2018 CCR Annual Groundwater Monitoring And Corrective Action Report

Unit 3 Landfill

Sherburne County (Sherco) Generating Plant
Becker, Minnesota

Prepared for:

Northern States Power Company, a Minnesota Corporation

January 30, 2019

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2018 CCR ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

Sherco Unit 3 Landfill
Becker, Minnesota

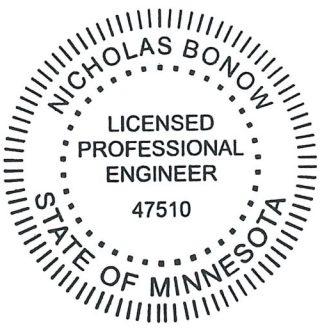
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Additionally, I certify that this report has been prepared to meet the requirements of § 257.90(e), Annual groundwater monitoring and corrective action report, as included in 40 CFR Part 257, Subpart D, Disposal of Coal Combustion Residuals from Electric Utilities.

Signature of Preparer:

Nicholas Bonow, P.E., P.G. #47510
Carlson McCain, Inc.

Date: January 30, 2019



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APPENDICES

1. INTRODUCTION

This report presents the documentation of the status of groundwater monitoring and corrective action for the year 2018 (YR2018) for the Sherco Unit III Landfill (Landfill) at the Sherburne County Generating Plant (Sherco) located in Becker, Minnesota. The Landfill is jointly owned by Northern States Power Company, a Minnesota Corporation (NSPM), and Southern Minnesota Municipal Power Agency (SMMPA), and is operated by NSPM.

The Landfill is an existing coal combustion residuals (CCR) landfill and is required to comply with provisions of the U.S. Code of Federal Regulations (CFR), Title 40, Parts 257 and 261 relating to disposal of coal combustion residuals from electric utilities. In particular, this report addresses the requirements of 40 CFR Section 257.90(e), annual groundwater monitoring and corrective action for YR2018.

This report has been prepared in general accordance with the reporting procedures outlined in the Sherco Unit 3 Landfill CCR Groundwater Sampling Plan (NSPM, 2017b). Any deviations from the requirements of the Groundwater Sampling Plan are described in subsequent sections of this report.

1.1 Annual Groundwater Monitoring Report Requirements

According to §257.90(e), CCR units must prepare an annual groundwater monitoring and corrective action report each year that complies with the following:

"For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

(1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

(2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

(3) In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

(4) A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

Section 3.6.2 of the CCR Groundwater Sampling Plan (NSPM, 2017b) also includes a list of items to be included in the annual report that is similar to items 1 through 5 above, with the addition of a water table contour map using data collected from the current year.

In this report, Section 2 (Site Description) briefly describes the site location and hydrogeologic setting, Section 3 (Monitoring Results) discusses the reporting requirements of the CCR Sampling Plan and §257.90(e), and Section 4 (Discussion) summarizes key actions completed in YR2018, describes any problems reported in YR2018 and the actions to resolve the problems, and key activities projected for 2019.

2. SITE DESCRIPTION

The Landfill is located in the City of Becker, Sherburne County, Minnesota. The Landfill is approximately 94 acres in size and is part of a larger generating plant site. The Landfill is comprised of five cells (1, 2A, 2B, 2C and 3) in which cell 1 was constructed in 1987 and cell 3 was most recently constructed in 2009. The Landfill location is shown on Figure 1 and an aerial photograph and site layout map for Landfill are shown on Figure 2.

2.1 Site Hydrogeology

The site hydrogeology is discussed in more detail in the Sherco Unit 3 Landfill Groundwater Monitoring System Certification (Carlson McCain, 2017), which was prepared for compliance with 40 CFR §257.91. Facility hydrogeology is briefly summarized below for convenience. Unless otherwise cited, the data presented in this section is credited to Carlson McCain, 2017.

The Landfill is located in the Anoka Sand Plain physiogeographic region. The site consists of moderate to highly permeable alluvial deposits above and below a low-permeability glacial till. Precambrian granite, the first bed rock encountered, is considered impermeable. Groundwater flows south-southwest beneath the Landfill, where it discharges into the Mississippi River. The till layer exhibits variable thickness and is absent in some locations. Groundwater travel velocities range from approximately 291 to 1020 feet per year.

The conceptual model for the hypothetical (or potential) release of a constituent of concern (COC) from the Landfill focuses on groundwater as the transport mechanism. The water table beneath the Landfill is typically 5 to 10 feet above the glacial till layer. Exfiltration from Landfill area is anticipated to move vertically downward from the base until it reaches the water table contact. No glacial till has been identified in the vadose zone, which would impede or redirect the infiltrating leachate. Upon reaching the water table, a COC would likely travel mainly horizontally toward the south-southwest and towards the Mississippi River.

3. MONITORING RESULTS

Section 3.1 below presents the monitoring results obtained during YR2018 in terms of the specific requirements of §257.90(e) that are to be included in this report.

3.1 Compliance with §257.90(e)

3.1.1 Groundwater Monitoring System (§257.90(e)(1))

The area of the Landfill and all upgradient and downgradient monitoring well locations included in the Landfill CCR groundwater monitoring system are shown on Figure 2. Figure 2 also includes labels for the well identification numbers that are part of the groundwater monitoring system for the Landfill. A summary of the monitoring wells included in the Landfill CCR Groundwater Monitoring System is included in Table 1.

3.1.2 Well Installation or Decommissioning (§257.90(e)(2))

No monitoring wells that are part of the groundwater monitoring system for the Landfill were installed or decommissioned during YR2018.

3.1.3 Summary of Monitoring Data (§257.90(e)(3))

Monitoring data collected during YR2018 is summarized in Tables 2 and 3. Table 2 summarizes the data collected and includes the number of groundwater samples that were collected for analysis for each upgradient and downgradient well, the dates the samples were collected, and whether the samples were required by the detection monitoring (i.e. constituents listed Appendix III to 40 CFR §257, hereafter referred to as "Appendix III constituents") or assessment monitoring (i.e. constituents listed in Appendix IV of 40 CFR §257, hereafter referred to as "Appendix IV constituents") programs. Table 3 summarizes the analytical parameters and the number of times that each parameter was analyzed for each well in the groundwater monitoring system.

Assessment Monitoring Data

As reported in a Technical Memorandum dated April 13, 2018 (Carlson McCain, 2018c), NSPM initiated an assessment monitoring program at the Landfill during YR2018. Pursuant to the assessment monitoring requirements listed in §257.95, the following groundwater sampling events were conducted during YR2018:

- Pursuant to §257.95(b), the initial assessment monitoring samples were collected within 90 days of triggering the assessment monitoring program. These samples were collected during the spring monitoring event, which occurred between April 2 and April 19, 2018. The samples were analyzed for Appendix IV constituents, as required by §257.95(b), as well as Appendix III constituents. Laboratory reports and field datasheets for the spring monitoring event are included in this report as Appendix A.
- Pursuant to §257.95(d)(1), all wells in the groundwater monitoring system were resampled within 90 days of obtaining the validated results of the initial assessment monitoring sampling. The results of the initial assessment monitoring sampling were received from the laboratory on May 16, 2018 and resampling was conducted between July 30 and August 1, 2018 (summer monitoring event). The resampling included analyzing for all Appendix III

constituents and only those Appendix IV constituents that were detected during the initial assessment monitoring event. Laboratory reports and field datasheets for the summer monitoring event are included in this report as Appendix B.

- Pursuant to the semiannual sampling requirement in §257.95(d)(1), all wells in the groundwater monitoring system were resampled between November 2 and November 6, 2018 (fall monitoring event) and analyzed for the same constituents as the summer event (i.e. all Appendix III constituents and only those Appendix IV constituents detected during the initial assessment monitoring event). Laboratory reports and field datasheets for the fall monitoring event are included in this report as Appendix C.

Background Concentrations and Groundwater Protection Standards

Pursuant to §257.95(d)(3), the annual groundwater monitoring and corrective action report must identify the background parameter concentrations established under §257.94(b) and identify the groundwater protection standards established under §257.95(d)(2).

- Background Concentrations: The background wells at the Landfill include P-125, P-134 and P-141 and the background parameter concentrations were obtained as part of the baseline data set that was completed by collecting nine independent samples from each of the wells in the groundwater monitoring system from December 2016 through September 2017. Each of the baseline samples were analyzed for Appendix III and Appendix IV constituents. Laboratory reports and field datasheets for the baseline dataset, which includes all background concentrations, are provided in Appendix A of the 2017 CCR Annual Groundwater Monitoring and Corrective Action Report (Carlson McCain, 2018b).
- Groundwater Protection Standards: Pursuant to §257.95(h)(1) through §257.95(h)(3), groundwater protection standards have been established for each Appendix IV constituent as either: 1) the maximum contaminant level (MCL) established under 40 CFR §141.62 and §141.66, 2) for those constituents without an MCL (i.e. cobalt, lead, lithium, and molybdenum), the concentration listed in §257.95(h)(2), as amended on July 30, 2018 or 3) for constituents for which the background level is higher than the levels identified under 1) or 2), the background concentration.

The range of background concentrations for each Appendix III and Appendix IV constituent and the groundwater protection standard for each Appendix IV constituent are summarized on the following page.

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	Parameter	Background Range	Groundwater Protection Standard
Appendix III Parameters	Boron, total (mg/L)	<0.050	NA
	Calcium, total (mg/L)	62.3 to 91.9	NA
	Chloride, total (mg/L)	24.3 to 48.9	NA
	Fluoride, total (mg/L)	<0.750	NA
	pH (lab) (pH)	7.73 to 7.9	NA
	Sulfate, total (mg/L)	15.6 to 39.5	NA
	Total Dissolved Solids (mg/L)	212 to 406	NA
Appendix IV Parameters	Antimony, total (mg/L)	<0.0005	0.006
	Arsenic, total (mg/L)	0.0005 to 0.0012	0.01
	Barium, total (mg/L)	0.057 to 0.107	2
	Beryllium, total (mg/L)	<0.0005	0.004
	Cadmium,total (mg/L)	<0.0005	0.05
	Chromium, total (mg/L)	0.0005 to 0.0026	0.1
	Cobalt, total (mg/L)	<0.0005 to 0.0012	0.006
	Fluoride, total (mg/L)	<0.750	4
	Lead, total (mg/L)	<0.0005	0.015
	Lithium Total (mg/L)	<0.05[1]	0.04[1]
	Mercury, total (mg/L)	<0.0002	0.002
	Molybdenum, total (mg/L)	<0.0005	0.1
	Radium, 226 and 228 combined (pCi/L)	<0.92 to <2.12[2]	5
	Selenium, total (mg/L)	<0.0005	0.05
	Thallium, total (mg/L)	<0.0005	0.002

[1] All background samples for lithium were obtained prior to amendment of §257.95(h)(2) on July 30, 2018, which implemented a groundwater protection standard of 0.04 mg/L for lithium. The analytical laboratory has lowered the reporting limit for lithium from 0.05 mg/L to 0.015 mg/L in response to the rule amendment.

[2] The reporting limit for radium varies from sample to sample and several radium detections were reported between 0.92 and 2.12 pCi/L.

Statistical Analysis

Statistical analysis was performed on the YR2018 monitoring data using the procedures described in the Landfill's Statistical Analysis Plan (NSPM, 2017a), and demonstrates compliance with §257.95(e), §257.95(f), and §257.95(g) as described below:

1. *Subpart §257.95(e) (paraphrased): If the concentrations of all Appendix III and Appendix IV constituents are shown to be at or below background values for two consecutive monitoring events, the owner or operator may return to detection monitoring of the CCR unit.*
    a. Based on statistical comparisons of compliance data to background data for Appendix III and Appendix IV constituents, concentrations of one or more constituents continue to exceed background values, therefore the Landfill will not return to detection monitoring at this time.

2. *Subpart §257.95(f) (paraphrased): If the concentrations of any Appendix III or Appendix IV constituent are above background values, but all concentrations are below the applicable groundwater protection standard, the owner or operator must continue assessment monitoring.*
    a. Based on statistical comparisons of Appendix III and Appendix IV constituent concentrations to groundwater protection standards, all concentrations are below the applicable groundwater protection standards, therefore the Landfill will continue assessment monitoring.

3. *Subpart §257.95(g) (paraphrased): If one or more Appendix IV constituents are detected at statistically significant levels above the groundwater protection standard in any sampling event, the owner or operator must issue notifications of the exceedance(s) and initiate an assessment of corrective measures.*
    a. As stated in item 2.a, above, all Appendix III and Appendix IV concentrations are below applicable groundwater protection standards, therefore no additional notifications or assessment of corrective measures are required.

Groundwater Elevations and Flow Direction

Groundwater elevations and flow direction in the vicinity of the Landfill during the spring and fall of 2018 monitoring events are shown on the water table elevation contour maps in Figures 3 and 4, respectively. The contours were derived from water level measurements from the wells included in the CCR groundwater monitoring system for the Landfill along with additional water level piezometers near the Landfill. During both of the spring and fall events, the flow direction was generally to the south-southwest. The flow direction is consistent with historical data from over 20 years of monitoring at the Landfill and is also consistent with the regional groundwater flow direction towards the Mississippi River.

3.1.4 Transition Between Monitoring Programs (§257.90(e)(4))

The Landfill transitioned from the detection monitoring program (§257.94) to the assessment monitoring program (§257.95) as described in Technical Memorandum dated January 15, 2018 (Carlson McCain, 2018a) and April 13, 2018 (Carlson McCain, 2018c). Based on the results of the statistical analysis of the monitoring data from the initial detection monitoring event completed in October 2017, NSPM determined that one or more monitoring wells exhibited a statistically significant increase (SSI) for one or more Appendix III constituent. The following table lists each monitoring well in which an SSI was identified, and the constituent which exhibited the SSI:

Monitoring Well	Constituents Exhibiting SSIs – October 2017
P-120	Boron
P-137A	Boron, Calcium, Sulfate, Total Dissolved Solids
P-138A	Calcium, Total Dissolved Solids
P-73A-1	Boron
P-74-1	Boron
P-75-1	Calcium
P-97	Boron

In response to the SSIs, multiple rounds of assessment monitoring sampling occurred during YR2018, as described in Section 3.1.3 of this report.

3.1.5 Other Information (§257.90(e)(5))

No other information is required to be reported in this CCR Annual Groundwater Monitoring and Corrective Action Report pursuant to §257.90 through §257.98.

4. DISCUSSION

§257.90(e) states that *"For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year."*

Pursuant to the rule requirements, Section 4.1 below discusses the key actions completed for the groundwater monitoring program at the Landfill; Section 4.2 discusses the any problems encountered with the groundwater monitoring and actions to resolve such problems; and Section 4.3 discusses key activities that may occur in the upcoming year.

4.1 Key Actions Completed

Key actions that were completed during YR2018 include the following items:

- Within 90 days after completing sampling and analysis as required by §257.93(h)(2), NSPM reported in a Technical Memorandum, dated January 15, 2018 (Carlson McCain, 2018a), that one or more monitoring wells exhibited an SSI for one or more Appendix III constituents; and that NSPM will establish an assessment monitoring program or document that the SSI resulted from an alternative source. The Technical Memorandum was placed on the Landfill's publicly available website on January 15, 2018.
- The 2017 Annual CCR Groundwater Monitoring and Corrective Report (Carlson McCain, 2018b) was completed and placed on the Landfill's publicly available website by January 31, 2018.
- A Technical Memorandum dated April 13, 2018 (Carlson McCain, 2018c), which documented that an alternate source demonstration (ASD) for the Landfill was initiated but was not completed by April 15, 2018, was placed in the Landfill's operating record on April 13, 2018.
- Initiation of the assessment monitoring program including sampling and analyzing for all Appendix IV constituents at each background and downgradient well during the spring monitoring event in April 2018 as required by §257.95(b);
- Monitoring wells were resampled during the summer between July 30 and August 1, 2018 and analyzed for all Appendix III constituents and only those Appendix IV constituents that were detected during the initial assessment monitoring event (i.e. spring 2018 event) as required by §257.95(d)(1);
- Monitoring wells were resampled during the fall between November 2 and November 6, 2018 and analyzed for all Appendix III constituents and only those Appendix IV constituents that were detected during the spring 2018 event as part of semiannual sampling required by §257.95(d)(1);
- Laboratory reports and field datasheets for the spring, summer and fall sampling events were placed in the operating record on July 27, 2018, August 29, 2018 and December 6, 2018, respectively;
- Pursuant to §257.95(d)(2), groundwater protection standards were established for all Appendix IV constituents;
- Statistical evaluation of the monitoring data was conducted to demonstrate compliance with §257.95(e) through (g); and

- The CCR Groundwater Sampling Plan for the Landfill (NSPM, 2018) was revised on December 27, 2018.

4.2 Problems

4.2.1 Problems Encountered

Dedicated bladder pumps installed in the wells at the Landfill were partially frozen during the spring sampling event, which necessitated an additional mobilization for sampling personnel, and ultimately resulting in water level measurements and samples being obtained as many as seventeen days apart. Water level measurements and samples were obtained as many as three days apart during the summer monitoring event and five days apart during the fall event due to scheduling constraints with the sampling contractor. This is a deviation from the CCR Groundwater Sampling Plan (NSPM, 2017b), which states that the sampling crew will take initial water level measurements within a 24-hour timeframe to provide comparable numbers by which to calculate the groundwater gradient.

The primary objective of the water level measurements is to ensure an accurate computation of the groundwater gradient in order to verify monitoring assumptions regarding background and downgradient well locations. The groundwater elevation and flow direction at the Landfill is well-understood based on the decades-long history of groundwater monitoring at the Landfill, and provides baseline water levels that can be readily compared with new observations to identify anomalies that may result from more widely spaced measurements. Time concentration plots were reviewed for YR2018 static water levels and water table elevations and no anomalies were observed, suggesting that the more widely spaced water level measurements did not impact the calculation of the groundwater gradient during YR2018.

No other significant problems with the groundwater monitoring system, or deviations from the CCR Groundwater Sampling Plan were reported at the facility during YR2018. No corrective action was required at the facility during YR2018.

4.2.2 Resolution of Problems

In regards to the frozen dedicated bladder pumps during Spring, 2018, it was determined that the pumps are equipped with freeze kits that were not utilized to blow out the water in the upper 10 feet of the pump tubing during fall of 2017 sampling to prevent freeze up during cold winter weather. It was discussed with the sampling crew that the freeze kits must be utilized to blow the water in the upper 10 feet of the pump tubing in each well during the last monitoring event prior to the arrival of cold winter weather.

The schedule of the sampling crew and the desire to minimize repeated trips to the individual wells during the summer and fall sampling events played a role in number of days apart water level measurements were obtained and wells were sampled. A meeting is planned with sampling crew prior to the spring of 2019 monitoring event to discuss specifically how to ensure water level measurements will be obtained within an appropriate timeframe to achieve the monitoring objectives.

4.3 Key Activities for 2019

The following key actions are anticipated at the Landfill in the year 2019:

1. Routine, semi-annual assessment monitoring events at monitoring system wells are planned in the spring between March 15 and May 15, 2019 and in the fall between September 15 and November 15, 2019.
2. Statistical analysis of monitoring results will be conducted to demonstrate compliance with §257.95(e) through (g).
3. The groundwater monitoring system may require modification during 2019 to accommodate planned construction of Cell 4 of the Landfill. Any modifications will be documented and reported in accordance with applicable rules.

5.0 REFERENCES

Carlson McCain, 2017. CCR Groundwater Monitoring System Certification, Sherco Unit 3 Landfill, Sherco Generating Plant, prepared for Northern States Power Company, A Minnesota Corporation, October 16, 2017.

Carlson McCain, 2018a. SSI Determination – Unit 3 Landfill, Prepared for NSPM Environmental Services, Carlson McCain, Inc., January 15, 2018.

Carlson McCain, 2018b. CCR Annual Groundwater and Corrective Action Monitoring Report, Sherco Unit 3 Landfill, Sherco Generating Plant, prepared for Northern States Power Company, A Minnesota Corporation, January 29, 2018.

Carlson McCain, 2018c. Alternate Source Demonstration Update – Unit 3 Landfill, Prepared for NSPM Environmental Services, Carlson McCain, Inc., April 13, 2018.

NSPM, 2017a. Statistical Analysis Plan, Sherco Unit 3 Landfill, Northern States Power Company, a Minnesota Corporation, October 16, 2017.

NSPM, 2017b. Sherco Unit 3 Landfill CCR Ground Water Sampling Plan. Northern States Power Company, a Minnesota Corporation, October 17, 2017.

NSPM, 2018. Sherco Unit 3 Landfill CCR Ground Water Sampling Plan Revision #1. Northern States Power Company, a Minnesota Corporation, December 27, 2018.

Tables

Table 1
CCR Groundwater Monitoring System
Sherco III Ash Disposal Facility

Well ID	Minnesota Unique Well ID	Date Installed	Location Site Coordinates (ft)		Elevation Top of Riser Pipe	Screen Length (ft)	Elevation Top of Screen	Elevation Bottom of Screen	Monitoring Status	Hydrologic Location
			Easting	Northing						
P-73A-1	429451	9/25/86	2025348	872626	973	10	947	937	Routine Semiannual	Side-Gradient
P-74-1	429457	9/25/86	2025237	870732	970.66	10	943	933	Routine Semiannual	Side-Gradient
P-75-1	429454	9/29/86	2023946	871250	972.89	10	943	933	Routine Semiannual	Down-Gradient
P-97	426839	10/13/86	2023990	870840	974.65	10	944	934	Routine Semiannual	Down-Gradient
P-98	426838	10/14/86	2024683	870531	973.37	10	940	930	Routine Semiannual	Down-Gradient
P-117	474026	2/8/91	2023987	872256	973.41	10	940	930	Routine Semiannual	Down-Gradient
P-120	474023	2/11/91	2024299	870529	973.33	10	933	923	Routine Semiannual	Down-Gradient
P-125	517548	4/1/93	2024679	873649	972.2	10	933	923	Routine Semiannual	Up-gradient
P-134	747065	12/6/08	2022754	873698	973.85	10	946	936	Routine Semiannual	Up-gradient
P-137A	768518	7/29/09	2023473	872511	972.64	10	941	931	Routine Semiannual	Down-Gradient
P-138A	768520	7/27/09	2022968	872512	969.27	10	942	932	Routine Semiannual	Down-Gradient
P-141	822160	7/22/16	2023787	873696	975.17	10	947	937	Routine Semiannual	Up-gradient

*Notes:

Elevation is feet above mean sea level

Table 2
Summary of Data Collected
Sherco III Ash Disposal Facility

Upgradient & Sidegradient Wells				
Well ID	Number of Samples	Sample Dates		
		Spring 2018[1]	Summer 2018[2]	Fall 2018[3]
P-73A-1	3	4/2/2018	7/30/2018	11/2/2018
P-74-1	3	4/2/2018	7/30/2018	11/2/2018
P-125	3	4/3/2018	7/31/2018	11/2/2018
P-134	3	4/19/2018	7/30/2018	11/5/2018
P-141	3	4/19/2018	7/30/2018	11/2/2018

Downgradient Wells				
Well ID	Number of Samples	Sample Dates		
		Spring 2018[1]	Summer 2018[2]	Fall 2018[3]
P-75-1	3	4/2/2018	7/31/2018	11/5/2018
P-97	3	4/2/2018	7/31/2018	11/5/2018
P-98	3	4/2/2018	8/1/2018	11/6/2018
P-117	3	4/2/2018	7/31/2018	11/5/2018
P-120	3	4/2/2018	7/31/2018	11/6/2018
P-137A	3	4/19/2018	7/31/2018	11/5/2018
P-138A	3	4/19/2018	7/30/2018	11/5/2018

[1] Initial assessment monitoring event sampled and analyzed for Appendix IV constituents as required by §257.95(b). Appendix III constituents were also analyzed.

[2] Assessment monitoring 90-day resample event sampled and analyzed for Appendix III constituents and only those Appendix IV constituents detected during Spring 2018 as required by §257.95(d)(1).

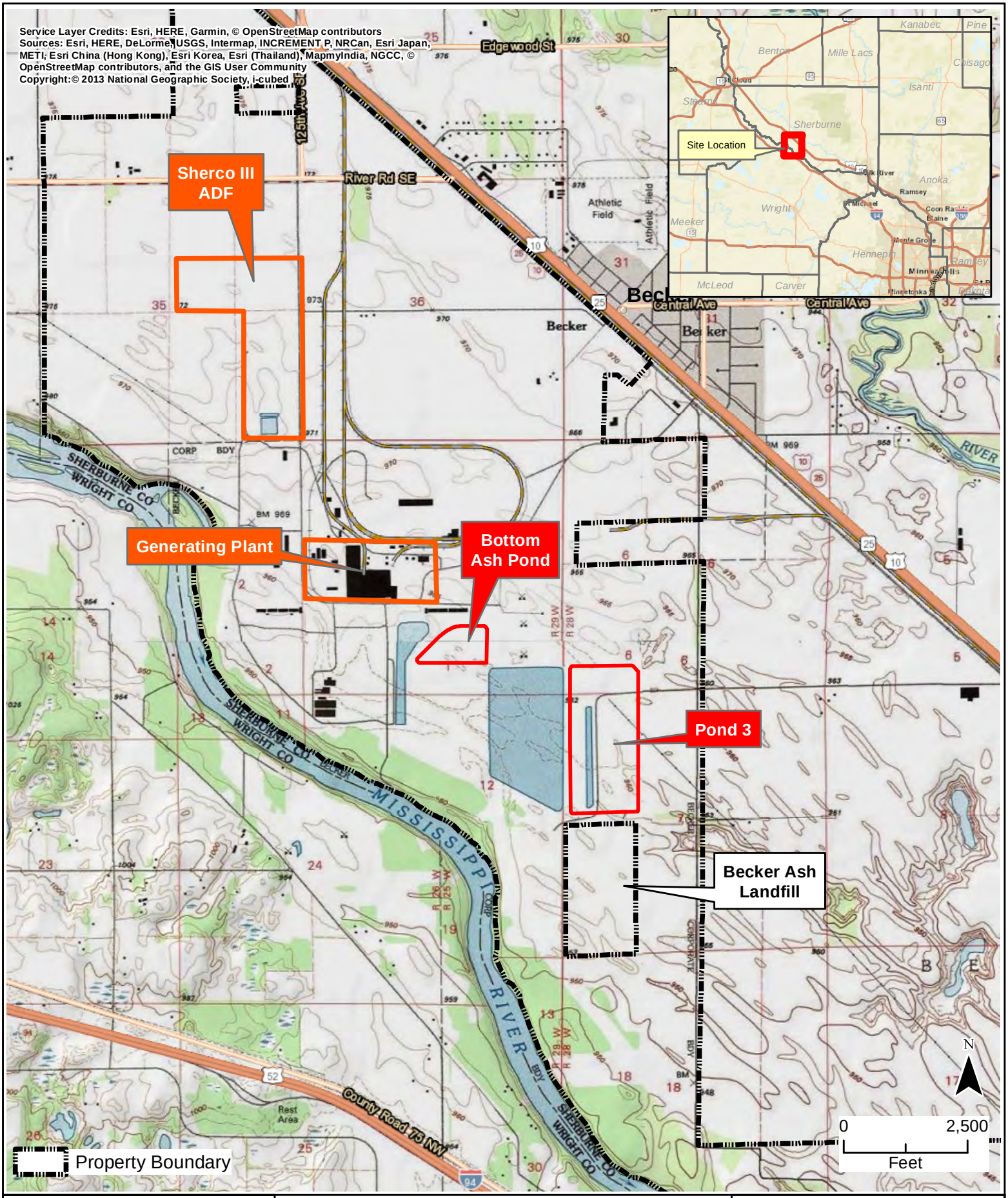
[3] Assessment monitoring semiannual resample event sampled and analyzed for Appendix III constituents and only those Appendix IV constituents detected during Spring 2018 as required by §257.95(d)(1).

Table 3
Count of Parameters Analyzed by Well
Sherco III Ash Disposal Facility

Appendix III Parameters												
Parameter	Well ID and Number of Samples											
	P-73A-1	P-74-1	P-75-1	P-97	P-98	P-117	P-120	P-125	P-134	P-137A	P-138A	P-141
Boron, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Calcium, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Chloride, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Fluoride, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
pH (lab) (pH)	3	3	3	3	3	3	3	3	3	3	3	3
Sulfate, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Total Dissolved Solids (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3

Appendix IV Parameters												
Parameter	Well ID and Number of Samples											
	P-73A-1	P-74-1	P-75-1	P-97	P-98	P-117	P-120	P-125	P-134	P-137A	P-138A	P-141
Antimony, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Arsenic, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Barium, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Beryllium, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Cadmium,total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Chromium, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Cobalt, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Lead, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Lithium Total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Mercury, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Molybdenum, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Selenium, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Thallium, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Radium, 226 and 228 combined (pCi/L)	3	3	3	3	3	3	3	3	3	3	3	3

Figures



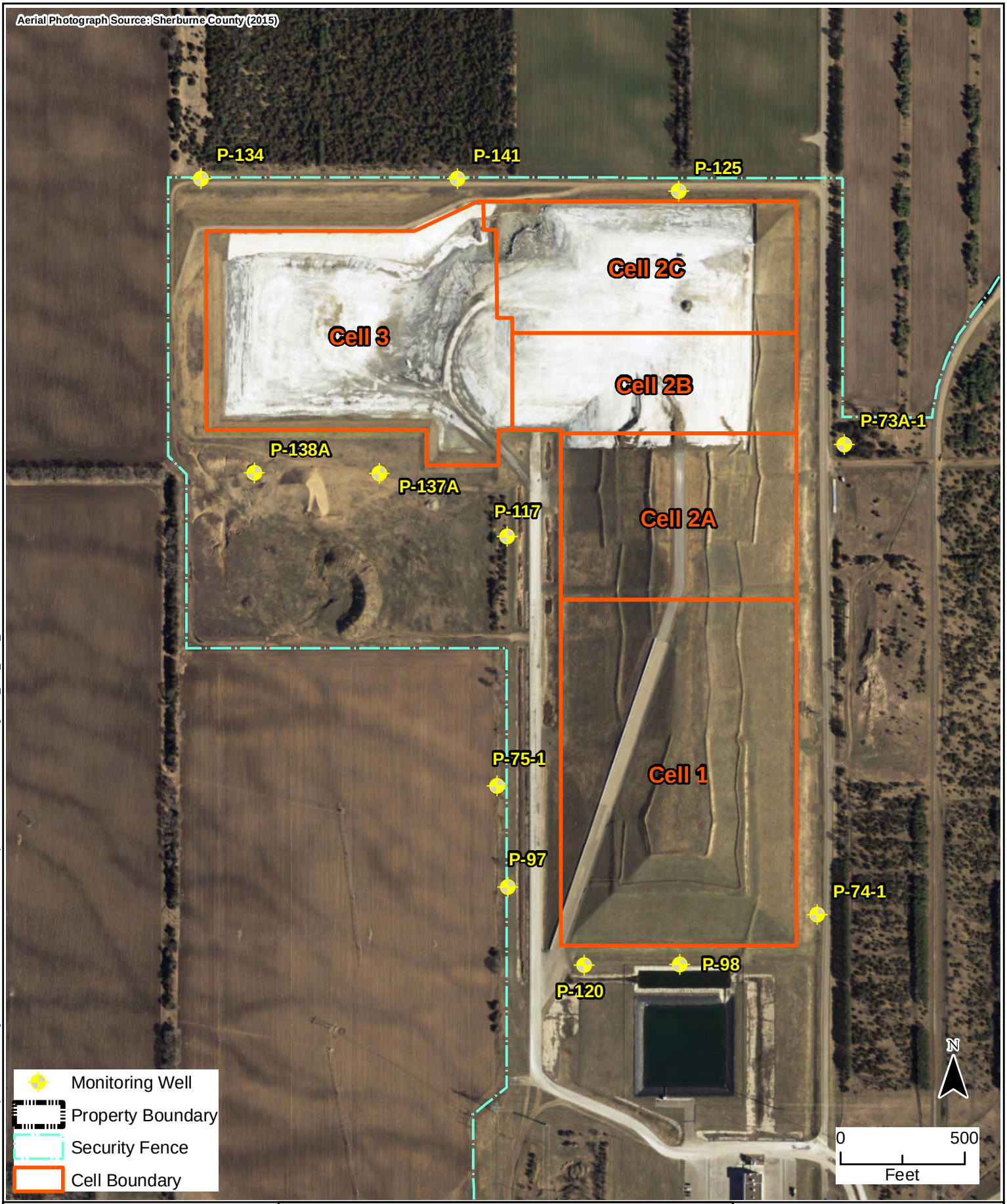
CCR ANNUAL GROUNDWATER MONITORING REPORT

Sherco III Ash Disposal Facility

Sherburne County Generating Plant
Becker, Minnesota

FIGURE 1

SITE LOCATION MAP



Document Path: P:\Projects\XCEL\6559 Ash Operations and Mgmt\Sherco\2018 CCR Annual GW Reports\Sherco III ADF\GIS\Figure 2_Sh3_CCR_EMS.mxd

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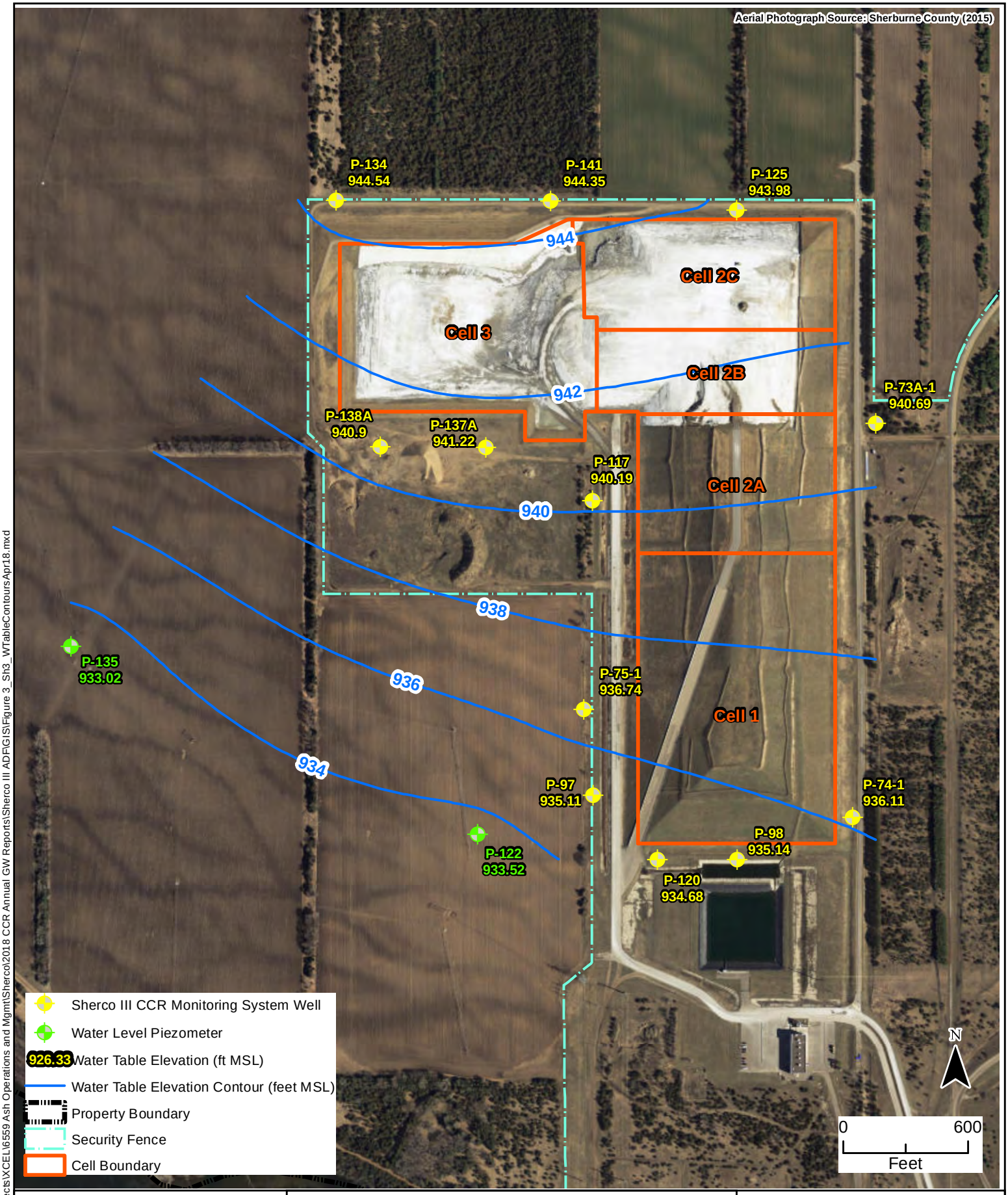
CCR ANNUAL GROUNDWATER MONITORING REPORT
Sherco III Ash Disposal Facility
Sherburne County Generating Plant
Becker, Minnesota

FIGURE 2
CCR GROUNDWATER MONITORING SYSTEM



Document Path: P:\Projects\XCEL\6559 Ash Operations and Mgmt\Sherco\2018 CCR Annual GW Reports\Sherco III ADF\GIS\Figure 3_Sh3_WTableContoursApr18.mxd

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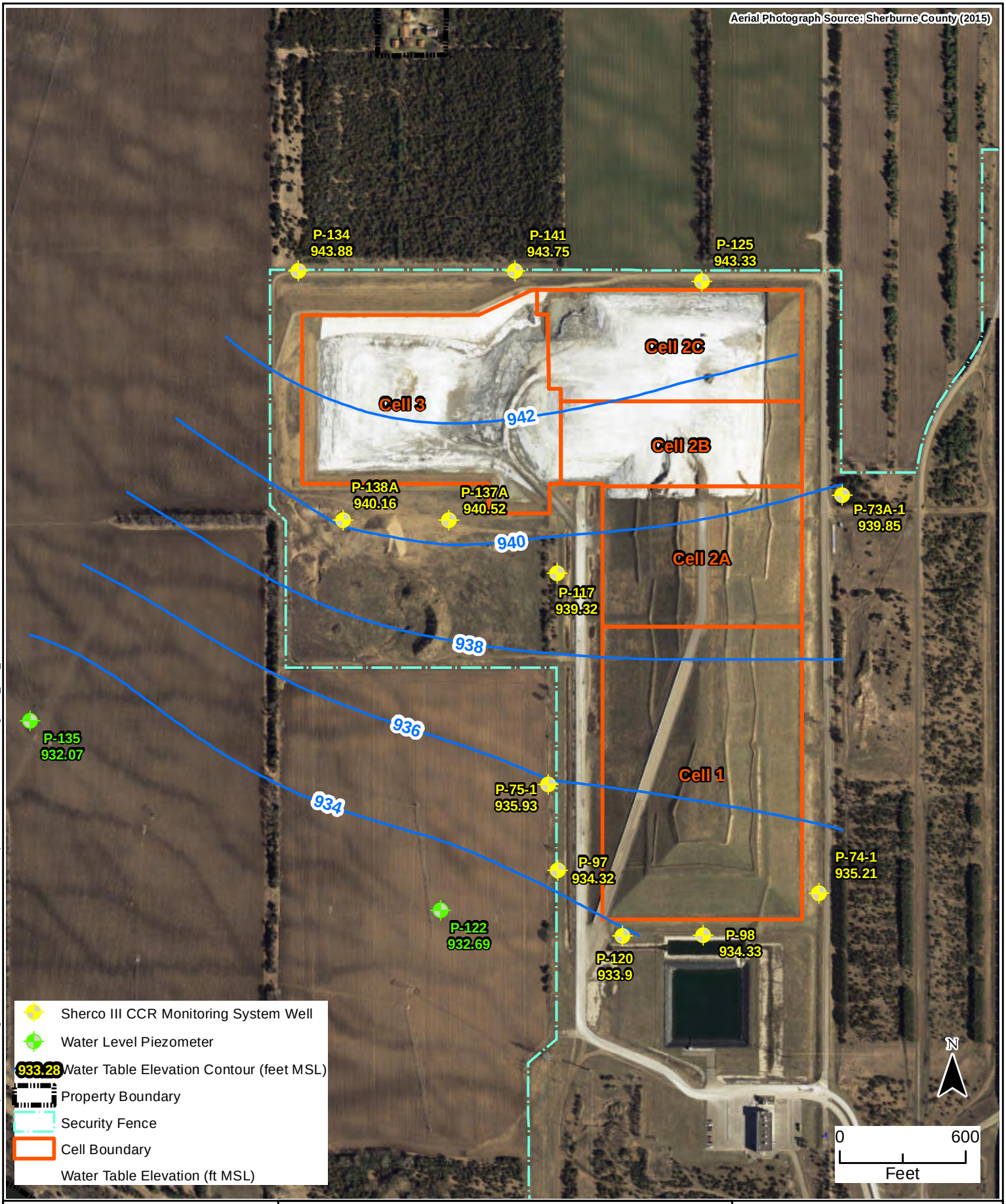
CCR ANNUAL GROUNDWATER MONITORING REPORT
Sherco III Ash Disposal Facility
Sherburne County Generating Plant
Becker, Minnesota

FIGURE 3
WATER TABLE ELEVATION CONTOUR MAP (04/02-19/2018)



Document Path: P:\Projects\XCEL\6559 Ash Operations and Mgmt\Sherco\2018 CCR Annual GW Reports\Sherco III ADF\GIS\Figure 4_Sh3_WTableContoursNov18.mxd

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CCR ANNUAL GROUNDWATER MONITORING REPORT
Sherco III Ash Disposal Facility
Sherburne County Generating Plant
Becker, Minnesota

FIGURE 4
WATER TABLE ELEVATION CONTOUR MAP (11/2-6/2018)

Appendix A

Spring 2018 Initial Assessment Monitoring Sampling Event
Field Datasheets and Laboratory Reports

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-73a-1 Labeled P73A-1

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	36.18	Feet
Static water level measurement before purging (Start Depth)	32.31	Feet
Static water level measurement at time of sampling (Final Depth)	32.31	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-2-18 Water Column 3.87 Feet

Time Purged 1810-1822 One Casing Volume 0.6 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 4-2-18

Time Sampled 1840

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 9.6 (mg/l)

Spec. Cond. 590 (µmhos/cm) Turbidity 4.4 (NTU)

Temp. 9.0 (°C) Eh 174 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 31° & light snow, wind SE 10

Sample Description: clear & odorless

Observations: pump discharge water line frozen at the top.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1814	7.4	590	9.0	9.8	NA	175	0.6
1818	7.4	590	9.0	9.6	NA	175	1.2
1822	7.4	590	9.0	9.6	NA	174	1.8
				DJA	4/3/18		

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4/2/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-74-1 Labeled P74-1

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 38.10 Feet

Static water level measurement before purging (Start Depth) 34.55 Feet

Static water level measurement at time of sampling (Final Depth) 34.55 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-2-18 Water Column 3.55 Feet

Time Purged 1715-1727 One Casing Volume 0.6 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 4-2-18

Time Sampled 1740

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 8.4 (mg/l)

Spec. Cond. 600 (µmhos/cm) Turbidity 4.0 (NTU)

Temp. 9.0 (°C) Eh 162 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 32° & light snow, wind SE 10

Sample Description: clear & odorless

Observations:

DTA 4/2/18

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1719	7.3	600	9.0	8.3	NA	160	0.6
1723	7.3	600	9.0	8.4	NA	161	1.2
1727	7.4	600	9.0	8.4	NA	162	1.8

DTA 4/2/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4/2/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco CCR, April **Project No.** 18-00455

Well Description and Presampling Information

Monitoring Point ID P-75-1 Labeled P75-1

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	39.66	Feet
Static water level measurement before purging (Start Depth)	36.15	Feet
Static water level measurement at time of sampling (Final Depth)	36.15	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-2-18 Water Column 3.51 Feet

Time Purged ~~4-2-18~~ 1510-1522 One Casing Volume 0.6 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 4-2-18

Time Sampled 1535

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 8.3 (mg/l)

Spec. Cond. 680 (µmhos/cm) Turbidity 4.3 (NTU)

Temp. 9.0 (°C) Eh 158 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 32° + snow, wind SE 10

Sample Description: clear + odorless

Observations: pump water discharge line frozen at top.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1514	7.5	680	9.5	8.5	NA	150	0.6
1518	7.4	680	9.0	8.4	NA	155	1.2
1522	7.4	680	9.0	8.3	NA	158	1.8
			DJA 4/2/18				

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4-2-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-97 Labeled P-97

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	41.99	Feet
Static water level measurement before purging (Start Depth)	39.54	Feet
Static water level measurement at time of sampling (Final Depth)	39.54	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-2-18 Water Column 2.45 Feet

Time Purged 1425 - 1434 One Casing Volume 0.4 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 1.35 Gallons

Field Sampling Data

Date Sampled 4-2-18

Time Sampled 1450

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.0 (units) D.O 9.3 (mg/l)

Spec. Cond. 630 (µmhos/cm) Turbidity 2.8 (NTU)

Temp. 8.5 (°C) Eh 161 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 32° + snow, wind SE 10

Sample Description: clear + odorless

Observations: pump discharge water line frozen at top.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1428	6.9	630	8.5	9.4	NA	186	0.45
1431	7.0	630	8.5	9.3	NA	173	0.90
1434	7.0	630	8.5	9.3	NA	161	1.35
				DTA 4/2/18			

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4-2-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-98 Labeled P-98

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	43.35	Feet
Static water level measurement before purging (Start Depth)	38.23	Feet
Static water level measurement at time of sampling (Final Depth)	38.23	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-2-18 Water Column 5.12 Feet

Time Purged 1305-1323 One Casing Volume 0.8 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 2.7 Gallons

Field Sampling Data

Date Sampled 4-2-18

Time Sampled 1340

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O 7.8 (mg/l)

Spec. Cond. 560 (µmhos/cm) Turbidity 3.8 (NTU)

Temp. 11.5 (°C) Eh 150 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 32° & snow, wind SE 10

Sample Description: clear & odorless

Observations: water discharge line from pump frozen at the top, had to thaw out.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1311	7.6	550	11.0	7.7	NA	149	0.9
1317	7.6	560	11.5	7.8	NA	150	1.8
1323	7.6	560	11.5	7.8	NA	150	2.7

DTA 4/2/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4-2-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client: Xcel Energy Project: Sherco CCR, April Project No.: 18-00455

Monitoring Point ID: P-117 Labeled: P117

Inside Diameter: 2 (inches) Key #: 2106 [X] Locked [ ] Not Locked

Casing Material: [X] PVC [ ] Steel [ ] Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	40.97	Feet
Static water level measurement before purging (Start Depth)	33.22	Feet
Static water level measurement at time of sampling (Final Depth)	33.22	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method: dedicated bladder pump Pump ID: PC-6

Date Purged: 4-2-18 Water Column: 7.75 Feet

Time Purged: 1615-1636 One Casing Volume: 1.3 Gallons

Pump Rate: 0.2 (GPM / LPM) Volume Purged: 4.2 Gallons

Field Sampling Data

Date Sampled: 4-2-18

Time Sampled: 1650

Sampling Equip.: above pump

Meter ID: MPS-5

Analyzed by: DTA

Field Parameter Measurements of Sample

pH: 7.3 (units) D.O: 8.4 (mg/l)

Spec. Cond.: 630 (µmhos/cm) Turbidity: 9.5 (NTU)

Temp.: 9.0 (°C) Eh: 160 (mV)

Other: NA

Field Measurements Temp. Corrected: [X] Yes [ ] No [ ] NA

Sample for Soluble Metals Filtered in Field: [X] Yes [ ] No [ ] NA

Weather Conditions During Sampling: 32° + snow, wind SE 10

Sample Description: clear + odorless

Observations: pump discharge water line frozen at top!

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1622	7.3	630	9.0	8.3	NA	169	1.4
1629	7.3	630	9.0	8.4	NA	164	2.8
1636	7.3	630	9.0	8.4	NA	160	4.2
			DTA 4/2/18				

Samples chilled immediately after collection: [X] Yes [ ] Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4/2/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-120 Labeled P-120

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	48.53	Feet
Static water level measurement before purging (Start Depth)	38.65	Feet
Static water level measurement at time of sampling (Final Depth)	38.65	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-2-18 Water Column 9.88 Feet

Time Purged 1200-1224 One Casing Volume 1.6 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 4.8 Gallons

Field Sampling Data

Date Sampled 4-2-18

Time Sampled 1235

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O 7.2 (mg/l)

Spec. Cond. 600 (µmhos/cm) Turbidity 50.0 (NTU)

Temp. 10.0 (°C) Eh 137 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 32° + light snow, wind SE 10

Sample Description: slightly cloudy + odorless

Observations: collected Rinse Blank at this well. water discharge line from pump frozen, had to thaw out, at top.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1208	7.3	600	10.0	7.1	NA	133	1.6
1216	7.3	600	10.0	7.2	NA	135	3.2
1224	7.3	600	10.0	7.2	NA	137	4.8

DTA 4/2/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: Dave Anderson Date: 4/2/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-125 Labeled P-125

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	36.41	Feet
Static water level measurement before purging (Start Depth)	28.22	Feet
Static water level measurement at time of sampling (Final Depth)	28.22	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-3-18 Water Column 8.19 Feet

Time Purged 0840-0901 One Casing Volume 1.3 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 4.2 ~~4.3~~ Gallons

Field Sampling Data

Date Sampled 4-3-18

Time Sampled 0915

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O 9.6 (mg/l)

Spec. Cond. 490 (µmhos/cm) Turbidity 4.0 (NTU)

Temp. 9.5 (°C) Eh 137 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 29° F snow flurries, wind SE 10

Sample Description: clear + odorless

Observations: DTA 4-3-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0847	7.2	500	9.5	9.6	NA	152	1.4
0854	7.3	490	9.5	9.6	NA	141	2.8
0901	7.3	490	9.5	9.6	NA	137	4.2

DTA 4/3/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4/3/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-134 Labeled 747065

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 37.52 Feet

Static water level measurement before purging (Start Depth) 29.31 Feet

Static water level measurement at time of sampling (Final Depth) 29.31 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-19-18 Water Column 8.21 Feet

Time Purged 0945-1006 One Casing Volume 1.3 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 4-19-18

Time Sampled 1015

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 7.3 (mg/l)

Spec. Cond. 750 (µmhos/cm) Turbidity 8.9 (NTU)

Temp. 9.0 (°C) Eh 105 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 35°+ sunny, wind W 5

Sample Description: clear + odorless

Observations: DTA 4/19/18

Stabilization Test

Time	pH (units)	Specifc Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0952	7.3	740	9.0	7.4	NA	122	1.4
0959	7.4	750	9.0	7.4	NA	112	2.8
1006	7.4	750	9.0	7.3	NA	105	4.2
			DTA	4/19/18			

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4-19-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-137A Labeled P137A

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	41.70	Feet
Static water level measurement before purging (Start Depth)	31.42	Feet
Static water level measurement at time of sampling (Final Depth)	31.42	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-19-18 Water Column 10.28 Feet

Time Purged 1350 - 1417 One Casing Volume 1.7 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 5.4 Gallons

Field Sampling Data

Date Sampled 4-19-18

Time Sampled 1425

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O 7.7 (mg/l)

Spec. Cond. 730 (µmhos/cm) Turbidity 11.8 (NTU)

Temp. 9.5 (°C) Eh 160 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☐ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 43° + sunny, wind SW 10

Sample Description: clear + odorless

Observations:

DTA 4/19/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1359	7.3	720	9.5	7.8	NA	162	1.8
1408	7.3	730	9.5	7.7	NA	166	3.6
1417	7.3	730	9.5	7.7	NA	160	5.4

DTA 4/19/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4-19-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-138A Labeled P-138A

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	36.95	Feet
Static water level measurement before purging (Start Depth)	28.37	Feet
Static water level measurement at time of sampling (Final Depth)	28.37	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-19-18 Water Column 8.58 Feet

Time Purged 1200-1221 One Casing Volume 1.4 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 4-19-18

Time Sampled 1230

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.2 (units) D.O 7.7 (mg/l)

Spec. Cond. 750 (µmhos/cm) Turbidity 7.4 (NTU)

Temp. 9.5 (°C) Eh 139 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 40° + sunny, wind SW 10

Sample Description: clear + odorless

Observations: DJA 4-19-18

Stabilization Test

Time	pH (units)	Specifc Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1207	7.1	740	9.5	7.8	NA	149	1.4
1214	7.2	750	9.5	7.7	NA	144	2.8
1221	7.2	750	9.5	7.7	NA	139	4.2

DJA 4/19/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4-19-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco CCR, April Project No. 18-00455

Monitoring Point ID P-141 Labeled 822160

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	39.24	Feet
Static water level measurement before purging (Start Depth)	30.82	Feet
Static water level measurement at time of sampling (Final Depth)	30.82	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-19-18 Water Column 8.42 Feet

Time Purged 1035-1056 One Casing Volume 1.4 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 4-19-18

Time Sampled 1110

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 7.9 (mg/l)

Spec. Cond. 710 (µmhos/cm) Turbidity 9.7 (NTU)

Temp. 9.0 (°C) Eh 124 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 35°+ sunny, wind W-5

Sample Description: clear + odorless

Observations:

DTA 4-19-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1042	7.5	710	9.0	8.0	NA	120	1.4
1049	7.5	710	9.0	7.9	NA	123	2.8
1056	7.4	710	9.0	7.9	NA	124	4.2

DTA 4/19/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 4-19-18

Minneapolis Testing Laboratory
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Certification #MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

27 July 2018

Charles A Donkers

Environmental Services-Water Minneapolis

250 Marquette Plaza

Minneapolis, MN 55401

cc:

RE: Sherco Unit 3 Landfill CCR

Enclosed are the results of analyses for samples received by the laboratory on 04/04/2018 10:30-04/20/2018 09:30. If you have any questions concerning this report, please feel free to contact me.

I certify that this analysis report was prepared under my direction or supervision under a system designed to assure that qualified personnel analyzed the submitted samples. All protocols for analysis were followed as required by Minnesota Rules and the Applicable Management Plan.

Sincerely,

Steve Davis

Project Manager

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Rinse		MDD0052-01	Water	04/02/2018 11:30	04/04/2018 10:30
P-120		MDD0052-02	Water	04/02/2018 12:35	04/04/2018 10:30
P-98		MDD0052-03	Water	04/02/2018 13:40	04/04/2018 10:30
P-97		MDD0052-04	Water	04/02/2018 14:50	04/04/2018 10:30
P-75-1		MDD0052-05	Water	04/02/2018 15:35	04/04/2018 10:30
P-117		MDD0052-06	Water	04/02/2018 16:50	04/04/2018 10:30
P-74-1		MDD0052-07	Water	04/02/2018 17:40	04/04/2018 10:30
P-73A-1		MDD0052-08	Water	04/02/2018 18:40	04/04/2018 10:30
P-125		MDD0052-09	Water	04/03/2018 9:15	04/04/2018 10:30
P-134		MDD0184-04	Water	04/19/2018 10:15	04/20/2018 9:30
P-141		MDD0184-05	Water	04/19/2018 11:10	04/20/2018 9:30
P-138A		MDD0184-06	Water	04/19/2018 12:30	04/20/2018 9:30
P-137A		MDD0184-07	Water	04/19/2018 14:25	04/20/2018 9:30

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Rinse

MDD0052-01 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	< 1.00	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 10:25	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 10:25	EPA 300.0	CRL
Sulfate	< 1.00	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 10:25	EPA 300.0	CRL
Wet Chemistry										
pH	6.32		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 12:08	SM 4500-H+ B	CRL
Total Dissolved Solids	< 20.0	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Barium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:53	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 13:52	EPA 200.7	HRD
Calcium	< 0.500	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 13:51	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 13:51	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Rinse

MDD0052-01 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:18	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0052-02 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	29.5	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 10:46	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 10:46	EPA 300.0	CRL
Sulfate	25.6	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 10:46	EPA 300.0	CRL
Wet Chemistry										
pH	7.66		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 12:23	SM 4500-H+ B	CRL
Total Dissolved Solids	270	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	54.8	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	1.51	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Barium	103	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Cobalt	1.76	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Chromium	3.22	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Lead	0.822	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 8:57	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 13:57	EPA 200.7	HRD
Calcium	80.1	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 13:56	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 13:56	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-120

MDD0052-02 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:20	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-98

MDD0052-03 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	27.0	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:06	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:06	EPA 300.0	CRL
Sulfate	18.0	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:06	EPA 300.0	CRL
Wet Chemistry										
pH	7.75		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 12:29	SM 4500-H+ B	CRL
Total Dissolved Solids	284	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.708	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Barium	82.0	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Chromium	0.985	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:01	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:02	EPA 200.7	HRD
Calcium	69.8	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:01	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:01	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-98

MDD0052-03 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:21	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-97

MDD0052-04 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	29.5	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:26	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:26	EPA 300.0	CRL
Sulfate	26.3	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:26	EPA 300.0	CRL
Wet Chemistry										
pH	7.70		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 12:36	SM 4500-H+ B	CRL
Total Dissolved Solids	330	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.557	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Barium	81.3	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Chromium	0.580	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Selenium	0.547	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:05	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:07	EPA 200.7	HRD
Calcium	80.0	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:06	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:06	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-97

MDD0052-04 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:23	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-75-1

MDD0052-05 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	29.7	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:47	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:47	EPA 300.0	CRL
Sulfate	42.4	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 11:47	EPA 300.0	CRL
Wet Chemistry										
pH	7.68		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 12:43	SM 4500-H+ B	CRL
Total Dissolved Solids	370	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.697	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Barium	100	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Chromium	0.802	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Selenium	1.07	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:09	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.111	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:12	EPA 200.7	HRD
Calcium	91.1	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:11	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:11	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-75-1

MDD0052-05 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:25	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0052-06 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	31.8	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 13:49	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 13:49	EPA 300.0	CRL
Sulfate	26.0	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 13:49	EPA 300.0	CRL
Wet Chemistry										
pH	7.74		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 12:50	SM 4500-H+ B	CRL
Total Dissolved Solids	338	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	15.6	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	2.26	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Barium	103	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Cobalt	3.59	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Chromium	3.67	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Lead	2.51	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:21	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:28	EPA 200.7	HRD
Calcium	98.9	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:26	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:26	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0052-06 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:26	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0052-07 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	13.8	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:10	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:10	EPA 300.0	CRL
Sulfate	31.1	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:10	EPA 300.0	CRL
Wet Chemistry										
pH	7.68		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 12:57	SM 4500-H+ B	CRL
Total Dissolved Solids	324	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Barium	98.7	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Chromium	0.730	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Selenium	0.623	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:25	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0946	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:33	EPA 200.7	HRD
Calcium	85.9	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:31	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:31	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-74-1

MDD0052-07 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:28	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-73A-1

MDD0052-08 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	15.2	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:30	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:30	EPA 300.0	CRL
Sulfate	54.9	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:30	EPA 300.0	CRL
Wet Chemistry										
pH	7.81		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 13:04	SM 4500-H+ B	CRL
Total Dissolved Solids	322	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.579	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Barium	66.6	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Chromium	1.14	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Selenium	1.13	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:29	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0573	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:38	EPA 200.7	HRD
Calcium	82.9	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:36	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:36	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-73A-1

MDD0052-08 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:33	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0052-09 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	18.4	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:50	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:50	EPA 300.0	CRL
Sulfate	18.0	1.00	mg/L		1	BDD0120	4/5/18 12:24	4/6/18 14:50	EPA 300.0	CRL
Wet Chemistry										
pH	7.89		pH Units	M_TTT	1	BDD0090	4/4/18 10:57	4/4/18 13:10	SM 4500-H+ B	CRL
Total Dissolved Solids	258	20.0	mg/L		1	BDD0125	4/6/18 8:40	4/6/18 8:40	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0124	4/6/18 7:02	4/6/18 7:02	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.649	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Barium	57.0	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Cadmium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0147	4/9/18 7:52	4/10/18 9:33	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:43	EPA 200.7	HRD
Calcium	61.2	0.500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:41	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0146	4/9/18 7:50	4/10/18 14:41	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

P-125

MDD0052-09 (Water) - Chain of Custody Number: 2201224

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDD0198	4/11/18 8:58	4/11/18 15:35	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0184-04 (Water) - Chain of Custody Number: 2201229

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	40.9	1.00	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 19:54	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 19:54	EPA 300.0	CRL
Sulfate	29.6	1.00	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 19:54	EPA 300.0	CRL
Wet Chemistry										
pH	7.87		pH Units	M_TTT	1	BDD0424	4/20/18 10:21	4/20/18 12:43	SM 4500-H+ B	CRL
Total Dissolved Solids	402	20.0	mg/L		1	BDD0453	4/24/18 9:02	4/24/18 9:02	SM 2540C	HSD
Total Suspended Solids	4.00	4.00	mg/L		1	BDD0452	4/24/18 6:53	4/24/18 6:53	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	1.10	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Barium	104	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Cobalt	0.724	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Chromium	0.690	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:52	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 14:52	EPA 200.7	HRD
Calcium	92.7	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 14:51	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 14:51	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0184-04 (Water) - Chain of Custody Number: 2201229

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDE0137	5/8/18 6:10	5/8/18 12:46	EPA 245.1, 7470A	HSD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0184-05 (Water) - Chain of Custody Number: 2201229

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	40.0	1.00	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:14	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:14	EPA 300.0	CRL
Sulfate	49.4	1.00	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:14	EPA 300.0	CRL
Wet Chemistry										
pH	7.93		pH Units	M_TTT	1	BDD0424	4/20/18 10:21	4/20/18 12:51	SM 4500-H+ B	CRL
Total Dissolved Solids	396	20.0	mg/L		1	BDD0453	4/24/18 9:02	4/24/18 9:02	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0452	4/24/18 6:53	4/24/18 6:53	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.749	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Barium	84.2	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Cobalt	0.528	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Chromium	1.08	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Selenium	0.506	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:55	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 14:57	EPA 200.7	HRD
Calcium	88.4	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 14:56	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 14:56	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0184-05 (Water) - Chain of Custody Number: 2201229

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDE0137	5/8/18 6:10	5/8/18 12:48	EPA 245.1, 7470A	HSD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0184-06 (Water) - Chain of Custody Number: 2201229

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	41.0	1.00	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:35	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:35	EPA 300.0	CRL
Sulfate	29.0	1.00	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:35	EPA 300.0	CRL
Wet Chemistry										
pH	7.79		pH Units	M_TTT	1	BDD0424	4/20/18 10:21	4/20/18 12:58	SM 4500-H+ B	CRL
Total Dissolved Solids	402	20.0	mg/L		1	BDD0453	4/24/18 9:02	4/24/18 9:02	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0452	4/24/18 6:53	4/24/18 6:53	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.813	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Barium	107	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Chromium	0.512	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:59	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 15:02	EPA 200.7	HRD
Calcium	92.7	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 15:01	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 15:01	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0184-06 (Water) - Chain of Custody Number: 2201229

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDE0137	5/8/18 6:10	5/8/18 12:49	EPA 245.1, 7470A	HSD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0184-07 (Water) - Chain of Custody Number: 2201229

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	29.2	1.00	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:55	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:55	EPA 300.0	CRL
Sulfate	85.5	1.00	mg/L		1	BDD0432	4/23/18 5:47	4/23/18 20:55	EPA 300.0	CRL
Wet Chemistry										
pH	7.82		pH Units	M_TTT	1	BDD0424	4/20/18 10:21	4/20/18 13:04	SM 4500-H+ B	CRL
Total Dissolved Solids	442	20.0	mg/L		1	BDD0453	4/24/18 9:02	4/24/18 9:02	SM 2540C	HSD
Total Suspended Solids	9.60	4.00	mg/L		1	BDD0452	4/24/18 6:53	4/24/18 6:53	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.891	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Barium	115	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Cobalt	0.685	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Chromium	2.20	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Selenium	0.760	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 12:03	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.128	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 15:07	EPA 200.7	HRD
Calcium	93.1	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 15:06	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 15:06	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

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MDD0184-07 (Water) - Chain of Custody Number: 2201229

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BDE0137	5/8/18 6:10	5/8/18 12:51	EPA 245.1, 7470A	HSD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0120 - Wet Prep										
Blank (BDD0120-BLK1)				Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
Blank (BDD0120-BLK2)				Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BDD0120-BS1)				Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	23.7	1.00	mg/L	25.000		95.0	90-110			
Fluoride	4.57	0.750	mg/L	5.0000		91.4	90-110			
Sulfate	94.2	1.00	mg/L	100.00		94.2	90-110			
LCS (BDD0120-BS2)				Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	23.8	1.00	mg/L	25.000		95.4	90-110			
Fluoride	4.71	0.750	mg/L	5.0000		94.2	90-110			
Sulfate	94.7	1.00	mg/L	100.00		94.7	90-110			
LCS (BDD0120-BS3)				Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	23.7	1.00	mg/L	25.000		94.9	90-110			
Fluoride	4.67	0.750	mg/L	5.0000		93.4	90-110			
Sulfate	94.1	1.00	mg/L	100.00		94.1	90-110			
Duplicate (BDD0120-DUP1)		**Source: MDD0036-01**		Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	30.1	1.00	mg/L		29.9			0.534	20	
Fluoride	0.143	0.750	mg/L		0.153			6.76	20	
Sulfate	44.9	1.00	mg/L		44.7			0.462	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0120 - Wet Prep										
Duplicate (BDD0120-DUP2)		**Source: MDD0048-01**		Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	14.5	1.00	mg/L		14.4			0.477	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	10.1	1.00	mg/L		9.81			2.87	20	
Matrix Spike (BDD0120-MS1)		**Source: MDD0036-01**		Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	41.5	1.00	mg/L	12.500	29.9	92.8	80-120			
Fluoride	2.49	0.750	mg/L	2.5000	0.153	93.6	80-120			
Sulfate	92.0	1.00	mg/L	50.000	44.7	94.7	80-120			
Matrix Spike (BDD0120-MS2)		**Source: MDD0048-01**		Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	25.7	1.00	mg/L	12.500	14.4	90.1	80-120			
Fluoride	2.33	0.750	mg/L	2.5000	<0.750	93.4	80-120			
Sulfate	56.4	1.00	mg/L	50.000	9.81	93.1	80-120			
Matrix Spike Dup (BDD0120-MSD1)		**Source: MDD0036-01**		Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	41.7	1.00	mg/L	12.500	29.9	94.4	80-120	0.481	20	
Fluoride	2.56	0.750	mg/L	2.5000	0.153	96.2	80-120	2.57	20	
Sulfate	93.0	1.00	mg/L	50.000	44.7	96.5	80-120	0.983	20	
Matrix Spike Dup (BDD0120-MSD2)		**Source: MDD0048-01**		Prepared: 04/05/2018 Analyzed: 04/06/2018						
Chloride	26.0	1.00	mg/L	12.500	14.4	92.3	80-120	1.03	20	
Fluoride	2.39	0.750	mg/L	2.5000	<0.750	95.6	80-120	2.37	20	
Sulfate	57.2	1.00	mg/L	50.000	9.81	94.9	80-120	1.56	20	
Batch BDD0432 - Wet Prep										
Blank (BDD0432-BLK1)				Prepared & Analyzed: 04/23/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0432 - Wet Prep										
Blank (BDD0432-BLK2)				Prepared & Analyzed: 04/23/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BDD0432-BS1)				Prepared & Analyzed: 04/23/2018						
Chloride	23.8	1.00	mg/L	25.000		95.1	90-110			
Fluoride	4.76	0.750	mg/L	5.0000		95.1	90-110			
Sulfate	95.9	1.00	mg/L	100.00		95.9	90-110			
LCS (BDD0432-BS2)				Prepared & Analyzed: 04/23/2018						
Chloride	23.4	1.00	mg/L	25.000		93.6	90-110			
Fluoride	4.54	0.750	mg/L	5.0000		90.9	90-110			
Sulfate	93.9	1.00	mg/L	100.00		93.9	90-110			
LCS (BDD0432-BS3)				Prepared & Analyzed: 04/23/2018						
Chloride	23.4	1.00	mg/L	25.000		93.4	90-110			
Fluoride	4.72	0.750	mg/L	5.0000		94.4	90-110			
Sulfate	97.1	1.00	mg/L	100.00		97.1	90-110			
Duplicate (BDD0432-DUP1)		**Source: MDD0183-06**		Prepared & Analyzed: 04/23/2018						
Chloride	11.8	1.00	mg/L		11.8			0.161	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	22.7	1.00	mg/L		22.8			0.0615	20	
Duplicate (BDD0432-DUP2)		**Source: MDD0183-08**		Prepared & Analyzed: 04/23/2018						
Chloride	11.5	1.00	mg/L		11.6			0.364	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	11.7	1.00	mg/L		11.8			1.15	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0432 - Wet Prep										
Matrix Spike (BDD0432-MS1)		**Source: MDD0183-06**		Prepared & Analyzed: 04/23/2018						
Chloride	23.6	1.00	mg/L	12.500	11.8	94.1	80-120			
Fluoride	2.34	0.750	mg/L	2.5000	<0.750	93.6	80-120			
Sulfate	70.1	1.00	mg/L	50.000	22.8	94.6	80-120			
Matrix Spike (BDD0432-MS2)		**Source: MDD0183-08**		Prepared & Analyzed: 04/23/2018						
Chloride	22.9	1.00	mg/L	12.500	11.6	90.4	80-120			
Fluoride	2.28	0.750	mg/L	2.5000	<0.750	91.0	80-120			
Sulfate	57.6	1.00	mg/L	50.000	11.8	91.6	80-120			
Matrix Spike Dup (BDD0432-MSD1)		**Source: MDD0183-06**		Prepared & Analyzed: 04/23/2018						
Chloride	23.6	1.00	mg/L	12.500	11.8	94.2	80-120	0.0425	20	
Fluoride	2.26	0.750	mg/L	2.5000	<0.750	90.6	80-120	3.30	20	
Sulfate	69.1	1.00	mg/L	50.000	22.8	92.7	80-120	1.35	20	
Matrix Spike Dup (BDD0432-MSD2)		**Source: MDD0183-08**		Prepared & Analyzed: 04/23/2018						
Chloride	23.2	1.00	mg/L	12.500	11.6	92.8	80-120	1.33	20	
Fluoride	2.26	0.750	mg/L	2.5000	<0.750	90.6	80-120	0.485	20	
Sulfate	58.2	1.00	mg/L	50.000	11.8	92.7	80-120	0.921	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0090 - Wet Prep										
LCS (BDD0090-BS1)				Prepared & Analyzed: 04/04/2018						
pH	7.07		pH Units	7.0000		101	90-110			
Duplicate (BDD0090-DUP1)		**Source: MDD0048-01**		Prepared & Analyzed: 04/04/2018						
pH	8.04		pH Units		8.07			0.372	20	
Duplicate (BDD0090-DUP2)		**Source: MDD0052-02**		Prepared & Analyzed: 04/04/2018						
pH	7.68		pH Units		7.66			0.261	20	
Batch BDD0124 - Wet Prep										
Blank (BDD0124-BLK1)				Prepared & Analyzed: 04/06/2018						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDD0124-DUP1)		**Source: MDD0052-02**		Prepared & Analyzed: 04/06/2018						
Total Suspended Solids	53.2	4.00	mg/L		54.8			2.96	20	
Batch BDD0125 - Wet Prep										
Blank (BDD0125-BLK1)				Prepared & Analyzed: 04/06/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDD0125-DUP1)		**Source: MDD0052-02**		Prepared & Analyzed: 04/06/2018						
Total Dissolved Solids	304	20.0	mg/L		270			11.8	20	
Batch BDD0424 - Wet Prep										
LCS (BDD0424-BS1)				Prepared & Analyzed: 04/20/2018						
pH	7.08		pH Units	7.0000		101	90-110			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0424 - Wet Prep										
Duplicate (BDD0424-DUP1)		**Source: MDD0183-01**		Prepared & Analyzed: 04/20/2018						
pH	7.52		pH Units		7.55			0.398	20	
Duplicate (BDD0424-DUP2)		**Source: MDD0184-02**		Prepared & Analyzed: 04/20/2018						
pH	7.73		pH Units		7.73			0.00	20	
Batch BDD0452 - Wet Prep										
Blank (BDD0452-BLK1)				Prepared & Analyzed: 04/24/2018						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDD0452-DUP1)		**Source: MDD0184-01**		Prepared & Analyzed: 04/24/2018						
Total Suspended Solids	12.8	4.00	mg/L		12.8			0.00	20	
Batch BDD0453 - Wet Prep										
Blank (BDD0453-BLK1)				Prepared & Analyzed: 04/24/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDD0453-DUP1)		**Source: MDD0184-01**		Prepared & Analyzed: 04/24/2018						
Total Dissolved Solids	238	20.0	mg/L		246			3.31	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0147 - EPA 200.2, EPA 3005										
Blank (BDD0147-BLK1)				Prepared: 04/09/2018 Analyzed: 04/10/2018						
Chromium	<0.500	0.500	ug/L							
Thallium	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Molybdenum	<0.500	0.500	ug/L							
Beryllium	<0.500	0.500	ug/L							
Antimony	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Cadmium	<0.100	0.100	ug/L							
Arsenic	<0.500	0.500	ug/L							
LCS (BDD0147-BS1)				Prepared: 04/09/2018 Analyzed: 04/10/2018						
Molybdenum	98.4	0.500	ug/L	100.00		98.4	85-115			
Barium	97.9	0.500	ug/L	100.00		97.9	85-115			
Arsenic	99.2	0.500	ug/L	100.00		99.2	85-115			
Thallium	98.6	0.500	ug/L	100.00		98.6	85-115			
Cobalt	100	0.500	ug/L	100.00		100	85-115			
Cadmium	99.5	0.100	ug/L	100.00		99.5	85-115			
Beryllium	98.4	0.500	ug/L	100.00		98.4	85-115			
Lead	98.1	0.500	ug/L	100.00		98.1	85-115			
Antimony	99.1	0.500	ug/L	100.00		99.1	85-115			
Selenium	98.6	0.500	ug/L	100.00		98.6	85-115			
Chromium	99.5	0.500	ug/L	100.00		99.5	85-115			
Duplicate (BDD0147-DUP1)		**Source: MDD0052-03**		Prepared: 04/09/2018 Analyzed: 04/10/2018						
Selenium	0.261	0.500	ug/L		0.297			12.7	20	
Thallium	0.0522	0.500	ug/L		<0.500				20	
Cobalt	0.435	0.500	ug/L		0.455			4.49	20	
Beryllium	0.127	0.500	ug/L		<0.500				20	
Arsenic	0.738	0.500	ug/L		0.708			4.20	20	
Cadmium	0.0336	0.100	ug/L		0.0242			32.6	20	M_D-RL
Molybdenum	0.207	0.500	ug/L		0.209			0.531	20	
Antimony	0.0943	0.500	ug/L		0.0638			38.6	20	M_D-RL
Chromium	0.758	0.500	ug/L		0.985			26.0	20	M_D
Barium	80.9	0.500	ug/L		82.0			1.36	20	
Lead	0.201	0.500	ug/L		0.182			9.73	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0147 - EPA 200.2, EPA 3005										
Matrix Spike (BDD0147-MS1)		**Source: MDD0052-03**		Prepared: 04/09/2018 Analyzed: 04/10/2018						
Cobalt	103	0.500	ug/L	100.00	0.455	102	70-130			
Antimony	101	0.500	ug/L	100.00	0.0638	101	70-130			
Arsenic	104	0.500	ug/L	100.00	0.708	103	70-130			
Chromium	104	0.500	ug/L	100.00	0.985	103	70-130			
Lead	92.0	0.500	ug/L	100.00	0.182	91.8	70-130			
Thallium	94.5	0.500	ug/L	100.00	<0.500	94.5	70-130			
Molybdenum	99.1	0.500	ug/L	100.00	0.209	98.9	70-130			
Selenium	101	0.500	ug/L	100.00	0.297	101	70-130			
Cadmium	98.8	0.100	ug/L	100.00	0.0242	98.8	70-130			
Beryllium	99.1	0.500	ug/L	100.00	<0.500	99.1	70-130			
Barium	182	0.500	ug/L	100.00	82.0	99.9	70-130			
Matrix Spike Dup (BDD0147-MSD1)		**Source: MDD0052-03**		Prepared: 04/09/2018 Analyzed: 04/10/2018						
Barium	184	0.500	ug/L	100.00	82.0	102	70-130	1.14	20	
Beryllium	99.5	0.500	ug/L	100.00	<0.500	99.5	70-130	0.426	20	
Arsenic	105	0.500	ug/L	100.00	0.708	104	70-130	1.11	20	
Thallium	96.2	0.500	ug/L	100.00	<0.500	96.2	70-130	1.73	20	
Molybdenum	102	0.500	ug/L	100.00	0.209	102	70-130	2.92	20	
Selenium	94.6	0.500	ug/L	100.00	0.297	94.3	70-130	6.49	20	
Antimony	101	0.500	ug/L	100.00	0.0638	101	70-130	0.341	20	
Chromium	102	0.500	ug/L	100.00	0.985	101	70-130	1.87	20	
Lead	94.6	0.500	ug/L	100.00	0.182	94.4	70-130	2.80	20	
Cobalt	102	0.500	ug/L	100.00	0.455	101	70-130	0.679	20	
Cadmium	98.4	0.100	ug/L	100.00	0.0242	98.4	70-130	0.421	20	
Batch BDD0438 - EPA 200.2, EPA 3005										
Blank (BDD0438-BLK1)				Prepared: 04/23/2018 Analyzed: 04/24/2018						
Beryllium	<0.500	0.500	ug/L							
Molybdenum	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Cadmium	<0.100	0.100	ug/L							
Arsenic	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Antimony	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Thallium	<0.500	0.500	ug/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0438 - EPA 200.2, EPA 3005										
Blank (BDD0438-BLK2)				Prepared: 04/23/2018 Analyzed: 04/24/2018						
Selenium	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Beryllium	<0.500	0.500	ug/L							
Molybdenum	<0.500	0.500	ug/L							
Thallium	<0.500	0.500	ug/L							
Antimony	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Cadmium	<0.100	0.100	ug/L							
Barium	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
LCS (BDD0438-BS1)				Prepared: 04/23/2018 Analyzed: 04/24/2018						
Chromium	101	0.500	ug/L	100.00		101	85-115			
Selenium	97.9	0.500	ug/L	100.00		97.9	85-115			
Lead	97.9	0.500	ug/L	100.00		97.9	85-115			
Antimony	98.5	0.500	ug/L	100.00		98.5	85-115			
Molybdenum	97.2	0.500	ug/L	100.00		97.2	85-115			
Arsenic	97.4	0.500	ug/L	100.00		97.4	85-115			
Barium	97.9	0.500	ug/L	100.00		97.9	85-115			
Cobalt	99.3	0.500	ug/L	100.00		99.3	85-115			
Thallium	98.3	0.500	ug/L	100.00		98.3	85-115			
Cadmium	101	0.100	ug/L	100.00		101	85-115			
Beryllium	94.1	0.500	ug/L	100.00		94.1	85-115			
LCS (BDD0438-BS2)				Prepared: 04/23/2018 Analyzed: 04/24/2018						
Cobalt	97.9	0.500	ug/L	100.00		97.9	85-115			
Chromium	98.8	0.500	ug/L	100.00		98.8	85-115			
Beryllium	101	0.500	ug/L	100.00		101	85-115			
Selenium	96.9	0.500	ug/L	100.00		96.9	85-115			
Molybdenum	103	0.500	ug/L	100.00		103	85-115			
Lead	104	0.500	ug/L	100.00		104	85-115			
Barium	104	0.500	ug/L	100.00		104	85-115			
Cadmium	99.6	0.100	ug/L	100.00		99.6	85-115			
Antimony	104	0.500	ug/L	100.00		104	85-115			
Arsenic	100	0.500	ug/L	100.00		100	85-115			
Thallium	104	0.500	ug/L	100.00		104	85-115			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0438 - EPA 200.2, EPA 3005										
Duplicate (BDD0438-DUP1)		**Source: MDD0177-04**		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Molybdenum	0.277	0.500	ug/L		0.195			34.9	20	M_D-RL
Cadmium	<0.100	0.100	ug/L		<0.100				20	
Chromium	0.783	0.500	ug/L		0.740			5.63	20	
Cobalt	0.0541	0.500	ug/L		0.0444			19.6	20	
Beryllium	0.144	0.500	ug/L		<0.500				20	
Selenium	0.292	0.500	ug/L		0.314			7.24	20	
Thallium	0.0755	0.500	ug/L		<0.500				20	
Barium	77.7	0.500	ug/L		79.3			2.01	20	
Antimony	0.0736	0.500	ug/L		<0.500				20	
Lead	0.0715	0.500	ug/L		0.0324			75.3	20	M_D-RL
Arsenic	0.630	0.500	ug/L		0.585			7.34	20	
Duplicate (BDD0438-DUP2)		**Source: MDD0177-05**		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Cobalt	0.548	0.500	ug/L		0.640			15.5	20	
Lead	0.257	0.500	ug/L		0.255			0.778	20	
Molybdenum	0.417	0.500	ug/L		0.436			4.46	20	
Beryllium	0.0229	0.500	ug/L		0.0254			10.1	20	
Chromium	4.71	0.500	ug/L		4.77			1.30	20	
Thallium	<0.500	0.500	ug/L		<0.500				20	
Barium	39.3	0.500	ug/L		39.0			0.688	20	
Arsenic	0.502	0.500	ug/L		0.497			0.876	20	
Selenium	0.629	0.500	ug/L		0.679			7.65	20	
Cadmium	<0.100	0.100	ug/L		<0.100				20	
Antimony	0.0547	0.500	ug/L		0.0338			47.2	20	M_D-RL
Duplicate (BDD0438-DUP3)		**Source: MDD0177-06**		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Thallium	<0.500	0.500	ug/L		<0.500				20	
Molybdenum	0.379	0.500	ug/L		0.384			1.40	20	
Arsenic	0.396	0.500	ug/L		0.385			2.65	20	
Cobalt	0.214	0.500	ug/L		0.201			6.07	20	
Cadmium	<0.100	0.100	ug/L		<0.100				20	
Lead	0.0851	0.500	ug/L		0.0876			2.96	20	
Antimony	<0.500	0.500	ug/L		<0.500				20	
Chromium	3.86	0.500	ug/L		3.68			4.89	20	
Selenium	0.842	0.500	ug/L		0.870			3.26	20	
Beryllium	<0.500	0.500	ug/L		0.00572				20	
Barium	46.7	0.500	ug/L		46.2			1.04	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0438 - EPA 200.2, EPA 3005										
Matrix Spike (BDD0438-MS1)	**Source: MDD0177-04**			Prepared: 04/23/2018 Analyzed: 04/24/2018						
Molybdenum	104	0.500	ug/L	100.00	0.195	104	70-130			
Beryllium	105	0.500	ug/L	100.00	<0.500	105	70-130			
Chromium	106	0.500	ug/L	100.00	0.740	105	70-130			
Thallium	99.7	0.500	ug/L	100.00	<0.500	99.7	70-130			
Barium	185	0.500	ug/L	100.00	79.3	106	70-130			
Arsenic	105	0.500	ug/L	100.00	0.585	105	70-130			
Selenium	99.9	0.500	ug/L	100.00	0.314	99.6	70-130			
Lead	97.5	0.500	ug/L	100.00	0.0324	97.4	70-130			
Antimony	105	0.500	ug/L	100.00	<0.500	105	70-130			
Cadmium	102	0.100	ug/L	100.00	<0.100	102	70-130			
Cobalt	103	0.500	ug/L	100.00	0.0444	103	70-130			
Matrix Spike (BDD0438-MS2)	**Source: MDD0177-05**			Prepared: 04/23/2018 Analyzed: 04/24/2018						
Selenium	100	0.500	ug/L	100.00	0.679	99.8	70-130			
Thallium	100	0.500	ug/L	100.00	<0.500	100	70-130			
Molybdenum	102	0.500	ug/L	100.00	0.436	102	70-130			
Cadmium	102	0.100	ug/L	100.00	<0.100	102	70-130			
Barium	145	0.500	ug/L	100.00	39.0	106	70-130			
Lead	97.7	0.500	ug/L	100.00	0.255	97.5	70-130			
Arsenic	103	0.500	ug/L	100.00	0.497	103	70-130			
Antimony	105	0.500	ug/L	100.00	0.0338	105	70-130			
Chromium	109	0.500	ug/L	100.00	4.77	104	70-130			
Cobalt	103	0.500	ug/L	100.00	0.640	102	70-130			
Beryllium	101	0.500	ug/L	100.00	0.0254	101	70-130			
Matrix Spike (BDD0438-MS3)	**Source: MDD0177-06**			Prepared: 04/23/2018 Analyzed: 04/24/2018						
Beryllium	99.2	0.500	ug/L	100.00	0.00572	99.2	70-130			
Thallium	96.4	0.500	ug/L	100.00	<0.500	96.4	70-130			
Antimony	101	0.500	ug/L	100.00	<0.500	101	70-130			
Molybdenum	101	0.500	ug/L	100.00	0.384	101	70-130			
Barium	149	0.500	ug/L	100.00	46.2	103	70-130			
Arsenic	103	0.500	ug/L	100.00	0.385	103	70-130			
Cobalt	99.7	0.500	ug/L	100.00	0.201	99.5	70-130			
Chromium	105	0.500	ug/L	100.00	3.68	102	70-130			
Selenium	101	0.500	ug/L	100.00	0.870	99.7	70-130			
Cadmium	101	0.100	ug/L	100.00	<0.100	101	70-130			
Lead	93.2	0.500	ug/L	100.00	0.0876	93.1	70-130			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0438 - EPA 200.2, EPA 3005										
Matrix Spike Dup (BDD0438-MSD1)		**Source: MDD0177-04**		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Lead	97.6	0.500	ug/L	100.00	0.0324	97.5	70-130	0.0785	20	
Barium	184	0.500	ug/L	100.00	79.3	105	70-130	0.478	20	
Thallium	99.2	0.500	ug/L	100.00	<0.500	99.2	70-130	0.520	20	
Molybdenum	104	0.500	ug/L	100.00	0.195	104	70-130	0.518	20	
Arsenic	106	0.500	ug/L	100.00	0.585	105	70-130	0.556	20	
Cobalt	101	0.500	ug/L	100.00	0.0444	101	70-130	2.11	20	
Selenium	99.0	0.500	ug/L	100.00	0.314	98.6	70-130	0.997	20	
Cadmium	101	0.100	ug/L	100.00	<0.100	101	70-130	1.18	20	
Chromium	103	0.500	ug/L	100.00	0.740	103	70-130	2.18	20	
Beryllium	102	0.500	ug/L	100.00	<0.500	102	70-130	2.70	20	
Antimony	104	0.500	ug/L	100.00	<0.500	104	70-130	0.695	20	
Matrix Spike Dup (BDD0438-MSD2)		**Source: MDD0177-05**		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Selenium	101	0.500	ug/L	100.00	0.679	100	70-130	0.652	20	
Antimony	107	0.500	ug/L	100.00	0.0338	107	70-130	1.52	20	
Thallium	103	0.500	ug/L	100.00	<0.500	103	70-130	2.75	20	
Barium	148	0.500	ug/L	100.00	39.0	109	70-130	2.08	20	
Lead	101	0.500	ug/L	100.00	0.255	101	70-130	3.64	20	
Cadmium	100	0.100	ug/L	100.00	<0.100	100	70-130	1.42	20	
Chromium	109	0.500	ug/L	100.00	4.77	104	70-130	0.238	20	
Cobalt	103	0.500	ug/L	100.00	0.640	103	70-130	0.377	20	
Beryllium	104	0.500	ug/L	100.00	0.0254	104	70-130	2.77	20	
Arsenic	108	0.500	ug/L	100.00	0.497	107	70-130	3.89	20	
Molybdenum	106	0.500	ug/L	100.00	0.436	106	70-130	4.02	20	
Matrix Spike Dup (BDD0438-MSD3)		**Source: MDD0177-06**		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Cobalt	103	0.500	ug/L	100.00	0.201	102	70-130	2.81	20	
Antimony	104	0.500	ug/L	100.00	<0.500	104	70-130	2.83	20	
Barium	152	0.500	ug/L	100.00	46.2	106	70-130	2.08	20	
Chromium	109	0.500	ug/L	100.00	3.68	105	70-130	3.35	20	
Molybdenum	103	0.500	ug/L	100.00	0.384	103	70-130	1.87	20	
Cadmium	104	0.100	ug/L	100.00	<0.100	104	70-130	2.72	20	
Thallium	98.1	0.500	ug/L	100.00	<0.500	98.1	70-130	1.72	20	
Beryllium	102	0.500	ug/L	100.00	0.00572	102	70-130	3.07	20	
Arsenic	106	0.500	ug/L	100.00	0.385	106	70-130	2.78	20	
Selenium	101	0.500	ug/L	100.00	0.870	99.6	70-130	0.0309	20	
Lead	95.3	0.500	ug/L	100.00	0.0876	95.2	70-130	2.21	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0146 - EPA 200.2, EPA 3005										
Blank (BDD0146-BLK1)				Prepared: 04/09/2018 Analyzed: 04/10/2018						
Calcium	<0.500	0.500	mg/L							
Boron	<0.0500	0.0500	mg/L							
Lithium	<0.0500	0.0500	mg/L							
LCS (BDD0146-BS1)				Prepared: 04/09/2018 Analyzed: 04/10/2018						
Lithium	1.00	0.0500	mg/L	1.0000		100	85-115			
Boron	0.972	0.0500	mg/L	1.0000		97.2	85-115			
Calcium	102	0.500	mg/L	100.00		102	85-115			
Duplicate (BDD0146-DUP1)		**Source: MDD0052-02**		Prepared: 04/09/2018 Analyzed: 04/10/2018						
Lithium	<0.0500	0.0500	mg/L		<0.0500				20	
Boron	0.0499	0.0500	mg/L		0.0485			2.79	20	
Calcium	81.3	0.500	mg/L		80.1			1.42	20	
Matrix Spike (BDD0146-MS1)		**Source: MDD0052-02**		Prepared: 04/09/2018 Analyzed: 04/10/2018						
Lithium	1.01	0.0500	mg/L	1.0000	<0.0500	101	75-125			
Calcium	182	0.500	mg/L	100.00	80.1	102	70-130			
Boron	1.05	0.0500	mg/L	1.0000	0.0485	99.8	70-130			
Matrix Spike Dup (BDD0146-MSD1)		**Source: MDD0052-02**		Prepared: 04/09/2018 Analyzed: 04/10/2018						
Boron	1.08	0.0500	mg/L	1.0000	0.0485	103	70-130	2.94	20	
Calcium	184	0.500	mg/L	100.00	80.1	104	70-130	1.33	20	
Lithium	1.01	0.0500	mg/L	1.0000	<0.0500	101	75-125	0.350	20	
Batch BDD0437 - EPA 200.2, EPA 3005										
Blank (BDD0437-BLK1)				Prepared: 04/23/2018 Analyzed: 04/25/2018						
Calcium	<0.500	0.500	mg/L							
Boron	<0.0500	0.0500	mg/L							
Lithium	<0.0500	0.0500	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0437 - EPA 200.2, EPA 3005										
Blank (BDD0437-BLK2)				Prepared: 04/23/2018 Analyzed: 04/25/2018						
Calcium	<0.500	0.500	mg/L							
Lithium	<0.0500	0.0500	mg/L							
Boron	<0.0500	0.0500	mg/L							
LCS (BDD0437-BS1)				Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	1.01	0.0500	mg/L	1.0000		101	85-115			
Calcium	104	0.500	mg/L	100.00		104	85-115			
Lithium	1.00	0.0500	mg/L	1.0000		100	85-115			
LCS (BDD0437-BS2)				Prepared: 04/23/2018 Analyzed: 04/25/2018						
Calcium	101	0.500	mg/L	100.00		101	85-115			
Lithium	0.977	0.0500	mg/L	1.0000		97.7	85-115			
Boron	0.976	0.0500	mg/L	1.0000		97.6	85-115			
Duplicate (BDD0437-DUP1)		**Source: MDD0177-01**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	0.170	0.0500	mg/L		0.168			1.16	20	
Lithium	<0.0500	0.0500	mg/L		<0.0500				20	
Calcium	98.5	0.500	mg/L		98.8			0.371	20	
Duplicate (BDD0437-DUP2)		**Source: MDD0177-02**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	0.403	0.0500	mg/L		0.408			1.12	20	
Calcium	144	0.500	mg/L		145			0.827	20	
Lithium	<0.0500	0.0500	mg/L		<0.0500				20	
Duplicate (BDD0437-DUP3)		**Source: MDD0177-03**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Lithium	<0.0500	0.0500	mg/L		<0.0500				20	
Calcium	76.5	0.500	mg/L		76.3			0.331	20	
Boron	0.0360	0.0500	mg/L		0.0381			5.53	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0437 - EPA 200.2, EPA 3005										
Matrix Spike (BDD0437-MS1)		**Source: MDD0177-01**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	1.20	0.0500	mg/L	1.0000	0.168	103	70-130			
Lithium	1.01	0.0500	mg/L	1.0000	<0.0500	101	75-125			
Calcium	207	0.500	mg/L	100.00	98.8	109	70-130			
Matrix Spike (BDD0437-MS2)		**Source: MDD0177-02**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	1.44	0.0500	mg/L	1.0000	0.408	104	70-130			
Calcium	254	0.500	mg/L	100.00	145	108	70-130			
Lithium	0.993	0.0500	mg/L	1.0000	<0.0500	99.3	75-125			
Matrix Spike (BDD0437-MS3)		**Source: MDD0177-03**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	1.04	0.0500	mg/L	1.0000	0.0381	100	70-130			
Lithium	0.971	0.0500	mg/L	1.0000	<0.0500	97.1	75-125			
Calcium	175	0.500	mg/L	100.00	76.3	99.2	70-130			
Matrix Spike Dup (BDD0437-MSD1)		**Source: MDD0177-01**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Calcium	204	0.500	mg/L	100.00	98.8	106	70-130	1.46	20	
Lithium	0.996	0.0500	mg/L	1.0000	<0.0500	99.6	75-125	1.10	20	
Boron	1.19	0.0500	mg/L	1.0000	0.168	103	70-130	0.624	20	
Matrix Spike Dup (BDD0437-MSD2)		**Source: MDD0177-02**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Calcium	246	0.500	mg/L	100.00	145	100	70-130	3.22	20	
Boron	1.43	0.0500	mg/L	1.0000	0.408	102	70-130	1.13	20	
Lithium	0.967	0.0500	mg/L	1.0000	<0.0500	96.7	75-125	2.67	20	
Matrix Spike Dup (BDD0437-MSD3)		**Source: MDD0177-03**		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	1.03	0.0500	mg/L	1.0000	0.0381	99.3	70-130	1.17	20	
Calcium	174	0.500	mg/L	100.00	76.3	98.2	70-130	0.558	20	
Lithium	0.967	0.0500	mg/L	1.0000	<0.0500	96.7	75-125	0.427	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Mercury - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDD0198 - EPA 245.1, EPA 7470A										
Blank (BDD0198-BLK1)				Prepared & Analyzed: 04/11/2018						
Mercury	<0.200	0.200	ug/L							
LCS (BDD0198-BS1)				Prepared & Analyzed: 04/11/2018						
Mercury	2.72	0.200	ug/L	3.0000		90.6	85-115			
Duplicate (BDD0198-DUP1)		**Source: MDD0052-04**		Prepared & Analyzed: 04/11/2018						
Mercury	<0.200	0.200	ug/L		<0.200				20	
Matrix Spike (BDD0198-MS1)		**Source: MDD0052-04**		Prepared & Analyzed: 04/11/2018						
Mercury	2.67	0.200	ug/L	3.0000	<0.200	88.9	70-130			
Matrix Spike Dup (BDD0198-MSD1)		**Source: MDD0052-04**		Prepared & Analyzed: 04/11/2018						
Mercury	2.57	0.200	ug/L	3.0000	<0.200	85.8	70-130	3.48	20	
Batch BDE0137 - EPA 245.1, EPA 7470A										
Blank (BDE0137-BLK1)				Prepared & Analyzed: 05/08/2018						
Mercury	<0.200	0.200	ug/L							
LCS (BDE0137-BS1)				Prepared & Analyzed: 05/08/2018						
Mercury	2.73	0.200	ug/L	3.0000		91.1	85-115			
LCS (BDE0137-BS2)				Prepared & Analyzed: 05/08/2018						
Mercury	2.62	0.200	ug/L	3.0000		87.3	85-115			
LCS (BDE0137-BS3)				Prepared & Analyzed: 05/08/2018						
Mercury	2.66	0.200	ug/L	3.0000		88.7	85-115			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Mercury - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDE0137 - EPA 245.1, EPA 7470A										
LCS (BDE0137-BS4)				Prepared & Analyzed: 05/08/2018						
Mercury	2.75	0.200	ug/L	3.0000		91.8	85-115			
Duplicate (BDE0137-DUP1)		**Source: MDD0184-06**		Prepared & Analyzed: 05/08/2018						
Mercury	<0.200	0.200	ug/L		<0.200				20	
Duplicate (BDE0137-DUP2)		**Source: MDD0227-03**		Prepared & Analyzed: 05/08/2018						
Mercury	<0.200	0.200	ug/L		<0.200				20	
Matrix Spike (BDE0137-MS1)		**Source: MDD0184-06**		Prepared & Analyzed: 05/08/2018						
Mercury	2.76	0.200	ug/L	3.0000	<0.200	91.9	70-130			
Matrix Spike (BDE0137-MS2)		**Source: MDD0227-03**		Prepared & Analyzed: 05/08/2018						
Mercury	2.65	0.200	ug/L	3.0000	<0.200	88.3	70-130			
Matrix Spike Dup (BDE0137-MSD1)		**Source: MDD0184-06**		Prepared & Analyzed: 05/08/2018						
Mercury	2.64	0.200	ug/L	3.0000	<0.200	88.0	70-130	4.28	20	
Matrix Spike Dup (BDE0137-MSD2)		**Source: MDD0227-03**		Prepared & Analyzed: 05/08/2018						
Mercury	2.63	0.200	ug/L	3.0000	<0.200	87.6	70-130	0.781	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 12:53

Qualifiers and Definitions

M_TTT	Sample received at the lab outside of required hold time.
M_D-RL	The RPD for the sample duplicate was outside of QC acceptance limits due to<RL.
M_D	The RPD for the sample duplicate was outside of QC acceptance limits possibly due to non-homogeneous matrix.
Z	Non Accredited Analyte
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

DJA 4/3/18

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2201224

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Xcel Energy	Report To: Chuck Donkers	Attention: Steve Davis
Address: Environmental Services MP-7	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Sherco CCR, April 2018	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

	ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: GW-CCR	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1.	1	Rinse	WT				4/2/18	1130		4	1	1	2						✓		
1.	2	P-120	↓				↓	1235		4	1	1	2						✓		
1.	3	P-98	↓				↓	1340		4	1	1	2						✓		
1.	4	P-97	↓				↓	1450		4	1	1	2						✓		
1.	5	P-75-1	↓				↓	1535		4	1	1	2						✓		
1.	6	P-117	↓				↓	1650		4	1	1	2						✓		
1.	7	P-74-1	↓				↓	1740		4	1	1	2						✓		
1.	8	P-734-1	↓				↓	1840		4	1	1	2						✓		
1.	9	P-125	WT				4/3/18	0915		4	1	1	2						✓		
	10																				
	11																				
	12																				

DJA 4/3/18

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
1. Sherco III well also, analyzed for GW-A list in the Spring.	~~David Anderson / Pace~~	4/3/18		[signature] / Xcel	4/4/18	1030	MB0841: 3.5
	David Anderson / Pace	4/4/18	1030				
2. Sherco NPDES well also, analyzed for GW-B list in the Spring. Noted next to Item #.							

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Y	Y	Y

ORIGINAL

pH strips: MB00508

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: David Anderson
SIGNATURE of SAMPLER: David Anderson
DATE Signed (MM/DD/YY): 4/3/18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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2201229

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Xcel Energy	Report To: Chuck Donkers	Attention: Steve Davis
Address: Environmental Services MP-7	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Sherco CCR, April 2018	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

	ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	TIME	COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	GW-CCR									Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
2.	1	P-156 ⓧ Total	WT				4/18/18	1510		4	1		12							✓										* ccl
2.	2	P-014-1	↓				↓	1640		4	1		12							✓										B
2.	3	P-155	↓				↓	1740		4	1		12							✓										* ccl
1.	4	P-134	WT				4/19/18	1015		4	1		12							✓										A
	5	P-141	↓				↓	1110		4	1		12							✓										A
1.	6	P-138A ⓧ Total	↓				↓	1230		4	1		12							✓										A
1.	7	P-137A ⓧ Dissolved	↓				↓	1425		4	1		12							✓										A
	8																													
	9																													
	10																													
	11																													
	12																													

DJA 4/19/18

ⓧ Added 0.65ml MCE205 HNO 4/20/18 0955

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
1. Sherco III well also, analyzed for GW-A list in the Spring.	David Anderson / Pace	4/20/18	0925	/ Xcel	4/20/18	0930	2.7°C MU0084!			
2. Sherco NPDES well also, analyzed for GW-B list in the spring. Noted next to Item #								Y	Y	X

ORIGINAL

1st Shift MB00585

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson

DATE Signed (MM/DD/YY): 4-19-18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

May 15, 2018

Dave Anderson
Pace Analytical Services - Field Svcs Division
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Dear Dave Anderson:
Enclosed are the analytical results for sample(s) received by the laboratory on April 24, 2018. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Harry S. Davis III, Xcel Energy
Charles A. Donkers, Xcel Energy
Christine M. Keefe, Xcel Energy
Ciara Ruikkie, Pace Analytical Services - Field Svcs Division

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30250570001	**P-120**	Water	04/02/18 12:35	04/24/18 10:30
30250570002	**P-98**	Water	04/02/18 13:40	04/24/18 10:30
30250570003	**P-97**	Water	04/02/18 14:50	04/24/18 10:30
30250570004	**P-75-1**	Water	04/02/18 15:35	04/24/18 10:30
30250570005	**P-117**	Water	04/02/18 16:50	04/24/18 10:30
30250570006	**P-74-1**	Water	04/02/18 17:40	04/24/18 10:30
30250570007	**P-73a-1**	Water	04/02/18 18:40	04/24/18 10:30
30250570008	**P-125**	Water	04/03/18 09:15	04/24/18 10:30
30250570009	**P-162**	Water	04/16/18 14:10	04/24/18 10:30
30250570010	**P-163**	Water	04/16/18 15:10	04/24/18 10:30
30250570011	**P-164**	Water	04/16/18 16:30	04/24/18 10:30
30250570012	**P-131**	Water	04/16/18 17:50	04/24/18 10:30
30250570013	**P-165**	Water	04/17/18 12:05	04/24/18 10:30
30250570014	**P-132**	Water	04/17/18 09:45	04/24/18 10:30
30250570015	**P-154a**	Water	04/17/18 11:00	04/24/18 10:30
30250570016	**P-150**	Water	04/17/18 13:15	04/24/18 10:30
30250570017	**P-151**	Water	04/17/18 15:00	04/24/18 10:30
30250570018	**P-153**	Water	04/17/18 15:50	04/24/18 10:30
30250570019	**P-130**	Water	04/17/18 17:00	04/24/18 10:30
30250570020	**P-17**	Water	04/17/18 18:20	04/24/18 10:30
30250570021	**P-152a**	Water	04/18/18 08:40	04/24/18 10:30
30250570022	**P-158**	Water	04/18/18 10:00	04/24/18 10:30
30250570023	**P-157**	Water	04/18/18 11:00	04/24/18 10:30
30250570024	**P-23**	Water	04/18/18 12:30	04/24/18 10:30
30250570025	**P-22**	Water	04/18/18 13:40	04/24/18 10:30
30250570026	**P-156**	Water	04/18/18 15:10	04/24/18 10:30
30250570027	**P-01a-1**	Water	04/18/18 16:40	04/24/18 10:30
30250570028	**P-155**	Water	04/18/18 17:40	04/24/18 10:30
30250570029	**P-134**	Water	04/19/18 10:15	04/24/18 10:30
30250570030	**P-141**	Water	04/19/18 11:10	04/24/18 10:30
30250570031	**P-138A**	Water	04/19/18 12:30	04/24/18 10:30
30250570032	**P-137A**	Water	04/19/18 14:25	04/24/18 10:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30250570001	**P-120**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570002	**P-98**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570003	**P-97**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570004	**P-75-1**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570005	**P-117**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570006	**P-74-1**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570007	**P-73a-1**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570008	**P-125**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570009	**P-162**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570010	**P-163**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570011	**P-164**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570012	**P-131**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570013	**P-165**	EPA 903.1	KAC	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570014	**P-132**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570015	**P-154a**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570016	**P-150**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570017	**P-151**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570018	**P-153**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570019	**P-130**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570020	**P-17**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570021	**P-152a**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570022	**P-158**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570023	**P-157**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570024	**P-23**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570025	**P-22**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Total Radium Calculation	CMC	1	PASI-PA
30250570026	**P-156**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570027	**P-01a-1**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570028	**P-155**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570029	**P-134**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570030	**P-141**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570031	**P-138A**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30250570032	**P-137A**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

Pace Analytical Services, LLC
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PROJECT NARRATIVE

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: Pace-MN Field Services Division
Date: May 15, 2018

General Information:
32 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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PROJECT NARRATIVE

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: Pace-MN Field Services Division
Date: May 15, 2018

General Information:
32 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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PROJECT NARRATIVE

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: Pace-MN Field Services Division
Date: May 15, 2018

General Information:
32 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Sample: P-120 **Lab ID: 30250570001** Collected: 04/02/18 12:35 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample IDs were not present on the sample containers, collection dates and times match.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.631 ± 0.544 (0.809) C:NA T:94%**	pCi/L	05/08/18 19:59	13982-63-3	
Radium-228	EPA 904.0	**0.719 ± 0.358 (0.617) C:77% T:90%**	pCi/L	05/11/18 11:18	15262-20-1	
Total Radium	Total Radium Calculation	**1.35 ± 0.902 (1.43)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-98 **Lab ID: 30250570002** Collected: 04/02/18 13:40 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.059 ± 0.385 (0.836) C:NA T:88%**	pCi/L	05/08/18 19:59	13982-63-3	
Radium-228	EPA 904.0	**0.361 ± 0.341 (0.698) C:77% T:89%**	pCi/L	05/11/18 14:25	15262-20-1	
Total Radium	Total Radium Calculation	**0.361 ± 0.726 (1.53)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-97 **Lab ID: 30250570003** Collected: 04/02/18 14:50 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.240 ± 0.276 (0.163) C:NA T:88%**	pCi/L	05/08/18 19:59	13982-63-3	
Radium-228	EPA 904.0	**0.0561 ± 0.293 (0.671) C:79% T:82%**	pCi/L	05/11/18 14:25	15262-20-1	
Total Radium	Total Radium Calculation	**0.296 ± 0.569 (0.834)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-75-1 **Lab ID: 30250570004** Collected: 04/02/18 15:35 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.179 ± 0.311 (0.555) C:NA T:89%**	pCi/L	05/08/18 19:59	13982-63-3	
Radium-228	EPA 904.0	**-0.271 ± 0.237 (0.624) C:78% T:84%**	pCi/L	05/11/18 14:26	15262-20-1	
Total Radium	Total Radium Calculation	**0.179 ± 0.548 (1.18)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-117 **Lab ID: 30250570005** Collected: 04/02/18 16:50 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.172 ± 0.297 (0.531) C:NA T:90%**	pCi/L	05/08/18 19:59	13982-63-3	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Sample: P-117 **Lab ID: 30250570005** Collected: 04/02/18 16:50 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-228	EPA 904.0	**0.291 ± 0.325 (0.679) C:75% T:84%**	pCi/L	05/11/18 14:26	15262-20-1	
Total Radium	Total Radium Calculation	**0.463 ± 0.622 (1.21)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-74-1 **Lab ID: 30250570006** Collected: 04/02/18 17:40 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.310 ± 0.324 (0.875) C:NA T:83%**	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	**0.711 ± 0.352 (0.596) C:79% T:85%**	pCi/L	05/11/18 14:26	15262-20-1	
Total Radium	Total Radium Calculation	**0.711 ± 0.676 (1.47)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-73a-1 **Lab ID: 30250570007** Collected: 04/02/18 18:40 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0551 ± 0.252 (0.512) C:NA T:93%**	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	**0.369 ± 0.282 (0.546) C:80% T:89%**	pCi/L	05/11/18 14:26	15262-20-1	
Total Radium	Total Radium Calculation	**0.424 ± 0.534 (1.06)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-125 **Lab ID: 30250570008** Collected: 04/03/18 09:15 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0573 ± 0.262 (0.155) C:NA T:94%**	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	**0.608 ± 0.377 (0.710) C:81% T:83%**	pCi/L	05/11/18 11:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.665 ± 0.639 (0.865)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-162 **Lab ID: 30250570009** Collected: 04/16/18 14:10 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.183 ± 0.279 (0.449) C:NA T:91%**	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	**0.379 ± 0.367 (0.757) C:82% T:85%**	pCi/L	05/11/18 12:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.562 ± 0.646 (1.21)**	pCi/L	05/15/18 10:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Sample: P-163 **Lab ID: 30250570010** Collected: 04/16/18 15:10 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.193 ± 0.294 (0.174) C:NA T:83%**	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	**0.348 ± 0.340 (0.700) C:82% T:83%**	pCi/L	05/11/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	**0.541 ± 0.634 (0.874)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-164 **Lab ID: 30250570011** Collected: 04/16/18 16:30 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.554 ± 0.440 (0.572) C:NA T:85%**	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	**0.235 ± 0.349 (0.753) C:84% T:88%**	pCi/L	05/11/18 13:30	15262-20-1	
Total Radium	Total Radium Calculation	**0.789 ± 0.789 (1.33)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-131 **Lab ID: 30250570012** Collected: 04/16/18 17:50 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.060 ± 0.312 (0.722) C:NA T:86%**	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	**0.807 ± 0.379 (0.650) C:83% T:89%**	pCi/L	05/11/18 11:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.807 ± 0.691 (1.37)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-165 **Lab ID: 30250570013** Collected: 04/17/18 12:05 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.105 ± 0.291 (0.564) C:NA T:96%**	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	**0.354 ± 0.372 (0.774) C:79% T:85%**	pCi/L	05/11/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	**0.459 ± 0.663 (1.34)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-132 **Lab ID: 30250570014** Collected: 04/17/18 09:45 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.414 ± 0.388 (0.550) C:NA T:85%**	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	**0.291 ± 0.330 (0.694) C:81% T:91%**	pCi/L	05/11/18 11:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Sample: P-132 **Lab ID: 30250570014** Collected: 04/17/18 09:45 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.705 ± 0.718 (1.24)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-154a **Lab ID: 30250570015** Collected: 04/17/18 11:00 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.296 ± 0.350 (0.551) C:NA T:88%**	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	**0.682 ± 0.415 (0.777) C:82% T:81%**	pCi/L	05/11/18 15:06	15262-20-1	
Total Radium	Total Radium Calculation	**0.978 ± 0.765 (1.33)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-150 **Lab ID: 30250570016** Collected: 04/17/18 13:15 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.166 ± 0.325 (0.594) C:NA T:91%**	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	**0.610 ± 0.456 (0.905) C:79% T:78%**	pCi/L	05/11/18 15:07	15262-20-1	
Total Radium	Total Radium Calculation	**0.776 ± 0.781 (1.50)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-151 **Lab ID: 30250570017** Collected: 04/17/18 15:00 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.281 ± 0.332 (0.522) C:NA T:92%**	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	**0.165 ± 0.327 (0.720) C:83% T:87%**	pCi/L	05/11/18 15:07	15262-20-1	
Total Radium	Total Radium Calculation	**0.446 ± 0.659 (1.24)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-153 **Lab ID: 30250570018** Collected: 04/17/18 15:50 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.375 ± 0.389 (0.580) C:NA T:87%**	pCi/L	05/08/18 20:41	13982-63-3	
Radium-228	EPA 904.0	**-0.166 ± 0.329 (0.796) C:81% T:85%**	pCi/L	05/11/18 15:07	15262-20-1	
Total Radium	Total Radium Calculation	**0.375 ± 0.718 (1.38)**	pCi/L	05/15/18 10:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Sample: P-130 **Lab ID: 30250570019** Collected: 04/17/18 17:00 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.238 ± 0.287 (0.438) C:NA T:93%**	pCi/L	05/08/18 20:41	13982-63-3	
Radium-228	EPA 904.0	**0.227 ± 0.373 (0.810) C:84% T:83%**	pCi/L	05/11/18 15:07	15262-20-1	
Total Radium	Total Radium Calculation	**0.465 ± 0.660 (1.25)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-17 **Lab ID: 30250570020** Collected: 04/17/18 18:20 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.168 ± 0.291 (0.521) C:NA T:88%**	pCi/L	05/08/18 20:41	13982-63-3	
Radium-228	EPA 904.0	**0.416 ± 0.369 (0.751) C:81% T:86%**	pCi/L	05/11/18 15:07	15262-20-1	
Total Radium	Total Radium Calculation	**0.584 ± 0.660 (1.27)**	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-152a **Lab ID: 30250570021** Collected: 04/18/18 08:40 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.660 ± 0.490 (0.613) C:NA T:90%**	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	**0.797 ± 0.447 (0.840) C:84% T:86%**	pCi/L	05/11/18 11:15	15262-20-1	
Total Radium	Total Radium Calculation	**1.46 ± 0.937 (1.45)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-158 **Lab ID: 30250570022** Collected: 04/18/18 10:00 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.244 ± 0.294 (0.449) C:NA T:90%**	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	**0.246 ± 0.319 (0.679) C:85% T:88%**	pCi/L	05/11/18 11:15	15262-20-1	
Total Radium	Total Radium Calculation	**0.490 ± 0.613 (1.13)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-157 **Lab ID: 30250570023** Collected: 04/18/18 11:00 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.259 ± 0.313 (0.477) C:NA T:81%**	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	**0.471 ± 0.348 (0.679) C:80% T:82%**	pCi/L	05/11/18 11:15	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Sample: P-157 **Lab ID: 30250570023** Collected: 04/18/18 11:00 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.730 ± 0.661 (1.16)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-23 **Lab ID: 30250570024** Collected: 04/18/18 12:30 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.130 ± 0.296 (0.477) C:NA T:90%**	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	**0.264 ± 0.368 (0.789) C:80% T:82%**	pCi/L	05/11/18 11:15	15262-20-1	
Total Radium	Total Radium Calculation	**0.394 ± 0.664 (1.36)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-22 **Lab ID: 30250570025** Collected: 04/18/18 13:40 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.442 (0.904) C:NA T:95%**	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	**0.00902 ± 0.328 (0.762) C:79% T:78%**	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	**0.00902 ± 0.770 (1.67)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-156 **Lab ID: 30250570026** Collected: 04/18/18 15:10 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.063 ± 0.410 (0.889) C:NA T:88%**	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	**-0.00613 ± 0.361 (0.836) C:81% T:79%**	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	**0.000 ± 0.771 (1.73)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-01a-1 **Lab ID: 30250570027** Collected: 04/18/18 16:40 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.130 ± 0.297 (0.479) C:NA T:86%**	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	**0.291 ± 0.350 (0.738) C:82% T:77%**	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	**0.421 ± 0.647 (1.22)**	pCi/L	05/15/18 10:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Sample: P-155 **Lab ID: 30250570028** Collected: 04/18/18 17:40 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.321 ± 0.418 (0.690) C:NA T:92%**	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	**0.316 ± 0.393 (0.834) C:82% T:72%**	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	**0.637 ± 0.811 (1.52)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-134 **Lab ID: 30250570029** Collected: 04/19/18 10:15 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0711 ± 0.325 (0.523) C:NA T:81%**	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	**0.445 ± 0.323 (0.627) C:82% T:84%**	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	**0.516 ± 0.648 (1.15)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-141 **Lab ID: 30250570030** Collected: 04/19/18 11:10 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.260 ± 0.313 (0.478) C:NA T:83%**	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	**0.574 ± 0.377 (0.716) C:77% T:81%**	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	**0.834 ± 0.690 (1.19)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-138A **Lab ID: 30250570031** Collected: 04/19/18 12:30 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.215 ± 0.329 (0.528) C:NA T:79%**	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	**0.262 ± 0.302 (0.633) C:79% T:88%**	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	**0.477 ± 0.631 (1.16)**	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-137A **Lab ID: 30250570032** Collected: 04/19/18 14:25 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.264 ± 0.319 (0.486) C:NA T:86%**	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	**0.101 ± 0.309 (0.696) C:82% T:79%**	pCi/L	05/11/18 11:17	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Sample: P-137A **Lab ID: 30250570032** Collected: 04/19/18 14:25 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.365 ± 0.628 (1.18)**	pCi/L	05/15/18 10:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

QC Batch: 296005 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30250570021, 30250570022, 30250570023, 30250570024, 30250570025, 30250570026, 30250570027, 30250570028, 30250570029, 30250570030, 30250570031, 30250570032

METHOD BLANK: 1449102 Matrix: Water
Associated Lab Samples: 30250570021, 30250570022, 30250570023, 30250570024, 30250570025, 30250570026, 30250570027, 30250570028, 30250570029, 30250570030, 30250570031, 30250570032

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0211 ± 0.300 (0.695) C:85% T:77%	pCi/L	05/11/18 11:15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

QC Batch: 295990 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30250570021, 30250570022, 30250570023, 30250570024, 30250570025, 30250570026, 30250570027, 30250570028, 30250570029, 30250570030, 30250570031, 30250570032

METHOD BLANK: 1449069 Matrix: Water
Associated Lab Samples: 30250570021, 30250570022, 30250570023, 30250570024, 30250570025, 30250570026, 30250570027, 30250570028, 30250570029, 30250570030, 30250570031, 30250570032

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.133 ± 0.303 (0.488) C:NA T:82%	pCi/L	05/08/18 20:41	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

QC Batch: 296004 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30250570001, 30250570002, 30250570003, 30250570004, 30250570005, 30250570006, 30250570007, 30250570008, 30250570009, 30250570010, 30250570011, 30250570012, 30250570013, 30250570014, 30250570015, 30250570016, 30250570017, 30250570018, 30250570019, 30250570020

METHOD BLANK: 1449100 Matrix: Water
Associated Lab Samples: 30250570001, 30250570002, 30250570003, 30250570004, 30250570005, 30250570006, 30250570007, 30250570008, 30250570009, 30250570010, 30250570011, 30250570012, 30250570013, 30250570014, 30250570015, 30250570016, 30250570017, 30250570018, 30250570019, 30250570020

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.139 ± 0.351 (0.783) C:76% T:79%	pCi/L	05/11/18 11:18	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

QC Batch: 295989 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30250570001, 30250570002, 30250570003, 30250570004, 30250570005, 30250570006, 30250570007, 30250570008, 30250570009, 30250570010, 30250570011, 30250570012, 30250570013, 30250570014, 30250570015, 30250570016, 30250570017, 30250570018, 30250570019, 30250570020

METHOD BLANK: 1449066 Matrix: Water
Associated Lab Samples: 30250570001, 30250570002, 30250570003, 30250570004, 30250570005, 30250570006, 30250570007, 30250570008, 30250570009, 30250570010, 30250570011, 30250570012, 30250570013, 30250570014, 30250570015, 30250570016, 30250570017, 30250570018, 30250570019, 30250570020

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.288 ± 0.375 (0.619) C:NA T:88%	pCi/L	05/08/18 19:59	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CU WO# : 30250570

The Chain-of-Custody is a

30250570

DJA 4/20/18
~~DJA 4/3/18~~

Page: (1) of ~~3~~ ~~1~~ (3)

2201227

Section A
Required Client Information:

Company: Xcel Energy
Address: c/o Pace MN Field
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B
Required Project Information:

Report To: David Anderson
Copy To:
Purchase Order No.:
Project Name: 18-00455, Xcel Energy -
Project Number: Sherco CCR, April 2018

Invoice Information:

Attention: Ciara Ruikkie
Company Name: Pace MN Field Services
Address:
Pace Quote Reference: Tom Halverson
Pace Project Manager: Carin Ferris
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location
STATE:

Section D
Required Client Information

Matrix Codes
MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	RA-226EPA903.1	RA-228EPA904.0	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-120	WT				4/2/18	1235		2			2							✓	✓		001
2	P-98	↓				↓	1340		2			2							✓	✓		002
3	P-97	↓				↓	1450		2			2							✓	✓		003
4	P-75-1	↓				↓	1535		2			2							✓	✓		004
5	P-117	↓				↓	1650		2			2							✓	✓		005
6	P-74-1	↓				↓	1740		2			2							✓	✓		006
7	P-734-1	↓				↓	1840		2			2							✓	✓		007
8	P-125	WT				4/3/18	0915		2			2							✓	✓		008
9																						
10																						
11						DJA 4/3/18																
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
(1) client needs to	~~David Anderson / Pace~~	~~4/3/18~~		[illegible] / Pace	4/24/18	1210	–	N	N	Y
analyze for:	~~David Anderson / Pace~~	~~4/4/18~~	~~0800~~							
Radium 226+228 pCi/L	David Anderson / Pace	4/20/18	1200							
combined.										

ORIGINAL

(2) RA-226 EPA 903.1
RA-228 EPA 904.0

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson
SIGNATURE of SAMPLER: David Anderson
DATE Signed (MM/DD/YY): 4/3/18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

30250570

Page: ~~2~~ 2 of 3

2201223

Section A Required Client Information:
- Company: Xcel Energy
- Address: c/o Pace MN Field
- Email To:
- Phone:
- Fax:
- Requested Due Date/TAT:

Section B Required Project Information:
- Report To: David Anderson
- Copy To:
- Purchase Order No.:
- Project Name: 18-00455, Xcel Energy – Sherco CCR, April 2018
- Project Number:

Section C Invoice Information:
- Attention: Clara Ruikkle
- Company Name: Pace MN Field Services
- Address:
- Pace Quote Reference: Tom Halverson
- Pace Project Manager: Carin Ferris
- Pace Profile #:

REGULATORY AGENCY
- NPDES
- GROUND WATER
- DRINKING WATER
- UST
- RCRA
- OTHER
- Site Location
- STATE:

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	RA-226EPA903.1	RA-228EPA904.0	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-162	WT				4/16/18	1410		2			2							✓	✓		009
2	P-163	↓				↓	1510		2			2							✓	✓		010
3	P-164	↓				↓	1630		2			2							✓	✓		011
4	P-131	↓				↓	1750		2			2							✓	✓		012
5	P-165	WT				4/17/18	1205		2			2							✓	✓		013
6	P-132	↓				↓	0945		2			2							✓	✓		014
7	P-154d	↓				↓	1100		2			2							✓	✓		015
8	P-150	↓				↓	1315		2			2							✓	✓		016
9	P-151	↓				↓	1500		2			2							✓	✓		017
10	P-153	↓				↓	1550		2			2							✓	✓		018
11	P-130	↓				↓	1700		2			2							✓	✓		019
12	P-17	↓				↓	1820		2			2							✓	✓		020

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
(1) client needs to analyze for: Radium 226 + 228 pCi/L combined.	David Anderson / Pace	4/20/18	1200	[signature] Pace	4/20/18	1010	–	N	N	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

(2) RA-226 EPA 903.1
RA-228 EPA 904.0

SAMPLER NAME AND SIGNATURE
- PRINT Name of SAMPLER: David Anderson
- SIGNATURE of SAMPLER: [signature]
- DATE Signed (MM/DD/YY): 4-17-18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

30250570

Page: 3 of 3

2201228

Section A Required Client Information:
Company: Xcel Energy
Address: c/o Pace MN Field
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:
Report To: David Anderson
Copy To:
Purchase Order No.:
Project Name: 18-00455 Xcel Energy - Sherco CCR, April 2018
Project Number:

Section C Invoice Information:
Attention: Ciara Ruikkie
Company Name: Pace MN Field Services
Address:
Pace Quote Reference: Tom Halverson
Pace Project Manager: Carin Ferris
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER
Site Location STATE:

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: RA-226 EPA 903.1	RA-228 EPA 904.0	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-1524	WT				4/18/18	0840		2			2						✓	✓		021
2	P-158						1000		2			2						✓	✓		022
3	P-157						1100		2			2						✓	✓		023
4	P-23						1230		2			2						✓	✓		024
5	P-22						1340		2			2						✓	✓		025
6	P-156						1510		2			2						✓	✓		026
7	P-01a-1						1640		2			2						✓	✓		027
8	P-155						1740		2			2						✓	✓		028
9	P-134	WT				4/19/18	1015		2			2						✓	✓		029
10	P-141						1110		2			2						✓	✓		030
11	~~P-13~~ P-138A						1230		2			2						✓	✓		031
12	P-137A						1425		2			2						✓	✓		032

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
① Client needs to analyze for: Radium 226+228 pCi/L combined.	David Anderson/Pace	4/20/18	1200	Pace	4/20/18	1230	– N N Y

ORIGINAL

② RA-226 EPA 903.1
RA-228 EPA 904.0

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: David Anderson
SIGNATURE of SAMPLER: David Anderson
DATE Signed (MM/DD/YY): 4/19/18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Xcel Energy Project # 30250570

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

Label: B

Tracking #: 7475 9639 3415

LIMS Login: BLM

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used: NA Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp: ___ °C Correction Factor: ___ °C Final Temp: ___ °C

Temp should be above freezing to 6°C

pH paper Lot#: 10D3671 Date and Initials of person examining contents: DS 4-24-18

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. Sample 1 - one bottle no id or date but time matches
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓ ✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. All containers needing preservation are found to be in compliance with EPA recommendation.	✓ ✓			16. pH <2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: DS Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present: Trip Blank Custody Seals Present			✓ ✓	18.
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: DS Date: 4-24-18

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

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)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Appendix B

Summer 2018 90-day Assessment Monitoring Resample Event
Field Datasheets and Laboratory Reports

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco III ADF+CCR, Summer 2018 **Project No.** 18-00928

Well Description and Presampling Information

Monitoring Point ID P-73a-1 Labeled P73A-1

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 36.18 Feet

Static water level measurement before purging (Start Depth) 32.98 Feet

Static water level measurement at time of sampling (Final Depth) 32.98 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-30-18 Water Column 3.20 Feet

Time Purged 1400 - 1412 One Casing Volume 0.5 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 7-30-18

Time Sampled 1430

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 8.8 (mg/l)

Spec. Cond. 520 (µmhos/cm) Turbidity 2.5 (NTU)

Temp. 11.5 (°C) Eh 145 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 77° + sunny, wind W10

Sample Description: clear + odorless

Observations: DTA 7/30/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative ga)
1404	7.6	520	12.0	8.8	NA	140	0.6
1408	7.5	520	11.5	8.8	NA	142	1.2
1412	7.5	520	11.5	8.8	NA	145	1.8

DTA 7/30/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7/30/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco III ADF+CCR, Summer 2018 **Project No.** 18-00928

Well Description and Presampling Information

Monitoring Point ID P-74-1 Labeled P74-1

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 38.10 Feet

Static water level measurement before purging (Start Depth) 34.99 Feet

Static water level measurement at time of sampling (Final Depth) 34.99 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-30-18 Water Column 3.11 Feet

Time Purged 1305 - 1317 One Casing Volume 0.5 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 7-30-18

Time Sampled 1335

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O 7.0 (mg/l)

Spec. Cond. 540 (µmhos/cm) Turbidity 2.8 (NTU)

Temp. 12.5 (°C) Eh 144 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 75° + sunny, wind SW 5-10

Sample Description: clear + odorless

Observations: Collected Rinse Blank at this well.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1309	7.4	550	12.5	7.0	NA	141	0.6
1313	7.3	540	12.5	7.0	NA	142	1.2
1317	7.3	540	12.5	7.0	NA	144	1.8
			DTA 7/30/18				

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7-30-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco III ADF+CCR Summer 2018 **Project No.** 18-00928

Well Description and Presampling Information

Monitoring Point ID P-75-1 Labeled P75-1

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 39.66 Feet

Static water level measurement before purging (Start Depth) 36.56 Feet

Static water level measurement at time of sampling (Final Depth) 36.56 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-31-18 Water Column 3.10 Feet

Time Purged 1605-1617 One Casing Volume 0.5 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 7-31-18

Time Sampled 1630

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 7.8 (mg/l)

Spec. Cond. 360 (µmhos/cm) Turbidity 3.8 (NTU)

Temp. 12.0 (°C) Eh 161 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☐ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 86° + sunny, wind W 10

Sample Description: clear + odorless

Observations:

DTA 7/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1609	7.5	350	12.0	8.1	NA	158	0.6
1613	7.4	360	12.0	7.9	NA	160	1.2
1617	7.4	360	12.0	7.8	NA	161	1.8

DTA 7/31/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7/31/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF+CCR/Summer 2018 Project No. 18-00928

Monitoring Point ID P-97 Labeled P-97

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 41.99 Feet

Static water level measurement before purging (Start Depth) 39.94 Feet

Static water level measurement at time of sampling (Final Depth) 39.94 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-31-18 Water Column 2.05 Feet

Time Purged 1700 - 1706 One Casing Volume 0.3 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 0.9 Gallons

Field Sampling Data

Date Sampled 7-31-18

Time Sampled 1720

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.2 (units) D.O 8.2 (mg/l)

Spec. Cond. 460 (µmhos/cm) Turbidity 3.1 (NTU)

Temp. 12.5 (°C) Eh 170 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 87° + sunny, wind W10

Sample Description: clear + odorless

Observations: DTA 7-31-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1702	7.1	470	12.0	8.6	NA	181	0.3
1704	7.1	460	12.0	8.3	NA	174	0.6
1706	7.2	460	12.5	8.2	NA	170	0.9

DTA 7/31/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7/31/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF+CCR, Summer 2018 Project No. 18-00928

Monitoring Point ID P-98 Labeled P-98

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	43.35	Feet
Static water level measurement before purging (Start Depth)	38.65	Feet
Static water level measurement at time of sampling (Final Depth)	38.65	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID

Date Purged 8-1-18 Water Column 4.70 Feet

Time Purged 0745-0803 One Casing Volume 0.8 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 2.7 Gallons

Field Sampling Data

Date Sampled 8-1-18

Time Sampled 0815

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH	6.8 (units)	D.O	7.0 (mg/l)
Spec. Cond.	540 (µmhos/cm)	Turbidity	8.3 (NTU)
Temp.	13.5 (°C)	Eh	218 (mV)
Other	NA		

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 62° + cloudy, wind W-S

Sample Description: clear + odorless

Observations:

DTA 8-1-18

Stabilization Test

Time	pH (Units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0751	6.7	540	13.5	7.4	NA	228	0.9
0757	6.7	540	13.5	7.1	NA	221	1.8
0803	6.8	540	13.5	7.0	NA	218	2.7

DTA 8-1-18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 8-1-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco III ADF+CCR, Summer 2018 **Project No.** 18-00928

Well Description and Presampling Information

Monitoring Point ID P-117 Labeled P117

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 40.97 Feet

Static water level measurement before purging (Start Depth) 33.75 Feet

Static water level measurement at time of sampling (Final Depth) 33.75 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID

Date Purged 7-31-18 Water Column 7.22 Feet

Time Purged 1520-1538 One Casing Volume 1.2 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 7-31-18

Time Sampled 1550

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.0 (units) D.O 7.8 (mg/l)

Spec. Cond. 610 (µmhos/cm) Turbidity 2.7 (NTU)

Temp. 12.0 (°C) Eh 153 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☐ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 86° + sunny, wind W10

Sample Description: clear + odorless

Observations:

DTA 7-31-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1526	7.1	610	12.0	8.0	NA	150	1.2
1532	7.0	610	12.0	7.9	NA	152	2.4
1538	7.0	610	12.0	7.8	NA	153	3.6
			DTA 7/31/18				

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7-31-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF+CCR Summer 2018 Project No. 18-00928

Monitoring Point ID P-120 Labeled P-120

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 48.53 Feet

Static water level measurement before purging (Start Depth) 39.06 Feet

Static water level measurement at time of sampling (Final Depth) 39.06 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-31-18 Water Column 9.47 Feet

Time Purged 1800-1824 One Casing Volume 1.5 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 4.8 Gallons

Field Sampling Data

Date Sampled 7-31-18

Time Sampled 1840

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 6.9 (units) D.O 7.2 (mg/l)

Spec. Cond. 590 (µmhos/cm) Turbidity 4.7 (NTU)

Temp. 12.0 (°C) Eh 141 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 86° + sunny, wind W 10

Sample Description: clear + odorless

Observations:

DJA 7/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1808	6.8	590	12.5	8.1	NA	153	1.6
1816	6.9	590	12.0	7.5	NA	146	3.2
1824	6.9	590	12.0	7.2	NA	141	4.8

DJA 7/31/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7/31/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco III ADF+CCR, Summer 2018 **Project No.** 18-00928

Well Description and Presampling Information

Monitoring Point ID P-125 Labeled P-125

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 36.41 Feet

Static water level measurement before purging (Start Depth) 28.85 Feet

Static water level measurement at time of sampling (Final Depth) 28.85 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-31-18 Water Column 7.56 Feet

Time Purged 1128 - 1152 One Casing Volume 1.2 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 7-31-18

Time Sampled 1200

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O 8.8 (mg/l)

Spec. Cond. 520 (µmhos/cm) Turbidity 2.3 (NTU)

Temp. 11.0 (°C) Eh 132 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 79° + sunny, wind W 10

Sample Description: clear + odorless

Observations: DTA 7/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1136	7.4	520	11.0	9.0	NA	144	1.2
1144	7.3	530	11.0	8.8	NA	142	2.4
1152	7.3	520	11.0	8.8	NA	132	3.6

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7-31-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco III ADF+CCR, Summer 2018 **Project No.** 18-00928

Well Description and Presampling Information

Monitoring Point ID P-134 Labeled 747065

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 37.52 Feet

Static water level measurement before purging (Start Depth) 29.63 Feet

Static water level measurement at time of sampling (Final Depth) 29.63 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-30-18 Water Column 7.89 Feet

Time Purged 1630-1651 One Casing Volume 1.3 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 7-30-18

Time Sampled 1700

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 7.5 (mg/l)

Spec. Cond. 740 (µmhos/cm) Turbidity 4.0 (NTU)

Temp. 10.5 (°C) Eh 115 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☐ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 82° + sunny, wind W10

Sample Description: clear + odorless

Observations: DJA 7-30-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1637	7.6	740	10.5	8.8	NA	135	1.4
1644	7.5	740	10.5	7.6	NA	126	2.8
1651	7.5	740	10.5	7.5	NA	115	4.2
			DJA 7/30/18				

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7-30-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco III ADF+CCR, Summer 2018 **Project No.** 18-00928

Well Description and Presampling Information

Monitoring Point ID P-137A Labeled P137A

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 41.70 Feet

Static water level measurement before purging (Start Depth) 31.74 Feet

Static water level measurement at time of sampling (Final Depth) 31.74 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-31-18 Water Column 9.96 Feet

Time Purged 1245-1309 One Casing Volume 1.6 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 4.8 Gallons

Field Sampling Data

Date Sampled 7-31-18

Time Sampled 1330

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.1 (units) D.O 9.3 (mg/l)

Spec. Cond. 680 (µmhos/cm) Turbidity 2.4 (NTU)

Temp. 10.5 (°C) Eh 160 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 81° + sunny, wind W 10

Sample Description: clear + odorless

Observations: Collected Duplicate at this well.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1253	7.1	660	11.0	9.7	NA	160	1.6
1301	7.1	680	10.5	9.5	NA	160	3.2
1309	7.1	680	10.5	9.3	NA	160	4.8

DTA 7/31/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7/31/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco III ADF+CCR, Summer 2018 **Project No.** 18-00928

Well Description and Presampling Information

Monitoring Point ID P-138A Labeled P-138A

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 36.95 Feet

Static water level measurement before purging (Start Depth) 28.67 Feet

Static water level measurement at time of sampling (Final Depth) 28.67 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-30-18 Water Column 8.28 Feet

Time Purged 1715-1736 One Casing Volume 1.3 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 7-30-18

Time Sampled 1750

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 6.3 (mg/l)

Spec. Cond. 740 (µmhos/cm) Turbidity 4.2 (NTU)

Temp. 11.0 (°C) Eh 139 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 82° + partly cloudy, wind W10

Sample Description: clear + odorless

Observations: DTA 7/30/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp °C	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1722	7.5	740	11.0	7.1	NA	141	1.4
1729	7.4	740	11.0	6.6	NA	140	2.8
1736	7.4	740	11.0	6.3	NA	139	4.2

DTA 7/30/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7/30/18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy **Project** Sherco III ADF+CCR, Summer 2018 **Project No.** 18-00928

Monitoring Point ID P-141 Labeled 822160

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	39.24	Feet
Static water level measurement before purging (Start Depth)	31.20	Feet
Static water level measurement at time of sampling (Final Depth)	31.20	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-30-18 Water Column 8.04 Feet

Time Purged 1540-1601 One Casing Volume 1.3 Gallons

Pump Rate 0.2 (GPM) / LPM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 7-30-18

Time Sampled 1615

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 7.8 (mg/l)

Spec. Cond. 740 (µmhos/cm) Turbidity 6.7 (NTU)

Temp. 10.0 (°C) Eh 137 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☐ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 80°+ sunny, wind W 10

Sample Description: clear + odorless

Observations: DTA 7/30/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1547	7.6	750	10.5	7.9	NA	132	1.4
1554	7.5	740	10.0	7.8	NA	135	2.8
1601	7.5	740	10.0	7.8	NA	137	4.2

DTA 7/30/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 7/30/18

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification #MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

29 August 2018

Charles A Donkers

Environmental Services-Water Minneapolis

250 Marquette Plaza

Minneapolis, MN 55401

cc:

RE: Sherco Unit 3 Landfill CCR

Enclosed are the results of analyses for samples received by the laboratory on 08/01/2018 06:40-08/03/2018 09:43. If you have any questions concerning this report, please feel free to contact me.

I certify that this analysis report was prepared under my direction or supervision under a system designed to assure that qualified personnel analyzed the submitted samples. All protocols for analysis were followed as required by Minnesota Rules and the Applicable Management Plan.

Sincerely,

Steve Davis

Project Manager

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification # MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Rinse		MDH0008-01	Water	07/30/2018 12:45	08/01/2018 6:40
P-74-1		MDH0008-04	Water	07/30/2018 13:35	08/01/2018 6:40
P-73a-1		MDH0008-05	Water	07/30/2018 14:30	08/01/2018 6:40
P-141		MDH0008-07	Water	07/30/2018 16:15	08/01/2018 6:40
P-134		MDH0008-08	Water	07/30/2018 17:00	08/01/2018 6:40
P-138A		MDH0008-09	Water	07/30/2018 17:50	08/01/2018 6:40
P-125		MDH0008-11	Water	07/31/2018 12:00	08/01/2018 6:40
P-137A		MDH0008-12	Water	07/31/2018 13:30	08/01/2018 6:40
Duplicate		MDH0008-13	Water	07/31/2018 13:30	08/01/2018 6:40
P-117		MDH0008-16	Water	07/31/2018 15:50	08/01/2018 6:40
P-97		MDH0008-17	Water	07/31/2018 17:20	08/01/2018 6:40
P-75-1		MDH0008-18	Water	07/31/2018 16:30	08/01/2018 6:40
P-120		MDH0008-19	Water	07/31/2018 18:40	08/01/2018 6:40
P-98		MDH0064-01	Water	08/01/2018 8:15	08/03/2018 9:43

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification # MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Rinse

MDH0008-01 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	< 1.00	1.00	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 21:22	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 21:22	EPA 300.0	CRL
Sulfate	< 1.00	1.00	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 21:22	EPA 300.0	CRL
Wet Chemistry										
pH	6.79		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 10:42	SM 4500-H+ B	CRL
Total Dissolved Solids	< 20.0	20.0	mg/L		1	BDH0031	8/2/18 9:12	8/2/18 9:12	SM 2540C	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:13	EPA 200.8	CRL
Barium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:13	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:13	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:13	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:13	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:13	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:16	EPA 200.7	HRD
Calcium	< 1.25	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:14	EPA 200.7	HRD

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification # MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

P-74-1

MDH0008-04 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	13.0	1.00	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 22:23	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 22:23	EPA 300.0	CRL
Sulfate	22.5	1.00	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 22:23	EPA 300.0	CRL
Wet Chemistry										
pH	7.69		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 11:10	SM 4500-H+ B	CRL
Total Dissolved Solids	316	20.0	mg/L		1	BDH0031	8/2/18 9:12	8/2/18 9:12	SM 2540C	HSD
Total Metals by ICPMS										
Arsenic	0.516	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:17	EPA 200.8	CRL
Barium	82.9	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:17	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:17	EPA 200.8	CRL
Chromium	0.741	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:17	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:17	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:17	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0811	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:21	EPA 200.7	HRD
Calcium	74.5	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:19	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

P-73a-1

MDH0008-05 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	14.1	1.00	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 22:44	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 22:44	EPA 300.0	CRL
Sulfate	33.4	1.00	mg/L		1	BDH0027	8/1/18 12:04	8/1/18 22:44	EPA 300.0	CRL
Wet Chemistry										
pH	7.83		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 11:17	SM 4500-H+ B	CRL
Total Dissolved Solids	294	20.0	mg/L		1	BDH0031	8/2/18 9:12	8/2/18 9:12	SM 2540C	HSD
Total Metals by ICPMS										
Arsenic	0.562	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:29	EPA 200.8	CRL
Barium	52.0	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:29	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:29	EPA 200.8	CRL
Chromium	0.955	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:29	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:29	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:29	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0619	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:37	EPA 200.7	HRD
Calcium	66.6	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:35	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

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MDH0008-07 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	49.9	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 11:54	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 11:54	EPA 300.0	CRL
Sulfate	50.3	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 11:54	EPA 300.0	CRL
Wet Chemistry										
pH	7.80		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 11:27	SM 4500-H+ B	CRL
Total Dissolved Solids	444	20.0	mg/L		1	BDH0031	8/2/18 9:12	8/2/18 9:12	SM 2540C	HSD
Total Metals by ICPMS										
Arsenic	0.656	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:33	EPA 200.8	CRL
Barium	82.5	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:33	EPA 200.8	CRL
Cobalt	0.596	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:33	EPA 200.8	CRL
Chromium	1.39	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:33	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:33	EPA 200.8	CRL
Selenium	0.516	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:33	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:42	EPA 200.7	HRD
Calcium	87.6	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:40	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

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MDH0008-08 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	44.7	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 12:14	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 12:14	EPA 300.0	CRL
Sulfate	32.2	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 12:14	EPA 300.0	CRL
Wet Chemistry										
pH	7.79		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 11:33	SM 4500-H+ B	CRL
Total Dissolved Solids	416	20.0	mg/L		1	BDH0031	8/2/18 9:12	8/2/18 9:12	SM 2540C	HSD
Total Metals by ICPMS										
Arsenic	0.836	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:36	EPA 200.8	CRL
Barium	88.9	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:36	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:36	EPA 200.8	CRL
Chromium	0.682	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:36	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:36	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:36	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:47	EPA 200.7	HRD
Calcium	85.9	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:45	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

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MDH0008-09 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	41.3	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 12:35	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 12:35	EPA 300.0	CRL
Sulfate	32.6	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 12:35	EPA 300.0	CRL
Wet Chemistry										
pH	7.68		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 11:41	SM 4500-H+ B	CRL
Total Dissolved Solids	424	20.0	mg/L		1	BDH0031	8/2/18 9:12	8/2/18 9:12	SM 2540C	HSD
Total Metals by ICPMS										
Arsenic	0.779	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:40	EPA 200.8	CRL
Barium	97.8	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:40	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:40	EPA 200.8	CRL
Chromium	0.776	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:40	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:40	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:40	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:52	EPA 200.7	HRD
Calcium	90.2	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:50	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

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MDH0008-11 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	28.9	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:15	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:15	EPA 300.0	CRL
Sulfate	13.5	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:15	EPA 300.0	CRL
Wet Chemistry										
pH	7.90		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 12:01	SM 4500-H+ B	CRL
Total Dissolved Solids	272	20.0	mg/L		1	BDH0081	8/3/18 8:15	8/3/18 8:15	SM 2540C	CRL
Total Metals by ICPMS										
Arsenic	0.647	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:44	EPA 200.8	CRL
Barium	55.9	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:44	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:44	EPA 200.8	CRL
Chromium	0.767	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:44	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:44	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:44	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:56	EPA 200.7	HRD
Calcium	60.6	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 12:55	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

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MDH0008-12 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	26.9	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:36	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:36	EPA 300.0	CRL
Sulfate	84.8	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:36	EPA 300.0	CRL
Wet Chemistry										
pH	7.79		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 12:08	SM 4500-H+ B	CRL
Total Dissolved Solids	396	20.0	mg/L		1	BDH0081	8/3/18 8:15	8/3/18 8:15	SM 2540C	CRL
Total Metals by ICPMS										
Arsenic	0.668	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:48	EPA 200.8	CRL
Barium	93.5	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:48	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:48	EPA 200.8	CRL
Chromium	1.71	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:48	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:48	EPA 200.8	CRL
Selenium	0.898	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:48	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.117	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:01	EPA 200.7	HRD
Calcium	85.0	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:00	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Duplicate

MDH0008-13 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	27.0	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:56	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:56	EPA 300.0	CRL
Sulfate	84.9	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 13:56	EPA 300.0	CRL
Wet Chemistry										
pH	7.79		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 12:16	SM 4500-H+ B	CRL
Total Dissolved Solids	400	20.0	mg/L		1	BDH0081	8/3/18 8:15	8/3/18 8:15	SM 2540C	CRL
Total Metals by ICPMS										
Arsenic	0.680	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:52	EPA 200.8	CRL
Barium	94.9	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:52	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:52	EPA 200.8	CRL
Chromium	1.71	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:52	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:52	EPA 200.8	CRL
Selenium	0.887	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:52	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.117	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:06	EPA 200.7	HRD
Calcium	85.8	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:05	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

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MDH0008-16 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	30.0	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 14:58	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 14:58	EPA 300.0	CRL
Sulfate	26.8	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 14:58	EPA 300.0	CRL
Wet Chemistry										
pH	7.80		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 12:35	SM 4500-H+ B	CRL
Total Dissolved Solids	316	20.0	mg/L		1	BDH0081	8/3/18 8:15	8/3/18 8:15	SM 2540C	CRL
Total Metals by ICPMS										
Arsenic	0.645	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:56	EPA 200.8	CRL
Barium	74.8	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:56	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:56	EPA 200.8	CRL
Chromium	0.756	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:56	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:56	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 9:56	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:12	EPA 200.7	HRD
Calcium	75.5	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:10	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

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MDH0008-17 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	28.1	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:00	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:00	EPA 300.0	CRL
Sulfate	28.3	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:00	EPA 300.0	CRL
Wet Chemistry										
pH	7.81		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 12:42	SM 4500-H+ B	CRL
Total Dissolved Solids	330	20.0	mg/L		1	BDH0081	8/3/18 8:15	8/3/18 8:15	SM 2540C	CRL
Total Metals by ICPMS										
Arsenic	0.609	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:00	EPA 200.8	CRL
Barium	76.4	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:00	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:00	EPA 200.8	CRL
Chromium	0.909	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:00	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:00	EPA 200.8	CRL
Selenium	0.941	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:00	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:17	EPA 200.7	HRD
Calcium	77.1	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:15	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

P-75-1

MDH0008-18 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	32.4	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:21	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:21	EPA 300.0	CRL
Sulfate	29.5	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:21	EPA 300.0	CRL
Wet Chemistry										
pH	7.77		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 12:50	SM 4500-H+ B	CRL
Total Dissolved Solids	342	20.0	mg/L		1	BDH0081	8/3/18 8:15	8/3/18 8:15	SM 2540C	CRL
Total Metals by ICPMS										
Arsenic	0.699	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:04	EPA 200.8	CRL
Barium	82.4	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:04	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:04	EPA 200.8	CRL
Chromium	0.804	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:04	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:04	EPA 200.8	CRL
Selenium	0.598	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:04	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:22	EPA 200.7	HRD
Calcium	78.1	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/8/18 13:20	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

P-120

MDH0008-19 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	29.3	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:41	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:41	EPA 300.0	CRL
Sulfate	28.8	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 17:41	EPA 300.0	CRL
Wet Chemistry										
pH	7.81		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 12:56	SM 4500-H+ B	CRL
Total Dissolved Solids	306	20.0	mg/L		1	BDH0081	8/3/18 8:15	8/3/18 8:15	SM 2540C	CRL
Total Metals by ICPMS										
Arsenic	0.674	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:16	EPA 200.8	CRL
Barium	69.9	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:16	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:16	EPA 200.8	CRL
Chromium	0.978	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:16	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:16	EPA 200.8	CRL
Selenium	0.676	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:16	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0703	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/13/18 13:27	EPA 200.7	HRD
Calcium	75.6	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/13/18 13:25	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

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MDH0064-01 (Water) - Chain of Custody Number: 2202853

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	25.7	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 11:36	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 11:36	EPA 300.0	CRL
Sulfate	17.7	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 11:36	EPA 300.0	CRL
Wet Chemistry										
pH	7.70		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 11:36	SM 4500-H+ B	HRD
Total Dissolved Solids	302	20.0	mg/L		1	BDH0172	8/7/18 9:11	8/7/18 9:11	SM 2540C	HSD
Total Metals by ICPMS										
Arsenic	0.685	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:19	EPA 200.8	CRL
Barium	76.0	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:19	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:19	EPA 200.8	CRL
Chromium	0.894	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:19	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:19	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0214	8/7/18 12:25	8/13/18 10:19	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDH0213	8/7/18 12:22	8/13/18 13:32	EPA 200.7	HRD
Calcium	70.2	1.25	mg/L		1	BDH0213	8/7/18 12:22	8/13/18 13:30	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0027 - Wet Prep										
Blank (BDH0027-BLK1)				Prepared & Analyzed: 08/01/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
Blank (BDH0027-BLK2)				Prepared & Analyzed: 08/01/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BDH0027-BS1)				Prepared & Analyzed: 08/01/2018						
Chloride	24.5	1.00	mg/L	25.076		97.5	90-110			
Fluoride	2.75	0.750	mg/L	2.5076		109	90-110			
Sulfate	48.2	1.00	mg/L	48.144		100	90-110			
LCS (BDH0027-BS2)				Prepared & Analyzed: 08/01/2018						
Chloride	24.6	1.00	mg/L	25.076		97.9	90-110			
Fluoride	2.61	0.750	mg/L	2.5076		104	90-110			
Sulfate	47.9	1.00	mg/L	48.144		99.4	90-110			
LCS (BDH0027-BS3)				Prepared & Analyzed: 08/01/2018						
Chloride	24.6	1.00	mg/L	25.076		98.2	90-110			
Fluoride	2.61	0.750	mg/L	2.5076		104	90-110			
Sulfate	47.9	1.00	mg/L	48.144		99.5	90-110			
Duplicate (BDH0027-DUP1)		**Source: MDG0361-01**		Prepared & Analyzed: 08/01/2018						
Chloride	7.33	1.00	mg/L		7.45			1.62	20	
Fluoride	0.124	0.750	mg/L		0.128			3.17	20	
Sulfate	5.19	1.00	mg/L		5.16			0.638	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0027 - Wet Prep										
Duplicate (BDH0027-DUP2)		**Source: MDG0361-02**		Prepared & Analyzed: 08/01/2018						
Chloride	7.21	1.00	mg/L		7.19			0.222	20	
Fluoride	0.130	0.750	mg/L		0.127			2.33	20	
Sulfate	4.50	1.00	mg/L		4.48			0.445	20	
Matrix Spike (BDH0027-MS1)		**Source: MDG0361-01**		Prepared & Analyzed: 08/01/2018						
Chloride	37.3	1.25	mg/L	31.345	7.45	95.3	80-120			
Fluoride	3.21	0.938	mg/L	3.1345	<0.938	102	80-120			
Sulfate	63.3	1.25	mg/L	60.180	5.16	96.6	80-120			
Matrix Spike (BDH0027-MS2)		**Source: MDG0361-02**		Prepared & Analyzed: 08/01/2018						
Chloride	37.5	1.25	mg/L	31.345	7.19	96.7	80-120			
Fluoride	3.25	0.938	mg/L	3.1345	<0.938	104	80-120			
Sulfate	63.3	1.25	mg/L	60.180	4.48	97.8	80-120			
Matrix Spike Dup (BDH0027-MSD1)		**Source: MDG0361-01**		Prepared & Analyzed: 08/01/2018						
Chloride	37.5	1.25	mg/L	31.345	7.45	95.9	80-120	0.534	20	
Fluoride	3.31	0.938	mg/L	3.1345	<0.938	106	80-120	3.07	20	
Sulfate	63.9	1.25	mg/L	60.180	5.16	97.5	80-120	0.879	20	
Matrix Spike Dup (BDH0027-MSD2)		**Source: MDG0361-02**		Prepared & Analyzed: 08/01/2018						
Chloride	37.7	1.25	mg/L	31.345	7.19	97.4	80-120	0.588	20	
Fluoride	3.35	0.938	mg/L	3.1345	<0.938	107	80-120	3.26	20	
Sulfate	63.9	1.25	mg/L	60.180	4.48	98.8	80-120	0.953	20	
Batch BDH0056 - Wet Prep										
Blank (BDH0056-BLK1)				Prepared & Analyzed: 08/02/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0056 - Wet Prep										
Blank (BDH0056-BLK2)				Prepared & Analyzed: 08/02/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BDH0056-BS1)				Prepared & Analyzed: 08/02/2018						
Chloride	24.2	1.00	mg/L	25.076		96.5	90-110			
Fluoride	2.50	0.750	mg/L	2.5076		99.5	90-110			
Sulfate	47.4	1.00	mg/L	48.144		98.4	90-110			
LCS (BDH0056-BS2)				Prepared & Analyzed: 08/02/2018						
Chloride	24.5	1.00	mg/L	25.076		97.7	90-110			
Fluoride	2.62	0.750	mg/L	2.5076		104	90-110			
Sulfate	47.7	1.00	mg/L	48.144		99.2	90-110			
LCS (BDH0056-BS3)				Prepared & Analyzed: 08/02/2018						
Chloride	24.5	1.00	mg/L	25.076		97.7	90-110			
Fluoride	2.51	0.750	mg/L	2.5076		100	90-110			
Sulfate	47.7	1.00	mg/L	48.144		99.1	90-110			
Duplicate (BDH0056-DUP1)		**Source: MDH0008-11**		Prepared & Analyzed: 08/02/2018						
Chloride	28.8	1.00	mg/L		28.9			0.194	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	13.5	1.00	mg/L		13.5			0.119	20	
Duplicate (BDH0056-DUP2)		**Source: MDH0008-16**		Prepared & Analyzed: 08/02/2018						
Chloride	30.0	1.00	mg/L		30.0			0.150	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	26.7	1.00	mg/L		26.8			0.213	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0056 - Wet Prep										
Matrix Spike (BDH0056-MS1)		**Source: MDH0008-11**		Prepared & Analyzed: 08/02/2018						
Chloride	58.6	1.25	mg/L	31.345	28.9	95.0	80-120			
Fluoride	3.11	0.938	mg/L	3.1345	<0.938	99.2	80-120			
Sulfate	71.4	1.25	mg/L	60.180	13.5	96.2	80-120			
Matrix Spike (BDH0056-MS2)		**Source: MDH0008-16**		Prepared & Analyzed: 08/02/2018						
Chloride	60.1	1.25	mg/L	31.345	30.0	95.9	80-120			
Fluoride	3.20	0.938	mg/L	3.1345	<0.938	102	80-120			
Sulfate	85.7	1.25	mg/L	60.180	26.8	97.8	80-120			
Matrix Spike Dup (BDH0056-MSD1)		**Source: MDH0008-11**		Prepared & Analyzed: 08/02/2018						
Chloride	58.8	1.25	mg/L	31.345	28.9	95.5	80-120	0.294	20	
Fluoride	3.20	0.938	mg/L	3.1345	<0.938	102	80-120	2.81	20	
Sulfate	71.8	1.25	mg/L	60.180	13.5	97.0	80-120	0.670	20	
Matrix Spike Dup (BDH0056-MSD2)		**Source: MDH0008-16**		Prepared & Analyzed: 08/02/2018						
Chloride	60.3	1.25	mg/L	31.345	30.0	96.5	80-120	0.289	20	
Fluoride	3.28	0.938	mg/L	3.1345	<0.938	105	80-120	2.43	20	
Sulfate	86.0	1.25	mg/L	60.180	26.8	98.3	80-120	0.355	20	
Batch BDH0353 - Wet Prep										
Blank (BDH0353-BLK1)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
Blank (BDH0353-BLK2)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0353 - Wet Prep										
LCS (BDH0353-BS1)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	23.9	1.00	mg/L	25.076		95.1	90-110			
Fluoride	2.55	0.750	mg/L	2.5076		102	90-110			
Sulfate	46.3	1.00	mg/L	48.144		96.2	90-110			
LCS (BDH0353-BS2)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	23.9	1.00	mg/L	25.076		95.2	90-110			
Fluoride	2.56	0.750	mg/L	2.5076		102	90-110			
Sulfate	46.3	1.00	mg/L	48.144		96.1	90-110			
LCS (BDH0353-BS3)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	24.0	1.00	mg/L	25.076		95.9	90-110			
Fluoride	2.57	0.750	mg/L	2.5076		102	90-110			
Sulfate	46.6	1.00	mg/L	48.144		96.8	90-110			
Duplicate (BDH0353-DUP1)		**Source: MDH0068-07**		Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	1.88	1.00	mg/L		1.89			0.636	20	
Fluoride	0.121	0.750	mg/L		0.121			0.00	20	
Sulfate	13.4	1.00	mg/L		13.4			0.523	20	
Duplicate (BDH0353-DUP2)		**Source: MDH0071-05**		Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	1.16	1.00	mg/L		1.13			2.27	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	7.84	1.00	mg/L		7.81			0.332	20	
Matrix Spike (BDH0353-MS1)		**Source: MDH0068-07**		Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	31.2	1.25	mg/L	31.345	1.89	93.4	80-120			
Fluoride	3.18	0.938	mg/L	3.1345	<0.938	101	80-120			
Sulfate	70.9	1.25	mg/L	60.180	13.4	95.5	80-120			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0353 - Wet Prep										
Matrix Spike (BDH0353-MS2)		**Source: MDH0071-05**		Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	30.1	1.25	mg/L	31.345	1.13	92.4	80-120			
Fluoride	3.13	0.938	mg/L	3.1345	<0.938	100	80-120			
Sulfate	64.8	1.25	mg/L	60.180	7.81	94.7	80-120			
Matrix Spike Dup (BDH0353-MSD1)		**Source: MDH0068-07**		Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	31.1	1.25	mg/L	31.345	1.89	93.1	80-120	0.265	20	
Fluoride	3.23	0.938	mg/L	3.1345	<0.938	103	80-120	1.83	20	
Sulfate	70.7	1.25	mg/L	60.180	13.4	95.3	80-120	0.212	20	
Matrix Spike Dup (BDH0353-MSD2)		**Source: MDH0071-05**		Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	30.9	1.25	mg/L	31.345	1.13	95.0	80-120	2.70	20	
Fluoride	3.28	0.938	mg/L	3.1345	<0.938	105	80-120	4.52	20	
Sulfate	66.4	1.25	mg/L	60.180	7.81	97.3	80-120	2.38	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0014 - Wet Prep										
LCS (BDH0014-BS1)				Prepared & Analyzed: 08/01/2018						
pH	7.06		pH Units	7.0000		101	90-110			
LCS (BDH0014-BS2)				Prepared & Analyzed: 08/01/2018						
pH	7.11		pH Units	7.0000		102	90-110			
Duplicate (BDH0014-DUP1)		**Source: MDH0008-02**		Prepared & Analyzed: 08/01/2018						
pH	7.47		pH Units		7.50			0.401	20	
Duplicate (BDH0014-DUP2)		**Source: MDH0008-11**		Prepared & Analyzed: 08/01/2018						
pH	7.90		pH Units		7.90			0.00	20	
Duplicate (BDH0014-DUP3)		**Source: MDH0009-01**		Prepared & Analyzed: 08/01/2018						
pH	7.94		pH Units		7.94			0.00	20	
Batch BDH0031 - Wet Prep										
Blank (BDH0031-BLK1)				Prepared & Analyzed: 08/02/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDH0031-DUP1)		**Source: MDH0008-02**		Prepared & Analyzed: 08/02/2018						
Total Dissolved Solids	420	20.0	mg/L		420			0.00	20	
Batch BDH0081 - Wet Prep										
Blank (BDH0081-BLK1)				Prepared & Analyzed: 08/03/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0081 - Wet Prep										
Duplicate (BDH0081-DUP1)		**Source: MDH0008-11**		Prepared & Analyzed: 08/03/2018						
Total Dissolved Solids	262	20.0	mg/L		272			3.75	20	
Duplicate (BDH0081-DUP2)		**Source: MDH0010-01**		Prepared & Analyzed: 08/03/2018						
Total Dissolved Solids	272	20.0	mg/L		288			5.71	20	
Batch BDH0105 - Wet Prep										
LCS (BDH0105-BS1)				Prepared & Analyzed: 08/03/2018						
pH	7.09		pH Units	7.0000		101	90-110			
LCS (BDH0105-BS2)				Prepared & Analyzed: 08/03/2018						
pH	7.08		pH Units	7.0000		101	90-110			
Duplicate (BDH0105-DUP1)		**Source: MDH0064-01**		Prepared & Analyzed: 08/03/2018						
pH	7.66		pH Units		7.70			0.521	20	
Duplicate (BDH0105-DUP2)		**Source: MDH0071-07**		Prepared & Analyzed: 08/03/2018						
pH	7.46		pH Units		7.46			0.00	20	
Duplicate (BDH0105-DUP3)		**Source: MDH0071-10**		Prepared & Analyzed: 08/03/2018						
pH	8.01		pH Units		8.00			0.125	20	
Batch BDH0172 - Wet Prep										
Blank (BDH0172-BLK1)				Prepared & Analyzed: 08/07/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0172 - Wet Prep										
Duplicate (BDH0172-DUP1)		**Source: MDH0064-01**		Prepared & Analyzed: 08/07/2018						
Total Dissolved Solids	360	20.0	mg/L		302			17.5	20	
Duplicate (BDH0172-DUP2)		**Source: MDH0064-02**		Prepared & Analyzed: 08/07/2018						
Total Dissolved Solids	322	20.0	mg/L		322			0.00	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0214 - EPA 200.2, EPA 3005										
Blank (BDH0214-BLK1)				Prepared: 08/07/2018 Analyzed: 08/13/2018						
Chromium	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
LCS (BDH0214-BS1)				Prepared: 08/07/2018 Analyzed: 08/13/2018						
Cobalt	99.5	0.500	ug/L	100.00		99.5	85-115			
Barium	93.7	0.500	ug/L	100.00		93.7	85-115			
Arsenic	96.2	0.500	ug/L	100.00		96.2	85-115			
Lead	94.1	0.500	ug/L	100.00		94.1	85-115			
Chromium	102	0.500	ug/L	100.00		102	85-115			
Selenium	97.6	0.500	ug/L	100.00		97.6	85-115			
Duplicate (BDH0214-DUP1)		**Source: MDH0008-07**		Prepared: 08/07/2018 Analyzed: 08/13/2018						
Arsenic	0.706	0.500	ug/L		0.656			7.38	20	
Selenium	0.486	0.500	ug/L		0.516			6.03	20	
Lead	0.136	0.500	ug/L		0.102			28.4	20	M_D-RL
Chromium	1.41	0.500	ug/L		1.39			1.44	20	
Cobalt	0.575	0.500	ug/L		0.596			3.56	20	
Barium	86.4	0.500	ug/L		82.5			4.60	20	
Duplicate (BDH0214-DUP2)		**Source: MDH0008-08**		Prepared: 08/07/2018 Analyzed: 08/13/2018						
Chromium	0.721	0.500	ug/L		0.682			5.45	20	
Cobalt	0.333	0.500	ug/L		0.325			2.51	20	
Lead	0.0358	0.500	ug/L		0.0309			14.6	20	
Barium	91.3	0.500	ug/L		88.9			2.75	20	
Arsenic	0.785	0.500	ug/L		0.836			6.27	20	
Selenium	0.425	0.500	ug/L		0.460			8.07	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0214 - EPA 200.2, EPA 3005										
Matrix Spike (BDH0214-MS1)	**Source: MDH0008-07**			Prepared: 08/07/2018 Analyzed: 08/13/2018						
Lead	89.1	0.500	ug/L	100.00	0.102	89.0	70-130			
Selenium	99.4	0.500	ug/L	100.00	0.516	98.9	70-130			
Cobalt	99.7	0.500	ug/L	100.00	0.596	99.1	70-130			
Barium	179	0.500	ug/L	100.00	82.5	97.0	70-130			
Chromium	105	0.500	ug/L	100.00	1.39	104	70-130			
Arsenic	102	0.500	ug/L	100.00	0.656	101	70-130			
Matrix Spike (BDH0214-MS2)	**Source: MDH0008-08**			Prepared: 08/07/2018 Analyzed: 08/13/2018						
Arsenic	106	0.500	ug/L	100.00	0.836	105	70-130			
Barium	188	0.500	ug/L	100.00	88.9	99.6	70-130			
Chromium	102	0.500	ug/L	100.00	0.682	101	70-130			
Cobalt	96.3	0.500	ug/L	100.00	0.325	96.0	70-130			
Selenium	98.2	0.500	ug/L	100.00	0.460	97.7	70-130			
Lead	90.3	0.500	ug/L	100.00	0.0309	90.3	70-130			
Matrix Spike Dup (BDH0214-MSD1)	**Source: MDH0008-07**			Prepared: 08/07/2018 Analyzed: 08/13/2018						
Lead	88.0	0.500	ug/L	100.00	0.102	87.9	70-130	1.25	20	
Chromium	103	0.500	ug/L	100.00	1.39	101	70-130	2.50	20	
Selenium	101	0.500	ug/L	100.00	0.516	101	70-130	1.65	20	
Cobalt	99.8	0.500	ug/L	100.00	0.596	99.2	70-130	0.109	20	
Barium	183	0.500	ug/L	100.00	82.5	101	70-130	2.19	20	
Arsenic	102	0.500	ug/L	100.00	0.656	102	70-130	0.365	20	
Matrix Spike Dup (BDH0214-MSD2)	**Source: MDH0008-08**			Prepared: 08/07/2018 Analyzed: 08/13/2018						
Arsenic	103	0.500	ug/L	100.00	0.836	103	70-130	2.03	20	
Lead	88.6	0.500	ug/L	100.00	0.0309	88.6	70-130	1.90	20	
Selenium	98.4	0.500	ug/L	100.00	0.460	97.9	70-130	0.164	20	
Chromium	105	0.500	ug/L	100.00	0.682	104	70-130	2.59	20	
Cobalt	99.7	0.500	ug/L	100.00	0.325	99.4	70-130	3.41	20	
Barium	186	0.500	ug/L	100.00	88.9	97.3	70-130	1.21	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0395 - EPA 200.2, EPA 3005										
Blank (BDH0395-BLK1)				Prepared: 08/14/2018 Analyzed: 08/16/2018						
Lead	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
LCS (BDH0395-BS1)				Prepared: 08/14/2018 Analyzed: 08/16/2018						
Selenium	98.8	0.500	ug/L	100.00		98.8	85-115			
Lead	96.3	0.500	ug/L	100.00		96.3	85-115			
Barium	96.8	0.500	ug/L	100.00		96.8	85-115			
Arsenic	98.7	0.500	ug/L	100.00		98.7	85-115			
Duplicate (BDH0395-DUP1)	**Source: MDH0008-15**			Prepared: 08/14/2018 Analyzed: 08/16/2018						
Lead	0.0668	0.500	ug/L		0.0508			27.2	20	M_D-RL
Selenium	48.5	0.500	ug/L		47.1			2.74	20	
Arsenic	1.22	0.500	ug/L		1.26			3.58	20	
Barium	86.8	0.500	ug/L		84.7			2.34	20	
Matrix Spike (BDH0395-MS1)	**Source: MDH0008-15**			Prepared: 08/14/2018 Analyzed: 08/16/2018						
Arsenic	111	0.500	ug/L	100.00	1.26	110	70-130			
Barium	185	0.500	ug/L	100.00	84.7	100	70-130			
Lead	84.9	0.500	ug/L	100.00	0.0508	84.8	70-130			
Selenium	150	0.500	ug/L	100.00	47.1	103	70-130			
Matrix Spike Dup (BDH0395-MSD1)	**Source: MDH0008-15**			Prepared: 08/14/2018 Analyzed: 08/16/2018						
Lead	82.9	0.500	ug/L	100.00	0.0508	82.9	70-130	2.35	20	
Arsenic	109	0.500	ug/L	100.00	1.26	108	70-130	1.66	20	
Barium	182	0.500	ug/L	100.00	84.7	96.9	70-130	1.92	20	
Selenium	150	0.500	ug/L	100.00	47.1	103	70-130	0.162	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0213 - EPA 200.2, EPA 3005										
Blank (BDH0213-BLK1)				Prepared: 08/07/2018 Analyzed: 08/08/2018						
Calcium	<1.25	1.25	mg/L							
Boron	<0.0500	0.0500	mg/L							
LCS (BDH0213-BS1)				Prepared: 08/07/2018 Analyzed: 08/08/2018						
Boron	0.956	0.0500	mg/L	1.0000		95.6	85-115			
Calcium	98.6	1.25	mg/L	100.00		98.6	85-115			
Duplicate (BDH0213-DUP1)		**Source: MDH0008-04**		Prepared: 08/07/2018 Analyzed: 08/08/2018						
Calcium	76.0	1.25	mg/L		74.5			1.89	20	
Boron	0.0827	0.0500	mg/L		0.0811			1.88	20	
Duplicate (BDH0213-DUP2)		**Source: MDH0008-05**		Prepared: 08/07/2018 Analyzed: 08/08/2018						
Boron	0.0626	0.0500	mg/L		0.0619			1.03	20	
Calcium	67.1	1.25	mg/L		66.6			0.860	20	
Matrix Spike (BDH0213-MS1)		**Source: MDH0008-04**		Prepared: 08/07/2018 Analyzed: 08/08/2018						
Calcium	180	1.25	mg/L	100.00	74.5	105	70-130			
Boron	1.06	0.0500	mg/L	1.0000	0.0811	97.6	70-130			
Matrix Spike (BDH0213-MS2)		**Source: MDH0008-05**		Prepared: 08/07/2018 Analyzed: 08/08/2018						
Boron	1.04	0.0500	mg/L	1.0000	0.0619	98.2	70-130			
Calcium	171	1.25	mg/L	100.00	66.6	104	70-130			
Matrix Spike Dup (BDH0213-MSD1)		**Source: MDH0008-04**		Prepared: 08/07/2018 Analyzed: 08/08/2018						
Boron	1.06	0.0500	mg/L	1.0000	0.0811	98.1	70-130	0.493	20	
Calcium	175	1.25	mg/L	100.00	74.5	100	70-130	2.89	20	
Matrix Spike Dup (BDH0213-MSD2)		**Source: MDH0008-05**		Prepared: 08/07/2018 Analyzed: 08/08/2018						
Calcium	167	1.25	mg/L	100.00	66.6	101	70-130	2.05	20	
Boron	1.03	0.0500	mg/L	1.0000	0.0619	96.5	70-130	1.57	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDH0394 - EPA 200.2, EPA 3005										
Blank (BDH0394-BLK1)				Prepared: 08/14/2018 Analyzed: 08/15/2018						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							
LCS (BDH0394-BS1)				Prepared: 08/14/2018 Analyzed: 08/15/2018						
Boron	0.997	0.0500	mg/L	1.0000		99.7	85-115			
Calcium	104	1.25	mg/L	100.00		104	85-115			
Duplicate (BDH0394-DUP1)		**Source: MDH0160-01**		Prepared: 08/14/2018 Analyzed: 08/15/2018						
Calcium	101	1.25	mg/L		100			0.585	20	
Boron	0.106	0.0500	mg/L		0.105			0.725	20	
Matrix Spike (BDH0394-MS1)		**Source: MDH0160-01**		Prepared: 08/14/2018 Analyzed: 08/15/2018						
Boron	1.13	0.0500	mg/L	1.0000	0.105	103	70-130			
Calcium	208	1.25	mg/L	100.00	100	107	70-130			
Matrix Spike Dup (BDH0394-MSD1)		**Source: MDH0160-01**		Prepared: 08/14/2018 Analyzed: 08/15/2018						
Calcium	211	1.25	mg/L	100.00	100	111	70-130	1.59	20	
Boron	1.13	0.0500	mg/L	1.0000	0.105	103	70-130	0.0112	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:40

Qualifiers and Definitions

M_TTT	Sample received at the lab outside of required hold time.
M_D-RL	The RPD for the sample duplicate was outside of QC acceptance limits due to<RL.
Z	Non Accredited Analyte
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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2202851

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Xcel Energy	Report To: Chuck Donkers	Attention: Steve Davis
Address: Environmental Services	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Sherco III ADF + CCR,	Pace Project Manager:
Requested Due Date/TAT:	Project Number: Summer 2018	Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test	GW-CCR-SH3+GW-B	GW-B	Lead-A	GW-CCR-SH3	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Rinse	WT				7/30/18	1245		4	1	1	2							✓					
2	P-139	↓				↓	1120		3	1	1	1								✓				
3	Seeley Well	↓				↓	1215		3	1	1	1								✓				
4	P-74-1	↓				↓	1335		4	1	1	2							✓					
5	P-73a-1	↓				↓	1430		4	1	1	2							✓					
6	P-73B-1	↓				↓	1510		3	1	1	1								✓				
7	P-141	↓				↓	1615		4	1	1	2										✓		
8	P-134	↓				↓	1700		4	1	1	2							✓					
9	P-138A	↓				↓	1750		4	1	1	2							✓					
10	P-138B	↓				↓	1830		3	1	1	1								✓				
11	P-125	WT				7/31/18	1200		4	1	1	2							✓					
12	P-137A	↓				↓	1330		4	1	1	2							✓					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
(1.) marked HNO3 bottles filtered and unfiltered.	David Anderson / Pace	8-1-18	0640	[signature] / Xcel	8/1/18	0640	3.1			
MBW508 + 4 Stops:							MW0841	Y	Y	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: David Anderson
SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7-31-18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

2202853

Section A Required Client Information:

Company: Xcel Energy
Address: Environmental Services
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Chuck Dorkets
Copy To:
Purchase Order No.:
Project Name: Sherco III ADF + CCR,
Project Number: Summer 2018

Section C Invoice Information:

Attention: Steve Davis
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: 6W-CCR-SH3+6W-B	6-W-B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-98	WT				8-1-18	0815		4	1	1	2					✓				
2	P76A-1						0905		3	1	1	1						✓			
3	P-76B-1						0945		3	1	1	1						✓			
4	P-99						1025		3	1	1	1						✓			
5																					
6																					
7																					
8							DUP		8/1/18												
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
(1) marked #NO3 bottles filtered and unfiltered.	David Anderson/Pace	8/3/18	0930		8/3/18	09:43	Temp: 3.0°C M400841 pH strips: MB400508

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson
SIGNATURE of SAMPLER: David Anderson
DATE Signed (MM/DD/YY): 8-1-18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2202850

Section A Required Client Information:
- Company: Xcel Energy
- Address: Environmental Services
- Email To:
- Phone: Fax:
- Requested Due Date/TAT:

Section B Required Project Information:
- Report To: Chuck Donkers
- Copy To:
- Purchase Order No.:
- Project Name: Sherco III ADF + CCR,
- Project Number: Summer 2018

Section C Invoice Information:
- Attention: Steve Davis
- Company Name:
- Address:
- Pace Quote Reference:
- Pace Project Manager:
- Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	TIME	COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: GW-CCR-SH3+GW-B	GW-B	Lea-A	GW-CCR-SH3	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Duplicate	WT				7/31/18	1330		4	1	1	2						✓					
2	P-137B	↓				↓	1425		3	1	1	1							✓				
3	Leachate	↓				↓	1450		3	1	1	1								✓			
4	P-117	↓				↓	1550		4	1	1	2						✓					
5	P-97	↓				↓	1720		4	1	1	2						✓					
6	P-75-1	↓				↓	1630		4	1	1	2						✓					
7	P-120	↓				↓	1840		4	1	1	2						✓					
8																							
9																							
10						DJA 7/31/18																	
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
(1) marked HNO3 bottles filtered and unfiltered. pH strips: MB00508	David Anderson / Pace	8-1-18	0640	[signature] / Xcel	8/1/18	0640	Temp in °C: 3.1°C MW 8/1/18; Received on Ice (Y/N): Y; Custody Sealed Cooler (Y/N): Y; Samples Intact (Y/N): Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
- PRINT Name of SAMPLER: David Anderson
- SIGNATURE of SAMPLER: David Anderson
- DATE Signed (MM/DD/YY): 7/31/18

M

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

August 20, 2018

Dave Anderson
Pace Analytical Services - Field Svcs Division
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Dear Dave Anderson:
Enclosed are the analytical results for sample(s) received by the laboratory on August 07, 2018. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Harry S. Davis III, Xcel Energy
Charles A. Donkers, Xcel Energy
Christine M. Keefe, Xcel Energy
Ciara Ruikkie, Pace Analytical Services - Field Svcs Division

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30261473001	**Rinse**	Water	07/30/18 12:45	08/07/18 09:45
30261473002	**P-74-1**	Water	07/30/18 13:35	08/07/18 09:45
30261473003	**P-73a-1**	Water	07/30/18 14:30	08/07/18 09:45
30261473004	**P-141**	Water	07/30/18 16:15	08/07/18 09:45
30261473005	**P-134**	Water	07/30/18 17:00	08/07/18 09:45
30261473006	**P-138A**	Water	07/30/18 17:50	08/07/18 09:45
30261473007	**P-125**	Water	07/31/18 12:00	08/07/18 09:45
30261473008	**P-137A**	Water	07/31/18 13:30	08/07/18 09:45
30261473009	**Duplicate**	Water	07/31/18 13:30	08/07/18 09:45
30261473010	**P-117**	Water	07/31/18 15:50	08/07/18 09:45
30261473011	**P-75-1**	Water	07/31/18 16:30	08/07/18 09:45
30261473012	**P-97**	Water	07/31/18 17:20	08/07/18 09:45
30261473013	**P-120**	Water	07/31/18 18:40	08/07/18 09:45
30261473014	**P-98**	Water	08/01/18 08:15	08/07/18 09:45

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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30261473001	**Rinse**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473002	**P-74-1**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473003	**P-73a-1**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473004	**P-141**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473005	**P-134**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473006	**P-138A**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473007	**P-125**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473008	**P-137A**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473009	**Duplicate**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473010	**P-117**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473011	**P-75-1**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473012	**P-97**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473013	**P-120**	EPA 903.1	KAC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261473014	**P-98**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: Pace-MN Field Services Division
Date: August 20, 2018

General Information:
14 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: Pace-MN Field Services Division
Date: August 20, 2018

General Information:
14 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: Pace-MN Field Services Division
Date: August 20, 2018

General Information:
14 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Sample: Rinse **Lab ID: 30261473001** Collected: 07/30/18 12:45 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0702 ± 0.364 (0.756) C:NA T:81%**	pCi/L	08/16/18 19:55	13982-63-3	
Radium-228	EPA 904.0	**0.277 ± 0.416 (0.900) C:79% T:80%**	pCi/L	08/15/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	**0.347 ± 0.780 (1.66)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-74-1 **Lab ID: 30261473002** Collected: 07/30/18 13:35 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.126 ± 0.304 (0.586) C:NA T:87%**	pCi/L	08/16/18 19:55	13982-63-3	
Radium-228	EPA 904.0	**1.07 ± 0.460 (0.751) C:80% T:85%**	pCi/L	08/15/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	**1.20 ± 0.764 (1.34)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-73a-1 **Lab ID: 30261473003** Collected: 07/30/18 14:30 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.302 ± 0.357 (0.561) C:NA T:91%**	pCi/L	08/16/18 19:55	13982-63-3	
Radium-228	EPA 904.0	**-0.126 ± 0.333 (0.798) C:80% T:88%**	pCi/L	08/15/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	**0.302 ± 0.690 (1.36)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-141 **Lab ID: 30261473004** Collected: 07/30/18 16:15 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.354 ± 0.462 (0.761) C:NA T:83%**	pCi/L	08/16/18 19:55	13982-63-3	
Radium-228	EPA 904.0	**-0.0814 ± 0.373 (0.879) C:81% T:83%**	pCi/L	08/15/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	**0.354 ± 0.835 (1.64)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-134 **Lab ID: 30261473005** Collected: 07/30/18 17:00 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.214 ± 0.326 (0.193) C:NA T:80%**	pCi/L	08/16/18 19:55	13982-63-3	
Radium-228	EPA 904.0	**-0.0612 ± 0.390 (0.917) C:78% T:79%**	pCi/L	08/15/18 16:41	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Sample: P-134 **Lab ID: 30261473005** Collected: 07/30/18 17:00 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.214 ± 0.716 (1.11)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-138A **Lab ID: 30261473006** Collected: 07/30/18 17:50 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.224 ± 0.341 (0.549) C:NA T:79%**	pCi/L	08/16/18 19:55	13982-63-3	
Radium-228	EPA 904.0	**0.639 ± 0.423 (0.810) C:79% T:82%**	pCi/L	08/15/18 16:41	15262-20-1	
Total Radium	Total Radium Calculation	**0.863 ± 0.764 (1.36)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-125 **Lab ID: 30261473007** Collected: 07/31/18 12:00 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0592 ± 0.270 (0.160) C:NA T:94%**	pCi/L	08/16/18 20:08	13982-63-3	
Radium-228	EPA 904.0	**1.59 ± 0.606 (0.961) C:75% T:86%**	pCi/L	08/15/18 16:41	15262-20-1	
Total Radium	Total Radium Calculation	**1.65 ± 0.876 (1.12)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-137A **Lab ID: 30261473008** Collected: 07/31/18 13:30 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.386 ± 0.439 (0.692) C:NA T:85%**	pCi/L	08/16/18 20:08	13982-63-3	
Radium-228	EPA 904.0	**0.621 ± 0.467 (0.921) C:73% T:79%**	pCi/L	08/15/18 16:41	15262-20-1	
Total Radium	Total Radium Calculation	**1.01 ± 0.906 (1.61)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: Duplicate **Lab ID: 30261473009** Collected: 07/31/18 13:30 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.122 ± 0.279 (0.450) C:NA T:88%**	pCi/L	08/16/18 20:08	13982-63-3	
Radium-228	EPA 904.0	**0.850 ± 0.555 (1.09) C:77% T:85%**	pCi/L	08/15/18 16:46	15262-20-1	
Total Radium	Total Radium Calculation	**0.972 ± 0.834 (1.54)**	pCi/L	08/20/18 15:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Sample: P-117 **Lab ID: 30261473010** Collected: 07/31/18 15:50 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.133 ± 0.370 (0.718) C:NA T:82%**	pCi/L	08/16/18 20:08	13982-63-3	
Radium-228	EPA 904.0	**0.223 ± 0.425 (0.932) C:79% T:86%**	pCi/L	08/15/18 16:46	15262-20-1	
Total Radium	Total Radium Calculation	**0.356 ± 0.795 (1.65)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-75-1 **Lab ID: 30261473011** Collected: 07/31/18 16:30 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.193 ± 0.379 (0.693) C:NA T:87%**	pCi/L	08/16/18 20:08	13982-63-3	
Radium-228	EPA 904.0	**0.0154 ± 0.418 (0.959) C:78% T:86%**	pCi/L	08/15/18 16:46	15262-20-1	
Total Radium	Total Radium Calculation	**0.208 ± 0.797 (1.65)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-97 **Lab ID: 30261473012** Collected: 07/31/18 17:20 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.136 ± 0.310 (0.184) C:NA T:86%**	pCi/L	08/16/18 20:08	13982-63-3	
Radium-228	EPA 904.0	**1.27 ± 0.624 (1.13) C:76% T:83%**	pCi/L	08/15/18 16:46	15262-20-1	
Total Radium	Total Radium Calculation	**1.41 ± 0.934 (1.31)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-120 **Lab ID: 30261473013** Collected: 07/31/18 18:40 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.201 ± 0.395 (0.722) C:NA T:81%**	pCi/L	08/16/18 20:21	13982-63-3	
Radium-228	EPA 904.0	**0.125 ± 0.473 (1.06) C:76% T:83%**	pCi/L	08/15/18 16:46	15262-20-1	
Total Radium	Total Radium Calculation	**0.326 ± 0.868 (1.78)**	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-98 **Lab ID: 30261473014** Collected: 08/01/18 08:15 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.347 ± 0.362 (0.511) C:NA T:84%**	pCi/L	08/16/18 20:21	13982-63-3	
Radium-228	EPA 904.0	**-0.348 ± 0.495 (1.18) C:78% T:83%**	pCi/L	08/15/18 16:46	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

Sample: P-98 **Lab ID: 30261473014** Collected: 08/01/18 08:15 Received: 08/07/18 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.347 ± 0.857 (1.69)**	pCi/L	08/20/18 15:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

QC Batch: 308839 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30261473001, 30261473002, 30261473003, 30261473004, 30261473005, 30261473006, 30261473007, 30261473008, 30261473009, 30261473010, 30261473011, 30261473012, 30261473013, 30261473014

METHOD BLANK: 1509091 Matrix: Water
Associated Lab Samples: 30261473001, 30261473002, 30261473003, 30261473004, 30261473005, 30261473006, 30261473007, 30261473008, 30261473009, 30261473010, 30261473011, 30261473012, 30261473013, 30261473014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.127 ± 0.290 (0.468) C:NA T:92%	pCi/L	08/16/18 19:41	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

QC Batch: 308840 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30261473001, 30261473002, 30261473003, 30261473004, 30261473005, 30261473006, 30261473007, 30261473008, 30261473009, 30261473010, 30261473011, 30261473012, 30261473013, 30261473014

METHOD BLANK: 1509095 Matrix: Water
Associated Lab Samples: 30261473001, 30261473002, 30261473003, 30261473004, 30261473005, 30261473006, 30261473007, 30261473008, 30261473009, 30261473010, 30261473011, 30261473012, 30261473013, 30261473014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.173 ± 0.301 (0.748) C:76% T:84%	pCi/L	08/15/18 16:41	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 18-00928, Xcel Energy-ShercoII
Pace Project No.: 30261473

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

2202805

Section A Required Client Information:

Company: Xcel Energy
Address: C/o Pace MN Field
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: David Anderson
Copy To:
Purchase Order No.:
Project Name: 18-00928, Xcel Energy - Sherco III ADF + ECR, Summer 2018
Project Number:

Section C Invoice Information:

Attention: Ciara Ruikkie
Company Name: Pace MN Field Services
Address:
Pace Quote Reference: Tom Halverson
Pace Project Manager: Carin Ferris
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: RA-226 EPA 903.1	RA-228 EPA 904.0	Residual	Pace Project No./ Lab I.D.
1	Rinse	WT				7/30/18	1245		2			2						✓	✓		001
2	P-74-1						1335		2			2						✓	✓		002
3	P-73A-1						1430		2			2						✓	✓		003
4	P-141						1615		2			2						✓	✓		004
5	P-134						1700		2			2						✓	✓		005
6	P-138A	↓				↓	1750		2			2						✓	✓		006
7	~~P-138B~~ P-125	WT				7/31/18	1200		2			2						✓	✓		007
8	P-137A						1330		2			2						✓	✓		008
9	Duplicate						1330		2			2						✓	✓		009
10	P-117						1550		2			2						✓	✓		010
11	P-75-1						1630		2			2						✓	✓		011
12	P-97	↓				↓	1720		2			2						✓	✓		012

WO#: 30261473

30261473

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
(1) client needs to analyze for: Radium 226+228 pCi/L combined. (2) RA-226 EPA 903.1 RA-228 EPA 904.0	David Anderson/Pace	8/3/18	1115	[signature]	8-7-18	945	N/A	N	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson DATE Signed (MM/DD/YY): 7-31-18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2202804

Section A Required Client Information:

Company: Xcel Energy
Address: c/o Pace MN Field
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: David Anderson
Copy To:
Purchase Order No.:
Project Name: 18-00928, Xcel Energy - Sherco III ADF + CCR, Summer 2018
Project Number:

Section C Invoice Information:

Attention: Ciara Quikkie
Company Name: Pace MN Field Services
Address:
Pace Quote Reference: Tom Halverson
Pace Project Manager: Carin Fettis
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: RA-226 EPA 903.1	RA-228 EPA 904.0	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-120	WT				7/31/18	1840		2			2						✓	✓		013
2	P-98	WT				8-1-18	0815		2			2						✓	✓		014
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

3026173

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
(1) client needs to analyze for: Radium 226+228 pCi/L combined.	David Anderson / Pace	8/3/18	1145		8-7-18	945	N/A	N	N	Y
(2) RA-226 EPA 903.1 RA-228 EPA 904.0										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson

DATE Signed (MM/DD/YY): 8-1-18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: XCel Energy Project # 30261473

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

Label ET

Tracking #: 4486 7787 0983 LIMS Login BAH

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Thermometer Used N/A Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp ___ °C Correction Factor: ___ °C Final Temp: ___ °C

Temp should be above freezing to 6°C

pH paper Lot# 10D36671 Date and Initials of person examining contents: ET 8-7-18

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓			16. DH L2 Initial when completed CT Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: ET Date: 8-7-18

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

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)

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Appendix C

November 2018 Assessment Monitoring Semiannual Sampling Event
Field Datasheets and Laboratory Reports

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF+ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-73a-1 Labeled P73A-1

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel Well needs new lock.

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 36.18 Feet

Static water level measurement before purging (Start Depth) 33.15 Feet

Static water level measurement at time of sampling (Final Depth) 33.15 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-2-18 Water Column 3.03 Feet

Time Purged 0940-0952 One Casing Volume 0.5 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 11-2-18

Time Sampled 1015

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 7.4 (mg/l)

Spec. Cond. 490 (µmhos/cm) Turbidity 4.1 (NTU)

Temp. 9.0 (°C) Eh 254 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 37° + sunny, wind W5

Sample Description: clear + odorless

Observations: Collected Duplicate of this well.

DTA 11-2-18.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0944	7.8	490	9.0	7.4	NA	253	0.6
0948	7.7	490	9.0	7.4	NA	254	1.2
0952	7.7	490	9.0	7.4	NA	254	1.8

DTA 11-2-18

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-2-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF + ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-74-1 Labeled P74-1

Inside Diameter _____ (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	38.10	Feet
Static water level measurement before purging (Start Depth)	35.45	Feet
Static water level measurement at time of sampling (Final Depth)	35.45	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-2-18 Water Column 2.65 Feet

Time Purged 0850-0902 One Casing Volume 0.4 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 11-2-18

Time Sampled 0915

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O 6.6 (mg/l)

Spec. Cond. 570 (µmhos/cm) Turbidity 2.9 (NTU)

Temp. 9.5 (°C) Eh 244 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 35° + sunny, wind W 5

Sample Description: clear + odorless

Observations: collected Rinse Blank of this well.

DJA 11-2-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0854	7.7	570	9.5	6.8	NA	243	0.6
0858	7.7	570	9.5	6.7	NA	244	1.2
0902	7.6	570	9.5	6.6	NA	244	1.8
			DJA	11-2-18			

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-2-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF + ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-75-1 Labeled P75-1

Inside Diameter _____ (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	39.66	Feet
Static water level measurement before purging (Start Depth)	36.96	Feet
Static water level measurement at time of sampling (Final Depth)	36.96	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-5-18 Water Column 2.70 Feet

Time Purged 1535-1544 One Casing Volume 0.4 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 1.35 Gallons

Field Sampling Data

Date Sampled 11-5-18

Time Sampled 1600

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DVA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 8.2 (mg/l)

Spec. Cond. 620 (µmhos/cm) Turbidity 2.4 (NTU)

Temp. 9.5 (°C) Eh 272 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 40° + light rain, wind SE 10

Sample Description: clear + odorless

Observations: DVA 11-5-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1538	7.8	620	9.5	8.5	NA	270	0.45
1541	7.7	620	9.5	8.3	NA	271	0.90
1544	7.7	620	9.5	8.2	NA	272	1.35

DVA 11/5/18

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-5-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF+ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-97 Labeled P-97

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 41.99 Feet

Static water level measurement before purging (Start Depth) 40.33 Feet

Static water level measurement at time of sampling (Final Depth) 40.33 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-5-18 Water Column 1.66 Feet

Time Purged 1640-1649 One Casing Volume 0.3 Gallons

Pump Rate 0.10 GPM / LPM Volume Purged 0.9 Gallons

Field Sampling Data

Date Sampled 11-5-18

Time Sampled 1705

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 9.4 (mg/l)

Spec. Cond. 610 (µmhos/cm) Turbidity 3.0 (NTU)

Temp. 9.0 (°C) Eh 270 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 39° + light rain, wind SE 10

Sample Description: clear + odorless

Observations:

DTA 11-5-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1643	7.7	610	9.0	10.0	NA	276	0.3
1646	7.7	610	9.0	9.8	NA	273	0.6
1649	7.7	610	9.0	9.4	NA	270	0.9

DTA 11-5-18

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-5-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF+ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-98 Labeled P-98

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 43.35 Feet

Static water level measurement before purging (Start Depth) 39.04 Feet

Static water level measurement at time of sampling (Final Depth) 39.04 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-6-18 Water Column 4.31 Feet

Time Purged 0735-0750 One Casing Volume 0.7 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 2.25 Gallons

Field Sampling Data

Date Sampled 11-6-18

Time Sampled 0810

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O 7.2 (mg/l)

Spec. Cond. 530 (µmhos/cm) Turbidity 1.9 (NTU)

Temp. 12.0 (°C) Eh 251 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 35° + light rain, wind W15

Sample Description: clear + odorless

Observations:

DTA 11-6-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0740	7.7	530	12.0	7.2	NA	248	0.75
0745	7.6	530	12.0	7.2	NA	250	1.50
0750	7.6	530	12.0	7.2	NA	251	2.25

DTA 11-6-18

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-6-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF + ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-117 Labeled P117

Inside Diameter _____ (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 40.97 Feet

Static water level measurement before purging (Start Depth) 34.09 Feet

Static water level measurement at time of sampling (Final Depth) 34.09 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-5-18 Water Column 6.88 Feet

Time Purged 1430 - 1454 One Casing Volume 1.1 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 11-5-18

Time Sampled 1505

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 8.4 (mg/l)

Spec. Cond. 600 (µmhos/cm) Turbidity 1.7 (NTU)

Temp. 10.0 (°C) Eh 269 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 40° + light rain, wind SE 10

Sample Description: clear + odorless

Observations: DJA 11-5-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1438	7.8	600	10.0	8.5	NA	266	1.2
1446	7.8	600	10.0	8.5	NA	268	2.4
1454	7.7	600	10.0	8.4	NA	269	3.6

DJA 11-5-18

Samples chilled immediately after collection ☒ Yes ☐ Other _____

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-5-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF + ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-120 Labeled P-120

Inside Diameter 2 (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 48.53 Feet

Static water level measurement before purging (Start Depth) 39.43 Feet

Static water level measurement at time of sampling (Final Depth) 39.43 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-6-18 Water Column 9.10 Feet

Time Purged 0830-0854 One Casing Volume 1.5 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 4.8 Gallons

Field Sampling Data

Date Sampled 11-6-18

Time Sampled 0910

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O 6.9 (mg/l)

Spec. Cond. 600 (µmhos/cm) Turbidity 3.9 (NTU)

Temp. 10.0 (°C) Eh 261 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 35° + light rain, wind W 15

Sample Description: clear + odorless

Observations: DJA 11-6-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0838	7.6	600	10.0	6.8	NA	260	1.6
0846	7.6	600	10.0	6.9	NA	261	3.2
0854	7.6	600	10.0	6.9	NA	261	4.8

DJA 11-6-18

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-6-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF + ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-125 Labeled P-125

Inside Diameter ____ (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 36.41 Feet

Static water level measurement before purging (Start Depth) 28.87 Feet

Static water level measurement at time of sampling (Final Depth) 28.87 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-2-18 Water Column 7.54 Feet

Time Purged 1115 - 1133 One Casing Volume 1.2 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 11-2-18

Time Sampled 1145

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 7.3 (mg/l)

Spec. Cond. 540 (µmhos/cm) Turbidity 2.1 (NTU)

Temp. 10.0 (°C) Eh 254 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 39° + partly cloudy, wind W 5

Sample Description: clear + odorless

Observations: DTA 11-2-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1121	7.8	540	10.0	7.3	NA	254	1.2
1127	7.8	540	10.0	7.3	NA	254	2.4
1133	7.7	540	10.0	7.3	NA	254	3.6

DTA 11-2-18

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-2-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF+ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-134 Labeled 747065

Inside Diameter ____ (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 37.52 Feet

Static water level measurement before purging (Start Depth) 29.97 Feet

Static water level measurement at time of sampling (Final Depth) 29.97 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-5-18 Water Column 7.55 Feet

Time Purged 0955-1013 One Casing Volume 1.2 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 11-5-18

Time Sampled 1025

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 8.7 (mg/l)

Spec. Cond. 720 (µmhos/cm) Turbidity 4.6 (NTU)

Temp. 9.0 (°C) Eh 272 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 38° + cloudy, wind 5 5-10

Sample Description: clear + odorless

Observations:

DJA 11-5-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1001	7.6	720	9.0	9.0	NA	262	1.2
1007	7.5	720	9.0	8.8	NA	267	2.4
1013	7.5	720	9.0	8.7	NA	272	3.6

DJA 11-5-18

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-5-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF + ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-137A Labeled P137A

Inside Diameter _____ (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	41.70	Feet
Static water level measurement before purging (Start Depth)	32.12	Feet
Static water level measurement at time of sampling (Final Depth)	32.12	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-5-18 Water Column 9.58 Feet

Time Purged 1220 - 1244 One Casing Volume 1.6 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 4.8 Gallons

Field Sampling Data

Date Sampled 11-5-18

Time Sampled 1255

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 7.9 (mg/l)

Spec. Cond. 680 (µmhos/cm) Turbidity 2.8 (NTU)

Temp. 9.5 (°C) Eh 275 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 41° + cloudy, wind SE 10

Sample Description: clear + odorless

Observations: DTA 11-5-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1228	7.6	670	9.5	7.9	NA	275	1.6
1236	7.6	680	9.5	7.9	NA	275	3.2
1244	7.5	680	9.5	7.9	NA	275	4.8

DTA 11-5-18

Samples chilled immediately after collection ☒ Yes ☐ Other _____

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-5-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco III ADF + ECR Fall 2018 Project No. 18-01329

Monitoring Point ID P-138A Labeled P-138A

Inside Diameter _____ (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation NA Feet

Total Well Depth 36.95 Feet

Static water level measurement before purging (Start Depth) 29.11 Feet

Static water level measurement at time of sampling (Final Depth) 29.11 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-5-18 Water Column 7.84 Feet

Time Purged 1050 - 1111 One Casing Volume 1.3 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 11-5-18

Time Sampled 1120

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 5.1 (mg/l)

Spec. Cond. 750 (µmhos/cm) Turbidity 2.8 (NTU)

Temp. 9.5 (°C) Eh 275 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 39°+ cloudy, wind SE 5-10

Sample Description: clear + odorless

Observations: DTA 11-5-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1057	7.5	740	10.0	4.7	NA	275	1.4
1104	7.4	750	9.5	5.2	NA	275	2.8
1111	7.4	750	9.5	5.1	NA	275	4.2

DTA 11-5-18

Samples chilled immediately after collection: ☒ Yes ☐ Other _____

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-5-18

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy **Project** Sherco III ADF+ECR Fall 2018 **Project No.** 18-01329

Monitoring Point ID P-141 Labeled _____

Inside Diameter _____ (inches) Key # 2106 ☒ Locked ☐ Not Locked

Casing Material: ☒ PVC ☐ Steel ☐ Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation	NA	Feet
Total Well Depth	39.24	Feet
Static water level measurement before purging (Start Depth)	31.42	Feet
Static water level measurement at time of sampling (Final Depth)	31.42	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-2-18 Water Column 7.82 Feet

Time Purged 1200-1221 One Casing Volume 1.3 Gallons

Pump Rate 0.2 (GPM / LPM) Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 11-2-18

Time Sampled 1230

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 6.9 (mg/l)

Spec. Cond. 690 (µmhos/cm) Turbidity 8.4 (NTU)

Temp. 9.0 (°C) Eh 257 (mV)

Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA

Sample for Soluble Metals Filtered in Field: ☒ Yes ☐ No ☐ NA

Weather Conditions During Sampling: 40° + cloudy, wind W 5

Sample Description: clear + odorless

Observations: DJA 11-2-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1207	7.7	690	9.0	6.9	NA	258	1.4
1214	7.7	690	9.0	6.9	NA	258	2.8
1221	7.7	690	9.0	6.9	NA	257	4.2
			DJA	11/2/18			

Samples chilled immediately after collection ☒ Yes ☐ Other _____

Form Revised: 01/25/2018

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 11-2-18

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification #MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

19 November 2018

Charles A Donkers

Environmental Services-Water Minneapolis

250 Marquette Plaza

Minneapolis, MN 55401

cc:

RE: Sherco Unit 3 Landfill CCR

Enclosed are the results of analyses for samples received by the laboratory on 11/05/2018 05:45-11/06/2018 10:20. If you have any questions concerning this report, please feel free to contact me.

I certify that this analysis report was prepared under my direction or supervision under a system designed to assure that qualified personnel analyzed the submitted samples. All protocols for analysis were followed as required by Minnesota Rules and the Applicable Management Plan.

Sincerely,

Steve Davis

Project Manager

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification # MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Rinse		MDK0029-01	Water	11/02/2018 8:20	11/05/2018 5:45
P-74-1		MDK0029-06	Water	11/02/2018 9:15	11/05/2018 5:45
P-73A-1		MDK0029-07	Water	11/02/2018 10:15	11/05/2018 5:45
Duplicate		MDK0029-08	Water	11/02/2018 10:15	11/05/2018 5:45
P-125		MDK0029-10	Water	11/02/2018 11:45	11/05/2018 5:45
P-141		MDK0029-11	Water	11/02/2018 12:30	11/05/2018 5:45
P-134		MDK0047-01	Water	11/05/2018 10:25	11/06/2018 10:20
P-138A		MDK0047-02	Water	11/05/2018 11:20	11/06/2018 10:20
P-137A		MDK0047-04	Water	11/05/2018 12:55	11/06/2018 10:20
P-117		MDK0047-06	Water	11/05/2018 15:05	11/06/2018 10:20
P-75-1		MDK0047-08	Water	11/05/2018 16:00	11/06/2018 10:20
P-97		MDK0047-09	Water	11/05/2018 17:05	11/06/2018 10:20
P-98		MDK0047-10	Water	11/06/2018 8:10	11/06/2018 10:20
P-120		MDK0047-11	Water	11/06/2018 9:10	11/06/2018 10:20

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification # MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Rinse

MDK0029-01 (Water) - Chain of Custody Number: 1845945

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	< 1.00	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 16:05	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 16:05	EPA 300.0	CRL
Sulfate	< 1.00	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 16:05	EPA 300.0	CRL
Wet Chemistry										
pH	6.15		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 11:06	SM 4500-H+ B	CRL
Total Dissolved Solids	< 20.0	20.0	mg/L		1	BDK0120	11/7/18 9:08	11/7/18 9:08	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0119	11/7/18 7:04	11/7/18 7:04	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:21	EPA 200.8	CRL
Barium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:21	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:21	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:21	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:21	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:21	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:24	EPA 200.7	HRD
Calcium	< 1.25	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:22	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

P-74-1

MDK0029-06 (Water) - Chain of Custody Number: 1845945

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	20.1	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 17:47	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 17:47	EPA 300.0	CRL
Sulfate	18.8	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 17:47	EPA 300.0	CRL
Wet Chemistry										
pH	7.73		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 11:48	SM 4500-H+ B	CRL
Total Dissolved Solids	312	20.0	mg/L		1	BDK0120	11/7/18 9:08	11/7/18 9:08	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0119	11/7/18 7:04	11/7/18 7:04	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.648	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:25	EPA 200.8	CRL
Barium	91.3	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:25	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:25	EPA 200.8	CRL
Chromium	0.534	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:25	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:25	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:25	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0804	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:29	EPA 200.7	HRD
Calcium	83.1	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:28	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

P-73A-1

MDK0029-07 (Water) - Chain of Custody Number: 1845945

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	16.0	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 18:08	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 18:08	EPA 300.0	CRL
Sulfate	15.8	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 18:08	EPA 300.0	CRL
Wet Chemistry										
pH	7.87		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 11:54	SM 4500-H+ B	CRL
Total Dissolved Solids	260	20.0	mg/L		1	BDK0120	11/7/18 9:08	11/7/18 9:08	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0119	11/7/18 7:04	11/7/18 7:04	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.630	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:29	EPA 200.8	CRL
Barium	49.4	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:29	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:29	EPA 200.8	CRL
Chromium	0.556	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:29	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:29	EPA 200.8	CRL
Selenium	0.609	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:29	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0524	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:34	EPA 200.7	HRD
Calcium	69.7	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:33	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Duplicate

MDK0029-08 (Water) - Chain of Custody Number: 1845945

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	15.9	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 18:28	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 18:28	EPA 300.0	CRL
Sulfate	15.8	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 18:28	EPA 300.0	CRL
Wet Chemistry										
pH	7.86		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 12:02	SM 4500-H+ B	CRL
Total Dissolved Solids	270	20.0	mg/L		1	BDK0120	11/7/18 9:08	11/7/18 9:08	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0119	11/7/18 7:04	11/7/18 7:04	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.665	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:33	EPA 200.8	CRL
Barium	50.8	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:33	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:33	EPA 200.8	CRL
Chromium	0.526	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:33	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:33	EPA 200.8	CRL
Selenium	0.590	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:33	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0560	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:39	EPA 200.7	HRD
Calcium	71.3	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:38	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

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MDK0029-10 (Water) - Chain of Custody Number: 1845945

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	28.1	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 10:28	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 10:28	EPA 300.0	CRL
Sulfate	13.4	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 10:28	EPA 300.0	CRL
Wet Chemistry										
pH	7.91		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 12:15	SM 4500-H+ B	CRL
Total Dissolved Solids	294	20.0	mg/L		1	BDK0169	11/8/18 8:54	11/8/18 8:54	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0168	11/8/18 6:47	11/8/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.831	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:36	EPA 200.8	CRL
Barium	59.4	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:36	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:36	EPA 200.8	CRL
Chromium	0.734	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:36	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:36	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:36	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:44	EPA 200.7	HRD
Calcium	68.0	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:43	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

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MDK0029-11 (Water) - Chain of Custody Number: 1845945

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	47.7	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 10:48	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 10:48	EPA 300.0	CRL
Sulfate	35.0	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 10:48	EPA 300.0	CRL
Wet Chemistry										
pH	7.87		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 12:19	SM 4500-H+ B	CRL
Total Dissolved Solids	386	20.0	mg/L		1	BDK0169	11/8/18 8:54	11/8/18 8:54	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0168	11/8/18 6:47	11/8/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.911	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:40	EPA 200.8	CRL
Barium	79.0	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:40	EPA 200.8	CRL
Cobalt	0.573	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:40	EPA 200.8	CRL
Chromium	1.10	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:40	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:40	EPA 200.8	CRL
Selenium	0.525	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 10:40	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0624	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:49	EPA 200.7	HRD
Calcium	90.0	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 15:48	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

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MDK0047-01 (Water) - Chain of Custody Number: 1845950

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	44.0	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 11:09	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 11:09	EPA 300.0	CRL
Sulfate	31.2	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 11:09	EPA 300.0	CRL
Wet Chemistry										
pH	7.77		pH Units	M_TTT	1	BDK0121	11/6/18 12:35	11/6/18 13:36	SM 4500-H+ B	CRL
Total Dissolved Solids	414	20.0	mg/L		1	BDK0169	11/8/18 8:54	11/8/18 8:54	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0168	11/8/18 6:47	11/8/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.844	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:51	EPA 200.8	CRL
Barium	93.9	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:51	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:51	EPA 200.8	CRL
Chromium	0.507	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:51	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:51	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:51	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0565	0.0500	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 13:51	EPA 200.7	HRD
Calcium	90.4	1.25	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 13:50	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

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MDK0047-02 (Water) - Chain of Custody Number: 1845950

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	43.0	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 11:29	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 11:29	EPA 300.0	CRL
Sulfate	30.9	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 11:29	EPA 300.0	CRL
Wet Chemistry										
pH	7.62		pH Units	M_TTT	1	BDK0121	11/6/18 12:35	11/6/18 13:42	SM 4500-H+ B	CRL
Total Dissolved Solids	422	20.0	mg/L		1	BDK0169	11/8/18 8:54	11/8/18 8:54	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0168	11/8/18 6:47	11/8/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.790	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:54	EPA 200.8	CRL
Barium	103	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:54	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:54	EPA 200.8	CRL
Chromium	0.519	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:54	EPA 200.8	CRL
Lead	0.995	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:54	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:54	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0530	0.0500	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 13:56	EPA 200.7	HRD
Calcium	95.8	1.25	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 13:55	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

P-137A

MDK0047-04 (Water) - Chain of Custody Number: 1845950

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	25.8	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 12:10	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 12:10	EPA 300.0	CRL
Sulfate	87.2	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 12:10	EPA 300.0	CRL
Wet Chemistry										
pH	7.72		pH Units	M_TTT	1	BDK0121	11/6/18 12:35	11/6/18 13:56	SM 4500-H+ B	CRL
Total Dissolved Solids	426	20.0	mg/L		1	BDK0169	11/8/18 8:54	11/8/18 8:54	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0168	11/8/18 6:47	11/8/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.816	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:58	EPA 200.8	CRL
Barium	95.0	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:58	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:58	EPA 200.8	CRL
Chromium	1.52	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:58	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:58	EPA 200.8	CRL
Selenium	0.999	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 8:58	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.147	0.0500	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:01	EPA 200.7	HRD
Calcium	90.4	1.25	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:00	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

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MDK0047-06 (Water) - Chain of Custody Number: 1845950

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	30.2	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 12:51	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 12:51	EPA 300.0	CRL
Sulfate	25.7	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 12:51	EPA 300.0	CRL
Wet Chemistry										
pH	7.80		pH Units	M_TTT	1	BDK0121	11/6/18 12:35	11/6/18 14:10	SM 4500-H+ B	CRL
Total Dissolved Solids	328	20.0	mg/L		1	BDK0169	11/8/18 8:54	11/8/18 8:54	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0168	11/8/18 6:47	11/8/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.754	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:02	EPA 200.8	CRL
Barium	72.1	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:02	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:02	EPA 200.8	CRL
Chromium	0.573	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:02	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:02	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:02	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:06	EPA 200.7	HRD
Calcium	77.8	1.25	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:05	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

P-75-1

MDK0047-08 (Water) - Chain of Custody Number: 1845950

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	27.0	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 13:32	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 13:32	EPA 300.0	CRL
Sulfate	27.7	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 13:32	EPA 300.0	CRL
Wet Chemistry										
pH	7.76		pH Units	M_TTT	1	BDK0121	11/6/18 12:35	11/6/18 14:23	SM 4500-H+ B	CRL
Total Dissolved Solids	336	20.0	mg/L		1	BDK0217	11/9/18 9:01	11/9/18 9:01	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0216	11/9/18 6:47	11/9/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.728	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:18	EPA 200.8	CRL
Barium	86.9	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:18	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:18	EPA 200.8	CRL
Chromium	0.563	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:18	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:18	EPA 200.8	CRL
Selenium	1.01	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:18	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0501	0.0500	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:11	EPA 200.7	HRD
Calcium	82.2	1.25	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:10	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

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MDK0047-09 (Water) - Chain of Custody Number: 1845950

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	26.6	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 15:34	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 15:34	EPA 300.0	CRL
Sulfate	26.8	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 15:34	EPA 300.0	CRL
Wet Chemistry										
pH	7.80		pH Units	M_TTT	1	BDK0121	11/6/18 12:35	11/6/18 14:30	SM 4500-H+ B	CRL
Total Dissolved Solids	342	20.0	mg/L		1	BDK0217	11/9/18 9:01	11/9/18 9:01	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0216	11/9/18 6:47	11/9/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.721	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:22	EPA 200.8	CRL
Barium	82.0	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:22	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:22	EPA 200.8	CRL
Chromium	0.701	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:22	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:22	EPA 200.8	CRL
Selenium	1.05	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:22	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0638	0.0500	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:16	EPA 200.7	HRD
Calcium	81.5	1.25	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:15	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

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MDK0047-10 (Water) - Chain of Custody Number: 1845950

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	22.3	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 15:54	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 15:54	EPA 300.0	CRL
Sulfate	18.2	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 15:54	EPA 300.0	CRL
Wet Chemistry										
pH	7.80		pH Units	M_TTT	1	BDK0121	11/6/18 12:35	11/6/18 14:37	SM 4500-H+ B	CRL
Total Dissolved Solids	284	20.0	mg/L		1	BDK0217	11/9/18 9:01	11/9/18 9:01	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0216	11/9/18 6:47	11/9/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.705	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:26	EPA 200.8	CRL
Barium	80.2	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:26	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:26	EPA 200.8	CRL
Chromium	0.577	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:26	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:26	EPA 200.8	CRL
Selenium	0.503	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:26	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:22	EPA 200.7	HRD
Calcium	69.7	1.25	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:20	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

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MDK0047-11 (Water) - Chain of Custody Number: 1845950

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	29.6	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 16:15	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 16:15	EPA 300.0	CRL
Sulfate	35.6	1.00	mg/L		1	BDK0171	11/7/18 13:24	11/8/18 16:15	EPA 300.0	CRL
Wet Chemistry										
pH	7.81		pH Units	M_TTT	1	BDK0121	11/6/18 12:35	11/6/18 14:51	SM 4500-H+ B	CRL
Total Dissolved Solids	322	20.0	mg/L		1	BDK0217	11/9/18 9:01	11/9/18 9:01	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0216	11/9/18 6:47	11/9/18 6:47	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.764	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:30	EPA 200.8	CRL
Barium	75.4	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:30	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:30	EPA 200.8	CRL
Chromium	0.766	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:30	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:30	EPA 200.8	CRL
Selenium	1.08	0.500	ug/L		1	BDK0195	11/8/18 9:04	11/12/18 9:30	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0877	0.0500	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:27	EPA 200.7	HRD
Calcium	75.7	1.25	mg/L		1	BDK0194	11/8/18 8:50	11/12/18 14:25	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0154 - Wet Prep										
Blank (BDK0154-BLK1)				Prepared & Analyzed: 11/07/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
Blank (BDK0154-BLK2)				Prepared & Analyzed: 11/07/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BDK0154-BS1)				Prepared & Analyzed: 11/07/2018						
Chloride	24.4	1.00	mg/L	25.000		97.4	90-110			
Fluoride	2.50	0.750	mg/L	2.5000		100	90-110			
Sulfate	47.0	1.00	mg/L	48.000		97.9	90-110			
LCS (BDK0154-BS2)				Prepared & Analyzed: 11/07/2018						
Chloride	23.7	1.00	mg/L	25.000		94.8	90-110			
Fluoride	2.50	0.750	mg/L	2.5000		100	90-110			
Sulfate	45.6	1.00	mg/L	48.000		94.9	90-110			
LCS (BDK0154-BS3)				Prepared & Analyzed: 11/07/2018						
Chloride	23.6	1.00	mg/L	25.000		94.5	90-110			
Fluoride	2.48	0.750	mg/L	2.5000		99.2	90-110			
Sulfate	45.4	1.00	mg/L	48.000		94.6	90-110			
Duplicate (BDK0154-DUP1)		**Source: MDK0026-08**		Prepared & Analyzed: 11/07/2018						
Chloride	18.1	1.00	mg/L		18.1			0.0938	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	18.2	1.00	mg/L		18.0			0.900	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0154 - Wet Prep										
Duplicate (BDK0154-DUP2)		**Source: MDK0026-09**		Prepared & Analyzed: 11/07/2018						
Chloride	0.405	1.00	mg/L		0.404			0.247	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	3.17	1.00	mg/L		3.14			0.887	20	
Matrix Spike (BDK0154-MS1)		**Source: MDK0026-08**		Prepared & Analyzed: 11/07/2018						
Chloride	47.4	1.25	mg/L	31.250	18.1	93.6	80-120			
Fluoride	2.98	0.938	mg/L	3.1250	<0.938	95.5	80-120			
Sulfate	74.4	1.25	mg/L	60.000	18.0	93.9	80-120			
Matrix Spike (BDK0154-MS2)		**Source: MDK0026-09**		Prepared & Analyzed: 11/07/2018						
Chloride	30.8	1.25	mg/L	31.250	0.404	97.4	80-120			
Fluoride	3.28	0.938	mg/L	3.1250	<0.938	105	80-120			
Sulfate	62.0	1.25	mg/L	60.000	3.14	98.0	80-120			
Matrix Spike Dup (BDK0154-MSD1)		**Source: MDK0026-08**		Prepared & Analyzed: 11/07/2018						
Chloride	48.8	1.25	mg/L	31.250	18.1	98.3	80-120	3.06	20	
Fluoride	3.28	0.938	mg/L	3.1250	<0.938	105	80-120	9.35	20	
Sulfate	76.9	1.25	mg/L	60.000	18.0	98.2	80-120	3.40	20	
Matrix Spike Dup (BDK0154-MSD2)		**Source: MDK0026-09**		Prepared & Analyzed: 11/07/2018						
Chloride	30.9	1.25	mg/L	31.250	0.404	97.5	80-120	0.0770	20	
Fluoride	3.40	0.938	mg/L	3.1250	<0.938	109	80-120	3.52	20	
Sulfate	62.1	1.25	mg/L	60.000	3.14	98.3	80-120	0.244	20	
Batch BDK0171 - Wet Prep										
Blank (BDK0171-BLK1)				Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0171 - Wet Prep										
Blank (BDK0171-BLK2)				Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BDK0171-BS1)				Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	24.5	1.00	mg/L	25.000		97.9	90-110			
Fluoride	2.59	0.750	mg/L	2.5000		104	90-110			
Sulfate	47.3	1.00	mg/L	48.000		98.5	90-110			
LCS (BDK0171-BS2)				Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	23.9	1.00	mg/L	25.000		95.5	90-110			
Fluoride	2.57	0.750	mg/L	2.5000		103	90-110			
Sulfate	45.9	1.00	mg/L	48.000		95.5	90-110			
LCS (BDK0171-BS3)				Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	23.7	1.00	mg/L	25.000		94.8	90-110			
Fluoride	2.41	0.750	mg/L	2.5000		96.4	90-110			
Sulfate	45.6	1.00	mg/L	48.000		94.9	90-110			
Duplicate (BDK0171-DUP1)		**Source: MDK0029-10**		Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	28.0	1.00	mg/L		28.1			0.517	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	13.5	1.00	mg/L		13.4			0.724	20	
Duplicate (BDK0171-DUP2)		**Source: MDK0029-11**		Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	47.9	1.00	mg/L		47.7			0.416	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	35.1	1.00	mg/L		35.0			0.454	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0171 - Wet Prep										
Matrix Spike (BDK0171-MS1)		**Source: MDK0029-10**		Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	58.1	1.25	mg/L	31.250	28.1	95.9	80-120			
Fluoride	2.97	0.938	mg/L	3.1250	<0.938	95.1	80-120			
Sulfate	71.2	1.25	mg/L	60.000	13.4	96.4	80-120			
Matrix Spike (BDK0171-MS2)		**Source: MDK0029-11**		Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	78.1	1.25	mg/L	31.250	47.7	97.2	80-120			
Fluoride	3.12	0.938	mg/L	3.1250	<0.938	99.8	80-120			
Sulfate	93.4	1.25	mg/L	60.000	35.0	97.3	80-120			
Matrix Spike Dup (BDK0171-MSD1)		**Source: MDK0029-10**		Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	58.4	1.25	mg/L	31.250	28.1	96.7	80-120	0.416	20	
Fluoride	3.26	0.938	mg/L	3.1250	<0.938	104	80-120	9.23	20	
Sulfate	71.7	1.25	mg/L	60.000	13.4	97.2	80-120	0.672	20	
Matrix Spike Dup (BDK0171-MSD2)		**Source: MDK0029-11**		Prepared: 11/07/2018 Analyzed: 11/08/2018						
Chloride	78.1	1.25	mg/L	31.250	47.7	97.4	80-120	0.0752	20	
Fluoride	3.30	0.938	mg/L	3.1250	<0.938	106	80-120	5.72	20	
Sulfate	93.5	1.25	mg/L	60.000	35.0	97.5	80-120	0.100	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0064 - Wet Prep										
LCS (BDK0064-BS1)				Prepared & Analyzed: 11/05/2018						
pH	7.06		pH Units	7.0000		101	90-110			
LCS (BDK0064-BS2)				Prepared & Analyzed: 11/05/2018						
pH	7.06		pH Units	7.0000		101	90-110			
Duplicate (BDK0064-DUP1)		**Source: MDK0025-01**		Prepared & Analyzed: 11/05/2018						
pH	7.70		pH Units		7.76			0.776	20	
Duplicate (BDK0064-DUP2)		**Source: MDK0026-01**		Prepared & Analyzed: 11/05/2018						
pH	8.01		pH Units		8.02			0.125	20	
Duplicate (BDK0064-DUP3)		**Source: MDK0026-11**		Prepared & Analyzed: 11/05/2018						
pH	7.84		pH Units		7.84			0.00	20	
Duplicate (BDK0064-DUP4)		**Source: MDK0029-02**		Prepared & Analyzed: 11/05/2018						
pH	7.62		pH Units		7.66			0.524	20	
Batch BDK0119 - Wet Prep										
Blank (BDK0119-BLK1)				Prepared & Analyzed: 11/07/2018						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDK0119-DUP1)		**Source: MDK0028-04**		Prepared & Analyzed: 11/07/2018						
Total Suspended Solids	<4.00	4.00	mg/L		<4.00				20	
Batch BDK0120 - Wet Prep										
Blank (BDK0120-BLK1)				Prepared & Analyzed: 11/07/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0120 - Wet Prep										
Duplicate (BDK0120-DUP1)			**Source: MDK0028-04**	Prepared & Analyzed: 11/07/2018						
Total Dissolved Solids	242	20.0	mg/L		254			4.84	20	
Batch BDK0121 - Wet Prep										
LCS (BDK0121-BS1)				Prepared & Analyzed: 11/06/2018						
pH	7.12		pH Units	4.0000		178	90-110			
LCS (BDK0121-BS2)				Prepared & Analyzed: 11/06/2018						
pH	7.11		pH Units	4.0000		178	90-110			
Duplicate (BDK0121-DUP1)			**Source: MDK0047-01**	Prepared & Analyzed: 11/06/2018						
pH	7.70		pH Units		7.77			0.905	20	
Duplicate (BDK0121-DUP2)			**Source: MDK0047-11**	Prepared & Analyzed: 11/06/2018						
pH	7.80		pH Units		7.81			0.128	20	
Batch BDK0168 - Wet Prep										
Blank (BDK0168-BLK1)				Prepared & Analyzed: 11/08/2018						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDK0168-DUP1)			**Source: MDK0029-09**	Prepared & Analyzed: 11/08/2018						
Total Suspended Solids	<4.00	4.00	mg/L		0.800				20	
Batch BDK0169 - Wet Prep										
Blank (BDK0169-BLK1)				Prepared & Analyzed: 11/08/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0169 - Wet Prep										
Duplicate (BDK0169-DUP1)		**Source: MDK0029-09**		Prepared & Analyzed: 11/08/2018						
Total Dissolved Solids	244	20.0	mg/L		250			2.43	20	
Batch BDK0216 - Wet Prep										
Blank (BDK0216-BLK1)				Prepared & Analyzed: 11/09/2018						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDK0216-DUP1)		**Source: MDK0047-08**		Prepared & Analyzed: 11/09/2018						
Total Suspended Solids	<4.00	4.00	mg/L		<4.00				20	
Batch BDK0217 - Wet Prep										
Blank (BDK0217-BLK1)				Prepared & Analyzed: 11/09/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDK0217-DUP1)		**Source: MDK0047-08**		Prepared & Analyzed: 11/09/2018						
Total Dissolved Solids	326	20.0	mg/L		336			3.02	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0069 - EPA 200.2, EPA 3005										
Blank (BDK0069-BLK1)				Prepared: 11/05/2018 Analyzed: 11/08/2018						
Chromium	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Blank (BDK0069-BLK2)				Prepared: 11/05/2018 Analyzed: 11/08/2018						
Lead	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
LCS (BDK0069-BS1)				Prepared: 11/05/2018 Analyzed: 11/08/2018						
Cobalt	100	0.500	ug/L	100.00		100	85-115			
Arsenic	96.2	0.500	ug/L	100.00		96.2	85-115			
Selenium	95.2	0.500	ug/L	100.00		95.2	85-115			
Chromium	99.4	0.500	ug/L	100.00		99.4	85-115			
Barium	93.8	0.500	ug/L	100.00		93.8	85-115			
Lead	93.7	0.500	ug/L	100.00		93.7	85-115			
LCS (BDK0069-BS2)				Prepared: 11/05/2018 Analyzed: 11/08/2018						
Lead	96.4	0.500	ug/L	100.00		96.4	85-115			
Chromium	101	0.500	ug/L	100.00		101	85-115			
Arsenic	98.6	0.500	ug/L	100.00		98.6	85-115			
Selenium	99.2	0.500	ug/L	100.00		99.2	85-115			
Cobalt	100	0.500	ug/L	100.00		100	85-115			
Barium	98.7	0.500	ug/L	100.00		98.7	85-115			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0069 - EPA 200.2, EPA 3005										
Duplicate (BDK0069-DUP1)		**Source: MDK0026-07**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Selenium	0.295	0.500	ug/L		0.381			25.5	20	M_D-RL
Chromium	0.735	0.500	ug/L		0.732			0.375	20	
Lead	0.0627	0.500	ug/L		0.0158			119	20	M_D-RL
Arsenic	0.568	0.500	ug/L		0.628			10.2	20	
Cobalt	0.0325	0.500	ug/L		<0.500				20	
Barium	51.6	0.500	ug/L		50.8			1.56	20	
Duplicate (BDK0069-DUP2)		**Source: MDK0026-08**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Lead	0.0878	0.500	ug/L		0.0866			1.41	20	
Chromium	0.841	0.500	ug/L		0.851			1.22	20	
Arsenic	0.250	0.500	ug/L		0.315			22.8	20	M_D-RL
Cobalt	0.193	0.500	ug/L		0.183			4.95	20	
Barium	46.8	0.500	ug/L		47.2			0.862	20	
Selenium	0.371	0.500	ug/L		0.468			23.1	20	M_D-RL
Duplicate (BDK0069-DUP3)		**Source: MDK0026-09**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Cobalt	0.0251	0.500	ug/L		<0.500				20	
Barium	16.5	0.500	ug/L		16.7			1.17	20	
Lead	0.0256	0.500	ug/L		0.0242			5.70	20	
Selenium	0.340	0.500	ug/L		0.387			13.0	20	
Arsenic	1.07	0.500	ug/L		1.14			6.67	20	
Chromium	0.817	0.500	ug/L		0.798			2.28	20	
Matrix Spike (BDK0069-MS1)		**Source: MDK0026-07**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Arsenic	102	0.500	ug/L	100.00	0.628	102	70-130			
Chromium	103	0.500	ug/L	100.00	0.732	102	70-130			
Selenium	103	0.500	ug/L	100.00	0.381	103	70-130			
Barium	144	0.500	ug/L	100.00	50.8	92.9	70-130			
Cobalt	106	0.500	ug/L	100.00	<0.500	106	70-130			
Lead	89.4	0.500	ug/L	100.00	0.0158	89.4	70-130			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0069 - EPA 200.2, EPA 3005										
Matrix Spike (BDK0069-MS2)		**Source: MDK0026-08**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Lead	94.9	0.500	ug/L	100.00	0.0866	94.8	70-130			
Arsenic	98.2	0.500	ug/L	100.00	0.315	97.8	70-130			
Barium	145	0.500	ug/L	100.00	47.2	98.2	70-130			
Cobalt	102	0.500	ug/L	100.00	0.183	102	70-130			
Selenium	98.3	0.500	ug/L	100.00	0.468	97.9	70-130			
Chromium	103	0.500	ug/L	100.00	0.851	102	70-130			
Matrix Spike (BDK0069-MS3)		**Source: MDK0026-09**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Arsenic	102	0.500	ug/L	100.00	1.14	101	70-130			
Barium	116	0.500	ug/L	100.00	16.7	98.9	70-130			
Cobalt	102	0.500	ug/L	100.00	<0.500	102	70-130			
Lead	94.7	0.500	ug/L	100.00	0.0242	94.7	70-130			
Chromium	102	0.500	ug/L	100.00	0.798	101	70-130			
Selenium	102	0.500	ug/L	100.00	0.387	102	70-130			
Matrix Spike Dup (BDK0069-MSD1)		**Source: MDK0026-07**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Cobalt	103	0.500	ug/L	100.00	<0.500	103	70-130	3.24	20	
Chromium	102	0.500	ug/L	100.00	0.732	101	70-130	0.941	20	
Lead	87.2	0.500	ug/L	100.00	0.0158	87.1	70-130	2.56	20	
Barium	143	0.500	ug/L	100.00	50.8	92.2	70-130	0.424	20	
Arsenic	97.2	0.500	ug/L	100.00	0.628	96.5	70-130	5.03	20	
Selenium	98.7	0.500	ug/L	100.00	0.381	98.3	70-130	4.29	20	
Matrix Spike Dup (BDK0069-MSD2)		**Source: MDK0026-08**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Barium	144	0.500	ug/L	100.00	47.2	97.1	70-130	0.729	20	
Selenium	102	0.500	ug/L	100.00	0.468	101	70-130	3.46	20	
Cobalt	101	0.500	ug/L	100.00	0.183	100	70-130	1.76	20	
Lead	92.7	0.500	ug/L	100.00	0.0866	92.6	70-130	2.36	20	
Chromium	103	0.500	ug/L	100.00	0.851	102	70-130	0.0966	20	
Arsenic	101	0.500	ug/L	100.00	0.315	101	70-130	2.77	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0069 - EPA 200.2, EPA 3005										
Matrix Spike Dup (BDK0069-MSD3)		**Source: MDK0026-09**		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Arsenic	102	0.500	ug/L	100.00	1.14	101	70-130	0.555	20	
Barium	114	0.500	ug/L	100.00	16.7	96.8	70-130	1.78	20	
Lead	97.7	0.500	ug/L	100.00	0.0242	97.7	70-130	3.14	20	
Chromium	100	0.500	ug/L	100.00	0.798	99.5	70-130	1.97	20	
Selenium	101	0.500	ug/L	100.00	0.387	101	70-130	0.613	20	
Cobalt	98.4	0.500	ug/L	100.00	<0.500	98.4	70-130	3.32	20	
Batch BDK0195 - EPA 200.2, EPA 3005										
Blank (BDK0195-BLK1)				Prepared: 11/08/2018 Analyzed: 11/12/2018						
Cobalt	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
LCS (BDK0195-BS1)				Prepared: 11/08/2018 Analyzed: 11/12/2018						
Chromium	100	0.500	ug/L	100.00		100	85-115			
Barium	95.9	0.500	ug/L	100.00		95.9	85-115			
Selenium	96.1	0.500	ug/L	100.00		96.1	85-115			
Cobalt	103	0.500	ug/L	100.00		103	85-115			
Lead	96.8	0.500	ug/L	100.00		96.8	85-115			
Arsenic	99.5	0.500	ug/L	100.00		99.5	85-115			
Duplicate (BDK0195-DUP1)		**Source: MDK0047-01**		Prepared: 11/08/2018 Analyzed: 11/12/2018						
Cobalt	0.347	0.500	ug/L		0.374			7.32	20	
Arsenic	0.855	0.500	ug/L		0.844			1.25	20	
Barium	91.8	0.500	ug/L		93.9			2.24	20	
Chromium	0.461	0.500	ug/L		0.507			9.57	20	
Lead	0.0856	0.500	ug/L		0.0726			16.5	20	
Selenium	0.404	0.500	ug/L		0.498			21.0	20	M_D-RL

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0195 - EPA 200.2, EPA 3005										
Matrix Spike (BDK0195-MS1)	**Source: MDK0047-01**			Prepared: 11/08/2018 Analyzed: 11/12/2018						
Barium	187	0.500	ug/L	100.00	93.9	92.7	70-130			
Arsenic	102	0.500	ug/L	100.00	0.844	101	70-130			
Chromium	100	0.500	ug/L	100.00	0.507	99.9	70-130			
Lead	92.1	0.500	ug/L	100.00	0.0726	92.0	70-130			
Selenium	102	0.500	ug/L	100.00	0.498	101	70-130			
Cobalt	98.9	0.500	ug/L	100.00	0.374	98.6	70-130			
Matrix Spike Dup (BDK0195-MSD1)	**Source: MDK0047-01**			Prepared: 11/08/2018 Analyzed: 11/12/2018						
Lead	91.1	0.500	ug/L	100.00	0.0726	91.0	70-130	1.06	20	
Barium	198	0.500	ug/L	100.00	93.9	104	70-130	5.96	20	
Chromium	102	0.500	ug/L	100.00	0.507	101	70-130	1.17	20	
Cobalt	100	0.500	ug/L	100.00	0.374	99.8	70-130	1.27	20	
Arsenic	101	0.500	ug/L	100.00	0.844	99.8	70-130	1.31	20	
Selenium	95.3	0.500	ug/L	100.00	0.498	94.8	70-130	6.78	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
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Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0068 - EPA 200.2, EPA 3005										
Blank (BDK0068-BLK1)				Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							
Blank (BDK0068-BLK2)				Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							
LCS (BDK0068-BS1)				Prepared: 11/05/2018 Analyzed: 11/07/2018						
Calcium	103	1.25	mg/L	100.00		103	85-115			
Boron	0.983	0.0500	mg/L	1.0000		98.3	85-115			
LCS (BDK0068-BS2)				Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.01	0.0500	mg/L	1.0000		101	85-115			
Calcium	106	1.25	mg/L	100.00		106	85-115			
Duplicate (BDK0068-DUP1)		**Source: MDK0026-01**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	0.205	0.0500	mg/L		0.212			3.59	20	
Calcium	95.4	1.25	mg/L		96.9			1.61	20	
Duplicate (BDK0068-DUP2)		**Source: MDK0026-02**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	0.500	0.0500	mg/L		0.506			1.15	20	
Calcium	142	1.25	mg/L		142			0.284	20	
Duplicate (BDK0068-DUP3)		**Source: MDK0026-03**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	0.0533	0.0500	mg/L		0.0532			0.0853	20	
Calcium	76.1	1.25	mg/L		80.2			5.32	20	
Matrix Spike (BDK0068-MS1)		**Source: MDK0026-01**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.24	0.0500	mg/L	1.0000	0.212	103	70-130			
Calcium	207	1.25	mg/L	100.00	96.9	111	70-130			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0068 - EPA 200.2, EPA 3005										
Matrix Spike (BDK0068-MS2)		**Source: MDK0026-02**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.53	0.0500	mg/L	1.0000	0.506	103	70-130			
Calcium	253	1.25	mg/L	100.00	142	111	70-130			
Matrix Spike (BDK0068-MS3)		**Source: MDK0026-03**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.09	0.0500	mg/L	1.0000	0.0532	103	70-130			
Calcium	188	1.25	mg/L	100.00	80.2	108	70-130			
Matrix Spike Dup (BDK0068-MSD1)		**Source: MDK0026-01**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.25	0.0500	mg/L	1.0000	0.212	104	70-130	0.415	20	
Calcium	204	1.25	mg/L	100.00	96.9	107	70-130	1.90	20	
Matrix Spike Dup (BDK0068-MSD2)		**Source: MDK0026-02**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Calcium	254	1.25	mg/L	100.00	142	112	70-130	0.227	20	
Boron	1.53	0.0500	mg/L	1.0000	0.506	102	70-130	0.0701	20	
Matrix Spike Dup (BDK0068-MSD3)		**Source: MDK0026-03**		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.09	0.0500	mg/L	1.0000	0.0532	104	70-130	0.474	20	
Calcium	188	1.25	mg/L	100.00	80.2	108	70-130	0.159	20	
Batch BDK0194 - EPA 200.2, EPA 3005										
Blank (BDK0194-BLK1)				Prepared: 11/08/2018 Analyzed: 11/12/2018						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							
LCS (BDK0194-BS1)				Prepared: 11/08/2018 Analyzed: 11/12/2018						
Calcium	102	1.25	mg/L	100.00		102	85-115			
Boron	0.968	0.0500	mg/L	1.0000		96.8	85-115			

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification # MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BDK0194 - EPA 200.2, EPA 3005										
Duplicate (BDK0194-DUP1)		**Source: MDK0061-01**		Prepared: 11/08/2018 Analyzed: 11/12/2018						
Boron	0.0955	0.0500	mg/L		0.116			19.0	20	
Calcium	123	1.25	mg/L		123			0.0746	20	
Duplicate (BDK0194-DUP2)		**Source: MDK0061-03**		Prepared: 11/08/2018 Analyzed: 11/12/2018						
Boron	0.0578	0.0500	mg/L		0.0786			30.5	20	M_D
Calcium	85.0	1.25	mg/L		83.8			1.45	20	
Matrix Spike (BDK0194-MS1)		**Source: MDK0061-01**		Prepared: 11/08/2018 Analyzed: 11/12/2018						
Boron	1.07	0.0500	mg/L	1.0000	0.116	95.3	70-130			
Calcium	230	1.25	mg/L	100.00	123	107	70-130			
Matrix Spike (BDK0194-MS2)		**Source: MDK0061-03**		Prepared: 11/08/2018 Analyzed: 11/12/2018						
Calcium	192	1.25	mg/L	100.00	83.8	108	70-130			
Boron	1.05	0.0500	mg/L	1.0000	0.0786	96.8	70-130			
Matrix Spike Dup (BDK0194-MSD1)		**Source: MDK0061-01**		Prepared: 11/08/2018 Analyzed: 11/12/2018						
Boron	1.08	0.0500	mg/L	1.0000	0.116	96.8	70-130	1.39	20	
Calcium	230	1.25	mg/L	100.00	123	107	70-130	0.0947	20	
Matrix Spike Dup (BDK0194-MSD2)		**Source: MDK0061-03**		Prepared: 11/08/2018 Analyzed: 11/12/2018						
Boron	1.04	0.0500	mg/L	1.0000	0.0786	96.5	70-130	0.288	20	
Calcium	190	1.25	mg/L	100.00	83.8	106	70-130	1.17	20	

Minneapolis Testing Laboratory
1518 Chestnut Ave N
Minneapolis, MN 55043
Certification # MN-027-053-197
WI-999071150
Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/19/2018 10:57

Qualifiers and Definitions

M_TTT	Sample received at the lab outside of required hold time.
M_D-RL	The RPD for the sample duplicate was outside of QC acceptance limits due to<RL.
M_D	The RPD for the sample duplicate was outside of QC acceptance limits possibly due to non-homogeneous matrix.
Z	Non Accredited Analyte
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

1845945

Section A Required Client Information:

Company: Xcel Energy
Address: Environmental Services
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Chuck Donkels
Copy To:
Purchase Order No.:
Project Name: Xcel Energy - Shercoll ADF
Project Number: +CCR wells, Fall 2018

Section C Invoice Information:

Attention: Steve Davis
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	GW-CCR-SH3 + GW-A	GW-A	GW-CCR-SH3	Le4-A	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Rinse	WT				11-2-18	0820		4	1	1	2						✓	✓					
2	P-139	WT				11-1-18	1525		3	1	1	1								✓				
3	P-76B-1	↓				↓	1655		3	1	1	1								✓				
4	P76A-1						1715		3	1	1	1								✓				
5	P-99	↓				↓	1800		3	1	1	1								✓				
6	P-74-1	WT				11-2-18	0915		4	1	1	2						✓	✓					
7	P-73a-1	↓				↓	1015		4	1	1	2						✓	✓					
8	Duplicate						1015		4	1	1	2						✓	✓					
9	P-73B-1						1050		3	1	1	1								✓				
10	P-125						1145		4	1	1	2						✓	✓					
11	P-141	↓				↓	1230		2	1		1									✓			
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	David Anderson / Pace	11-2-18	1345	/ Xcel	11/5/18	0545	MTBSW: 1.5°C
In Cooler							
pH Strips: MD00402							

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Y | X | X

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson DATE Signed (MM/DD/YY): 11-2-18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 2 of 2

1845950

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Xcel Energy	Report To: Chuck Dorkett	Attention: Steve Davis
Address: Environmental Services	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Xcel Energy – Sherco III ADF + CCR Wells, Fall 2018	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Requested Analysis Filtered (Y/N): GW-CCR-SH3 + GW-A	GW-A	GW-CCR-SH3	Lea-A	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-134	WT				11-5-18	1025		4	1	1	2						✓	✓						
2	P-138A						1120		4	1	1	2						✓	✓						
3	P-138B						1205		3	1	1	1								✓					
4	P-137A						1255		4	1	1	2						✓	✓						
5	P-137B						1330		3	1	1	1								✓					
6	P-117						1525		4	1	1	2						✓	✓						
7	Leachate						1440		3	1	1	1											✓		
8	P-75-1						1600		4	1	1	2						✓	✓						
9	P-97	↓				↓	1705		4	1	1	2						✓	✓						
10	P-98	WT				11-6-18	0810		4	1	1	2						✓	✓						
11	P-120	↓					0910		4	1	1	2						✓	✓						
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	David Anderson/Pace	11-6-18	1015	Xcel	11/6/18	1020
pH Strips: MD00402						

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2.1, 1.8	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson

DATE Signed (MM/DD/YY): 11-6-18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

November 29, 2018

Dave Anderson
Pace Analytical Services - Field Svcs Division
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Dear Dave Anderson:
Enclosed are the analytical results for sample(s) received by the laboratory on November 08, 2018. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Harry S. Davis III, Xcel Energy
Charles A. Donkers, Xcel Energy
Christine M. Keefe, Xcel Energy
Ciara Ruikkie, Pace Analytical Services - Field Svcs Division

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30270892001	**Rinse**	Water	11/02/18 08:20	11/08/18 10:15
30270892002	**P=74-1**	Water	11/02/18 09:15	11/08/18 10:15
30270892003	**P-73a-1**	Water	11/02/18 10:15	11/08/18 10:15
30270892004	**Duplicate**	Water	11/02/18 10:15	11/08/18 10:15
30270892005	**P-125**	Water	11/02/18 11:45	11/08/18 10:15
30270892006	**P-141**	Water	11/02/18 12:30	11/08/18 10:15
30270892007	**P-134**	Water	11/05/18 10:25	11/08/18 10:15
30270892008	**P-138A**	Water	11/05/18 01:20	11/08/18 10:15
30270892009	**P-137A**	Water	11/05/18 12:55	11/08/18 10:15
30270892010	**P-117**	Water	11/05/18 15:05	11/08/18 10:15
30270892011	**P-75-1**	Water	11/05/18 16:00	11/08/18 10:15
30270892012	**P-97**	Water	11/05/18 17:05	11/08/18 10:15
30270892013	**P-98**	Water	11/06/18 08:10	11/08/18 10:15
30270892014	**P-120**	Water	11/06/18 09:10	11/08/18 10:15

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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30270892001	**Rinse**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892002	**P=74-1**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892003	**P-73a-1**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892004	**Duplicate**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892005	**P-125**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892006	**P-141**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892007	**P-134**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892008	**P-138A**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892009	**P-137A**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892010	**P-117**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892011	**P-75-1**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892012	**P-97**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892013	**P-98**	EPA 903.1	MK1	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270892014	**P-120**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: Pace-MN Field Services Division
Date: November 29, 2018

General Information:
14 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: Pace-MN Field Services Division
Date: November 29, 2018

General Information:
14 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: Pace-MN Field Services Division
Date: November 29, 2018

General Information:
14 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Sample: Rinse **Lab ID: 30270892001** Collected: 11/02/18 08:20 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.223 ± 0.339 (0.584) C:NA T:95%**	pCi/L	11/27/18 11:30	13982-63-3	
Radium-228	EPA 904.0	**0.661 ± 0.634 (1.30) C:67% T:85%**	pCi/L	11/26/18 20:23	15262-20-1	
Total Radium	Total Radium Calculation	**0.884 ± 0.973 (1.88)**	pCi/L	11/27/18 16:12	7440-14-4	

Sample: P=74-1 **Lab ID: 30270892002** Collected: 11/02/18 09:15 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.458 ± 0.335 (0.374) C:NA T:87%**	pCi/L	11/27/18 11:30	13982-63-3	
Radium-228	EPA 904.0	**1.13 ± 0.654 (1.19) C:68% T:85%**	pCi/L	11/26/18 20:23	15262-20-1	
Total Radium	Total Radium Calculation	**1.59 ± 0.989 (1.56)**	pCi/L	11/27/18 16:12	7440-14-4	

Sample: P-73a-1 **Lab ID: 30270892003** Collected: 11/02/18 10:15 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.249 ± 0.294 (0.462) C:NA T:86%**	pCi/L	11/27/18 20:07	13982-63-3	
Radium-228	EPA 904.0	**0.624 ± 0.353 (0.629) C:75% T:87%**	pCi/L	11/26/18 13:41	15262-20-1	
Total Radium	Total Radium Calculation	**0.873 ± 0.647 (1.09)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: Duplicate **Lab ID: 30270892004** Collected: 11/02/18 10:15 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.708 ± 0.451 (0.544) C:NA T:91%**	pCi/L	11/27/18 20:07	13982-63-3	
Radium-228	EPA 904.0	**0.261 ± 0.260 (0.527) C:76% T:89%**	pCi/L	11/26/18 13:41	15262-20-1	
Total Radium	Total Radium Calculation	**0.969 ± 0.711 (1.07)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-125 **Lab ID: 30270892005** Collected: 11/02/18 11:45 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.502 ± 0.317 (0.136) C:NA T:83%**	pCi/L	11/27/18 20:07	13982-63-3	
Radium-228	EPA 904.0	**0.568 ± 0.613 (1.28) C:69% T:87%**	pCi/L	11/26/18 20:21	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Sample: P-125 **Lab ID: 30270892005** Collected: 11/02/18 11:45 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**1.07 ± 0.930 (1.42)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-141 **Lab ID: 30270892006** Collected: 11/02/18 12:30 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.527 ± 0.344 (0.353) C:NA T:92%**	pCi/L	11/27/18 20:07	13982-63-3	
Radium-228	EPA 904.0	**1.12 ± 0.639 (1.16) C:72% T:86%**	pCi/L	11/26/18 20:22	15262-20-1	
Total Radium	Total Radium Calculation	**1.65 ± 0.983 (1.51)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-134 **Lab ID: 30270892007** Collected: 11/05/18 10:25 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.923 ± 0.602 (0.815) C:NA T:85%**	pCi/L	11/27/18 20:07	13982-63-3	
Radium-228	EPA 904.0	**0.499 ± 0.492 (1.01) C:74% T:88%**	pCi/L	11/26/18 19:13	15262-20-1	
Total Radium	Total Radium Calculation	**1.42 ± 1.09 (1.83)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-138A **Lab ID: 30270892008** Collected: 11/05/18 01:20 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.242 ± 0.343 (0.582) C:NA T:90%**	pCi/L	11/27/18 20:20	13982-63-3	
Radium-228	EPA 904.0	**0.518 ± 0.625 (1.32) C:64% T:83%**	pCi/L	11/26/18 19:13	15262-20-1	
Total Radium	Total Radium Calculation	**0.760 ± 0.968 (1.90)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-137A **Lab ID: 30270892009** Collected: 11/05/18 12:55 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.825 ± 0.526 (0.661) C:NA T:84%**	pCi/L	11/27/18 20:20	13982-63-3	
Radium-228	EPA 904.0	**-0.148 ± 0.619 (1.47) C:61% T:85%**	pCi/L	11/26/18 19:13	15262-20-1	
Total Radium	Total Radium Calculation	**0.825 ± 1.15 (2.13)**	pCi/L	11/28/18 13:36	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Sample: P-117 **Lab ID: 30270892010** Collected: 11/05/18 15:05 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.410 ± 0.351 (0.476) C:NA T:87%**	pCi/L	11/27/18 20:20	13982-63-3	
Radium-228	EPA 904.0	**0.625 ± 0.591 (1.21) C:65% T:84%**	pCi/L	11/26/18 19:13	15262-20-1	
Total Radium	Total Radium Calculation	**1.04 ± 0.942 (1.69)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-75-1 **Lab ID: 30270892011** Collected: 11/05/18 16:00 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0569 ± 0.370 (0.746) C:NA T:85%**	pCi/L	11/27/18 20:20	13982-63-3	
Radium-228	EPA 904.0	**0.540 ± 0.693 (1.48) C:69% T:84%**	pCi/L	11/26/18 19:13	15262-20-1	
Total Radium	Total Radium Calculation	**0.597 ± 1.06 (2.23)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-97 **Lab ID: 30270892012** Collected: 11/05/18 17:05 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.102 ± 0.401 (0.768) C:NA T:92%**	pCi/L	11/27/18 20:20	13982-63-3	
Radium-228	EPA 904.0	**0.405 ± 0.618 (1.34) C:67% T:80%**	pCi/L	11/26/18 19:13	15262-20-1	
Total Radium	Total Radium Calculation	**0.507 ± 1.02 (2.11)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-98 **Lab ID: 30270892013** Collected: 11/06/18 08:10 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.703 ± 0.444 (0.502) C:NA T:81%**	pCi/L	11/27/18 20:20	13982-63-3	
Radium-228	EPA 904.0	**0.319 ± 0.567 (1.24) C:67% T:83%**	pCi/L	11/26/18 19:14	15262-20-1	
Total Radium	Total Radium Calculation	**1.02 ± 1.01 (1.74)**	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-120 **Lab ID: 30270892014** Collected: 11/06/18 09:10 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.560 ± 0.392 (0.473) C:NA T:87%**	pCi/L	11/27/18 20:34	13982-63-3	
Radium-228	EPA 904.0	**1.40 ± 0.642 (1.08) C:69% T:91%**	pCi/L	11/26/18 19:14	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

Sample: P-120 **Lab ID: 30270892014** Collected: 11/06/18 09:10 Received: 11/08/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**1.96 ± 1.03 (1.55)**	pCi/L	11/28/18 13:36	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

QC Batch: 320186 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30270892003, 30270892004, 30270892005, 30270892006, 30270892007, 30270892008, 30270892009, 30270892010, 30270892011, 30270892012, 30270892013, 30270892014

METHOD BLANK: 1562014 Matrix: Water
Associated Lab Samples: 30270892003, 30270892004, 30270892005, 30270892006, 30270892007, 30270892008, 30270892009, 30270892010, 30270892011, 30270892012, 30270892013, 30270892014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.405 ± 0.316 (0.616) C:80% T:79%	pCi/L	11/26/18 13:41	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

QC Batch: 320180 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30270892001, 30270892002

METHOD BLANK: 1562008 Matrix: Water
Associated Lab Samples: 30270892001, 30270892002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.302 ± 0.343 (0.542) C:NA T:84%	pCi/L	11/27/18 10:29	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

QC Batch: 320185 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30270892001, 30270892002

METHOD BLANK: 1562013 Matrix: Water
Associated Lab Samples: 30270892001, 30270892002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.773 ± 0.434 (0.752) C:68% T:77%	pCi/L	11/26/18 17:13	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

QC Batch: 320181 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30270892003, 30270892004, 30270892005, 30270892006, 30270892007, 30270892008, 30270892009, 30270892010, 30270892011, 30270892012, 30270892013, 30270892014

METHOD BLANK: 1562009 Matrix: Water
Associated Lab Samples: 30270892003, 30270892004, 30270892005, 30270892006, 30270892007, 30270892008, 30270892009, 30270892010, 30270892011, 30270892012, 30270892013, 30270892014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0996 ± 0.227 (0.366) C:NA T:88%	pCi/L	11/27/18 20:07	

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
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 18-01329, Xcel Energy
Pace Project No.: 30270892

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.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1845948

Section A Required Client Information:

Company: Xcel Energy
Address: c/o Pace MN Field
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: David Anderson
Copy To:
Purchase Order No.:
Project Name: 18-01329, Xcel Energy - Sherco III ADF + CCR wells, Fall 2018
Project Number:

Section C Invoice Information:

Attention: Ciara Ruikkie
Company Name: Pace MN Field Services
Address:
Pace Quote Reference: Tom Halverson
Pace Project Manager: Carin Ferris
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Requested Analysis Filtered (Y/N)

WO# : 30270892

30270892

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: RA-226 EPA903.1	RA-228 EPA904.0	Residual C	Pace Project No./ Lab I.D.
1	Rinse	WT				11-2-18	0850		2			2					✓	✓		001
2	P-74-1	WT				11-2-18	0915		2			2					✓	✓		002
3	P-73a-1						1015		2			2					✓	✓		003
4	Duplicate						1015		2			2					✓	✓		004
5	P-125						1145		2			2					✓	✓		005
6	P-141						1230		2			2					✓	✓		006
7	P-134	WT				11-5-18	1025		2			2					✓	✓		007
8	P-138A						1120		2			2					✓	✓		008
9	P-138B						1205		2			2					✓	✓		MS + Radium on this well. DS 11-5-18
10	P-137A						1255		2			2					✓	✓		009
11	P-117						1505		2			2					✓	✓		010
12	P-75-1						1600		2			2					✓	✓		011

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
(1) client needs to analyze for: Radium 226+228 pCi/L combined. (2) RA-226 EPA 903.1 RA-228 EPA 904.0	David Anderson	11-6-18	1250		11/8/18	1015	-	N	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson DATE Signed (MM/DD/YY): 11-5-18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1845947

Section A Required Client Information:
- Company: Xcel Energy
- Address: c/o Pace MN Field
- Email To:
- Phone:
- Fax:
- Requested Due Date/TAT:

Section B Required Project Information:
- Report To: David Anderson
- Copy To:
- Purchase Order No.:
- Project Name: 18-01329, Xcel Energy – Sherco III ADF + CCR Wells Fall 2018
- Project Number:

Section C Invoice Information:
- Attention: Ciara Ruikkie
- Company Name: Pace MN Field Services
- Address:
- Pace Quote Reference: Tom Halverson
- Pace Project Manager: Carin Ferris
- Pace Profile #:

REGULATORY AGENCY
- NPDES
- GROUND WATER
- DRINKING WATER
- UST
- RCRA
- OTHER
- Site Location STATE:

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

30270892

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test	RA-226 EPA903.1	RA-228 EPA904.0	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-97	WT				11-5-18	1705		2			2							✓	✓		012
2	P-98	WT				11-6-18	0810		2			2							✓	✓		013
3	P-120	↓				↓	0910		2			2							✓	✓		014
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

DPA 11/6/18

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
(1) client needs to analyze for: Radium 226 + 228 pCi/L combined.	David Anderson / Pace	11-6-18	1250	[illegible]	11/8/18	1015	-	N	N	Y

(2) RA-226 EPA903.1
RA-228 EPA 904.0

ORIGINAL

SAMPLER NAME AND SIGNATURE
- PRINT Name of SAMPLER: David Anderson
- SIGNATURE of SAMPLER: David Anderson
- DATE Signed (MM/DD/YY): 11-6-18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: XCel energy

Project # 30270892

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

Label BTH
LIMS Login BTH

Tracking #: 4486 7790 0718

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used N/A Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp — °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

pH paper Lot# 10D4671 | Date and Initials of person examining contents: BTH 11/8/18

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓ ✓			16. pH<2 Initial when completed BTH Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: BTH Date: 11/8/18

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ A check in this box indicates that additional information has been stored in ereports.

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)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.