	26.77	8.01	1.3 gal	0.15 GPM (slow recharge)

	pH	SpC	Temp	ORP	DO	SWL	Turb
0958	6.03	2596	10.09	637	1.82	20.36	49.3
1007	6.22	2631	11.66	636	1.16	20.37	20.5
1016	6.24	2575	11.10	613	0.00	20.33	12.4
1025	6.26	2540	11.98	566	0.00	20.26	7.6
1034	6.29	2526	10.55	511	0.00	20.30	20.5
1043	6.28	2510	11.79	489	0.00	20.32	18.7
1051	6.29	2509	11.39	458	0.00	20.31	13.7

* well did not stabilize to NTS stabilization parameters (Temp, ORP, Turb). Temperature affected by sun & clouds. Sampled after 7 well volumes removed. Key #2106

1110 **MW-3R** Begin pumping @ 1023 Sample @ 1205 FB 1150

SWL	TWD	WC	Vol	pump rate
65.79	77.58	11.79	1.9 gal	0.33

	pH	SpC	Temp	ORP	DO	Turb	SWL
1134	6.36	3019	10.99	216	0.19	27.3	66.61
1140	6.36	3031	10.93	184	0.00	16.6	66.52
1146	6.35	3012	10.95	167	0.00	9.0	66.52
1152	6.35	2997	11.04	155	0.00	4.5	66.52
1158	6.35	2988	11.11	149	0.00	2.6	66.52
1204	6.35	2983	11.08	144	0.00	1.5	66.52

Turb <5 NTU. Considered well stable.

1225 **MW-8** Begin pumping well @ 1240 sample @ 1324

SWL	TWD	WC	Vol	pump rate
34.23	41.40	7.17	1.2 gal	0.25 GPM

	pH	SpC	Temp	ORP	DO	Turb	SWL
1253	6.24	1837	11.47	247	0.00	371.4	37.45
1258	6.25	1812	11.03	231	0.00	383.2	37.45
1303	6.26	1825	11.38	224	0.00	200.2	37.45
1308	6.28	1837	11.45	221	0.00	152.0	37.45
1313	6.28	1833	11.40	217	0.00	64.1	37.40
1318	6.31	1793	11.44	215	0.00	69.8	37.40
1323	6.30	1821	11.36	215	0.00	75.3	37.40

Unable to stabilize turbidity (historically an issue with this well.). Turb bounces up and down during stabilization - never clears. Key #2108

Corey Andrews Gen Waste CCR Monitoring 6385CC 4/25/19

VA #60

High 65°F / Sunny / winds WNW 10-20 mph

1355 MW-99 start pumping @ 1400 Sample @ 1434 Dup 1435

SWL	TWD	WC	Vol	Pump Rate
10.99	18.95	7.96	1.3 gal	0.33

	pH	SpC	Temp	ORP	DO	Turb	SWL
1405	6.51	1590	7.46	141	0.00	135.8	11.38
1409	6.46	1606	7.63	136	0.00	81.4	11.38
1413	6.47	1573	7.92	134	0.00	15.7	11.38
1417	6.48	1556	7.70	132	0.00	9.5	11.40
1421	6.50	1543	7.75	131	0.00	6.0	11.40
1425	6.51	1539	7.73	130	0.00	3.5	11.40
1429	6.52	1527	7.68	129	0.00	2.1	11.40
1433	6.52	1522	7.65	129	0.00	1.2	11.40

1505 Depart Gen. Waste

1550 Cede samples to PACE

1555 Arrive back at NTS office. Unload / Post check / Report.

Corey Andrews

4/25/2019

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Vehicle Inspection Report

Event Key: 6385CC_2019 Apr(1 of 1)

Driver: Corey Andrews **Date:** 4/25/2019 **Time:** 08:28

Vehicle: V60 - 2013 GMC Sierra 1500 **Odometer:**

Check each Item Inspected

Driver/Passenger Side

External Side Mirrors (Right and Left): ☑	Windows (clean; free of cracks): ☑	Tires (properly inflated, adequate tread): ☑

Comments:

Front/Rear

Tail Lights: ☑	Head Lights ☑	Damage to Body/Bumpers ☑
License Plates ☑	Fluid Leaks ☑	Turn Signals ☑

Comments:

Routine Maintenance

Oil Change (Current): ☑	Transmission Fluid (Change every 60k): ☑	Air Filter (Change every 30k): ☑
Gauges Operational ('check engine' light OFF): ☑	Spare Tire (present, properly inflated): ☑	

Comments:

Interior

Cleanliness: ☑	Brakes: ☑	Windshield Wipers and Fluid: ☑
Seat Belts (working condition): ☑	Parking Brake (reset/release): ☑	Rearview Mirror: ☑

Comments:

General/Safety

Insurance Card: ☑	Wheel Chocks: ☑	First Aid Kit: ☑
Operator's Manual: ☑	Strobe Light (if needed): ☑	Buggy Whip (if needed): ☑

Comments:

Deficiencies Corrected

Environmental Science & Engineering

Daily Tailgate Safety

Project: 6385CC **Date:** 4/25/19

Work Site Hazard Assessment Worksheet

- ☒ PPE Required (List): High Vis. Level*____
- ☐ Weather Conditions (List): _____
- ☐ Vehicular Traffic
- ☐ Communications
- ☐ Noise
- ☐ Equipment/Tools
- ☐ Housekeeping
- ☐ Other Site Hazards**

☐ I have examined the work place named and found no hazards
☒ I have examined the work place named and hazards found are listed below with corrective action taken

Hazards Identified/Safety Items Discussed:
Trucks hauling preservatives in sample containers

Corrective Actions Taken:
Give trucks right of way
wear nitrile gloves

Participants in Safety Discussion:

	Print Name	Signature
1.	Corey Andrews	
2.		
3.		
4.		
5.		

Signature of Site Supervisor/Examiner: _____ Date: 4/25/19

*Level D, C, B or A
**Examples: Heavy Equipment, Air Quality, Flammable materials, Wildlife, Work Site Security, Confined Space

02/20/2015

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Comments:

TAT: Standard

PM: Dennis Schubbe

Report To: sampledata@netechnical.com

Project#: 6385CC_2019

Event Key:
6385CC_2019 Apr(1 of 1)

Environmental Science & Engineering

Sample ID:	Sample Location:	Date:	Time:	Mx:	ST:	Nitric, Metals	Unpreserved Generals						Required Analyses:
	Field Blank	4/25/19	1150	W	G	X	X						List #1
	Field Duplicate	"	1435	W	G	X	X						List #1
	MW3R	"	1205	W	G	X	X						List #1
	MW7	"	1052	W	G	X	X						List #1
	MW8	"	1324	W	G	X	X						List #1
	MW9	"	1434	W	G	X	X						List #1

Sampled by: Corey Andrews

Relinquished by: [signature] Date: 4/25/19 Time: 1550

Received by: Date: Time:

Relinquished by: Date: Time:

Received at Lab by: [signature] Date: 4/25/19 Time: 15:50

Temperature at Receipt: 5.8

List #1 **6385CC_2019 Apr(1 of 1)**

Field Blank,Field Duplicate,MW3R,MW7,MW8,MW9

Method:	Parameter:	NTS Limit:	J-Flag:
EPA 200.7			
	Calcium		[ ]
EPA 200.8			
	Boron		[ ]
EPA 300.0			
	Chloride		[ ]
	Fluoride		[ ]
	Sulfate		[ ]
SM 2540C			
	Solids, Total Dissolved (TDS)		[ ]
SM 4500-H+B			
	pH		[ ]

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Field Report Peer Review Report

Event Key: 6385CC_2019 Apr(1 of 1)
Report Date: 4/25/2019
Lab WO#: 12124076

Reviewer #1:	Date:	Reviewer #2:	Date:
Catherine Hafdahl	4/29/2019	Terri Sabetti	4/30/2019

Report Sections	Required:	Included:	Report Sections	Required:	Included:
Cover Sheet:	☑	☑	Cover Sheet:	☑	☑
Location Information			Location Information		
Data Collection:	☑	☑	Data Collection:	☑	☑
Observation:	☑	☑	Observation:	☑	☑
Flow or Stabilization:	☑	☑	Flow or Stabilization:	☑	☑
Photographs:	☐	☐	Photographs:	☐	☐
Calibration:	☑	☑	Calibration:	☑	☑
Field Notes:	☑	☑	Field Notes:	☑	☑
Safety Forms:	☑	☑	Safety Forms:	☑	☑

	N/A:	OK:		N/A:	OK:
GW Calculations are Accurate:	☐	☑	GW Calculations are Accurate:	☐	☑
GW Stabilization Criteria met:	☐	☐	GW Stabilization Criteria met:	☐	☐
Flow Calculations are Accurate:	☑	☐	Flow Calculations are Accurate:	☑	☐
Sonde Passed Post Event Check:	☐	☑	Sonde Passed Post Event Check:	☐	☑
Consistent Values in Notes:		☑	Consistent Values in Notes:		☑
Consistent Dates and Times:		☑	Consistent Dates and Times:		☑
No Deviations from SOPs:		☐	Qualifiers added to Data:	☐	☑
Cover Sheet provides a complete description of key activities and observations:		☑	Data under correct Event Key:	☐	☑
			All Req'd Parameters Meas'd; Limits Met:	☐	☑

Reviewer #1 Comments:

Turbidity was considered stable when < 5.0 NTU at MW3R, MW7, & MW9.
Temperature did not stabilize at MW7.
Turbidity did not stabilize at MW8.

Reviewer #2 Comments:

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

October 29, 2019

Dennis Schubbe
Northeast Technical Services
526 Chestnut Street
Virginia, MN 55792

RE: Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Dear Dennis Schubbe:
Enclosed are the analytical results for sample(s) received by the laboratory on October 21, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carrie Jensen
carrie.jensen@pacelabs.com
(218)742-1042
Project Manager

Enclosures

cc: Sample Data, Northeast Technical Services
Scott Seeley, NTS
Karissa Vosen, NTS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

CERTIFICATIONS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
Alaska Certification UST-107
Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification # : 998027470
WA Department of Ecology Lab ID# C1007

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

SAMPLE SUMMARY

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Lab ID	Sample ID	Matrix	Date Collected	Date Received
12137390001	**MW7**	Water	10/21/19 10:00	10/21/19 15:25
12137390002	**MW8**	Water	10/21/19 11:45	10/21/19 15:25
12137390003	**MW9**	Water	10/21/19 12:55	10/21/19 15:25
12137390004	**Field Duplicate**	Water	10/21/19 12:56	10/21/19 15:25
12137390005	**Field Blank**	Water	10/21/19 12:40	10/21/19 15:25

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

SAMPLE ANALYTE COUNT

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
12137390001	**MW7**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12137390002	**MW8**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12137390003	**MW9**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12137390004	**Field Duplicate**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12137390005	**Field Blank**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Sample: MW7 **Lab ID: 12137390001** Collected: 10/21/19 10:00 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**539**	mg/L	0.50	1	10/23/19 13:15	10/24/19 10:50	7440-70-2	P6
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**66.9**	ug/L	40.0	1	10/23/19 13:15	10/24/19 12:31	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**2250**	mg/L	20.0	1		10/25/19 08:16		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		10/22/19 16:28		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**37.4**	mg/L	1.0	1		10/23/19 15:48	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 15:48	16984-48-8	
Sulfate	**1120**	mg/L	20.0	10		10/23/19 16:09	14808-79-8	

Sample: MW8 **Lab ID: 12137390002** Collected: 10/21/19 11:45 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**354**	mg/L	0.50	1	10/23/19 13:21	10/28/19 12:47	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**70.5**	ug/L	40.0	1	10/23/19 13:21	10/28/19 17:54	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1490**	mg/L	20.0	1		10/25/19 17:33		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.1**	Std. Units	0.10	1		10/22/19 16:44		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**1.4**	mg/L	1.0	1		10/23/19 17:51	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 17:51	16984-48-8	
Sulfate	**630**	mg/L	10.0	5		10/23/19 18:12	14808-79-8	

Sample: MW9 **Lab ID: 12137390003** Collected: 10/21/19 12:55 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**217**	mg/L	0.50	1	10/23/19 13:15	10/24/19 10:45	7440-70-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Sample: MW9 **Lab ID: 12137390003** Collected: 10/21/19 12:55 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	40.0	1	10/23/19 13:15	10/24/19 12:09	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1100**	mg/L	20.0	1		10/25/19 17:34		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		10/22/19 17:04		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**6.0**	mg/L	1.0	1		10/23/19 18:53	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 18:53	16984-48-8	
Sulfate	**437**	mg/L	10.0	5		10/23/19 19:13	14808-79-8	

Sample: Field Duplicate **Lab ID: 12137390004** Collected: 10/21/19 12:56 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**219**	mg/L	0.50	1	10/23/19 13:15	10/24/19 10:56	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	40.0	1	10/23/19 13:15	10/24/19 12:35	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1090**	mg/L	20.0	1		10/25/19 17:34		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		10/22/19 16:35		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**5.9**	mg/L	1.0	1		10/23/19 16:29	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 16:29	16984-48-8	
Sulfate	**434**	mg/L	10.0	5		10/23/19 17:31	14808-79-8	

Sample: Field Blank **Lab ID: 12137390005** Collected: 10/21/19 12:40 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	ND	mg/L	0.50	1	10/23/19 13:21	10/28/19 12:51	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	40.0	1	10/23/19 13:21	10/28/19 18:01	7440-42-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Sample: Field Blank **Lab ID: 12137390005** Collected: 10/21/19 12:40 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	ND	mg/L	10.0	1		10/25/19 08:24		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**5.7**	Std. Units	0.10	1		10/22/19 16:49		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		10/23/19 18:32	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 18:32	16984-48-8	
Sulfate	ND	mg/L	2.0	1		10/23/19 18:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177775 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 12137390001, 12137390003, 12137390004

METHOD BLANK: 704434 Matrix: Water
Associated Lab Samples: 12137390001, 12137390003, 12137390004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	mg/L	ND	0.50	10/24/19 10:41	

LABORATORY CONTROL SAMPLE: 704435

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	25	25.1	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704436 704437

Parameter	Units	12137390001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	mg/L	539	25	25	559	574	78	140	70-130	3	20	P6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177777 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 12137390002, 12137390005

METHOD BLANK: 704448 Matrix: Water
Associated Lab Samples: 12137390002, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	mg/L	ND	0.50	10/28/19 12:10	

LABORATORY CONTROL SAMPLE: 704449

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	25	24.4	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704450 704451

Parameter	Units	12137471009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	mg/L	54.3	25	25	79.5	79.7	101	102	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704452 704453

Parameter	Units	12137471007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	mg/L	41.1	25	25	65.4	66.1	97	100	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177770 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 12137390001, 12137390003, 12137390004

METHOD BLANK: 704418 Matrix: Water
Associated Lab Samples: 12137390001, 12137390003, 12137390004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	40.0	10/24/19 12:01	

LABORATORY CONTROL SAMPLE: 704419

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	50	51.1	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704420 704421

Parameter	Units	12137390003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	50	50	90.7	88.8	102	98	70-130	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704422 704423

Parameter	Units	12137471011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	50	50	83.1	79.7	99	92	70-130	4	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177776 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 12137390002, 12137390005

METHOD BLANK: 704439 Matrix: Water
Associated Lab Samples: 12137390002, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	40.0	10/28/19 16:46	

LABORATORY CONTROL SAMPLE: 704440

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	50	51.8	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704441 704442

Parameter	Units	12137471008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	40.4	50	50	88.5	88.4	96	96	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704443 704444

Parameter	Units	12137471010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	50	50	71.3	73.5	96	100	70-130	3	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177953 Analysis Method: SM 2540C (1997)
QC Batch Method: SM 2540C (1997) Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 12137390001, 12137390005

METHOD BLANK: 705055 Matrix: Water
Associated Lab Samples: 12137390001, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	10/25/19 08:11	

METHOD BLANK: 705059 Matrix: Water
Associated Lab Samples: 12137390001, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	10/25/19 08:25	

LABORATORY CONTROL SAMPLE: 705056

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	255	260	102	80-120	

SAMPLE DUPLICATE: 705057

Parameter	Units	12137435003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	126	132	5	5	

SAMPLE DUPLICATE: 705249

Parameter	Units	12137421017 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1850	1850	0	5	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 178069 Analysis Method: SM 2540C (1997)
QC Batch Method: SM 2540C (1997) Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 12137390002, 12137390003, 12137390004

METHOD BLANK: 705567 Matrix: Water
Associated Lab Samples: 12137390002, 12137390003, 12137390004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	10/25/19 17:30	

METHOD BLANK: 705570 Matrix: Water
Associated Lab Samples: 12137390002, 12137390003, 12137390004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	10/25/19 17:35	

LABORATORY CONTROL SAMPLE: 705568

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	255	254	100	80-120	

SAMPLE DUPLICATE: 705569

Parameter	Units	12137651001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	842	816	3	5	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177675 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 12137390001, 12137390002, 12137390003, 12137390004, 12137390005

LABORATORY CONTROL SAMPLE: 704033

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	7	7.0	100	98-102	H6

SAMPLE DUPLICATE: 704034

Parameter	Units	12137223001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.0	0	10	H6

SAMPLE DUPLICATE: 704035

Parameter	Units	12137390003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	10	H6

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177698 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 12137390001, 12137390002, 12137390003, 12137390004, 12137390005

METHOD BLANK: 704132 Matrix: Water
Associated Lab Samples: 12137390001, 12137390002, 12137390003, 12137390004, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/23/19 13:25	
Fluoride	mg/L	ND	0.10	10/23/19 13:25	
Sulfate	mg/L	ND	2.0	10/23/19 13:25	

LABORATORY CONTROL SAMPLE: 704133

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	48.8	98	90-110	
Fluoride	mg/L	5	4.8	96	90-110	
Sulfate	mg/L	50	47.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704134 704135

Parameter	Units	12137383001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	50	50	52.3	52.5	104	104	90-110	0	20	
Fluoride	mg/L	ND	5	5	5.1	5.1	100	101	90-110	0	20	
Sulfate	mg/L	8.5	50	50	59.3	59.5	102	102	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704136 704137

Parameter	Units	12137385001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	200	250	250	451	449	100	99	90-110	1	20	
Fluoride	mg/L	0.14	5	5	5.1	5.1	99	100	90-110	0	20	
Sulfate	mg/L	6.5	50	50	56.1	56.2	99	99	90-110	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALIFIERS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-V	Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

H6	Analysis initiated outside of the 15 minute EPA required holding time.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
12137390001	**MW7**	EPA 200.7	177775	EPA 200.7	177852
12137390002	**MW8**	EPA 200.7	177777	EPA 200.7	178102
12137390003	**MW9**	EPA 200.7	177775	EPA 200.7	177852
12137390004	**Field Duplicate**	EPA 200.7	177775	EPA 200.7	177852
12137390005	**Field Blank**	EPA 200.7	177777	EPA 200.7	178102
12137390001	**MW7**	EPA 200.8	177770	EPA 200.8	177853
12137390002	**MW8**	EPA 200.8	177776	EPA 200.8	178101
12137390003	**MW9**	EPA 200.8	177770	EPA 200.8	177853
12137390004	**Field Duplicate**	EPA 200.8	177770	EPA 200.8	177853
12137390005	**Field Blank**	EPA 200.8	177776	EPA 200.8	178101
12137390001	**MW7**	SM 2540C (1997)	177953		
12137390002	**MW8**	SM 2540C (1997)	178069		
12137390003	**MW9**	SM 2540C (1997)	178069		
12137390004	**Field Duplicate**	SM 2540C (1997)	178069		
12137390005	**Field Blank**	SM 2540C (1997)	177953		
12137390001	**MW7**	SM 4500-H+B	177675		
12137390002	**MW8**	SM 4500-H+B	177675		
12137390003	**MW9**	SM 4500-H+B	177675		
12137390004	**Field Duplicate**	SM 4500-H+B	177675		
12137390005	**Field Blank**	SM 4500-H+B	177675		
12137390001	**MW7**	EPA 300.0	177698		
12137390002	**MW8**	EPA 300.0	177698		
12137390003	**MW9**	EPA 300.0	177698		
12137390004	**Field Duplicate**	EPA 300.0	177698		
12137390005	**Field Blank**	EPA 300.0	177698		

NTS
526 CHESTNUT STREET
VIRGINIA, MN 55792
(218) 741-4290 Fax: (218) 741-4291

CH

REQUIRED TURN-AROUND TIME:

WO#: 12137390

PM: CLJ Due Date: 11/04/19

CLIENT: NTS-Dennis

CLIENT NAME,ADDRESS,PHONE#:	REPORT TO:
GENERAL WASTE and RECYLING LLC DEMOLITION & INDUSTRIAL LANDFILL ITASCA COUNTY, MINNESOTA	DENNIS SCHUBBE, KARISSA VOSEN, RICK CRUM & SCOTT SEELEY
SAMPLER: Corey Andrews	PERMIT REQ.: SW-620-002
PROJECT: GENERAL WASTE DISPOSAL and RECYCLING, LLC.	Oct-19
PROJECT NUMBER: 6385CC CCR Monitoirng	COLLECTION:

LOG-IN #:	SAMPLE #	DESCRIPTION:	DATE:	TIME:	MATRIX LIQ.	MATRIX SOL.	filtered	TYPE & # CONTAINERS: VOC M. 8260 (HCL)	GENERAL CHEMISTRY (NO PRES)	GENERAL CHEMISTRY (H2SO4)	TOTAL METALS (HN03)	DISSOLVED METALS (HN03)	REQUIRED ANALYSIS:
	MW3R	GW WELL	No Sample		X		N		1		1		Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW7	GW WELL	10/21/19	1000	X		N		1		1		Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW8	GW WELL	10/21/19	1145	X		N		1		1		Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW9	GW WELL	10/21/19	1255	X		N		1		1		Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	Field Duplicate	GW WELL	10/21/19	1256	X		N		1		1		Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	Field Blank	Field Blank	10/21/19	1240	X		N		1		1		Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS

SPECIAL INSTRUCTIONS:

SEE ATTACHED LIST WITH METHODS

RELINQUISHED BY: Corey Andrews	DATE: 10/21/19 TIME: 1525	RECEIVED BY:	DATE: TIME:
RELINQUISHED TO NTS SAMPLE LOCK-UP BY:	DATE: TIME:	RECEIVED FROM NTS SAMPLE LOCKUP BY:	DATE: TIME:
RECEIVED FOR LAB BY: Katie Klaud	TEMP.AT ARRIVAL: 1.3 C		
DATE: 10/22/19	TIME: 15:05		

GENERAL WASTE CCR MONITORING METHODS

PARAMETER	SYMBOL	EPA Method
Boron	B	200.8
Calcium	Ca	200.7
Chloride	Chloride	300.0
Fluoride	Flouride	300.0
pH	pH	SM 4500 H+B
Sulfate	SO_4	300.0
TDS	TDS	SM 2540C

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 30Apr2019 Page 1 of 1
	Document No.: F-VM-C-001-rev.13	Issuing Authority: Pace Virginia Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: NTS

Project #: WO#: 12137390

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No Seals Intact? ☐ Yes ☐ No Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other: _____ Temp Blank? ☒ Yes ☐ No

Thermometer Used: ☒ 140792808 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.3, 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen? ☐ Yes ☐ No ☒ NA

Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: _____

				Comments:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3.
Sampler Name and Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5. If Fecal: ☐ <8 hours ☐ >8, <24 hours ☐ >24 hours
Short Hold Time Analysis (<72 hr)?	☒ Yes	☐ No	☐ N/A	6. pH
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☒ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation properly preserved?	☒ Yes	☐ No	☐ N/A	13. Note samples needing adjustment:
Headspace in Methyl Mercury Container	☐ Yes	☐ No	☒ N/A	14.
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☒ N/A	15.
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	16.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	
Pace Trip Blank Lot # (if purchased): _____				

CLIENT NOTIFICATION/RESOLUTION Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Nikki Jarvis Date: 10/21/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Field Report Cover Sheet

Event Key: 6385CC_2019 Oct(1 of 1)

Field Date: 10/21/2019

Report Created: 10/21/2019 4:49:01 PM

Client:
General Waste Disposal & Recovery

NTS Project Name:
CCR Landfill Monitoring 2019

NTS Project Manager:
Dennis Schubbe

NTS Field Personnel:
Corey Andrews

Summary of Services Performed:

Prepped and went to General Waste Demolition Landfill to conduct the Fall 2019 CCR well monitoring. Wells were sampled via the low flow stabilization method. Unable to stabilize for turbidity and ORP per NTS standards at MW-7 and was unable to stabilize turbidity at MW-8. A minimum of 5 well volumes were removed from each well before obtaining samples. Well MW-3R was unable to be located. During the new cell construction it is thought that this well was either buried by material or pushed over by equipment. General Waste personnel will attempt to locate well. Samples ceded to PACE Analytical in Virginia, MN. For additional details see field notes and COC.

I,Corey Andrews, certify that the information in this report is true and correct to the best of my knowledge.

MW3R

SECTION #1: DATA COLLECTION ☐ **Sample Collected** **Field Blank:**

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):

Static Water Level in Water by Field Measurement, ft

Elevation, GW (MSL) in Water by Calculation, ft

TRUE Unable to Monitor (Dry, Frozen, Other) in Water by Field Observation, N/A

SECTION #2: OBSERVATIONS **Time:** 13:25

Well has either been buried or pushed over with the construction of a new cell. Well Frozen or Dry.

Air Temperature:	41°F to 50°F	**MDH#:**	797239
Wind Speed:	10-20 mph	**Well Depth (ft):**	
Wind Direction:	N-NE	**SWL (ft):**	
Precipitation:	Rain	**Pump Rate (gpm):**	
Cloud Cover:	Overcast	**Interval (min):**	
Airborne Particulate:	None	**Well Casing Diameter(in):**	2
Color, Purge:		**Pump Start (HH:MM):**	
Appearance, Purge:		**Pump Stop (HH:MM):**	
Odor, Purge:		**Purge Volume (gal):**	
Color, Sample:		**Purging Strategy:**	
Appearance, Sample:		**Well Plug Present:**	☐
Odor, Sample:		**Well Locked:**	☐

GW CALCULATIONS:
Interval calculations not performed in Field Buddy.
Pumping calculations not performed in Field Buddy.
GW Elevation calculation not performed in Field Buddy.

SECTION #3: STABILIZATION *Stabilization not Performed at this Location*

Stabilization Passes NTS Criteria: ☐

SECTION #4: PHOTOGRAPHS

MW7

SECTION #1: DATA COLLECTION ☑ **Sample Collected** **Field Blank:**

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
9:57	6.25	0.20	2634	5.2	359	9.14

1475.94 Elevation, GW (MSL) in Water by Calculation, ft

20.19 Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS **Time:** 09:11

Unable to stabilize ORP and turbidity per NTS SOP standards. 5 well volumes removed prior to sampling.

Air Temperature: 41°F to 50°F
Wind Speed: 10-20 mph
Wind Direction: N-NE
Precipitation: None
Cloud Cover: Overcast
Airborne Particulate: None
Color, Purge: Orange
Appearance, Purge: Turbid
Odor, Purge: None
Color, Sample: Colorless
Appearance, Sample: Clear
Odor, Sample: None

MDH#:
Well Depth (ft): 26.77
SWL (ft): 20.19
Pump Rate (gpm): 0.10
Interval (min): 10.74
Well Casing Diameter(in): 2
Pump Start (HH:MM): 9:02
Pump Stop (HH:MM): 10:03
Purge Volume (gal): 6.10
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 26.77ft - Static Water Level 20.19ft = Water Column 6.58ft
Water Column 6.58ft x *Conversion Factor 0.163gal/ft = Well Volume 1.074gal
Well Volume 1.074gal ÷ Pump Rate 0.10gpm = Well Volume Interval 10.738min
*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48
Pump Start Time 09:02 - Pump End Time 10:03 = Pump Duration 61min
Pump Duration 61min x Pump Rate 0.10gpm = Volume Purged 6.1gal
Top of Casing Elevation 1496.13 - Static Water Level 20.19 = 1475.94ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 10.74 **Pump Rate (gpm):** 0.10

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	<=5 NTU +/- 10 %	+/- 20 mV	+/- 0.2 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
9:13	6.20	0.37	2700	51.5	497	9.41	21.27
9:24	6.19	0.37	2701	16.0	452	9.33	21.30
9:35	6.21	0.33	2680	22.7	404	9.27	21.31
9:46	6.21	0.27	2656	6.0	377	9.20	21.30
9:57	6.25	0.20	2634	5.2	359	9.14	21.29

Stabilization Passes NTS Criteria: ☐

MW8

SECTION #1: DATA COLLECTION ☑ **Sample Collected** **Field Blank:**

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
11:42	6.28	0.15	1917	42.8	317	9.20

1460.36	Elevation, GW (MSL) in Water by Calculation, ft
34.05	Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS **Time:** 11:08

Unable to stabilize well for turbidity. 7 well volumes removed.

Air Temperature:	41°F to 50°F	**MDH#:**	
Wind Speed:	10-20 mph	**Well Depth (ft):**	41.40
Wind Direction:	N-NE	**SWL (ft):**	34.05
Precipitation:	None	**Pump Rate (gpm):**	0.20
Cloud Cover:	Overcast	**Interval (min):**	6.00
Airborne Particulate:	None	**Well Casing Diameter(in):**	2
Color, Purge:	Orange	**Pump Start (HH:MM):**	11:00
Appearance, Purge:	Turbid	**Pump Stop (HH:MM):**	11:47
Odor, Purge:	None	**Purge Volume (gal):**	9.40
Color, Sample:	Colorless	**Purging Strategy:**	Low-Flow Stabilization
Appearance, Sample:	Silty	**Well Plug Present:**	☑
Odor, Sample:	None	**Well Locked:**	☑

GW CALCULATIONS:
Total Water Depth 41.40ft - Static Water Level 34.05ft = Water Column 7.35ft
Water Column 7.35ft x *Conversion Factor 0.163gal/ft = Well Volume 1.199gal
Well Volume 1.199gal ÷ Pump Rate 0.20gpm = Well Volume Interval 5.997min
*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48
Pump Start Time 11:00 - Pump End Time 11:47 = Pump Duration 47min
Pump Duration 47min x Pump Rate 0.20gpm = Volume Purged 9.4gal
Top of Casing Elevation 1494.41 - Static Water Level 34.05 = 1460.36ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 6.00 **Pump Rate (gpm):** 0.20

MW8 (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	<=5 NTU +/- 10 %	+/- 20 mV	+/- 0.2 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
11:06	6.16	1.21	1908	542	381	8.98	35.02
11:12	6.22	0.89	1853	250.1	370	9.47	35.04
11:18	6.24	0.54	1886	117.6	354	9.54	35.04
11:24	6.26	0.34	1909	56.8	340	9.40	35.06
11:30	6.26	0.25	1908	50.2	322	9.34	35.05
11:36	6.27	0.21	1909	47.9	327	9.27	35.05
11:42	6.28	0.15	1917	42.8	317	9.20	35.05

Stabilization Passes NTS Criteria: ☐

MW9

SECTION #1: DATA COLLECTION ☑ **Sample Collected** **Field Blank:** Field Blank

Field Duplicate: Field Duplicate **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
12:54	6.53	0.05	1531	3.8	166	7.95

1443.6 Elevation, GW (MSL) in Water by Calculation, ft

11.12 Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS

Air Temperature: 51°F to 60°F
Wind Speed: 10-20 mph
Wind Direction: N-NE
Precipitation: Rain
Cloud Cover: Overcast
Airborne Particulate: None
Color, Purge: Colorless
Appearance, Purge: Clear
Odor, Purge: None
Color, Sample: Colorless
Appearance, Sample: Clear
Odor, Sample: None

Time: 12:32
MDH#: 817980
Well Depth (ft): 18.95
SWL (ft): 11.12
Pump Rate (gpm): 0.33
Interval (min): 3.87
Well Casing Diameter(in): 2
Pump Start (HH:MM): 12:30
Pump Stop (HH:MM): 13:00
Purge Volume (gal): 9.90
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 18.95ft - Static Water Level 11.12ft = Water Column 7.83ft
Water Column 7.83ft x *Conversion Factor 0.163gal/ft = Well Volume 1.278gal
Well Volume 1.278gal ÷ Pump Rate 0.33gpm = Well Volume Interval 3.872min
*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48
Pump Start Time 12:30 - Pump End Time 13:00 = Pump Duration 30min
Pump Duration 30min x Pump Rate 0.33gpm = Volume Purged 9.9gal
Top of Casing Elevation 1454.72 - Static Water Level 11.12 = 1443.6ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 3.87 **Pump Rate (gpm):** 0.33

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	<=5 NTU +/- 10 %	+/- 20 mV	+/- 0.2 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
12:34	6.50	0.09	1620	27.0	204	7.93	11.15
12:38	6.51	0.06	1583	13.3	185	7.92	11.15
12:42	6.51	0.06	1564	8.1	178	7.94	11.15
12:46	6.52	0.06	1547	4.9	173	7.95	11.15
12:50	6.53	0.06	1538	4.0	169	7.95	11.15
12:54	6.53	0.05	1531	3.8	166	7.95	11.15

Stabilization Passes NTS Criteria: ☑

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Calibration Report

Event Key: 6385CC_2019 Oct(1 of 1)

Environmental Science & Engineering

Staff: Corey Andrews **Date:** 10/21/2019 **Post Cal Check:** ☑

Comments:

Sonde: R04-D	**PreCal (HH:MM):**	**PostCal (HH:MM):**	**PostEvent (HH:MM):**	
Last Temp Check: 6/26/2019				
Temp Specification: +/-0.1 ˚C	7:10	7:10	15:55	**Specifications:**
pH:	4.03	4.0	3.85	+/-0.2 SU
Standard (SU):	4.0	4.0	4.0	
Temperature (°C):	19.09	19.09	19.37	
pH:	7.07	7.0	6.87	+/-0.2 SU
Standard (SU):	7.0	7.0	7.0	
Temperature (°C):	19.55	19.55	18.61	
pH:	9.97	10.0	9.89	+/-0.2 SU
Standard (SU):	10.0	10.0	10.0	
Temperature (°C):	19.16	19.16	19.03	
Conductance, Specific:	0.5	0	0	Sum of +/-1 µmhos/cm AND +/-0.5%
Standard (µmhos/cm):	0	0	0	
Temperature (°C):	19.42	19.42	19.23	
Conductance, Specific:	982.2	1000	1005	Sum of +/-1 µmhos/cm AND +/-0.5%
Standard (µmhos/cm):	1000	1000	1000	
Temperature (°C):	19.37	19.37	19.89	
Turbidity:	0.0	0.0	0.2	<100 +/-1 NTU >100 AND <400 +/-12 NTU >400 AND <3000 +/-150 NTU
Standard (NTU):	0	0	0	
Temperature (°C):	17.37	17.37	18.54	
Turbidity:	111.5	114	113.7	<100 +/-1 NTU >100 AND <400 +/-12 NTU >400 AND <3000 +/-150 NTU
Standard (NTU):	114	114	114	
Temperature (°C):	19.92	19.92	19.62	

Calibration Report (cont'd)

Sonde:	R04-D	PreCal (HH:MM):	PostCal (HH:MM):	PostEvent (HH:MM):	
Last Temp Check:	6/26/2019				
Temp Specification:	+/-0.1 ˚C	7:10	7:10	15:55	Specifications:
Oxygen, Dissolved:		8.57	8.63	8.63	<8 +/-0.1 mg/L >8 AND <20 +/-0.2 mg/L >20 +/-10%
100% Oxygen Saturation:		8.65	8.65	8.73	
Temperature (°C):		19.5	19.5	18.4	
Bar.Pressure (mmHg):		717	717	708	
ORP:		450	455	450	+/-20 mV
Standard (mV):		455.5	455.5	447.2	
Temperature (°C):		15.0	15.0	18.3	

6385CC Gen Waste Fall 2019 CCR well Monitoring 10/21/2019
Corey Andrews V#60
High 47°F/Overcast w/ rain/winds NE 10-15 mph
0850 Arrive @ Gen Waste Demo Landfill.
0854 MW-7 Begin pumping @ 0902. Key #2106. 1000 sample obtained

SWL	TWD	WC	Vol	pump rate
20.19'	26.77'	6.58'	1.1 gal	0.10 GPM

	pH	SpC	Temp	ORP	LDO	Turb	SWL
0913	6.20	2700	9.41	497	0.37	51.5	21.27
0924	6.19	2701	9.33	452	0.37	16.0	21.30
0935	6.21	2680	9.27	404	0.33	22.7	21.31
0946	6.21	2656	9.20	377	0.27	6.0	21.30
0957	6.25	2634	9.14	359	0.20	5.2	21.29

* Unable to stabilize ORP & Turb per NTS SOP. standards. 5 well volumes removed prior to obtaining sample.
1015 Could not locate well MW-3R. Well has appeared to be covered or pushed over with landfill expansion. obtained photos.
1055 MW-8 1100 Begin pumping. Key #2106. 1145 sample obtained

SWL	TWD	WC	Vol	pump rate
34.05	41.40	7.35	1.2 gal	0.20 GPM

	pH	SpC	Temp	ORP	LDO	Turb	SWL
1106	6.16	1908	8.98	381	1.21	542	35.02
1112	6.22	1853	9.47	370	0.89	250.1	35.04
1118	6.24	1886	9.54	354	0.54	117.6	35.04
1124	6.26	1909	9.40	340	0.34	56.8	35.06
1130	6.26	1908	9.34	332	0.25	50.2	35.05
1136	6.27	1909	9.27	327	0.21	47.9	35.04
1142	6.28	1917	9.20	317	0.15	42.8	35.05

*Unable to stabilize for turbidity. Sampled well after 7 well volumes.
1217 MW-9 1230 Begin pumping. Key #0410. 1240 FB. 1255 sample. 1256 Dup

SWL	TWD	WC	Vol	pump rate
11.12	18.95	7.83	1.3 gal	0.33 GPM

	pH	SpC	Temp	ORP	LDO	Turb	SWL
1234	6.50	1620	7.93	204	0.09	27.0	11.15
1238	6.51	1583	7.92	185	0.06	13.3	11.15
1242	6.51	1564	7.94	178	0.06	8.1	11.15
1246	6.52	1547	7.95	173	0.06	4.9	11.15
1250	6.53	1538	7.95	169	0.06	4.0	11.15
1254	6.53	1531	7.95	166	0.05	3.8	11.15

1325 went around w/ gen. waste personnel & staked where MW-3R used to be.
1440 Depart
1525 cede samples to PACE.
Corey Andrews
Scale: 1 square = _____ 1530 Arrive back at NTS. Unload/Post check/Report 10/22/19
Rite in the Rain

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Vehicle Inspection Report

Event Key: 6385CC_2019 Oct(1 of 1)

Driver: Corey Andrews **Date:** 10/21/2019 **Time:** 08:00

Vehicle: V60 - 2013 GMC Sierra 1500 **Odometer:**

Check each Item Inspected

Driver/Passenger Side

External Side Mirrors (Right and Left): ☑	Windows (clean; free of cracks): ☑	Tires (properly inflated, adequate tread): ☑

Comments:

Front/Rear

Tail Lights: ☑	Head Lights ☑	Damage to Body/Bumpers ☑
License Plates ☑	Fluid Leaks ☑	Turn Signals ☑

Comments:

Routine Maintenance

Oil Change (Current): ☑	Transmission Fluid (Change every 60k): ☑	Air Filter (Change every 30k): ☑
Gauges Operational ('check engine' light OFF): ☑	Spare Tire (present, properly inflated): ☑	

Comments:

Interior

Cleanliness: ☑	Brakes: ☑	Windshield Wipers and Fluid: ☑
Seat Belts (working condition): ☑	Parking Brake (reset/release): ☑	Rearview Mirror: ☑

Comments:

General/Safety

Insurance Card: ☑	Wheel Chocks: ☑	First Aid Kit: ☑
Operator's Manual: ☑	Strobe Light (if needed): ☑	Buggy Whip (if needed): ☑

Comments:

Deficiencies Corrected

Environmental Science & Engineering

Daily Tailgate Safety

Project: 63850 **Date:** 10/21/2019

Work Site Hazard Assessment Worksheet

- ☑ PPE Required (List): High viz, safety glasses Level* D
- ☑ Weather Conditions (List): High 48°F, rain, NE 20 mph
- ☑ Vehicular Traffic
- ☑ Noise
- ☑ Housekeeping
- ☑ Communications
- ☑ Equipment/Tools
- ☐ Other Site Hazards**

☐ I have examined the work place named and found no hazards
☑ I have examined the work place named and hazards found are listed below with corrective action taken

Hazards Identified/Safety Items Discussed:

Vehicle Safety
Slips, Trips, Falls

Corrective Actions Taken:

Drive defensively
Maintain Proper Footing

Participants in Safety Discussion:

	Print Name	Signature
1.	Jan Strasburg	
2.	Corey Andrews	
3.		
4.		
5.		

Signature of Site Supervisor/Examiner: Date: 10/21/2019

*Level D, C, B or A
**Examples: Heavy Equipment, Air Quality, Flammable materials, Wildlife, Work Site Security, Confine Space

NTS
Environmental Science & Engineering
526 CHESTNUT STREET
VIRGINIA, MN 55792
(218) 741-4290 Fax: (218) 741-4291

PAGE 1 OF 1

CHAIN OF CUSTODY RECORD

REQUIRED TURN-AROUND TIME: 2 Weeks from submittal date

CLIENT NAME, ADDRESS, PHONE#:
GENERAL WASTE and RECYLING LLC
DEMOLITION & INDUSTRIAL LANDFILL
ITASCA COUNTY, MINNESOTA

REPORT TO:
DENNIS SCHUBBE, KARISSA VOSEN,
RICK CRUM & SCOTT SEELEY

SAMPLER: Corey Andrews

PERMIT REQ.: SW-620-002

PROJECT: GENERAL WASTE DISPOSAL and RECYCLING, LLC.

Oct-19

PROJECT NUMBER: 6385CC CCR Monitoirng

LOG-IN #	SAMPLE #	DESCRIPTION	COLLECTION: DATE	TIME	MATRIX: LIQ.	SOL.	filtered	TYPE & # CONTAINERS: VOC M. 8260 (HCL)	GENERAL CHEMISTRY (NO PRES)	GENERAL CHEMISTRY (H2SO4)	TOTAL METALS (HN03)	DISSOLVED METALS (HN03)		SPECIAL INSTRUCTIONS: SEE ATTACHED LIST WITH METHODS — REQUIRED ANALYSIS
	MW3R	GW WELL	No Sample		X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW7	GW WELL	10/21/19	1800	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW8	GW WELL	10/21/19	1145	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW9	GW WELL	10/21/19	1255	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	Field Duplicate	GW WELL	10/21/19	1256	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	Field Blank	Field Blank	10/21/19	1240	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS

RELINQUISHED BY: Corey Andrews DATE: 10/21/19 TIME: 1525

RECEIVED BY: DATE: TIME:

RELINQUISHED TO NTS SAMPLE LOCK-UP BY: DATE: TIME:

RECEIVED FROM NTS SAMPLE LOCKUP BY: DATE: TIME:

RECEIVED FOR LAB BY: Katie Rhoads

TEMP AT ARRIVAL: 1.3 C

DATE: 10/21/19 TIME: 1525

PARAMETER	SYMBOL	EPA Method
Boron	B	200.8
Calcium	Ca	200.7
Chloride	Chloride	300.0
Fluoride	Flouride	300.0
pH	pH	SM 4500 H+B
Sulfate	SO_4	300.0
TDS	TDS	SM 2540C

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Field Report Peer Review Report

Event Key: 6385CC_2019 Oct(1 of 1)
Report Date: 10/21/2019
Lab WO#: 12137390

Reviewer #1:	Date:
Karissa Vosen	10/22/2019

Report Sections	Required:	Included:
Cover Sheet:	☑	☑
Location Information		
Data Collection:	☑	☑
Observation:	☑	☑
Flow or Stabilization:	☑	☑
Photographs:	☐	☑
Calibration:	☑	☑
Field Notes:	☑	☑
Safety Forms:	☑	☑

	N/A:	OK:
GW Calculations are Accurate:	☐	☑
GW Stabilization Criteria met:	☐	☐
Flow Calculations are Accurate:	☑	☐
Sonde Passed Post Event Check:	☐	☑
Consistent Values in Notes:		☑
Consistent Dates and Times:		☑
No Deviations from SOPs:		☑
Cover Sheet provides a complete description of key activities and observations:		☑

Reviewer #1 Comments:

Stabilization criteria was not met for ORP and turbidity at MW7 and turbidity at MW8. A minumum of 5 well volumes was removed prior to sampling per NTS SOP. Results were qualified.

Reviewer #2:	Date:
Terri Sabetti	10/22/2019

Report Sections	Required:	Included:
Cover Sheet:	☑	☑
Location Information		
Data Collection:	☑	☑
Observation:	☑	☑
Flow or Stabilization:	☑	☑
Photographs:	☑	☑
Calibration:	☑	☑
Field Notes:	☑	☑
Safety Forms:	☑	☑

	N/A:	OK:
GW Calculations are Accurate:	☐	☑
GW Stabilization Criteria met:	☐	☐
Flow Calculations are Accurate:	☑	☐
Sonde Passed Post Event Check:	☐	☑
Consistent Values in Notes:		☑
Consistent Dates and Times:		☑
Qualifiers added to Data:	☐	☑
Data under correct Event Key:	☐	☑
All Req'd Parameters Meas'd; Limits Met:	☐	☑

Reviewer #2 Comments:

APPENDIX B

STATISTICAL ANALYSIS

July 17, 2019

Mr. Jon Penheiter
Dem-Con Companies
13020 Dem-Con Drive
Shakopee, MN 55379
jonpenheiter@dem-con.com

Sent Via Email

RE: Statistical Analysis for April 2019 groundwater monitoring event for CCR compliance at the Keewatin, MN facility

Mr. Penheiter,

NTS is pleased to submit this report summarizing the CCR monitoring data collected in April, 2019 as well as the statistical analysis completed in accordance with the facility Statistical Analysis Plan (SAP).

Review of the data shows that no downgradient wells (MW-3R, MW-8, MW-9) indicated any exceedance of trigger values. The facility up-gradient well (MW-7) did show two parameters (Sulfate, TDS) in exceedance of the trigger value. However, MW-7 is not a compliance well and therefore this would not be assessed in regards to determining if a Statistically Significant Increase (SSI) has occurred due to the CCR facility. This is the 1st occurrence of elevated Sulfate and Total Dissolved Solids (TDS) in MW-7. Chloride concentrations in MW-7 had been elevated above the trigger value in both the April, 2018 and October, 2018 events, but was measured below the trigger value in the April, 2019 event.

MW-7 continues to show significant variability in water quality. It is recommended that detection monitoring continue per the SAP and the potentially changing up-gradient conditions be assessed when the background dataset is updated following 2 years of detection monitoring (After October, 2019 event).

Detection Monitoring

Detection monitoring at the Keewatin facility includes monitoring of 4 groundwater wells, one up-gradient well (MW-7) and three downgradient wells (MW-3R, MW-8, and MW-9). Field parameters and laboratory samples were collected on April 25, 2019. Laboratory results were received from PACE Analytical on May 13, 2019. Lab analyses completed includes those found in the CCR guidance Appendix III table (See Appendix C). The monitoring results and the established detection monitoring trigger values can be seen in Tables 1 and 2, respectively. The highlighted cells in Table 1 indicate monitored results above the trigger value (MW-7 Sulfate & Total Dissolved Solids (TDS)).

Table 1
2019 April Detection Monitoring Event Results

Parameter	MW-7	MW-3R	MW-8	MW-9
Boron (ug/L)	69.7	96	75.8	<50
Calcium (mg/L)	481	484	343	206
Chloride (mg/L)	61.4	2.8	4.3	2.9
Fluoride (mg/L)	<0.10	<0.10	<0.10	<0.10
pH (SU)	6.29	6.35	6.30	6.52
Sulfate (mg/L)	988	1300	562	423
Total Dissolved Solids (mg/L)	1970	2560	1380	1020

Table 2
Detection Monitoring Trigger Values

Parameter	MW-7	MW-3R	MW-8	MW-9
Boron (ug/L)	87.8	130.1	87.8	87.8
Calcium (mg/L)	506.7	667.5	506.7	506.7
Chloride (mg/L)	81.94	81.94	81.94	81.94
Fluoride (mg/L)	0.11	0.11	0.11	0.11
pH (SU)	6.286 – 6.814	6.286 – 6.814	6.286 – 6.814	6.286 – 7.318
Sulfate (mg/L)	811.1	1937	811.1	811.1
Total Dissolved Solids (mg/L)	1742	3571	1742	1742

Statistical Analysis

The Statistical Analysis Plan (SAP) for the facility and CCR guidance details that only downgradient wells (compliance wells) are to be analyzed for Statistically Significant Increases (SSIs). The SAP also specifies a 2-sample test be used to determine if an SSI has occurred.

No SSI has occurred in the April, 2019 monitoring event.

A review of the 2017 annual report detailed a few points of interest that were to be further assessed following additional monitoring. The following is an excerpt from the annual report with responses in light of the 2018 and April, 2019 monitoring events:

"Review of Sulfate concentrations in MW-3R indicated a statistically significant increasing trend. Due to the narrow range (1710-1890 mg/L) of measured values, no correction for trending was completed. This should be further assessed following additional monitoring events."

> The April and October, 2018 events indicated a sulfate value of 1520 mg/L and 1550 mg/L in MW-3R. The April, 2019 event indicated a value of 1300 mg/L. These values do not support the measured increasing trend in the background dataset, but rather suggest a decreasing trend. This further indicates the observed trend in the background dataset to be coincidental.

If you have any questions, please contact me at (218) 742-1022.

Sincerely,
Northeast Technical Services, Inc.

Evan C. Johnson, PE
Geotechnical Engineer
MN License # 53755

Appendix A: April 2019 Monitoring Results
Appendix B: Statistical Analysis Plan
Appendix C: Appendix III Parameters

Appendix A
Laboratory Results and Field Report

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

May 13, 2019

Dennis Schubbe
Northeast Technical Services
526 Chestnut Street
Virginia, MN 55792

RE: Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Dear Dennis Schubbe:
Enclosed are the analytical results for sample(s) received by the laboratory on April 25, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised to remove the D3 flag on the Field Blank sample.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carrie Jensen
carrie.jensen@pacelabs.com
(218)742-1042
Project Manager

Enclosures

cc: Sample Data, Northeast Technical Services
Scott Seeley, NTS
Karissa Vosen, NTS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

CERTIFICATIONS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
Alaska Certification UST-107
Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification # : 998027470
WA Department of Ecology Lab ID# C1007

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

SAMPLE SUMMARY

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Lab ID	Sample ID	Matrix	Date Collected	Date Received
12124076001	**Field Blank**	Water	04/25/19 11:50	04/25/19 15:50
12124076002	**Field Duplicate**	Water	04/25/19 14:35	04/25/19 15:50
12124076003	**MW3R**	Water	04/25/19 12:05	04/25/19 15:50
12124076004	**MW7**	Water	04/25/19 10:52	04/25/19 15:50
12124076005	**MW8**	Water	04/25/19 13:24	04/25/19 15:50
12124076006	**MW9**	Water	04/25/19 14:34	04/25/19 15:50

Pace Analytical Services, LLC
315 Chestnut Street
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SAMPLE ANALYTE COUNT

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
12124076001	**Field Blank**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076002	**Field Duplicate**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076003	**MW3R**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076004	**MW7**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076005	**MW8**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12124076006	**MW9**	EPA 200.7	DM	1	PASI-M
		EPA 200.8	PW1	1	PASI-M
		SM 2540C (1997)	KER	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Sample: Field Blank **Lab ID: 12124076001** Collected: 04/25/19 11:50 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	ND	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:38	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	10.0	1	05/01/19 10:08	05/03/19 20:03	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	ND	mg/L	10.0	1		04/30/19 17:01		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.2**	Std. Units	0.10	1		04/30/19 18:04		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		05/01/19 07:13	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 07:13	16984-48-8	
Sulfate	ND	mg/L	2.0	1		05/01/19 07:13	14808-79-8	

Sample: Field Duplicate **Lab ID: 12124076002** Collected: 04/25/19 14:35 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**203**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:45	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:15	7440-42-8	D3
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1050**	mg/L	20.0	1		04/30/19 17:00		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		04/30/19 17:51		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**2.8**	mg/L	1.0	1		05/01/19 05:29	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 05:29	16984-48-8	
Sulfate	**441**	mg/L	8.0	4		05/01/19 12:06	14808-79-8	

Sample: MW3R **Lab ID: 12124076003** Collected: 04/25/19 12:05 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**484**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:40	7440-70-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Sample: MW3R **Lab ID: 12124076003** Collected: 04/25/19 12:05 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**96.0**	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:06	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**2560**	mg/L	20.0	1		04/30/19 16:59		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		04/30/19 18:07		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**2.8**	mg/L	1.0	1		05/01/19 04:26	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 04:26	16984-48-8	
Sulfate	**1300**	mg/L	20.0	10		05/01/19 04:47	14808-79-8	

Sample: MW7 **Lab ID: 12124076004** Collected: 04/25/19 10:52 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**481**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:37	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**69.7**	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:00	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1970**	mg/L	20.0	1		04/30/19 16:56		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		04/30/19 17:55		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**61.4**	mg/L	1.0	1		05/01/19 06:31	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 06:31	16984-48-8	
Sulfate	**988**	mg/L	20.0	10		05/01/19 12:27	14808-79-8	

Sample: MW8 **Lab ID: 12124076005** Collected: 04/25/19 13:24 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**343**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:42	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**75.8**	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:09	7440-42-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
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(218) 742-1042

ANALYTICAL RESULTS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Sample: MW8 **Lab ID: 12124076005** Collected: 04/25/19 13:24 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1380**	mg/L	20.0	1		04/30/19 16:59		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		04/30/19 17:48		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**1.3**	mg/L	1.0	1		05/01/19 05:08	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 05:08	16984-48-8	
Sulfate	**562**	mg/L	12.0	6		05/01/19 11:45	14808-79-8	

Sample: MW9 **Lab ID: 12124076006** Collected: 04/25/19 14:34 Received: 04/25/19 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**206**	mg/L	0.50	1	05/01/19 10:08	05/02/19 16:43	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	50.0	5	05/01/19 10:08	05/03/19 20:12	7440-42-8	D3
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1020**	mg/L	20.0	1		04/30/19 17:00		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.5**	Std. Units	0.10	1		04/30/19 17:58		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**2.9**	mg/L	1.0	1		05/01/19 06:52	16887-00-6	
Fluoride	ND	mg/L	0.10	1		05/01/19 06:52	16984-48-8	
Sulfate	**423**	mg/L	8.0	4		05/01/19 12:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 602602 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

METHOD BLANK: 3258183 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	mg/L	ND	0.50	05/02/19 16:17	

LABORATORY CONTROL SAMPLE: 3258184

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	20	20.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3258185 3258186

Parameter	Units	12123992003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	mg/L	20.3	20	20	40.9	40.7	103	102	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 602622 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

METHOD BLANK: 3258262 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	10.0	05/03/19 19:30	

LABORATORY CONTROL SAMPLE: 3258263

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	92.5	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3258264 3258265

Parameter	Units	12124033020 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	94.0	100	100	192	189	98	95	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 165113 Analysis Method: SM 2540C (1997)
QC Batch Method: SM 2540C (1997) Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

METHOD BLANK: 650643 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	04/30/19 16:55	

METHOD BLANK: 650647 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	04/30/19 17:02	

LABORATORY CONTROL SAMPLE: 650644

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	255	234	92	80-120	

SAMPLE DUPLICATE: 650645

Parameter	Units	12124120004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	930	908	2	5	H3

SAMPLE DUPLICATE: 650646

Parameter	Units	12124119002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	356	374	5	5	H1

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REPORT OF LABORATORY ANALYSIS

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315 Chestnut Street
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QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 165071 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

LABORATORY CONTROL SAMPLE: 650392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	7	7.0	101	98-102	H6

SAMPLE DUPLICATE: 650393

Parameter	Units	12123914004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	0	10	H6

SAMPLE DUPLICATE: 650394

Parameter	Units	12124076003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	10	H6

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

QC Batch: 165097 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

METHOD BLANK: 650540 Matrix: Water
Associated Lab Samples: 12124076001, 12124076002, 12124076003, 12124076004, 12124076005, 12124076006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/01/19 00:15	
Fluoride	mg/L	ND	0.10	05/01/19 00:15	
Sulfate	mg/L	ND	2.0	05/01/19 00:15	

LABORATORY CONTROL SAMPLE: 650541

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	51.1	102	90-110	
Fluoride	mg/L	5	5.0	100	90-110	
Sulfate	mg/L	50	50.9	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 650542 650543

Parameter	Units	12124074001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	0.66J	50	50	53.2	53.3	105	105	90-110	0	20	
Fluoride	mg/L	0.099J	5	5	5.1	5.2	100	101	90-110	1	20	
Sulfate	mg/L	0.63J	50	50	52.5	52.6	104	104	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 650544 650545

Parameter	Units	12124119002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	75.2	250	250	340	339	106	105	90-110	0	20	
Fluoride	mg/L	3.4	25	25	28.3	28.3	100	100	90-110	0	20	
Sulfate	mg/L	106	250	250	369	367	105	104	90-110	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Virginia, MN 55792
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QUALIFIERS

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-V	Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H1	Analysis conducted outside the recognized method holding time.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: [6385CC_2019 Apr(1 of 1)]-Revised Report
Pace Project No.: 12124076

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
12124076001	**Field Blank**	EPA 200.7	602602	EPA 200.7	603271
12124076002	**Field Duplicate**	EPA 200.7	602602	EPA 200.7	603271
12124076003	**MW3R**	EPA 200.7	602602	EPA 200.7	603271
12124076004	**MW7**	EPA 200.7	602602	EPA 200.7	603271
12124076005	**MW8**	EPA 200.7	602602	EPA 200.7	603271
12124076006	**MW9**	EPA 200.7	602602	EPA 200.7	603271
12124076001	**Field Blank**	EPA 200.8	602622	EPA 200.8	603644
12124076002	**Field Duplicate**	EPA 200.8	602622	EPA 200.8	603644
12124076003	**MW3R**	EPA 200.8	602622	EPA 200.8	603644
12124076004	**MW7**	EPA 200.8	602622	EPA 200.8	603644
12124076005	**MW8**	EPA 200.8	602622	EPA 200.8	603644
12124076006	**MW9**	EPA 200.8	602622	EPA 200.8	603644
12124076001	**Field Blank**	SM 2540C (1997)	165113		
12124076002	**Field Duplicate**	SM 2540C (1997)	165113		
12124076003	**MW3R**	SM 2540C (1997)	165113		
12124076004	**MW7**	SM 2540C (1997)	165113		
12124076005	**MW8**	SM 2540C (1997)	165113		
12124076006	**MW9**	SM 2540C (1997)	165113		
12124076001	**Field Blank**	SM 4500-H+B	165071		
12124076002	**Field Duplicate**	SM 4500-H+B	165071		
12124076003	**MW3R**	SM 4500-H+B	165071		
12124076004	**MW7**	SM 4500-H+B	165071		
12124076005	**MW8**	SM 4500-H+B	165071		
12124076006	**MW9**	SM 4500-H+B	165071		
12124076001	**Field Blank**	EPA 300.0	165097		
12124076002	**Field Duplicate**	EPA 300.0	165097		
12124076003	**MW3R**	EPA 300.0	165097		
12124076004	**MW7**	EPA 300.0	165097		
12124076005	**MW8**	EPA 300.0	165097		
12124076006	**MW9**	EPA 300.0	165097		

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Comments:

TAT: Standard

PM: Dennis Schubbe

Report To: sampledata@netechnical.com

Project#: 6385CC_2019

Event Key:
6385CC_2019 Apr(1 of 1)

WO# : 12124076

12124076

Environmental Science & Engineering

Sample ID:	Sample Location:	Date:	Time:	Mx:	ST:	Nitric, Metals	Unpreserved Generals						Required Analyses:
	Field Blank	4/25/19	1150	W	G	X	X						List #1
	Field Duplicate	"	1435	W	G	X	X						List #1
	MW3R	"	1205	W	G	X	X						List #1
	MW7	"	1052	W	G	X	X						List #1
	MW8	"	1324	W	G	X	X						List #1
	MW9	"	1434	W	G	X	X						List #1

Sampled by: Corey Andrews		**Relinquished by:**	**Date:** 4/25/19 **Time:** 1550
Received by:	**Date:** **Time:**	**Relinquished by:**	**Date:** **Time:**
Received at Lab by:	**Date:** 4/25/19 **Time:** 15:50	**Temperature at Receipt:** 5.8	

List #1 Field Blank,Field Duplicate,MW3R,MW7,MW8,MW9		6385CC_2019 Apr(1 of 1)	
Method:	**Parameter:**	**NTS Limit:**	**J-Flag:**
EPA 200.7			
	Calcium		☐
EPA 200.8			
	Boron		☐
EPA 300.0			
	Chloride		☐
	Fluoride		☐
	Sulfate		☐
SM 2540C			
	Solids, Total Dissolved (TDS)		☐
SM 4500-H+B			
	pH		☐

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 03Apr2019 Page 1 of 1
	Document No.: F-VM-C-001-Rev.12	Issuing Authority: Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: NTS

Project #: WO# : 12124076

PM: CLJ Due Date: 05/09/19

CLIENT: NTS-Dennis

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☐ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other: Temp Blank? ☑ Yes ☐ No

Thermometer Used: ☑ 140792808 Type of Ice: ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.5 Cooler Temp Corrected °C: 5.8 Biological Tissue Frozen? ☐ Yes ☐ No ☑ NA

Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: ZH 4/25/19

Comments:

Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5. If Fecal: ☐ <8 hours ☐ >8, <24 hours ☐ >24 hours
Short Hold Time Analysis (<72 hr)?	☑ Yes	☐ No	☐ N/A	6. pH
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation will be checked and documented in the pH logbook.	☑ Yes	☐ No	☐ N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	☐ Yes	☐ No	☑ N/A	13.
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION Field Data Required? ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Carrie Jean Date: 4/25/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Laboratory Data Verification Checklist

Event Key: 6385CC_2019 Apr(1 of 1)

Collection Date: 4/25/2019
Report Date: 5/8/2019
Review Date: 5/8/2019

Lab: Pace Analytical
Lab WO#: 12124076

Reviewer #1: Catherine Hafdahl
Reviewer #2: Karissa Vosen

SAMPLE HANDLING AND PRESERVATION	N/A:	OK:
A copy of the chain of custody (COC) is provided with the final report	☐	☑
A sample condition upon receipt form was included with the final report	☐	☑
Samples were received by the laboratory with proper preservation--i.e. on ice and/or in correct container types	☐	☑
Samples were received and analyzed by the laboratory within method required holding times	☐	☐
Any results associated with incorrect preservation or missed hold time are qualified in the body of the report	☐	☑

Comments: A qualifier was added to pH results (method 4500 H+B) indicating that the analysis was initiated outside of the 15 minutes EPA required holding time. Qualifiers are in SWX.

CALIBRATION	N/A:	OK:
The report narrative or data qualifiers indicate there were calibration failures for any of the required analyses	☐	☐

METHOD BLANKS	N/A:	OK:
A method blank was analyzed for all applicable analytical methods	☐	☑
All method blanks are free of target analytes	☐	☑
If any method blanks had a detect, were the detected analytes present in associated samples?	☑	☐

LABORATORY CONTROL SAMPLES	N/A:	OK:
An LCS was prepared and analyzed for each analytical method and contains all target analytes being reported	☐	☑
Laboratory control limits are listed on the report and seem reasonable when compared to the suggested guidelines in the MPCA QC Policy	☐	☑
The percent recovery of all target analytes are within laboratory control limits	☐	☑
Any analytes with a percent recovery outside of laboratory control limits are qualified (flagged) in the associated samples	☑	☐

MATRIX SPIKES/MATRIX SPIKE DUPLICATES	N/A:	OK:
An MS/MSD was prepared and analyzed for each applicable analytical method and contains all target analytes being reported	☐	☑
If no, was an alternate spiked sample processed instead? (Such as an LCSD)	☑	☐
Laboratory control limits are listed on the report and seem reasonable when compared to the suggested guidelines in the MPCA QC Policy	☐	☑
The percent recovery of all target analytes are within laboratory control limits	☐	☑
The RPD is within laboratory control limits for all target analytes	☐	☑
Any analytes with a % recovery or RPD outside of laboratory control limits are qualified (flagged) in the parent sample	☑	☐

LABORATORY DUPLICATES	N/A:	OK:
A Laboratory Duplicate was prepared and analyzed for each applicable analytical method	☐	☑
The RPD for the duplicate pair is within laboratory limits	☐	☑
Any analytes with an RPD outside of laboratory control limits are qualified (flagged) in the associated parent sample	☑	☐

SURROGATES	N/A:	OK:
Laboratory control limits are listed on the report and seem reasonable when compared to the suggested guidelines in the MPCA QC Policy	☑	☐
The percent recovery of all surrogate compounds are within laboratory control limits	☑	☐

FIELD DUPLICATES	N/A:	OK:
A field duplicate was required for this this project	☐	☑
The RPD for the duplicate pair is within the NTS control limits	☐	☑
Any analytes with an RPD outside of NTS control limits are qualified (flagged) in the parent sample	☑	☐

FIELD and TRIP BLANKS	N/A:	OK:

A field blank and/or trip blank was required for this project	☐	☑
The blank is free of target analytes	☐	☑
If an analyte was detected in the blank, was it present in the associated samples?	☐	☑
If yes, was the associated data qualified in SWX?	☑	☐

ADDITIONAL CHECKS	**N/A:**	**OK:**
This project has been uploaded into SWX and correctly reflects the results reported within the laboratory report	☐	☑
Analysis to the MDL was required for this project	☐	☐
If analysis to the MDL was required, data was appropriately qualified with J flags?	☑	☐
Dilution factors are typical of past events and non-detects are not reported off dilutions	☐	☑
Total and dissolved parameters are in agreement	☑	☐
All lab results were evaluated against the associated permit limits or appear typical of past monitoring events	☐	☑
All lab QC calculations were accurate against SWX calculations	☐	☑

Comments: Qualifiers were added to Boron (Field Duplicate and MW9) indicating that the sample was diluted due to the presence of high levels of non-target analytes or other matrix intererence.

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Field Report Cover Sheet

Event Key: 6385CC_2019 Apr(1 of 1)

Field Date: 4/25/2019

Report Created: 5/3/2019 3:08:42 PM

Client:
General Waste Disposal & Recovery

NTS Project Name:
CCR Landfill Monitoring 2019

NTS Project Manager:
Dennis Schubbe

NTS Field Personnel:
Corey Andrews

Summary of Services Performed:

Prepped and went to General Waste to conduct April 2019 CCR well monitoring. The following wells were sampled via the low flow method with submersible pumps: MW3R, MW7, MW8, and MW9. Dup obtained at MW9. Considered turbidity stable if three consecutive readings were under 5 NTU.

Samples ceded to PACE Analytical in Virginia, MN.

For additional details see stabilization sheets and fields notes.

I,Corey Andrews, certify that the information in this report is true and correct to the best of my knowledge.

MW3R

SECTION #1: DATA COLLECTIO ☑ **Sample Collected** **Field Blank:** Field Blank

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
12:04	6.35	0.00	2983	1.5	144	11.08

65.79 Static Water Level in Water by Field Measurement, ft

1466.5 Elevation, GW (MSL) in Water by Calculation, ft

SECTION #2: OBSERVATIONS **Time:** 11:15

Turbidity less than 5 NTU. Considered well stable.

Air Temperature: 51°F to 60°F
Wind Speed: 5-10 mph
Wind Direction: W-NW
Precipitation: None
Cloud Cover: Mostly Sunny
Airborne Particulate: Dust

Color, Purge: Gray/Black
Appearance, Purge: Clear
Odor, Purge: Definite
Color, Sample: Colorless
Appearance, Sample: Clear
Odor, Sample: Definite

Well Depth (ft): 77.58
SWL (ft): 65.79
Pump Rate (gpm): 0.33
Interval (min): 5.83
Pump Start (HH:MM): 11:23
Pump Stop (HH:MM): 12:12
Purge Volume (gal): 16.17
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 77.58ft - Static Water Level 65.79ft = Water Column 11.79ft
Water Column 11.79ft x *Conversion Factor 0.163gal/ft = Well Volume 1.924gal
Well Volume 1.924gal ÷ Pump Rate 0.33gpm = Well Volume Interval 5.83min

*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48

Pump Start Time 11:23 - Pump End Time 12:12 = Pump Duration 49min
Pump Duration 49min x Pump Rate 0.33gpm = Volume Purged 16.17gal

Top of Casing Elevation 1532.29 - Static Water Level 65.79 = 1466.5ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 5.83 **Pump Rate (gpm):** 0.33

MW3R (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	+/- 1.0 NTU	+/- 20 mV	+/- 0.10 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
11:34	6.36	0.19	3019	27.3	216	10.99	66.61
11:40	6.36	0.00	3031	16.6	184	10.93	66.52
11:46	6.35	0.00	3012	9.0	167	10.95	66.52
11:52	6.35	0.00	2997	4.5	155	11.04	66.52
11:58	6.35	0.00	2988	2.6	149	11.11	66.52
12:04	6.35	0.00	2983	1.5	144	11.08	66.52

Stabilization Passes NTS Criteria: ☐

MW7

SECTION #1: DATA COLLECTIO ☑ **Sample Collected** **Field Blank:**

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
10:51	6.29	0.00	2501	13.7	458	11.39

1477.37 Elevation, GW (MSL) in Water by Calculation, ft

18.76 Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS **Time:** 09:39

Air Temperature: 51°F to 60°F
Wind Speed: 5-10 mph
Wind Direction: W-NW
Precipitation: None
Cloud Cover: Mostly Sunny
Airborne Particulate: None

Color, Purge: Orange
Appearance, Purge: Turbid
Odor, Purge: None
Color, Sample: Colorless
Appearance, Sample: Clear
Odor, Sample: None

Well Depth (ft): 26.77
SWL (ft): 18.76
Pump Rate (gpm): 0.15
Interval (min): 8.71
Pump Start (HH:MM): 9:45
Pump Stop (HH:MM): 10:55
Purge Volume (gal): 10.50
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 26.77ft - Static Water Level 18.76ft = Water Column 8.01ft
Water Column 8.01ft x *Conversion Factor 0.163gal/ft = Well Volume 1.307gal
Well Volume 1.307gal ÷ Pump Rate 0.15gpm = Well Volume Interval 8.714min

*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48

Pump Start Time 09:45 - Pump End Time 10:55 = Pump Duration 70min
Pump Duration 70min x Pump Rate 0.15gpm = Volume Purged 10.5gal

Top of Casing Elevation 1496.13 - Static Water Level 18.76 = 1477.37ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 8.71 **Pump Rate (gpm):** 0.15

MW7 (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	+/- 1.0 NTU	+/- 20 mV	+/- 0.10 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
9:58	6.03	1.82	2596	49.3	637	10.09	20.36
10:07	6.22	1.16	2631	20.5	636	11.66	20.37
10:16	6.24	0.00	2575	12.4	613	11.10	20.33
10:25	6.26	0.00	2540	7.6	566	11.98	20.26
10:34	6.29	0.00	2526	20.5	511	10.55	20.30
10:43	6.28	0.00	2510	18.7	489	11.79	20.31
10:51	6.29	0.00	2501	13.7	458	11.39	20.31
10:50	6.29	0.05	2493	14.2	461	11.49	

Stabilization Passes NTS Criteria: ☐

MW8

SECTION #1: DATA COLLECTIO ☑ **Sample Collected** **Field Blank:**

Field Duplicate: **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
13:23	6.30	0.00	1821	75.3	215	11.36

1460.18 Elevation, GW (MSL) in Water by Calculation, ft

34.23 Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS **Time:** 12:28

unable to stabilize turbidity. Bounces up and down during stabilization. Purged well dry after sampling.

Air Temperature: 61°F to 70°F
Wind Speed: 5-10 mph
Wind Direction: W-NW
Precipitation: Drizzle
Cloud Cover: Mostly Sunny
Airborne Particulate: None

Color, Purge: Orange
Appearance, Purge: Turbid
Odor, Purge: None
Color, Sample: Orange
Appearance, Sample: Turbid
Odor, Sample: None

Well Depth (ft): 41.40
SWL (ft): 34.23
Pump Rate (gpm): 0.25
Interval (min): 4.68
Pump Start (HH:MM): 12:40
Pump Stop (HH:MM): 13:30
Purge Volume (gal): 12.50
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 41.40ft - Static Water Level 34.23ft = Water Column 7.17ft
Water Column 7.17ft x *Conversion Factor 0.163gal/ft = Well Volume 1.17gal
Well Volume 1.17gal ÷ Pump Rate 0.25gpm = Well Volume Interval 4.68min

*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48

Pump Start Time 12:40 - Pump End Time 13:30 = Pump Duration 50min
Pump Duration 50min x Pump Rate 0.25gpm = Volume Purged 12.5gal

Top of Casing Elevation 1494.41 - Static Water Level 34.23 = 1460.18ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 4.68 **Pump Rate (gpm):** 0.25

MW8 (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	+/- 1.0 NTU	+/- 20 mV	+/- 0.10 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
12:53	6.24	0.00	1837	371.4	247	11.47	37.45
12:58	6.25	0.00	1812	383.2	231	11.03	37.45
13:03	6.26	0.00	1825	200.2	224	11.38	37.45
13:08	6.28	0.00	1837	152.0	221	11.45	37.45
13:13	6.28	0.00	1833	64.1	217	11.40	37.40
13:18	6.31	0.00	1793	69.8	215	11.44	37.40
13:23	6.30	0.00	1821	75.3	215	11.36	37.40

Stabilization Passes NTS Criteria: ☐

MW9

SECTION #1: DATA COLLECTIO ☑ **Sample Collected** **Field Blank:**

Field Duplicate: Field Duplicate **Equip Blank:**

Time (HH:MM):	pH (SU):	DO (mg/L):	SpecCond (µS/cm):	Turbidity (NTU):	ORP (mV):	Temp (°C):
14:33	6.52	0.00	1522	1.2	129	7.65

1443.73 Elevation, GW (MSL) in Water by Calculation, ft

10.99 Static Water Level in Water by Field Measurement, ft

SECTION #2: OBSERVATIONS **Time:** 14:03

Turbidity less than 5 NTU, considered stable.

Air Temperature: 61°F to 70°F
Wind Speed: 5-10 mph
Wind Direction: W-NW
Precipitation: None
Cloud Cover: Mostly Sunny
Airborne Particulate: None

Color, Purge: Colorless
Appearance, Purge: Clear
Odor, Purge: None
Color, Sample: Colorless
Appearance, Sample: Clear
Odor, Sample: None

Well Depth (ft): 18.95
SWL (ft): 10.99
Pump Rate (gpm): 0.33
Interval (min): 3.94
Pump Start (HH:MM): 14:00
Pump Stop (HH:MM): 14:40
Purge Volume (gal): 13.20
Purging Strategy: Low-Flow Stabilization
Well Plug Present: ☑
Well Locked: ☑

GW CALCULATIONS:
Total Water Depth 18.95ft - Static Water Level 10.99ft = Water Column 7.96ft
Water Column 7.96ft x *Conversion Factor 0.163gal/ft = Well Volume 1.299gal
Well Volume 1.299gal ÷ Pump Rate 0.33gpm = Well Volume Interval 3.936min

*Conversion Factor Formula: ((Pi(([Casing Diameter ft]/2)^2)12)/(12^3))7.48

Pump Start Time 14:00 - Pump End Time 14:40 = Pump Duration 40min
Pump Duration 40min x Pump Rate 0.33gpm = Volume Purged 13.2gal

Top of Casing Elevation 1454.72 - Static Water Level 10.99 = 1443.73ft

SECTION #3: STABILIZATION **Well Vol Interval (min):** 3.94 **Pump Rate (gpm):** 0.33

MW9 (Cont'd)

Spec:	+/- 0.2 SU	+/- 0.2 mg/L	+/- 5 %	+/- 1.0 NTU	+/- 20 mV	+/- 0.10 °C	
Time (HH:MM):	**pH (SU):**	**DO (mg/L):**	**SpecCond (µS/cm):**	**Turbidity (NTU):**	**ORP (mV):**	**Temp (°C):**	**SWL (ft):**
14:05	6.51	0.00	1590	135.8	141	7.46	11.38
14:09	6.46	0.00	1606	81.4	136	7.63	11.38
14:13	6.47	0.00	1573	15.7	134	7.92	11.38
14:17	6.48	0.00	1556	9.5	132	7.70	11.40
14:21	6.50	0.00	1543	6.0	131	7.75	11.40
14:25	6.51	0.00	1539	3.5	130	7.73	11.40
14:29	6.52	0.00	1527	2.1	129	7.68	11.40
14:33	6.52	0.00	1522	1.2	129	7.65	11.40

Stabilization Passes NTS Criteria: ☐

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Calibration Report

Event Key: 6385CC_2019 Apr(1 of 1)

Environmental Science & Engineering

Staff: Corey Andrews **Date:** 4/25/2019 **Post Cal Check:** ☑

Comments:

Sonde: R04-B	**PreCal (HH:MM):**	**PostCal (HH:MM):**	**PostEvent (HH:MM):**	
Last Temp Check: 1/7/2019				
Temp Specification: +/-0.1 ˚C	7:50	7:50	16:45	**Specifications:**
pH:	4.07	4.0	3.87	+/-0.2 SU
Standard (SU):	4.0	4.0	4.0	
Temperature (°C):	19.5	19.5	20.25	
pH:	7.10	7.0	6.90	+/-0.2 SU
Standard (SU):	7.0	7.0	7.0	
Temperature (°C):	19.03	19.03	19.83	
pH:	10.03	10.0	9.89	+/-0.2 SU
Standard (SU):	10.0	10.0	10.0	
Temperature (°C):	19.36	19.36	19.74	
Conductance, Specific:	0	0	0	Sum of +/-1 µmhos/cm AND +/-0.5%
Standard (µmhos/cm):	0	0	0	
Temperature (°C):	19.0	19.0	16.74	
Conductance, Specific:	993	1000	1004	Sum of +/-1 µmhos/cm AND +/-0.5%
Standard (µmhos/cm):	1000	1000	1000	
Temperature (°C):	19.33	19.27	21.27	
Turbidity:	0	0	0.4	<100 +/-1 NTU >100 AND <400 +/-12 NTU >400 AND <3000 +/-150 NTU
Standard (NTU):	0	0	0	
Temperature (°C):	19.3	19.3	19.72	
Turbidity:	106.6	106	107.4	<100 +/-1 NTU >100 AND <400 +/-12 NTU >400 AND <3000 +/-150 NTU
Standard (NTU):	106	106	106	
Temperature (°C):	19.75	19.75	19.68	

Calibration Report (cont'd)

Sonde:	R04-B	PreCal (HH:MM):	PostCal (HH:MM):	PostEvent (HH:MM):	
Last Temp Check:	1/7/2019				
Temp Specification:	+/-0.1 ˚C	7:50	7:50	16:45	Specifications:
Oxygen, Dissolved:		8.63	8.73	8.69	<8 +/-0.1 mg/L >8 AND <20 +/-0.2 mg/L >20 +/-10%
100% Oxygen Saturation:		8.77	8.77	8.61	
Temperature (°C):		19.0	19.0	19.8	
Bar.Pressure (mmHg):		719	719	718	
ORP:		427	445	440	+/-20 mV
Standard (mV):		445.8	445.8	442.8	
Temperature (°C):		18.9	18.9	20.1	

3385CC Gen Waste CCR Monitoring 4/25/19

Corey Andrews V#60 62 miles

59°F / Sunny / wind WNW 10-20

0700-0845 Prep / Cal / load

0845 Depart NTS office

0935 MW-7 Begin pumping well @ 0945 Sample @ 1052

SWL	TWD	WC	Vol	pump rate
18.76	26.77	8.01	1.3 gal	0.15 GPM (slow recharge)

	pH	SpC	Temp	ORP	DO	SWL	Turb
0958	6.03	2596	10.09	637	1.82	20.36	49.3
1007	6.22	2631	11.66	636	1.16	20.37	20.5
1016	6.24	2575	11.10	613	0.00	20.33	12.4
1025	6.26	2540	11.98	566	0.00	20.26	7.6
1034	6.29	2526	10.55	511	0.00	20.30	20.5
1043	6.28	2510	11.79	489	0.00	20.32	18.7
1051	6.29	2509	11.39	458	0.00	20.31	13.7

* well did not stabilize to NTS stabilization parameters (Temp, ORP, Turb). Temperature affected by sun & clouds. Sampled after 7 well volumes removed. Key #2106

1110 MW-3R Begin pumping @ 1023 Sample @ 1205 FB 1150

SWL	TWD	WC	Vol	pump rate
65.79	77.58	11.79	1.9 gal	0.33

	pH	SpC	Temp	ORP	DO	Turb	SWL
1134	6.36	3019	10.99	216	0.19	27.3	66.61
1140	6.36	3031	10.93	184	0.00	16.6	66.52
1146	6.35	3012	10.95	167	0.00	9.0	66.52
1152	6.35	2997	11.04	155	0.00	4.5	66.52
1158	6.35	2988	11.11	149	0.00	2.6	66.52
1204	6.35	2983	11.08	144	0.00	1.5	66.52

Turb <5 NTU. Considered well stable.

1225 MW-8 Begin pumping well @ 1240 sample @ 1324

SWL	TWD	WC	Vol	pump rate
34.23	41.40	7.17	1.2 gal	0.25 GPM

	pH	SpC	Temp	ORP	DO	Turb	SWL
1253	6.24	1837	11.47	247	0.00	371.4	37.45
1258	6.25	1812	11.03	231	0.00	383.2	37.45
1303	6.26	1825	11.38	224	0.00	200.2	37.45
1308	6.28	1837	11.45	221	0.00	152.0	37.45
1313	6.28	1833	11.40	217	0.00	64.1	37.40
1318	6.31	1793	11.44	215	0.00	69.8	37.40
1323	6.30	1821	11.36	215	0.00	75.3	37.40

Unable to stabilize turbidity (historically an issue with this well.). Turb bounces up and down during stabilization - never clears. Key #2108

Corey Andrews Gen Waste CCR Monitoring 6385CC 4/25/19

VA #60

High 65°F / Sunny / winds WNW 10-20 mph

1355 MW-9 start pumping @ 1400 Sample @ 1434 Dup 1435

SWL	TwD	WC	Vol	Pump Rate
10.99	18.95	7.96	1.3 gal	0.33

	pH	SpC	Temp	ORP	DO	Turb	SWL
1405	6.51	1590	7.46	141	0.00	135.8	11.38
1409	6.46	1606	7.63	136	0.00	81.4	11.38
1413	6.47	1573	7.92	134	0.00	15.7	11.38
1417	6.48	1556	7.70	132	0.00	9.5	11.40
1421	6.50	1543	7.75	131	0.00	6.0	11.40
1425	6.51	1539	7.73	130	0.00	3.5	11.40
1429	6.52	1527	7.68	129	0.00	2.1	11.40
1433	6.52	1522	7.65	129	0.00	1.2	11.40

1505 Depart Gen. Waste

1550 Cede samples to PACE

1555 Arrive back at NTS office. Unload / Post check / Report.

Corey Andrews

4/25/2019

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Vehicle Inspection Report

Event Key: 6385CC_2019 Apr(1 of 1)

Driver: Corey Andrews **Date:** 4/25/2019 **Time:** 08:28

Vehicle: V60 - 2013 GMC Sierra 1500 **Odometer:**

Check each Item Inspected

Driver/Passenger Side

External Side Mirrors (Right and Left): ☑	Windows (clean; free of cracks): ☑	Tires (properly inflated, adequate tread): ☑

Comments:

Front/Rear

Tail Lights: ☑	Head Lights ☑	Damage to Body/Bumpers ☑
License Plates ☑	Fluid Leaks ☑	Turn Signals ☑

Comments:

Routine Maintenance

Oil Change (Current): ☑	Transmission Fluid (Change every 60k): ☑	Air Filter (Change every 30k): ☑
Gauges Operational ('check engine' light OFF): ☑	Spare Tire (present, properly inflated): ☑	

Comments:

Interior

Cleanliness: ☑	Brakes: ☑	Windshield Wipers and Fluid: ☑
Seat Belts (working condition): ☑	Parking Brake (reset/release): ☑	Rearview Mirror: ☑

Comments:

General/Safety

Insurance Card: ☑	Wheel Chocks: ☑	First Aid Kit: ☑
Operator's Manual: ☑	Strobe Light (if needed): ☑	Buggy Whip (if needed): ☑

Comments:

Deficiencies Corrected

Environmental Science & Engineering

Daily Tailgate Safety

Project: 6385CC **Date:** 4/25/19

Work Site Hazard Assessment Worksheet

- ☒ PPE Required (List): High Vis. Level*____
- ☐ Weather Conditions (List): ____
- ☐ Vehicular Traffic
- ☐ Noise
- ☐ Housekeeping
- ☐ Communications
- ☐ Equipment/Tools
- ☐ Other Site Hazards**

☐ I have examined the work place named and found no hazards
☒ I have examined the work place named and hazards found are listed below with corrective action taken

Hazards Identified/Safety Items Discussed:
Trucks hauling preservatives in sample containers

Corrective Actions Taken:
Give trucks right of way
wear nitrile gloves

Participants in Safety Discussion:

	Print Name	Signature
1.	Corey Andrews	
2.		
3.		
4.		
5.		

Signature of Site Supervisor/Examiner: Date: 4/25/19

*Level D, C, B or A
**Examples: Heavy Equipment, Air Quality, Flammable materials, Wildlife, Work Site Security, Confined Space

02/20/2015

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Comments:

TAT: Standard

PM: Dennis Schubbe

Report To: sampledata@netechnical.com

Project#: 6385CC_2019

Event Key:
6385CC_2019 Apr(1 of 1)

Environmental Science & Engineering

Sample ID:	Sample Location:	Date:	Time:	Mx:	ST:	Nitric, Metals	Unpreserved Generals						Required Analyses:
	Field Blank	4/25/19	1150	W	G	X	X						List #1
	Field Duplicate		1435	W	G	X	X						List #1
	MW3R		1205	W	G	X	X						List #1
	MW7		1052	W	G	X	X						List #1
	MW8		1324	W	G	X	X						List #1
	MW9		1434	W	G	X	X						List #1

Sampled by: Corey Andrews		**Relinquished by:**	**Date:** 4/25/19
			Time: 1550
Received by:	**Date:**	**Relinquished by:**	**Date:**
	Time:		**Time:**
Received at Lab by:	**Date:** 4/25/19	**Temperature at Receipt:** 5.8	
	Time: 15:50		

List #1 **6385CC_2019 Apr(1 of 1)**

Field Blank,Field Duplicate,MW3R,MW7,MW8,MW9

Method:	Parameter:	NTS Limit:	J-Flag:
EPA 200.7			
	Calcium		[ ]
EPA 200.8			
	Boron		[ ]
EPA 300.0			
	Chloride		[ ]
	Fluoride		[ ]
	Sulfate		[ ]
SM 2540C			
	Solids, Total Dissolved (TDS)		[ ]
SM 4500-H+B			
	pH		[ ]

NTS
526 Chestnut Street
Virginia, MN 55792
Phone: (218) 741-4290

Field Report Peer Review Report

Event Key: 6385CC_2019 Apr(1 of 1)
Report Date: 4/25/2019
Lab WO#: 12124076

Reviewer #1:	Date:	Reviewer #2:	Date:
Catherine Hafdahl	4/29/2019	Terri Sabetti	4/30/2019

Report Sections	Required:	Included:	Report Sections	Required:	Included:
Cover Sheet:	☑	☑	Cover Sheet:	☑	☑
Location Information			Location Information		
Data Collection:	☑	☑	Data Collection:	☑	☑
Observation:	☑	☑	Observation:	☑	☑
Flow or Stabilization:	☑	☑	Flow or Stabilization:	☑	☑
Photographs:	☐	☐	Photographs:	☐	☐
Calibration:	☑	☑	Calibration:	☑	☑
Field Notes:	☑	☑	Field Notes:	☑	☑
Safety Forms:	☑	☑	Safety Forms:	☑	☑

	N/A:	OK:		N/A:	OK:
GW Calculations are Accurate:	☐	☑	GW Calculations are Accurate:	☐	☑
GW Stabilization Criteria met:	☐	☐	GW Stabilization Criteria met:	☐	☐
Flow Calculations are Accurate:	☑	☐	Flow Calculations are Accurate:	☑	☐
Sonde Passed Post Event Check:	☐	☑	Sonde Passed Post Event Check:	☐	☑
Consistent Values in Notes:		☑	Consistent Values in Notes:		☑
Consistent Dates and Times:		☑	Consistent Dates and Times:		☑
No Deviations from SOPs:		☐	Qualifiers added to Data:	☐	☑
Cover Sheet provides a complete description of key activities and observations:		☑	Data under correct Event Key:	☐	☑
			All Req'd Parameters Meas'd; Limits Met:	☐	☑

Reviewer #1 Comments:

Turbidity was considered stable when < 5.0 NTU at MW3R, MW7, & MW9.
Temperature did not stabilize at MW7.
Turbidity did not stabilize at MW8.

Reviewer #2 Comments:

Appendix B
Statistical Analysis Plan

GENERAL WASTE & RECYCLING, LLC SW-620
INDUSTRIAL WASTE LANDFILL

Statistical Analysis Plan for Groundwater Monitoring Data

Prepared For:

GENERAL WASTE & RECYCLING, LLC

Prepared by:

Northeast Technical Services, Inc.
526 Chestnut Street
Virginia, Minnesota 55792

(218) 741-4290

October 6, 2017

Project Number: 6385CC

"I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete." I certify that this groundwater stasistical analysis plan for the General Waste Industrial Waste Landfill described in this report meets all requirements put forth by 40 CFR §257.93 'Groundwater Sampling and Analysis Requirements.'

10-13-17

Evan Johnson, P.E. Date
Geotechnical Engineer
Minnesota License No. 53648

Table of Contents

List of Tables

List of Figures

1.0 Purpose

Per 40 CFR 257.93 'Groundwater Sampling and Analysis Requirements' (the rule), a statistical procedure for assessing collected groundwater data as to whether or not a release has occurred must implemented at all CCR units. The rule outlines five (5) statistical methods that may be utilized for analyzing collected data. The statistical procedure utilized should account for spatial variance, temporal trends, and address the handling of non-detect data. This Statistical Analysis Plan has been prepared to meet the requirements of the rule and provide the framework for analyzing the collected groundwater data at the General Waste & Recycling, LLC facility (the facility) in Keewatin, Minnesota.

2.0 Initial Background Monitoring

2.1 Background Monitoring Parameters

The rule requires background monitoring of all CCR monitoring wells and eight (8) groundwater monitoring events must be completed prior to October 17, 2017. For this Statistical Analysis Plan, background monitoring includes monitoring for all parameters listed in Appendix III and Appendix IV of 40 CFR 257.93 (see Table 1 and Table 2, respectively).

2.2 Background Data Analysis

Per the rule, within 90 days of collecting the final background dataset, statistical analysis of the data is to be completed. Statistical analysis can be any of those allowed by the rule and should establish a means of determining if a Statistically Significant Inscrease (SSI) of a monitored parameter occurs during operation of the CCR unit to help determine if a leak or release has occurred from the CCR unit.

2.3 Establishing Background Dataset

2.3.1 Summary Statistics and Distribution

Once the final background dataset has been collected, summary statistics should be computed, including mean and variance. An analysis of the data set be conducted to see if data is parametric (normally distributed). A Shapiro-Wilk analysis should be completed to make this determination. This should be completed for each parameter at each well installation. If the data is skewed and does not pass the normality test, the data may be able to be transformed to a normal distribution via lognormal plotting.

If a normal distribution cannot be achieved naturally or by transformation, non-paremetric statistics may be utilized.

2.3.2 Interwell and Intrawell Analysis

It is recommended that the primary method of determining if a SSI has occurred at the site utilize an interwell analysis. This analysis will look at the dataset of the upgradient well (background well) to determine the Upper Prediction Limit (UPL), for the downgradient well concentrations. However, if spatial variation is present in the monitoring system, it may be necessary to assess data from an intrawell analysis. This analysis looks at the background dataset for a specific parameter in the same well to determine if a SSI has occurred. Both methods are viable and can be used for specific parameters. It is not necessary to have a single analysis type for all wells for all parameters at the facility.

Care should be taken when conducting an interwell analysis when the background dataset for downgradient wells may be affected by pre-existing CCR impacts. Given the timeframe of placed CCR materials at the facility, the estimated groundwater velocity, and the monitoring well locations, none of the existing monitoring wells would be expected to exhibit any signs of CCR impact. However, analysis should be completed for any future wells installed.

2.3.3 Upper Prediction Limit

Per the recommendation from the USEPA "Statistical Analysis of Groundwater Monitoring Data At RCRA Facilities Unified Guidance (2009)" (Unified Guidance) document, Upper Prediction Limits (UPL) will be utilized to assess for a SSI in the downgradient wells the facility. The UPL is calculated as follows:

$$UPL = x + ks$$

Where:
x = mean parameter concentration of background dataset
s = standard deviation of background dataset
k = site specific multiplier provided by the Unified Guidance Tables 19, depends on number of wells, number of parameters to be analyzed, size of background dataset

The UPL statistical method allows for both interwell and intrawell comparison.

2.4 Analyzing for Trends

Trends in data may occur due to natural temporal factors, but are not expected to be seen in the initial background dataset. Trend analysis should be completed for the background datasets. If a trend does exist, this should trigger an analysis to assess the potential cause of the trend (especially upward trends of monitored concentrations) and determination of the method to correct for the trend in the statistical approach.

Trend analysis to determine if a statistically significant trend exists can be completed by utilizing the Theil-Sen slope analysis with Mann-Kendall trend test ($\alpha = 0.05$) (non-parametric, more suitable for datasets with >20% non-detect results) or a Ordinary Least Squares (OLS) linear regression with Student's t-test ($\alpha = 0.01$) (parametric dataset, <20% non-detect results).

2.5 Non-Detect Data

Datasets that have less than 20% non-detect data may substitute the reporting limit divided by 2 (RL/2 method) for non-detect results for statistical analysis.

Datasets that contain 20-50% non-detect data must utilize the Kaplan-Meier method to compute summary statistics for the dataset.

Datasets that contain more than 50% non-detect data will not be able to compute summary statistics data reliably. It is recommended that the UPL be set to the highest or second highest observed value.

If all background data are non-detect, than the UPL shall be set to the highest Reporting Limit (RL) (assuming a reasonable RL have been reported that are below MCL concentrations).

2.6 Outliers

The dataset should be analyzed for outlier datapoints. This can be done visually by examining a time series plot of the data or by a box-and-whisker plot. If a datapoint appears to be an outlier, field notes, lab reports, and analysis programs should be checked for indications of erroneous data or transcription erros.

Numerical methods of determining an outlier may include a 3-sigma analaysis for parametric data (data point outside of 3 standard deviations) or the following for non-parametric data if the data point x is:

$$x > x'_{.75} + 3 * IQR$$

Where:

X = individual data point
$x'_{.75}$ = Third Quartile
IQR = $x'_{.75} - x'_{.25}$ (InterQuartile Range)

Datapoints determined to be outliers due to erroneous data collection may be removed from the dataset. Datapoints that appear to be representative data but are extreme may be excluded from the statistical analysis, but should remain in the data for future evaluation if the data set significantly changes.

2.7 Duplicate Samples

Duplicate samples collected for quality control means should not be included in the statistically analyzed dataset as they are not physically independent and will inappropriately skew the data.

3.0 Detection Monitoring

Following the completion of the background monitoring, detection monitoring will be initiated at the facility. Detection monitoring is to be conducted semiannually (preferably in the spring and

fall) and analyzed for Appendix III parameters only. Statisitcal analysis of the data must be completed within 90 days of receiving laboratory data.

3.1 Stastically Significant Increase

3.1.1 Two Sample Test

Two sample testing indicates that if a UPL (either interwell or intrawell) is exceeded for a parameter, then a second sample should be collected and analyzed. If analysis of the second sample indicates a concentration below the UPL, then a SSI has not occurred. If the second sample indicates a value above the UPL, then a SSI has occurred.

Three Sample Testing which would require 3 consecutive samples to indicate concentrations above the UPL for a SSI to be indicated may be appropriate for specific situations. One situation would be if False Positive readings (Type II error) appears to be exceeding 10% of the total dataset.

3.1.2 Pracitical monitoring Practice

Downgradient constituents should be compared to the established UPL determined from the upgradient well data (for interwell comparisons) or compared to the UPL determined from the segregated background dataset for the individual well (intrawell comparison). If a parameter exceeds a UPL, a second sample should be collected from the well and analyzed. If the second sample indicates a value above the UPL, then it can be determined that a SSI has occurred and Assessment monitoring should be initiated.

3.1.3 Responding to an SSI

If the statistical evaluation indicates a SSI has occurred, the data should be further evaluated to determine if the the SSI is likely caused by a CCR unit release and assessment monitoring should be initiated or if other factors of influence can be demonstrated to be taking effect. This demonstration must be certified by a qualified professional engineer within 90 days of completing the statistical evaluation (in addition to the 90 day requirement for conducting the statistical analysis).

4.0 Assessment Monitoring

Assessment monitoring occurs once evaluation of Detection Monitoring parameters (Appendix III) indicates a SSI and there is reason to believe that the SSI could indicate a release from a CCR unit. Assessment monitoring must begin within 90 days of determining that a SSI related to a potential release of the CCR unit has occurred.

4.1 Monitoring Parameters

The initial assessment monitoring event must include all parameters listed in Appendix III and Appendix IV of 40 CFR 257.93 at all monitoring well locations. Subsequent monitoring events may include Appendix III parameters and only the Appendix IV parameters that were detected in the initial monitoring event. Assessment monitoring will also be conducted on a semi-annual basis (e.g., spring and fall monitoring events).

4.2 Groundwater Protection Standard

A Groundwater Protection Standard (GWPS) must be established for each Appendix IV parameter. For parameters for which the USEPA has established a Maximum Contaminant Level (MCL), the MCL (shown on Tables 1 and 2) shall be used for the GWPS. For the parameters for which a MCL has not been established, then the Upper Tolerance Limit (UTL) ($\alpha = 0.05$, 95% coverage) of the parameter utilizing the upgradient (background) well(s) shall be utilized to establish a GWPS for the specific parameter. This determined UTL concentration shall be applied site-wide for all downgradient wells.

4.3 Move to Corrective Action

The UPL and UTL are useful to assess for a SSI or measurable increase above background. However, in order to assess if a dataset has stastically exceeded a set value (the GWPS), Confidence Limits would be the most appropriate. If the Lower Confidence Limit (LCL) of the Assessment Monitoring dataset exceeds the GWPS, then movement into Corrective Action is warranted.

This Statistical Analysis Plan does not address Corrective Action methods of monitoring. Corrective Action methods will be developed if required per the rule..

4.4 Return to Detection Monitoring

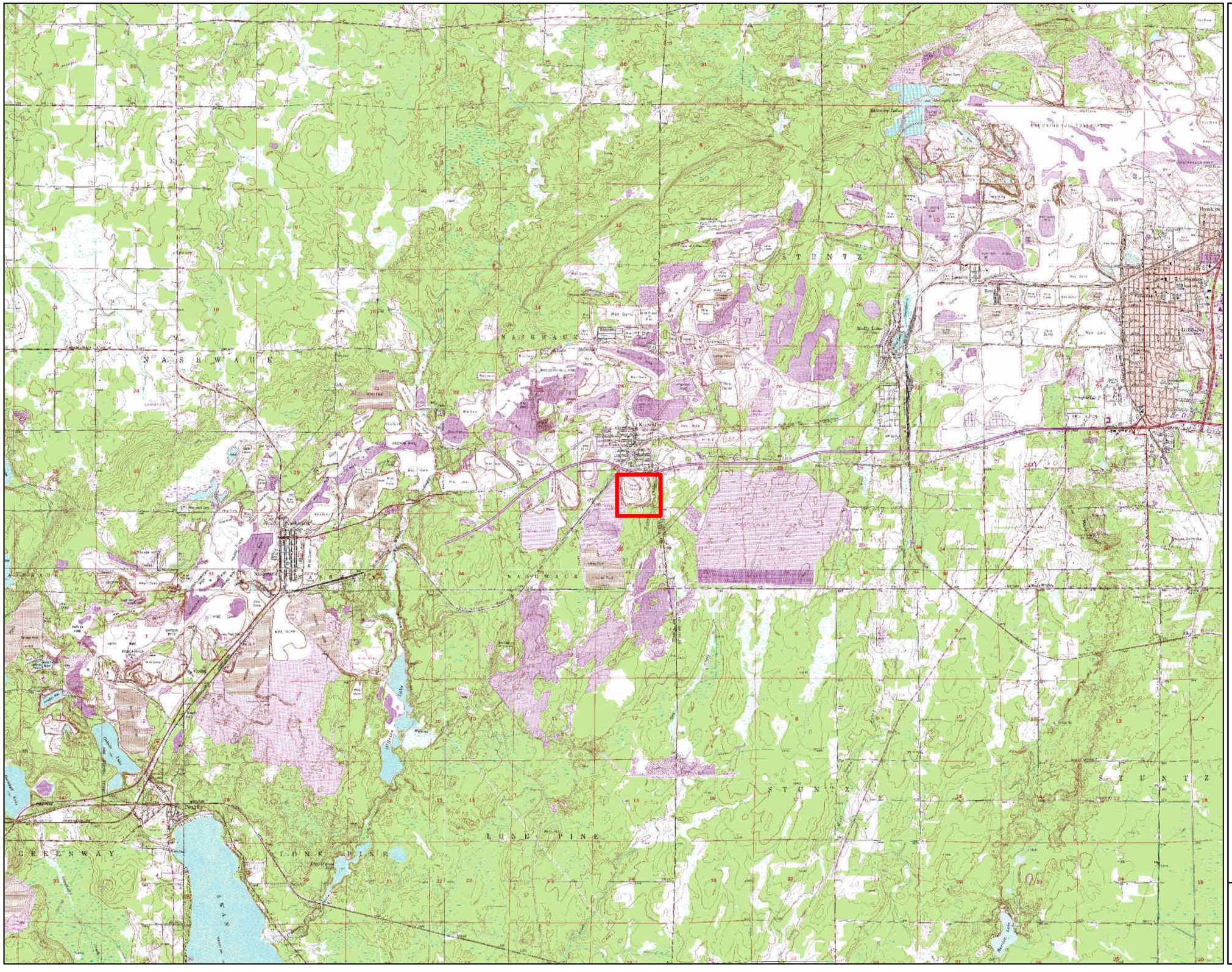
Assessment monitoring may cease and detection monitoring be re-initiated when all Appendix III and monitored Appendix IV parameters are below background (upgradient well) concentrations.

5.0 Updating Background Data

Background datasets should be updated every 2 years assuming that a SSI has not occurred. A Student t-test (α=0.01, parametric) or Mann-Whitney ($\alpha = 0.05$, non-parametric) should be utilized to assess if the existing background dataset and the dataset to be added to the background dataset are statisctically different. If the data is shown not to be significantly different, the dataset should be pooled and the background dataset updated. If analysis of the data using the t-test or Mann-Whitney test indicates a statistical difference, the data should be analyzed to determine a potential cause for the stastistically significant difference.

TABLE 1 Appendix III Parameters	
Parameter	**MCL**
Boron	NA
Calcium	NA
Chloride	NA
Fluoride	4.0 mg/L
pH	NA
Sulfate	NA
Total Dissolved Solids (TDS)	NA

TABLE 2 Appendix IV Parameters	
Parameter	**MCL**
Antimony	0.006 mg/L
Arsenic	0.01 mg/L
Barium	2.0 mg/L
Beryllium	0.004 mg/L
Cadmium	0.10 mg/L
Chromium	0.10 mg/L
Cobalt	NA
Fluoride	4.0 mg/L
Lead	0.015 mg/L
Lithium	NA
Mercury	0.002 mg/L
Molybdenum	NA
Selenium	0.05 mg/L
Thallium	0.002 mg/L
Radium 226 and 228 combined	5 pCi/L



N

0 3,000 6,000 12,000

Feet

1 Inch = 6,000 Feet

Legend

Project Location

Notes:

-Background image has been provided by MNGEO Web Services

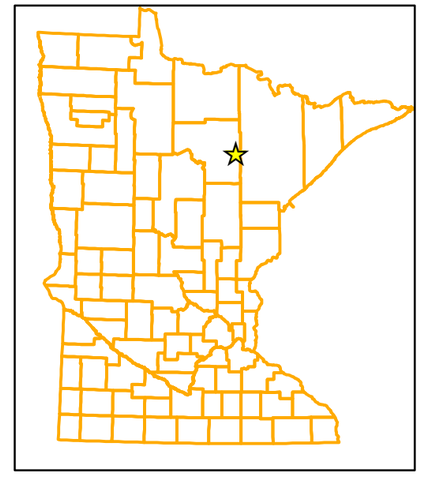


Figure 1
Site Location Map

General Waste Industrial Landfill
Statistical Analysis Plan **Certification**
Keewatin, MN (St. Louis)

Environmental Science & Engineering
www.netechnical.com

Date Drawn :
October 4, 2017

Drawn By :
Evan Johnson

NTS Project #:
6385CC

1

Appendix C
CCR Appendix III Parameters

CCR Appendix III Parameters	
Parameter	**MCL**
Boron	NA
Calcium	NA
Chloride	NA
Fluoride	4.0 mg/L
pH	NA
Sulfate	NA
Total Dissolved Solids (TDS)	NA

January 3, 2019

Mr. Jon Penheiter
Dem-Con Companies
13020 Dem-Con Drive
Shakopee, MN 55379
jonpenheiter@dem-con.com

Sent Via Email

RE: Statistical Analysis for October 2019 groundwater monitoring event for CCR compliance at the Keewatin, MN facility

Mr. Penheiter,

NTS is pleased to submit this report summarizing the CCR monitoring data collected in October, 2019 as well as the statistical analysis completed in accordance with the facility Statistical Analysis Plan (SAP).

MW-3R was abandoned during landfill expansion prior to the monitoring event on October 21, 2019. Therefore, this well was not monitored during the October event. Since MW-3R, a compliance/downgradient well, was unable to be monitored during the October 2019 event, a complete evaluation of a Statistically Significant Increase (SSI) as outlined by the site specific Statistical Analysis Plan (SAP) cannot be determined. Therefore, only MW-8 and MW-9 will be assessed.

Review of the data shows that 1 monitoring trigger value was intersected during the October, 2019 monitoring event at the compliance/downgradient wells (MW-8, MW-9). MW-8 indicated a pH of 6.28 with a lower trigger limit set to 6.286. This is the first occurrence at this location and therefore this is not considered an SSI. This location will be further assessed following the April, 2020 monitoring event.

In the up-gradient well MW-7, three parameters were measured above (or outside the range) of determined trigger limits. pH was measured to be 6.25 SU, which is below the facility lower trigger limit of 6.286. Sulfate was measured to be at 1120 mg/L, which is above the established trigger value of 811.1 mg/L. Lastly, Total Dissolved Solids (TDS) was measured to be 2250 mg/L, which is above the established trigger value of 1742 mg/L. MW-7 is not a compliance well and therefore this would not be assessed in regards to determining if a statistically significant increase (SSI) has occurred due to the CCR facility. However, this is the 2nd consecutive occurrence of elevated Sulfate and TDS observed in this well (988 mg/L Sulfate, 1970 mg/L TDS in April, 2019) and may indicate changing hydrologic/environmental conditions that may affect the hydrology/groundwater quality at the CCR facility and established detection monitoring trigger values. It is recommended that detection monitoring continue per the SAP and the potentially changing up-gradient conditions be assessed when the background dataset is updated.

Detection Monitoring

Detection monitoring at the Keewatin facility includes monitoring of 4 groundwater wells, one upgradient well (MW-7) and three downgradient wells (MW-3R, MW-8, and MW-9). MW-3R was not monitored in the October event due to it being abandoned prior to the event. Field parameters and laboratory samples were collected on October 21, 2019. Laboratory results were received from PACE Analytical on October 29, 2019. Lab analyses completed includes those found in the CCR guidance Appendix III table (See Appendix C). The monitoring results and the established detection monitoring trigger values can be seen in Tables 1 and 2, respectively. The highlighted cells in Table 1 indicate monitored results above the trigger value (MW-7 pH, Sulfate, TDS; MW-8 pH).

Table 1
2019 October Detection Monitoring Event Results

Parameter	MW-7	MW-3R	MW-8	MW-9
Boron (ug/L)	66.9	n/a	70.5	< 40.0 (Non-Detect)
Calcium (mg/L)	539	n/a	354	217
Chloride (mg/L)	37.4	n/a	1.4	6.0
Fluoride (mg/L)	<0.10 (Non-Detect)	n/a	<0.10 (Non-Detect)	<0.10 (Non-Detect)
pH (SU)	6.25	n/a	6.28	6.53
Sulfate (mg/L)	1120	n/a	630	437
Total Dissolved Solids (mg/L)	2250	n/a	1490	1100

Table 2
Detection Monitoring Trigger Values

Parameter	MW-7	MW-3R	MW-8	MW-9
Boron (ug/L)	87.8	130.1	87.8	87.8
Calcium (mg/L)	506.7	667.5	506.7	506.7
Chloride (mg/L)	81.94	81.94	81.94	81.94
Fluoride (mg/L)	0.11	0.11	0.11	0.11
pH (SU)	6.286 – 6.814	6.286 – 6.814	6.286 – 6.814	6.286 – 7.318
Sulfate (mg/L)	811.1	1937	811.1	811.1
Total Dissolved Solids (mg/L)	1742	3571	1742	1742

Statistical Analysis

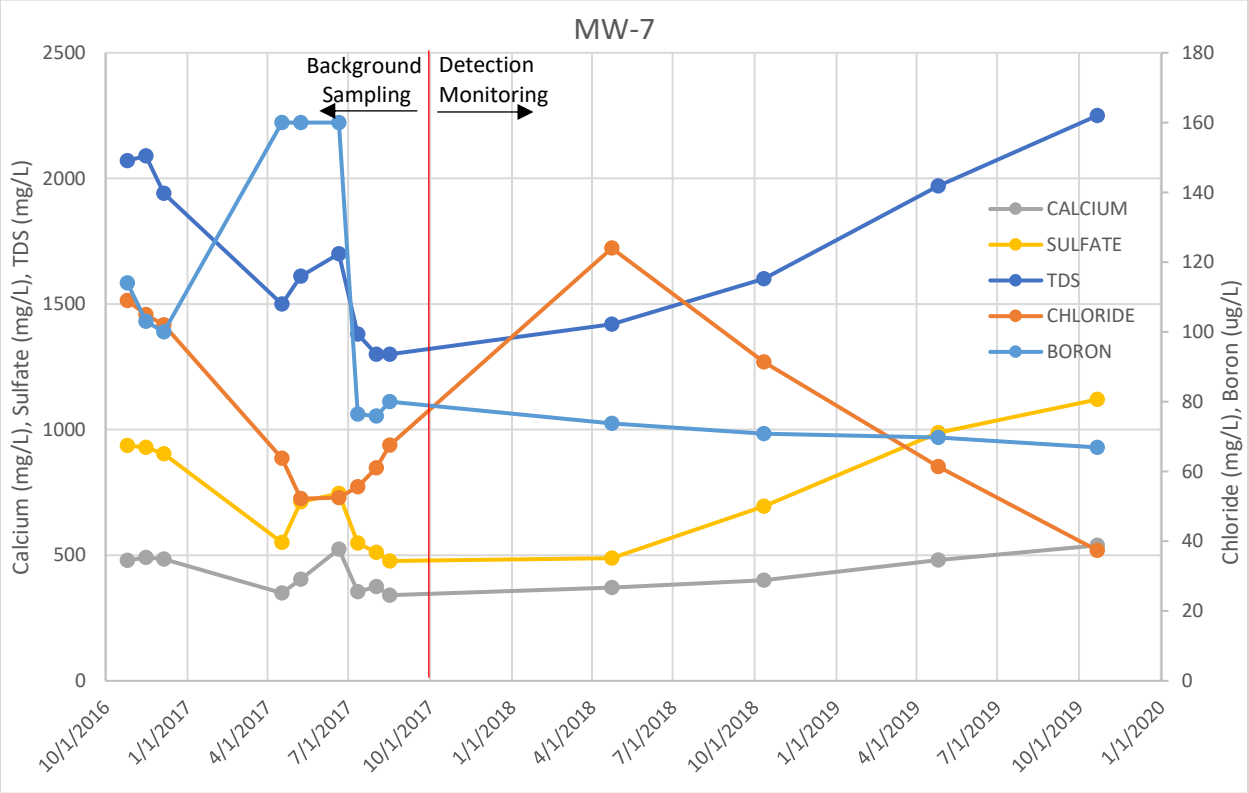
The Statistical Analysis Plan (SAP) for the facility and CCR guidance details that only downgradient wells (compliance wells) are to be analyzed for Statistically Significant Increases (SSIs). The SAP also specifies a 2-sample test be used to determine if an SSI has occurred. The lower trigger value exceedance at MW-8 is the first occurrence and therefore is not considered an SSI. Additionally, the accuracy of the utilized instrument (Hydrolab MS5) is reported to be 0.2 SU, and typically is only reported to the tenth SU though the instrument reports to the hundredth. Therefore the observed exceedance of 0.006 SU is not highly defensible.

The October 2019 monitoring data does not indicate that an SSI has occurred at the Keewatin facility. However, the analysis is incomplete since MW-3R was unable to be monitored.

In review of the April 2019 Statistical Analysis submitted for the facility, the following statement was made:

> *"MW-7 continues to show significant variability in water quality. It is recommended that detection monitoring continue per the SAP and the potentially changing up-gradient conditions be assessed when the background dataset is updated following 2 years of detection monitoring (After October, 2019 event)."*

MW-7 continues to show significant variability with trending concentrations of Chloride, Sulfate, and TDS observed. Boron and Calcium are also trending, but to a lesser extent. Figure 1 below illustrates these parameters for MW-7.



It can be seen that while Calcium, TDS, and Sulfate indicate increasing trends, Chloride and Boron indicate decreasing trends. All 5 parameters have exceeded the observed range of values collected while completing the background sampling for the facility. These observed trends and changes in the water chemistry are not reflected in the downgradient wells. The monitored parameters in the downgradient locations have remained consistent with the background dataset.

The SAP for the facility indicates that the background dataset shall be updated every two years provided an SSI has not occurred. The completion of the October, 2019 monitoring event completes the initial two years of detection monitoring with the exception of MW-3R which was not monitored. The 2019 annual report for the facility will further discuss the collected data, updated background datasets, and MW-7 behavior.

If you have any questions, please contact me at (218) 742-1022.

Sincerely,
Northeast Technical Services, Inc.

Evan Johnson 1-3-20

Evan C. Johnson, PE
Geotechnical Engineer

Appendix A: October 2019 Monitoring Results
Appendix B: Statistical Analysis Plan

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

October 29, 2019

Dennis Schubbe
Northeast Technical Services
526 Chestnut Street
Virginia, MN 55792

RE: Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Dear Dennis Schubbe:
Enclosed are the analytical results for sample(s) received by the laboratory on October 21, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carrie Jensen
carrie.jensen@pacelabs.com
(218)742-1042
Project Manager

Enclosures

cc: Sample Data, Northeast Technical Services
Scott Seeley, NTS
Karissa Vosen, NTS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

CERTIFICATIONS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
Alaska Certification UST-107
Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification # : 998027470
WA Department of Ecology Lab ID# C1007

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

SAMPLE SUMMARY

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Lab ID	Sample ID	Matrix	Date Collected	Date Received
12137390001	**MW7**	Water	10/21/19 10:00	10/21/19 15:25
12137390002	**MW8**	Water	10/21/19 11:45	10/21/19 15:25
12137390003	**MW9**	Water	10/21/19 12:55	10/21/19 15:25
12137390004	**Field Duplicate**	Water	10/21/19 12:56	10/21/19 15:25
12137390005	**Field Blank**	Water	10/21/19 12:40	10/21/19 15:25

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Virginia, MN 55792
(218) 742-1042

SAMPLE ANALYTE COUNT

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
12137390001	**MW7**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12137390002	**MW8**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12137390003	**MW9**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12137390004	**Field Duplicate**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V
12137390005	**Field Blank**	EPA 200.7	AK1	1	PASI-V
		EPA 200.8	DES	1	PASI-V
		SM 2540C (1997)	RC	1	PASI-V
		SM 4500-H+B	ZJT	1	PASI-V
		EPA 300.0	ZJT	3	PASI-V

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315 Chestnut Street
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ANALYTICAL RESULTS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Sample: MW7 **Lab ID: 12137390001** Collected: 10/21/19 10:00 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**539**	mg/L	0.50	1	10/23/19 13:15	10/24/19 10:50	7440-70-2	P6
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**66.9**	ug/L	40.0	1	10/23/19 13:15	10/24/19 12:31	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**2250**	mg/L	20.0	1		10/25/19 08:16		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		10/22/19 16:28		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**37.4**	mg/L	1.0	1		10/23/19 15:48	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 15:48	16984-48-8	
Sulfate	**1120**	mg/L	20.0	10		10/23/19 16:09	14808-79-8	

Sample: MW8 **Lab ID: 12137390002** Collected: 10/21/19 11:45 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**354**	mg/L	0.50	1	10/23/19 13:21	10/28/19 12:47	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	**70.5**	ug/L	40.0	1	10/23/19 13:21	10/28/19 17:54	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1490**	mg/L	20.0	1		10/25/19 17:33		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.1**	Std. Units	0.10	1		10/22/19 16:44		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**1.4**	mg/L	1.0	1		10/23/19 17:51	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 17:51	16984-48-8	
Sulfate	**630**	mg/L	10.0	5		10/23/19 18:12	14808-79-8	

Sample: MW9 **Lab ID: 12137390003** Collected: 10/21/19 12:55 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**217**	mg/L	0.50	1	10/23/19 13:15	10/24/19 10:45	7440-70-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
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(218) 742-1042

ANALYTICAL RESULTS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Sample: MW9 **Lab ID: 12137390003** Collected: 10/21/19 12:55 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	40.0	1	10/23/19 13:15	10/24/19 12:09	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1100**	mg/L	20.0	1		10/25/19 17:34		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		10/22/19 17:04		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**6.0**	mg/L	1.0	1		10/23/19 18:53	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 18:53	16984-48-8	
Sulfate	**437**	mg/L	10.0	5		10/23/19 19:13	14808-79-8	

Sample: Field Duplicate **Lab ID: 12137390004** Collected: 10/21/19 12:56 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	**219**	mg/L	0.50	1	10/23/19 13:15	10/24/19 10:56	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	40.0	1	10/23/19 13:15	10/24/19 12:35	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	**1090**	mg/L	20.0	1		10/25/19 17:34		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		10/22/19 16:35		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**5.9**	mg/L	1.0	1		10/23/19 16:29	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 16:29	16984-48-8	
Sulfate	**434**	mg/L	10.0	5		10/23/19 17:31	14808-79-8	

Sample: Field Blank **Lab ID: 12137390005** Collected: 10/21/19 12:40 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Calcium	ND	mg/L	0.50	1	10/23/19 13:21	10/28/19 12:51	7440-70-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Boron	ND	ug/L	40.0	1	10/23/19 13:21	10/28/19 18:01	7440-42-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Sample: Field Blank **Lab ID: 12137390005** Collected: 10/21/19 12:40 Received: 10/21/19 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C (1997)							
Total Dissolved Solids	ND	mg/L	10.0	1		10/25/19 08:24		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**5.7**	Std. Units	0.10	1		10/22/19 16:49		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		10/23/19 18:32	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/23/19 18:32	16984-48-8	
Sulfate	ND	mg/L	2.0	1		10/23/19 18:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177775 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 12137390001, 12137390003, 12137390004

METHOD BLANK: 704434 Matrix: Water
Associated Lab Samples: 12137390001, 12137390003, 12137390004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	mg/L	ND	0.50	10/24/19 10:41	

LABORATORY CONTROL SAMPLE: 704435

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	25	25.1	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704436 704437

Parameter	Units	12137390001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	mg/L	539	25	25	559	574	78	140	70-130	3	20	P6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177777 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 12137390002, 12137390005

METHOD BLANK: 704448 Matrix: Water
Associated Lab Samples: 12137390002, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	mg/L	ND	0.50	10/28/19 12:10	

LABORATORY CONTROL SAMPLE: 704449

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	25	24.4	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704450 704451

Parameter	Units	12137471009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	mg/L	54.3	25	25	79.5	79.7	101	102	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704452 704453

Parameter	Units	12137471007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	mg/L	41.1	25	25	65.4	66.1	97	100	70-130	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
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QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177770 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 12137390001, 12137390003, 12137390004

METHOD BLANK: 704418 Matrix: Water
Associated Lab Samples: 12137390001, 12137390003, 12137390004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	40.0	10/24/19 12:01	

LABORATORY CONTROL SAMPLE: 704419

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	50	51.1	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704420 704421

Parameter	Units	12137390003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	50	50	90.7	88.8	102	98	70-130	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704422 704423

Parameter	Units	12137471011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	50	50	83.1	79.7	99	92	70-130	4	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177776 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 12137390002, 12137390005

METHOD BLANK: 704439 Matrix: Water
Associated Lab Samples: 12137390002, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	40.0	10/28/19 16:46	

LABORATORY CONTROL SAMPLE: 704440

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	50	51.8	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704441 704442

Parameter	Units	12137471008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	40.4	50	50	88.5	88.4	96	96	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704443 704444

Parameter	Units	12137471010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	50	50	71.3	73.5	96	100	70-130	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177953 Analysis Method: SM 2540C (1997)
QC Batch Method: SM 2540C (1997) Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 12137390001, 12137390005

METHOD BLANK: 705055 Matrix: Water
Associated Lab Samples: 12137390001, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	10/25/19 08:11	

METHOD BLANK: 705059 Matrix: Water
Associated Lab Samples: 12137390001, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	10/25/19 08:25	

LABORATORY CONTROL SAMPLE: 705056

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	255	260	102	80-120	

SAMPLE DUPLICATE: 705057

Parameter	Units	12137435003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	126	132	5	5	

SAMPLE DUPLICATE: 705249

Parameter	Units	12137421017 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1850	1850	0	5	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 178069 Analysis Method: SM 2540C (1997)
QC Batch Method: SM 2540C (1997) Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 12137390002, 12137390003, 12137390004

METHOD BLANK: 705567 Matrix: Water
Associated Lab Samples: 12137390002, 12137390003, 12137390004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	10/25/19 17:30	

METHOD BLANK: 705570 Matrix: Water
Associated Lab Samples: 12137390002, 12137390003, 12137390004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	10/25/19 17:35	

LABORATORY CONTROL SAMPLE: 705568

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	255	254	100	80-120	

SAMPLE DUPLICATE: 705569

Parameter	Units	12137651001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	842	816	3	5	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177675 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 12137390001, 12137390002, 12137390003, 12137390004, 12137390005

LABORATORY CONTROL SAMPLE: 704033

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	7	7.0	100	98-102	H6

SAMPLE DUPLICATE: 704034

Parameter	Units	12137223001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.0	0	10	H6

SAMPLE DUPLICATE: 704035

Parameter	Units	12137390003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	10	H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

QC Batch: 177698 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 12137390001, 12137390002, 12137390003, 12137390004, 12137390005

METHOD BLANK: 704132 Matrix: Water
Associated Lab Samples: 12137390001, 12137390002, 12137390003, 12137390004, 12137390005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/23/19 13:25	
Fluoride	mg/L	ND	0.10	10/23/19 13:25	
Sulfate	mg/L	ND	2.0	10/23/19 13:25	

LABORATORY CONTROL SAMPLE: 704133

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	48.8	98	90-110	
Fluoride	mg/L	5	4.8	96	90-110	
Sulfate	mg/L	50	47.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704134 704135

Parameter	Units	12137383001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	50	50	52.3	52.5	104	104	90-110	0	20	
Fluoride	mg/L	ND	5	5	5.1	5.1	100	101	90-110	0	20	
Sulfate	mg/L	8.5	50	50	59.3	59.5	102	102	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 704136 704137

Parameter	Units	12137385001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	200	250	250	451	449	100	99	90-110	1	20	
Fluoride	mg/L	0.14	5	5	5.1	5.1	99	100	90-110	0	20	
Sulfate	mg/L	6.5	50	50	56.1	56.2	99	99	90-110	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALIFIERS

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-V	Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

H6	Analysis initiated outside of the 15 minute EPA required holding time.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

Pace Analytical Services, LLC
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 6385CC General Waste Disposal
Pace Project No.: 12137390

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
12137390001	**MW7**	EPA 200.7	177775	EPA 200.7	177852
12137390002	**MW8**	EPA 200.7	177777	EPA 200.7	178102
12137390003	**MW9**	EPA 200.7	177775	EPA 200.7	177852
12137390004	**Field Duplicate**	EPA 200.7	177775	EPA 200.7	177852
12137390005	**Field Blank**	EPA 200.7	177777	EPA 200.7	178102
12137390001	**MW7**	EPA 200.8	177770	EPA 200.8	177853
12137390002	**MW8**	EPA 200.8	177776	EPA 200.8	178101
12137390003	**MW9**	EPA 200.8	177770	EPA 200.8	177853
12137390004	**Field Duplicate**	EPA 200.8	177770	EPA 200.8	177853
12137390005	**Field Blank**	EPA 200.8	177776	EPA 200.8	178101
12137390001	**MW7**	SM 2540C (1997)	177953		
12137390002	**MW8**	SM 2540C (1997)	178069		
12137390003	**MW9**	SM 2540C (1997)	178069		
12137390004	**Field Duplicate**	SM 2540C (1997)	178069		
12137390005	**Field Blank**	SM 2540C (1997)	177953		
12137390001	**MW7**	SM 4500-H+B	177675		
12137390002	**MW8**	SM 4500-H+B	177675		
12137390003	**MW9**	SM 4500-H+B	177675		
12137390004	**Field Duplicate**	SM 4500-H+B	177675		
12137390005	**Field Blank**	SM 4500-H+B	177675		
12137390001	**MW7**	EPA 300.0	177698		
12137390002	**MW8**	EPA 300.0	177698		
12137390003	**MW9**	EPA 300.0	177698		
12137390004	**Field Duplicate**	EPA 300.0	177698		
12137390005	**Field Blank**	EPA 300.0	177698		

NTS
526 CHESTNUT STREET
VIRGINIA, MN 55792
(218) 741-4290 Fax: (218) 741-4291

Environmental Science & Engineering

CH

REQUIRED TURN-AROUND TIME:

WO#: 12137390

PM: CLJ Due Date: 11/04/19

CLIENT: NTS-Dennis

CLIENT NAME,ADDRESS,PHONE#:	REPORT TO:
GENERAL WASTE and RECYLING LLC DEMOLITION & INDUSTRIAL LANDFILL ITASCA COUNTY, MINNESOTA	DENNIS SCHUBBE, KARISSA VOSEN, RICK CRUM & SCOTT SEELEY
SAMPLER: Corey Andrews	PERMIT REQ.: SW-620-002
PROJECT: GENERAL WASTE DISPOSAL and RECYCLING, LLC.	Oct-19
PROJECT NUMBER: 6385CC CCR Monitoirng	COLLECTION:

LOG-IN #:	SAMPLE #	DESCRIPTION:	DATE:	TIME:	MATRIX LIQ.	MATRIX SOL.	filtered	TYPE & # CONTAINERS: VOC M. 8260 (HCL)	GENERAL CHEMISTRY (NO PRES)	GENERAL CHEMISTRY (H2SO4)	TOTAL METALS (HN03)	DISSOLVED METALS (HN03)		REQUIRED ANALYSIS:
	MW3R	GW WELL	No Sample		X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW7	GW WELL	10/21/19	1000	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW8	GW WELL	10/21/19	1145	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	MW9	GW WELL	10/21/19	1255	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	Field Duplicate	GW WELL	10/21/19	1256	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS
	Field Blank	Field Blank	10/21/19	1240	X		N		1		1			Boron, Calcium, Chloride, Flouride, pH, Sulfate & TDS

SPECIAL INSTRUCTIONS:

SEE ATTACHED LIST WITH METHODS

RELINQUISHED BY: Corey Andrews	DATE: 10/21/19 TIME: 1525	RECEIVED BY:	DATE: TIME:
RELINQUISHED TO NTS SAMPLE LOCK-UP BY:	DATE: TIME:	RECEIVED FROM NTS SAMPLE LOCKUP BY:	DATE: TIME:
RECEIVED FOR LAB BY: Katie Klaud	TEMP.AT ARRIVAL: 1.3 C		
DATE: 10/22/19	TIME: 1505		

GENERAL WASTE CCR MONITORING METHODS

PARAMETER	SYMBOL	EPA Method
Boron	B	200.8
Calcium	Ca	200.7
Chloride	Chloride	300.0
Fluoride	Flouride	300.0
pH	pH	SM 4500 H+B
Sulfate	SO_4	300.0
TDS	TDS	SM 2540C

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 30Apr2019 Page 1 of 1
	Document No.: F-VM-C-001-rev.13	Issuing Authority: Pace Virginia Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: NTS

Project #: WO#: 12137390

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No Seals Intact? ☐ Yes ☐ No Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other: _____ Temp Blank? ☒ Yes ☐ No

Thermometer Used: ☒ 140792808 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.3, 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen? ☐ Yes ☐ No ☒ NA

Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: _____

				Comments:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3.
Sampler Name and Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5. If Fecal: ☐ <8 hours ☐ >8, <24 hours ☐ >24 hours
Short Hold Time Analysis (<72 hr)?	☒ Yes	☐ No	☐ N/A	6. pH
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☒ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation properly preserved?	☒ Yes	☐ No	☐ N/A	13. Note samples needing adjustment:
Headspace in Methyl Mercury Container	☐ Yes	☐ No	☒ N/A	14.
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☒ N/A	15.
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	16.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	
Pace Trip Blank Lot # (if purchased): _____				

CLIENT NOTIFICATION/RESOLUTION Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Nikki Jarvis Date: 10/21/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

GENERAL WASTE & RECYCLING, LLC SW-620
INDUSTRIAL WASTE LANDFILL

Statistical Analysis Plan for Groundwater Monitoring Data

Prepared For:

GENERAL WASTE & RECYCLING, LLC

Prepared by:

Northeast Technical Services, Inc.
526 Chestnut Street
Virginia, Minnesota 55792

(218) 741-4290

October 6, 2017

Project Number: 6385CC

"I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete." I certify that this groundwater stasistical analysis plan for the General Waste Industrial Waste Landfill described in this report meets all requirements put forth by 40 CFR §257.93 'Groundwater Sampling and Analysis Requirements.'

10-13-17

Evan Johnson, P.E. Date
Geotechnical Engineer
Minnesota License No. 53648

Table of Contents

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1.0 Purpose

Per 40 CFR 257.93 'Groundwater Sampling and Analysis Requirements' (the rule), a statistical procedure for assessing collected groundwater data as to whether or not a release has occurred must implemented at all CCR units. The rule outlines five (5) statistical methods that may be utilized for analyzing collected data. The statistical procedure utilized should account for spatial variance, temporal trends, and address the handling of non-detect data. This Statistical Analysis Plan has been prepared to meet the requirements of the rule and provide the framework for analyzing the collected groundwater data at the General Waste & Recycling, LLC facility (the facility) in Keewatin, Minnesota.

2.0 Initial Background Monitoring

2.1 Background Monitoring Parameters

The rule requires background monitoring of all CCR monitoring wells and eight (8) groundwater monitoring events must be completed prior to October 17, 2017. For this Statistical Analysis Plan, background monitoring includes monitoring for all parameters listed in Appendix III and Appendix IV of 40 CFR 257.93 (see Table 1 and Table 2, respectively).

2.2 Background Data Analysis

Per the rule, within 90 days of collecting the final background dataset, statistical analysis of the data is to be completed. Statistical analysis can be any of those allowed by the rule and should establish a means of determining if a Statistically Significant Inscrease (SSI) of a monitored parameter occurs during operation of the CCR unit to help determine if a leak or release has occurred from the CCR unit.

2.3 Establishing Background Dataset

2.3.1 Summary Statistics and Distribution

Once the final background dataset has been collected, summary statistics should be computed, including mean and variance. An analysis of the data set be conducted to see if data is parametric (normally distributed). A Shapiro-Wilk analysis should be completed to make this determination. This should be completed for each parameter at each well installation. If the data is skewed and does not pass the normality test, the data may be able to be transformed to a normal distribution via lognormal plotting.

If a normal distribution cannot be achieved naturally or by transformation, non-paremetric statistics may be utilized.

2.3.2 Interwell and Intrawell Analysis

It is recommended that the primary method of determining if a SSI has occurred at the site utilize an interwell analysis. This analysis will look at the dataset of the upgradient well (background well) to determine the Upper Prediction Limit (UPL), for the downgradient well concentrations. However, if spatial variation is present in the monitoring system, it may be necessary to assess data from an intrawell analysis. This analysis looks at the background dataset for a specific parameter in the same well to determine if a SSI has occurred. Both methods are viable and can be used for specific parameters. It is not necessary to have a single analysis type for all wells for all parameters at the facility.

Care should be taken when conducting an interwell analysis when the background dataset for downgradient wells may be affected by pre-existing CCR impacts. Given the timeframe of placed CCR materials at the facility, the estimated groundwater velocity, and the monitoring well locations, none of the existing monitoring wells would be expected to exhibit any signs of CCR impact. However, analysis should be completed for any future wells installed.

2.3.3 Upper Prediction Limit

Per the recommendation from the USEPA "Statistical Analysis of Groundwater Monitoring Data At RCRA Facilities Unified Guidance (2009)" (Unified Guidance) document, Upper Prediction Limits (UPL) will be utilized to assess for a SSI in the downgradient wells the facility. The UPL is calculated as follows:

$$UPL = x + ks$$

Where:
x = mean parameter concentration of background dataset
s = standard deviation of background dataset
k = site specific multiplier provided by the Unified Guidance Tables 19, depends on number of wells, number of parameters to be analyzed, size of background dataset

The UPL statistical method allows for both interwell and intrawell comparison.

2.4 Analyzing for Trends

Trends in data may occur due to natural temporal factors, but are not expected to be seen in the initial background dataset. Trend analysis should be completed for the background datasets. If a trend does exist, this should trigger an analysis to assess the potential cause of the trend (especially upward trends of monitored concentrations) and determination of the method to correct for the trend in the statistical approach.

Trend analysis to determine if a statistically significant trend exists can be completed by utilizing the Theil-Sen slope analysis with Mann-Kendall trend test ($\alpha = 0.05$) (non-parametric, more suitable for datasets with >20% non-detect results) or a Ordinary Least Squares (OLS) linear regression with Student's t-test ($\alpha = 0.01$) (parametric dataset, <20% non-detect results).

2.5 Non-Detect Data

Datasets that have less than 20% non-detect data may substitute the reporting limit divided by 2 (RL/2 method) for non-detect results for statistical analysis.

Datasets that contain 20-50% non-detect data must utilize the Kaplan-Meier method to compute summary statistics for the dataset.

Datasets that contain more than 50% non-detect data will not be able to compute summary statistics data reliably. It is recommended that the UPL be set to the highest or second highest observed value.

If all background data are non-detect, than the UPL shall be set to the highest Reporting Limit (RL) (assuming a reasonable RL have been reported that are below MCL concentrations).

2.6 Outliers

The dataset should be analyzed for outlier datapoints. This can be done visually by examining a time series plot of the data or by a box-and-whisker plot. If a datapoint appears to be an outlier, field notes, lab reports, and analysis programs should be checked for indications of erroneous data or transcription erros.

Numerical methods of determining an outlier may include a 3-sigma analaysis for parametric data (data point outside of 3 standard deviations) or the following for non-parametric data if the data point x is:

$$x > x'_{.75} + 3 * IQR$$

Where:

X = individual data point
$x'_{.75}$ = Third Quartile
IQR = $x'_{.75} - x'_{.25}$ (InterQuartile Range)

Datapoints determined to be outliers due to erroneous data collection may be removed from the dataset. Datapoints that appear to be representative data but are extreme may be excluded from the statistical analysis, but should remain in the data for future evaluation if the data set significantly changes.

2.7 Duplicate Samples

Duplicate samples collected for quality control means should not be included in the statistically analyzed dataset as they are not physically independent and will inappropriately skew the data.

3.0 Detection Monitoring

Following the completion of the background monitoring, detection monitoring will be initiated at the facility. Detection monitoring is to be conducted semiannually (preferably in the spring and

fall) and analyzed for Appendix III parameters only. Statisitcal analysis of the data must be completed within 90 days of receiving laboratory data.

3.1 Stastically Significant Increase

3.1.1 Two Sample Test

Two sample testing indicates that if a UPL (either interwell or intrawell) is exceeded for a parameter, then a second sample should be collected and analyzed. If analysis of the second sample indicates a concentration below the UPL, then a SSI has not occurred. If the second sample indicates a value above the UPL, then a SSI has occurred.

Three Sample Testing which would require 3 consecutive samples to indicate concentrations above the UPL for a SSI to be indicated may be appropriate for specific situations. One situation would be if False Positive readings (Type II error) appears to be exceeding 10% of the total dataset.

3.1.2 Pracitical monitoring Practice

Downgradient constituents should be compared to the established UPL determined from the upgradient well data (for interwell comparisons) or compared to the UPL determined from the segregated background dataset for the individual well (intrawell comparison). If a parameter exceeds a UPL, a second sample should be collected from the well and analyzed. If the second sample indicates a value above the UPL, then it can be determined that a SSI has occurred and Assessment monitoring should be initiated.

3.1.3 Responding to an SSI

If the statistical evaluation indicates a SSI has occurred, the data should be further evaluated to determine if the the SSI is likely caused by a CCR unit release and assessment monitoring should be initiated or if other factors of influence can be demonstrated to be taking effect. This demonstration must be certified by a qualified professional engineer within 90 days of completing the statistical evaluation (in addition to the 90 day requirement for conducting the statistical analysis).

4.0 Assessment Monitoring

Assessment monitoring occurs once evaluation of Detection Monitoring parameters (Appendix III) indicates a SSI and there is reason to believe that the SSI could indicate a release from a CCR unit. Assessment monitoring must begin within 90 days of determining that a SSI related to a potential release of the CCR unit has occurred.

4.1 Monitoring Parameters

The initial assessment monitoring event must include all parameters listed in Appendix III and Appendix IV of 40 CFR 257.93 at all monitoring well locations. Subsequent monitoring events may include Appendix III parameters and only the Appendix IV parameters that were detected in the initial monitoring event. Assessment monitoring will also be conducted on a semi-annual basis (e.g., spring and fall monitoring events).

4.2 Groundwater Protection Standard

A Groundwater Protection Standard (GWPS) must be established for each Appendix IV parameter. For parameters for which the USEPA has established a Maximum Contaminant Level (MCL), the MCL (shown on Tables 1 and 2) shall be used for the GWPS. For the parameters for which a MCL has not been established, then the Upper Tolerance Limit (UTL) ($\alpha = 0.05$, 95% coverage) of the parameter utilizing the upgradient (background) well(s) shall be utilized to establish a GWPS for the specific parameter. This determined UTL concentration shall be applied site-wide for all downgradient wells.

4.3 Move to Corrective Action

The UPL and UTL are useful to assess for a SSI or measurable increase above background. However, in order to assess if a dataset has stastically exceeded a set value (the GWPS), Confidence Limits would be the most appropriate. If the Lower Confidence Limit (LCL) of the Assessment Monitoring dataset exceeds the GWPS, then movement into Corrective Action is warranted.

This Statistical Analysis Plan does not address Corrective Action methods of monitoring. Corrective Action methods will be developed if required per the rule..

4.4 Return to Detection Monitoring

Assessment monitoring may cease and detection monitoring be re-initiated when all Appendix III and monitored Appendix IV parameters are below background (upgradient well) concentrations.

5.0 Updating Background Data

Background datasets should be updated every 2 years assuming that a SSI has not occurred. A Student t-test (α=0.01, parametric) or Mann-Whitney ($\alpha = 0.05$, non-parametric) should be utilized to assess if the existing background dataset and the dataset to be added to the background dataset are statisctically different. If the data is shown not to be significantly different, the dataset should be pooled and the background dataset updated. If analysis of the data using the t-test or Mann-Whitney test indicates a statistical difference, the data should be analyzed to determine a potential cause for the stastistically significant difference.

TABLE 1 Appendix III Parameters	
Parameter	**MCL**
Boron	NA
Calcium	NA
Chloride	NA
Fluoride	4.0 mg/L
pH	NA
Sulfate	NA
Total Dissolved Solids (TDS)	NA

TABLE 2 Appendix IV Parameters	
Parameter	**MCL**
Antimony	0.006 mg/L
Arsenic	0.01 mg/L
Barium	2.0 mg/L
Beryllium	0.004 mg/L
Cadmium	0.10 mg/L
Chromium	0.10 mg/L
Cobalt	NA
Fluoride	4.0 mg/L
Lead	0.015 mg/L
Lithium	NA
Mercury	0.002 mg/L
Molybdenum	NA
Selenium	0.05 mg/L
Thallium	0.002 mg/L
Radium 226 and 228 combined	5 pCi/L

APPENDIX C

2020 UPDATE OF BACKGROUND DATASET RATIONALE/WORKFLOW

A two year period of detection monitoring was completed at General Waste CCR Facility. The Statistical Analysis Plan (SAP) indicates the background dataset should be assessed following a two year period and detection monitoring added to the background dataset if not statistically different and if no Statistically Significant Increase (SSI) has occurred. The following outlines the process followed to assess the detection/background monitoring results for the Appendix III parameters (Boron, Calcium, Chloride, Fluoride, Sulfate, TDS, pH).

1.) Complete time series Plots for all 4 CCR wells at the facility to allow for visual assessment of Detection monitoring as it relates to background monitoring data.
    a. MW-7 indicates large trends in Chloride, TDS, and Sulfate, with Chloride decreasing, and TDS & Sulfate increasing
    b. MW-3R indicates decreasing trends in Calcium, Boron, Sulfate, and TDS
    c. MW-8 and MW-9 Detection datasets appear generally consistent with background datasets
2.) A Students T-Test (STT) was conducted (α=.01)(no Non-detects) or Tarone-Ware (TW) (α=.01)(with Non-detects) to assess if the background dataset and detection monitoring dataset were statistically different or not. If the p-value is not less than 0.01, the background and detection monitoring datasets are not statistically different.
    a. MW-7
        i. Boron (TW): p=.02>.01, not statistically different, but close due to large non-detects in background dataset
        ii. Calcium (STT): p=.58
        iii. Chloride (STT): p=.81
        iv. Fluoride (n/a): Nearly all non-detect, cannot conduct statistics, but no change
        v. Sulfate (STT): p=.38
        vi. TDS (STT): p=.45
        vii. pH (STT): p=.93

    b. **MW-3R**
        i. Boron (TW): p=.07
        ii. Calcium (STT): p=.001, IS STATISTICALLY DIFFERENT. The Calcium results at MW-3R have been continually decreasing from the initial background monitoring. The cause for this is unknown. MW-3R was abandoned in 2019 and will no longer be monitored, therefore there is limited value for further assessment.
        iii. Chloride (STT): p=.02, not statistically different, but close, Chloride concentrations are elevated in the detection monitoring as compared to the background monitoring
        iv. Fluoride (n/a): Nearly all non-detect, cannot conduct statistics, but no change
        v. Sulfate (STT): p=0, IS STATISTIALLY DIFFERENT. All three Detection monitoring events indicated Sulfate concentrations below those observed in the initial background monitoring. The cause for this is unknown. MW-3R was abandoned in 2019 and will no longer be monitored, therefore there is limited value in further assessment.
        vi. TDS (STT): p=.001, IS STATISTICALLY DIFFERENT, very similar to Sulfate
        vii. pH (STT): p=.85

c. MW-8

i. Boron (TW): p=.51
ii. Calcium (STT): p=.001, IS STATISTICALLY DIFFERENT. 3 of the 4 Detection monitoring results were considerably below the background detection monitoring results (~12% below). However, the concentration appears to be increasing to be consistent with the background dataset. Will add Detection monitoring values to background data even though they are shown to be less than the background dataset, statistically.
iii. Chloride (STT): p=.009, IS STATISTICALLY DIFFERENT. 3 of the 4 Detection monitoring results were considerably HIGHER than the background dataset with a mean of 1.3 mg/L as compared to the background dataset mean of 1.1. (~20% higher). However, the very low concentrations make meaningful assessment difficult. Additionally, the upgradient well MW-7 has much higher Chloride concentrations (mean of 75 mg/L). Therefore, it would be very difficult to discern impact from upgradient watershed vs. the CCR unit. Chloride monitoring has limited value for our particular site.
iv. Fluoride (n/a): Nearly all non-detect, cannot conduct statistics, but no change
v. Sulfate (STT): p=0, IS STATISTICALLY DIFFERENT. All 4 Detection monitoring results were considerably below the background detection monitoring results with a mean of 600 mg/L as compared to 740 mg/L (~23% below). The Detection monitoring concentrations appear very stable with no trend and low deviation. Will add Detection monitoring values to background data even though they are shown to be less than the background dataset, statistically.
vi. TDS (STT): p=.001. IS STATISTICALLY DIFFERENT. Very similar to Sulfate results, only 17% difference between background and detection mean.
vii. pH (STT): p=.78, not statistically different.

d. MW-9

i. Boron (n/a): Nearly all non-detect, cannot conduct statistics, but no obvious change
ii. Calcium (STT): p=.26
iii. Chloride (STT): p=.08
iv. Fluoride (n/a): Nearly all non-detect, cannot conduct statistics, but no obvious change
v. Sulfate (STT): p=.414
vi. TDS (STT): p=.77
vii. pH (STT): p=.85

3.) Added Detection Monitoring results to 'background' dataset, despite statistical difference. Reasons discussed at each bullet point above.
4.) Due to the stark difference in behavior of MW-7 (upgradient) well with all downgradient wells (MW-3R, MW-8, MW-9), interwell analysis will no longer be performed between the upgradient and downgradient wells. Intrawell analyses will be conducted for MW-8 and MW-9. MW-3R will no longer be updated since it is abandoned. Additionally, intrawell analysis will be completed for MW-7 to assess for changes in the upgradient watershed, even though the upgradient well is not assessed for Statistically Significant Increases (SSIs).
5.) Check all updated 'background' datasets for normality utilizing Robust Regression on order Statistics (ROS) to analyze datasets
    a. Removed high non-detects from MW-7 Boron results, then dataset is normal.

b. Removed high non-detects from MW-8 Boron results, then dataset is normal.
c. Remove pH reading from 7/11/17 for all datasets, suspect pH, faulty equipment, bad reading. Without outlier, all pH datasets are normal.

6.) Determine Upper Prediction Limits (UPLs) for each parameter at each well using 2-sample, UPL at p=95 with ProUCL. See Table 2
   a. Utilize ROS Normal distribution for data with non-detects

Table 1: Previous UPLs				
Parameter	**MW-7**	**MW-3R**	**MW-8**	**MW-9**
Boron (ug/L)	87.8	130.1	87.8	87.8
Calcium (mg/L)	506.7	667.5	506.7	506.7
Chloride (mg/L)	81.94	81.94	81.94	81.94
Fluoride (mg/L)	0.11	0.11	0.11	0.11
pH (SU)	6.286 – 6.814	6.286 – 6.814	6.286 – 6.814	6.286 – 7.318
Sulfate (mg/L)	811.1	1937	811.1	811.1
Total Dissolved Solids (mg/L)	1742	3571	1742	1742

Table 2: Updated UPLs Based on ProUCL only				
Parameter	**MW-7**	**MW-3R**	**MW-8**	**MW-9**
Boron (ug/L)	113.5	n/a	100.8	50
Calcium (mg/L)	590.7	n/a	442.4	235.3
Chloride (mg/L)	136.9	n/a	1.50	23.59
Fluoride (mg/L)	0.11	n/a	0.11	0.11
pH (SU)	5.97 – 6.67	n/a	6.03 – 6.74	6.286 – 7.318
Sulfate (mg/L)	1231	n/a	877.2	534.3
Total Dissolved Solids (mg/L)	2441	n/a	1884	1256

7.) Determine UPL for each parameter at each well using Table 19 of the unified guidance with 1 of 2 sample, 3 wells, 12 background samples, 7 COCs, semi-annual assessment. See Table 3 Below.

Table 3: Updated UPLs Based on Unified Guidance Table 19				
Parameter	**MW-7**	**MW-3R**	**MW-8**	**MW-9**
Boron (ug/L)	110.01	n/a	119.29	50.00
Calcium (mg/L)	579.98	n/a	438.40	233.23
Chloride (mg/L)	132.82	n/a	1.52	22.65
Fluoride (mg/L)	0.11	n/a	0.10	0.10
pH (SU)	6.12 - 6.79	n/a	6.23-7.13	6.23-7.13
Sulfate (mg/L)	1197.73	n/a	865.08	527.68
Total Dissolved Solids (mg/L)	2391.34	n/a	1863.13	1243.10

8.) The 2 methodologies utilized to calculate UPLs exhibit similar results. The UPLs determined by the Unified Guidance will be utilized as the monitoring limits for the next 2 years. This methodology is specifically laid out in the Unified Guidance Rule and is therefore more defensible.