2019 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 28, 2020

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2019 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 28, 2019

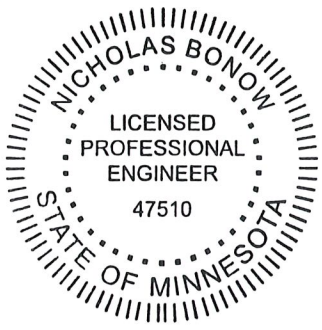

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1. EXECUTIVE SUMMARY

Groundwater monitoring was conducted for Unit 3 Landfill at the Sherburne County Generating Plant during monitoring year 2019 to comply with the requirements of U.S. Code of Federal Regulations, Title 40, Section 257.95 (i.e. assessment monitoring). Assessment monitoring was initiated for the Unit 3 Landfill during the 2018 monitoring year and continued during the 2019 monitoring year with routine assessment monitoring events occurring during the spring and fall of the year. Statistical analysis performed on 2019 groundwater data indicates no exceedances of groundwater protection standards. Concentrations of certain constituents continue to exceed background; therefore, Unit 3 Landfill will continue with assessment monitoring going into 2020. No additional notifications or assessment of corrective measures are required at this time.

2. INTRODUCTION

This report presents the documentation of the status of groundwater monitoring and corrective action for the year 2019 (YR2019) 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 YR2019.

This report has been prepared in general accordance with the reporting procedures outlined in the Sherco Unit 3 Landfill CCR Groundwater Sampling Plan (NSPM, 2018). Any deviations from the requirements of the Groundwater Sampling Plan are described in subsequent sections of this report.

2.1 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, 2018) 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 YR2019, describes any problems reported in YR2019 and the actions to resolve the problems, and key activities projected for 2020.

3. 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.

3.1 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 toward the Mississippi River, which is the regional groundwater discharge for the surficial sand and gravel aquifer. 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 the 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.

4. MONITORING RESULTS

Section 3.1 below presents the monitoring results obtained during YR2019 in terms of the specific requirements of §257.90(e) that are to be included in this report.

4.1 Compliance with §257.90(e)

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

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

4.1.2 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 YR2019.

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

Monitoring data collected during YR2019 is summarized in Tables 2 and 3 and results are provided in Tables 4 and 5. 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. A summary of the spring 2019 monitoring data is provided on Table 4 and a summary of the fall 2019 monitoring data is provided on Table 5.

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, and assessment monitoring continued in 2019. Pursuant to the assessment monitoring requirements listed in §257.95, the following groundwater sampling events were conducted during YR2019:

- All wells in the Landfill groundwater monitoring system were sampled during the spring monitoring event conducted on April 15 and 16, 2019. Samples were analyzed for Appendix III constituents and Appendix IV constituents. Laboratory reports and field datasheets for the spring monitoring event are included in this report as Appendix A.
- All wells in the Landfill groundwater monitoring system were sampled during the fall monitoring event conducted on October 29 and 30, 2019, and samples were analyzed for all Appendix III constituents and only those Appendix IV constituents detected during the spring 2019 assessment monitoring event. Laboratory reports and field datasheets for the fall monitoring event are included in this report as Appendix B.

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).

- Recorded Concentrations: The concentrations for the spring and fall monitoring events that are recorded in the operating record are attached to this report as Appendices A and B, respectively, and summary tables of the data are also provided in Tables 4 and 5, respectively.
- 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 YR2019 monitoring data using the procedures described in the Landfill's Statistical Analysis Plan (NSPM, 2017), 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 2019 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.

4.1.4 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

Since the initial transition to assessment monitoring program (§257.95) during YR2018, the BAP has not transitioned between monitoring programs and continues monitoring for the assessment monitoring program.

4.1.5 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.

5. 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.

5.1 Key Actions Completed

Key actions that were completed during YR2019 include the following items:

- The 2018 Annual CCR Groundwater Monitoring and Corrective Report (Carlson McCain, 2019) was completed and placed on the Pond 3's publicly available website by January 31, 2019.
- Monitoring wells were sampled during the spring event conducted on April 15 and 16, 2019 and analyzed for all Appendix III and Appendix IV constituents as required by §257.95(d)(1);
- Monitoring wells were sampled during the fall event conducted on October 29 and 30, 2019 and analyzed for all Appendix III constituents and only those Appendix IV constituents that were detected during the spring 2019 event as part of semiannual sampling required by §257.95(d)(1);
- Laboratory reports and field datasheets for the spring and fall sampling events were placed in the operating record on July 11, 2019 and December 31, 2019, respectively;
- Pursuant to §257.95(d)(2), groundwater protection standards are established for all Appendix IV constituents; and
- Statistical evaluation of the monitoring data was conducted to demonstrate compliance with §257.95(e) through (g).

5.2 Problems

5.2.1 Problems Encountered

No significant problems with the groundwater monitoring system, or deviations from the CCR Groundwater Sampling Plan were reported at the facility during YR2019. No corrective action was required at the facility during YR2019.

5.2.2 Resolution of Problems

No significant problems with the groundwater monitoring system, or deviations from the CCR Groundwater Sampling Plan requiring resolution were reported at the facility during YR2019.

5.3 Key Activities for 2020

The following key actions are anticipated at the Landfill in the year 2020:

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 2020 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.

Carlson McCain, 2019. 2018 CCR Annual Groundwater and Corrective Action Monitoring Report, Unit 3 Landfill, Sherco Generating Plant, prepared for Northern States Power Company, A Minnesota Corporation, January 30, 2019.

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

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 Unit 3 Landfill

Upgradient & Sidegradient Wells			
Well ID	Number of Samples	Sample Dates	
		Spring 2019[1]	Fall 2019[2]
P-73A-1	2	4/15/2019	10/29/2019
P-74-1	2	4/15/2019	10/29/2019
P-125	2	4/15/2019	10/29/2019
P-134	2	4/15/2019	10/29/2019
P-141	2	4/15/2019	10/29/2019

Downgradient Wells			
Well ID	Number of Samples	Sample Dates	
		Spring 2019[1]	Fall 2019[2]
P-75-1	2	4/16/2019	10/30/2019
P-97	2	4/16/2019	10/30/2019
P-98	2	4/16/2019	10/30/2019
P-117	2	4/16/2019	10/30/2019
P-120	2	4/16/2019	10/30/2019
P-137A	2	4/16/2019	10/30/2019
P-138A	2	4/16/2019	10/30/2019

[1] Assessment monitoring event sampled and analyzed for appendix III and appendix IV of §257 constituents as required by §257.95(b).

[2] Assessment monitoring semiannual resample event sampled and analyzed for appendix III of §257 and those appendix IV of §257 constituents detected during Spring 2019 as required by §257.95(d)(1).

Table 3
Count of Parameters Analyzed by Well
Sherco Unit 3 Landfill

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)	2	2	2	2	2	2	2	2	2	2	2	2
Calcium, total (mg/L)	2	2	2	2	2	2	2	2	2	2	2	2
Chloride, total (mg/L)	2	2	2	2	2	2	2	2	2	2	2	2
Fluoride, total (mg/L)	2	2	2	2	2	2	2	2	2	2	2	2
pH (lab) (pH)	2	2	2	2	2	2	2	2	2	2	2	2
Sulfate, total (mg/L)	2	2	2	2	2	2	2	2	2	2	2	2
Total Dissolved Solids (mg/L)	2	2	2	2	2	2	2	2	2	2	2	2

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)	2	2	2	2	2	2	2	2	2	2	2	2
Barium, total (mg/L)	2	2	2	2	2	2	2	2	2	2	2	2
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)	2	2	2	2	2	2	2	2	2	2	2	2
Cobalt, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Lead, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
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)	2	2	2	2	2	2	2	2	2	2	2	2
Thallium, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Radium, 226 and 228 combined (pCi/L)	2	2	2	2	2	2	2	2	2	2	2	2

Table 4
Spring 2019 Groundwater Summary Data
Sherco Unit 3 Landfill

Appendix III Parameters												
Parameter	Units	GWPS	Well ID and Sample Date									
			P-73A-1 10/29/2019	P-74-1 10/29/2019	P-75-1 10/30/2019	P-97 10/30/2019	P-98 10/30/2019	P-117 10/30/2019	P-120 10/30/2019	P-125 10/29/2019	P-134 10/29/2019	P-137A 10/30/2019	P-138A 10/30/2019	P-141 10/29/2019
Boron, total	mg/L	NA	<0.0500	0.111	<0.0500	<0.0500	0.109	<0.0500	0.051	<0.0500	0.0752	<0.0500	<0.0500	<0.0500
Calcium, total	mg/L	NA	78	84.1	57.5	90.8	89	96.2	91.5	72.2	79.4	80.3	82.9	74.4
Chloride, total	mg/L	NA	27.2	29.2	19.4	42.4	29.6	48.8	54.6	18.2	20.8	29.5	28.8	23
Fluoride, total	mg/L	NA	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
pH, Lab	pH	NA	7.82	7.82	7.94	7.84	7.83	7.7	7.84	7.86	7.72	7.8	7.82	7.83
Sulfate, total	mg/L	NA	29.6	51.5	14.5	33.7	76.3	30.6	41.9	17.2	17.7	27	29.1	18.5
Total Dissolved Solids	mg/L	NA	312	352	246	400	388	430	402	282	308	322	340	292

Appendix IV Parameters												
Parameter	Units	GWPS	Well ID and Sample Date									
			P-73A-1 10/29/2019	P-74-1 10/29/2019	P-75-1 10/30/2019	P-97 10/30/2019	P-98 10/30/2019	P-117 10/30/2019	P-120 10/30/2019	P-125 10/29/2019	P-134 10/29/2019	P-137A 10/30/2019	P-138A 10/30/2019	P-141 10/29/2019
Antimony, total	mg/L	0.006	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic, total	mg/L	0.01	0.00095	0.00087	0.00093	0.00107	0.00089	0.001	0.00095	0.00068	0.0006	0.00093	0.00086	0.00085
Barium, total	mg/L	2	0.0779	0.0862	0.0562	0.0931	0.0967	0.107	0.0859	0.055	0.0936	0.0845	0.0855	0.0805
Beryllium, total	mg/L	0.004	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cadmium,total	mg/L	0.005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Chromium, total	mg/L	0.1	0.00071	0.00072	0.001	0.00054	0.00127	<0.00050	0.00106	0.00065	0.00108	0.00058	0.00083	0.00058
Cobalt, total	mg/L	0.006	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Fluoride, total	mg/L	4	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Lead, total	mg/L	0.015	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium, total	mg/L	0.04	<0.01500	<0.01500	<0.01500	<0.01500	<0.01500	<0.01500	<0.01500	<0.01500	<0.01500	<0.01500	<0.01500	<0.01500
Mercury, total	mg/L	0.002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum, total	mg/L	0.1	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Selenium, total	mg/L	0.05	0.00088	0.00189	0.00056	0.00062	0.00103	0.00054	0.0007	0.0007	0.00051	0.00071	0.0013	0.00056
Thallium, total	mg/L	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Radium, 226 and 228 con	pCi/L	5	0.89	<1.16	<1.33	<1.38	<1.27	<1.38	0.97	<1.12	<1.27	<0.77	<1.07	<0.97

Field Parameters												
Parameter	Units	GWPS	Well ID and Sample Date									
			P-73A-1 10/29/2019	P-74-1 10/29/2019	P-75-1 10/30/2019	P-97 10/30/2019	P-98 10/30/2019	P-117 10/30/2019	P-120 10/30/2019	P-125 10/29/2019	P-134 10/29/2019	P-137A 10/30/2019	P-138A 10/30/2019	P-141 10/29/2019
ORP	mV	NA	140	180	156	150	144	158	153	146	131	150	147	166
Oxygen, dissolved	mg/L	NA	9.5	8.5	9.6	7.1	4.5	4.9	8.2	10.9	9	9.9	10.8	9
pH, field	pH	NA	7.4	7.1	7.1	7.5	7.5	7.2	7.5	7.5	7.2	7.4	7.3	6.9
Specific Cond, field	µmhos/cm	NA	570	620	430	670	640	730	680	470	550	530	590	520
Static Water Level	ft	NA	33.88	39.03	28.75	29.59	31.9	28.84	31.19	32.53	35.1	36.65	40.03	38.65
Temperature	degrees C	NA	10.5	11.5	8.5	8.5	9	9	8.5	9.5	9.5	11	11	13.5
Turbidity, field	NTU	NA	1.9	2.7	2.5	4.6	4.7	4.4	7.2	5	2.4	3.1	4	2.1
Water Level Elevation	ft	NA	939.53	934.3	943.45	944.26	940.74	940.43	943.98	940.47	935.56	936.24	934.62	934.72

GWPS = Groundwater Protection Standard

NA = Not Applicable

Two dashed lines = Not Analyzed

Downgradient Well

Table 5
Fall 2019 Groundwater Summary Data
Sherco Unit 3 Landfill

Appendix III Parameters													
Parameter	Units	GWPS	Well ID and Sample Date										
			P-73A-1 10/29/2019	P-74-1 10/29/2019	P-75-1 10/30/2019	P-97 10/30/2019	P-98 10/30/2019	P-117 10/30/2019	P-120 10/30/2019	P-125 10/29/2019	P-134 10/29/2019	P-137A 10/30/2019	P-138A 10/30/2019	P-141 10/29/2019
Boron, total	mg/L	NA	<0.0500	0.0851	0.19	<0.0500	<0.0500	<0.0500	0.0908	<0.0500	<0.0500	0.128	<0.0500	<0.0500
Calcium, total	mg/L	NA	57.4	82.8	92.4	87.9	71.7	93.1	80.1	73.2	85.9	102	95.2	86.7
Chloride, total	mg/L	NA	7.32	13.8	28.4	30.9	21.5	43.4	28.1	28	35.5	34.9	49.1	45.6
Fluoride, total	mg/L	NA	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750
pH, Lab	pH	NA	7.89	7.69	7.83	7.79	7.87	7.86	7.87	7.86	7.82	7.77	7.68	7.83
Sulfate, total	mg/L	NA	11.1	26.2	51.3	27.6	15	25.5	42.8	14	27.1	107	28.6	27.7
Total Dissolved Solids	mg/L	NA	204	294	394	344	288	374	340	272	346	444	380	346

Appendix IV Parameters													
Parameter	Units	GWPS	Well ID and Sample Date										
			P-73A-1 10/29/2019	P-74-1 10/29/2019	P-75-1 10/30/2019	P-97 10/30/2019	P-98 10/30/2019	P-117 10/30/2019	P-120 10/30/2019	P-125 10/29/2019	P-134 10/29/2019	P-137A 10/30/2019	P-138A 10/30/2019	P-141 10/29/2019
Antimony, total	mg/L	0.006	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic, total	mg/L	0.01	<0.00050	<0.00050	0.00058	0.00056	0.00059	0.00059	0.00063	<0.00050	0.00065	0.00058	0.00066	0.00054
Barium, total	mg/L	2	0.0422	0.093	0.103	0.0903	0.081	0.0906	0.0851	0.0611	0.0833	0.114	0.117	0.0795
Beryllium, total	mg/L	0.004	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium,total	mg/L	0.005	--	--	--	--	--	--	--	--	--	--	--	--
Chromium, total	mg/L	0.1	0.00051	0.00081	0.00085	0.00125	0.00065	<0.00050	0.00071	0.00055	<0.00050	0.00343	0.00096	0.00064
Cobalt, total	mg/L	0.006	--	--	--	--	--	--	--	--	--	--	--	--
Fluoride, total	mg/L	4	--	--	--	--	--	--	--	--	--	--	--	--
Lead, total	mg/L	0.015	--	--	--	--	--	--	--	--	--	--	--	--
Lithium, total	mg/L	0.04	--	--	--	--	--	--	--	--	--	--	--	--
Mercury, total	mg/L	0.002	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, total	mg/L	0.1	--	--	--	--	--	--	--	--	--	--	--	--
Selenium, total	mg/L	0.05	0.00062	<0.00050	0.0017	0.00059	<0.00050	<0.00050	0.00127	<0.00050	<0.00050	0.00091	<0.00050	<0.00050
Thallium, total	mg/L	0.002	--	--	--	--	--	--	--	--	--	--	--	--
Radium, 226 and 228 con	pCi/L	5	<1.63	<1.60	<1.33	<1.44	<1.17	<1.58	<1.32	<1.97	<1.54	<1.94	<1.72	<1.64

Field Parameters													
Parameter	Units	GWPS	Well ID and Sample Date										
			P-73A-1 10/29/2019	P-74-1 10/29/2019	P-75-1 10/30/2019	P-97 10/30/2019	P-98 10/30/2019	P-117 10/30/2019	P-120 10/30/2019	P-125 10/29/2019	P-134 10/29/2019	P-137A 10/30/2019	P-138A 10/30/2019	P-141 10/29/2019
ORP	mV	NA	163	147	166	170	162	185	167	163	161	166	175	197
Oxygen, dissolved	mg/L	NA	10.1	8.9	7.8	8.3	7.6	8.2	7.4	9	7.5	7.3	8.8	8.3
pH, field	pH	NA	7.8	7.6	7.6	7.6	7.7	7.7	7.6	7.7	7.7	7.6	7.5	7.7
Specific Cond, field	µmhos/cm	NA	400	540	670	620	530	690	610	540	650	760	760	660
Static Water Level	ft	NA	30.74	33.3	34.95	38.2	36.83	32.04	37.2	26.66	28.02	30.11	27.17	29.45
Temperature	degrees C	NA	9	9.5	9.5	9.5	12.5	10	10.5	9.5	9	10	10	8.5
Turbidity, field	NTU	NA	5.2	4.4	4.9	5.2	4.7	4.4	5.5	4.6	4.8	8.7	8.7	5.7
Water Level Elevation	ft	NA	942.26	937.36	937.94	936.45	936.54	941.37	936.13	945.54	945.83	942.53	942.1	945.72

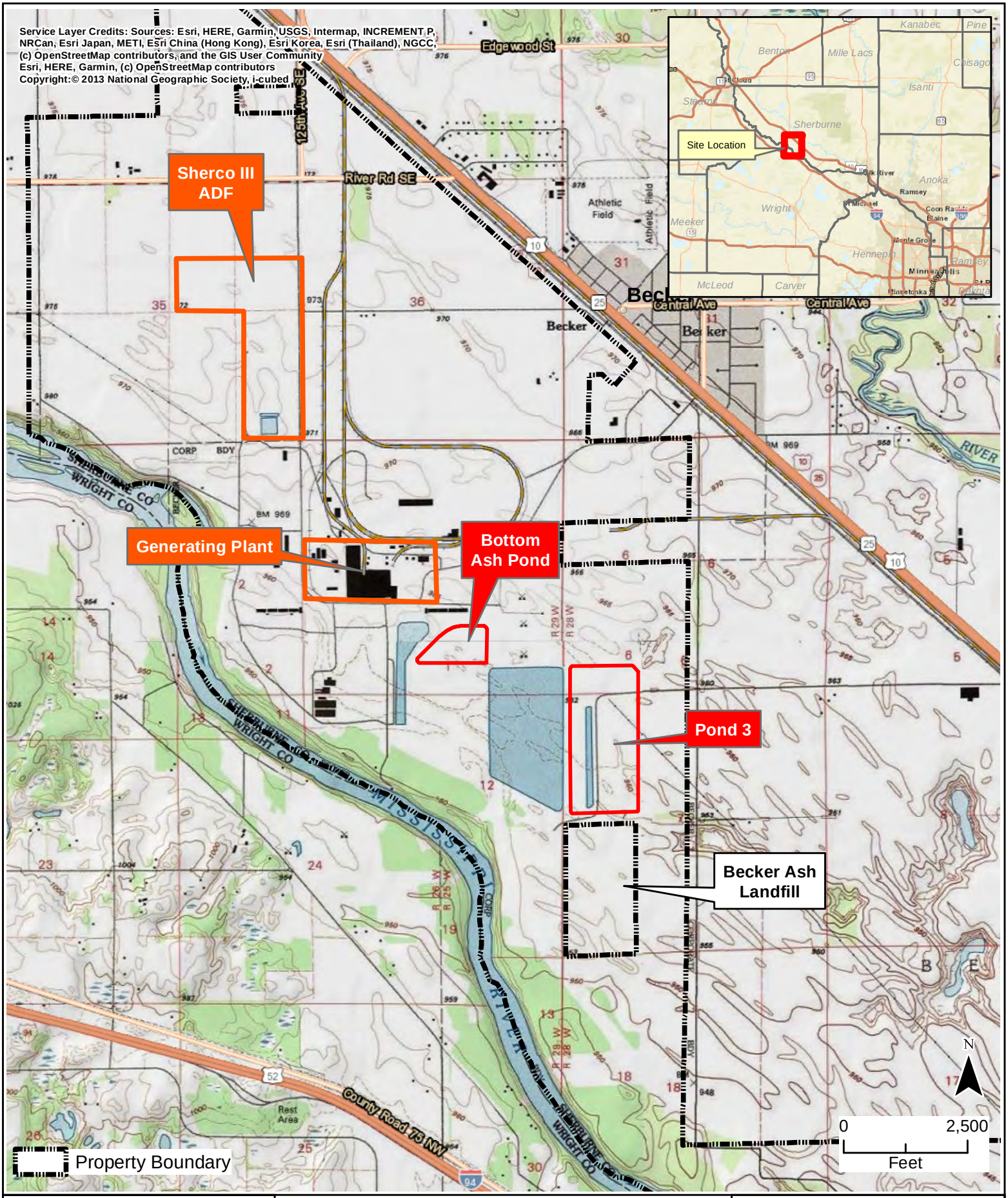
GWPS = Groundwater Protection Standard

NA = Not Applicable

Two dashed lines = Not Analyzed

Downgradient Well

Figures



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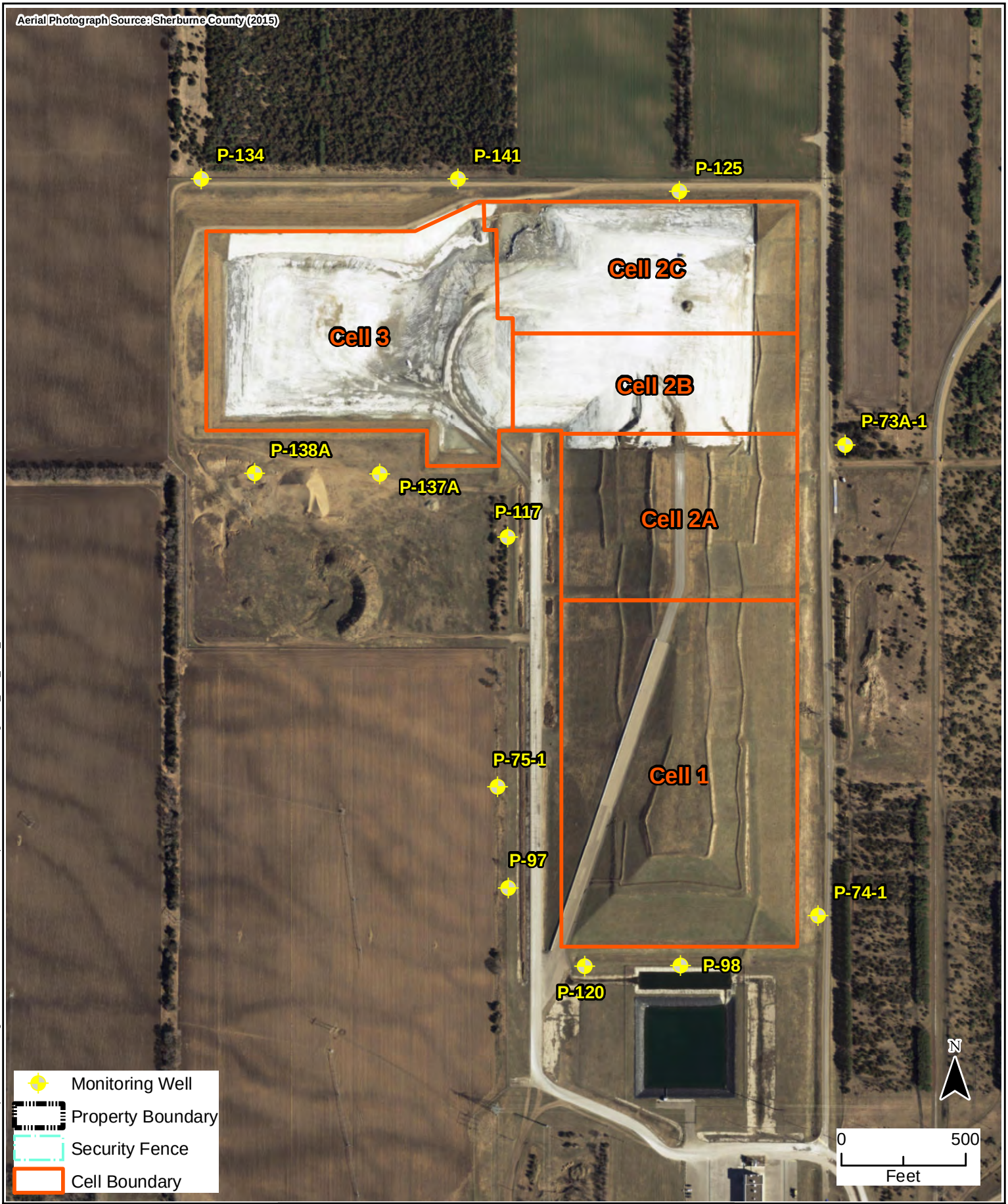
2019 CCR ANNUAL GROUNDWATER MONITORING REPORT

Sherco Unit 3 Landfill

Sherburne County Generating Plant
Becker, Minnesota

FIGURE 1

SITE LOCATION MAP



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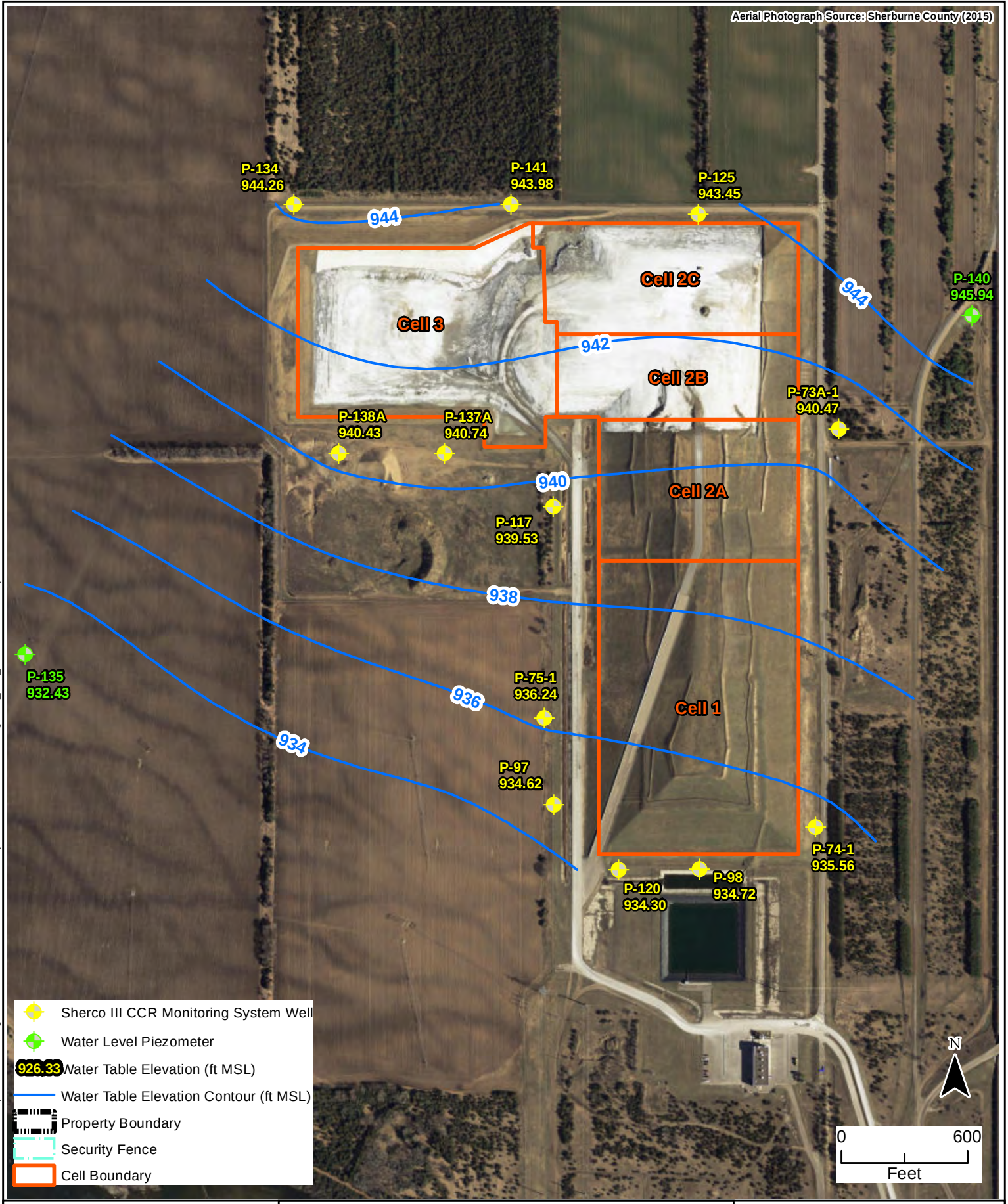
2019 CCR ANNUAL GROUNDWATER MONITORING REPORT
Sherco Unit 3 Landfill
Sherburne County Generating Plant
Becker, Minnesota

FIGURE 2

CCR GROUNDWATER MONITORING SYSTEM



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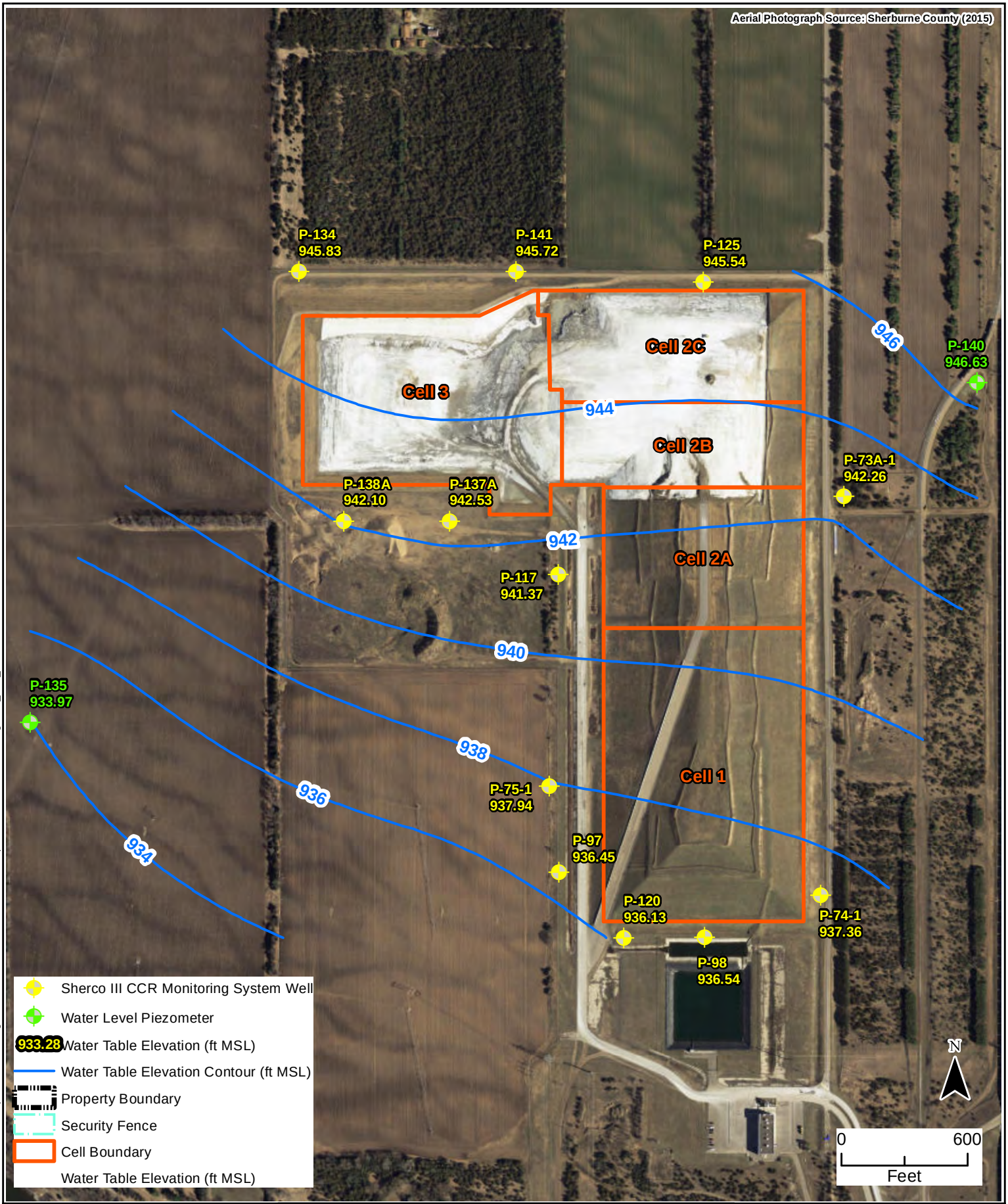
2019 CCR ANNUAL GROUNDWATER MONITORING REPORT
Sherco Unit 3 Landfill
Sherburne County Generating Plant
Becker, Minnesota

FIGURE 3
WATER TABLE ELEVATION CONTOUR MAP (04/15-16/2019)



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Carlson McCain

2019 CCR ANNUAL GROUNDWATER MONITORING REPORT
Sherco Unit 3 Landfill
Sherburne County Generating Plant
Becker, Minnesota

FIGURE 4
WATER TABLE ELEVATION CONTOUR MAP (10/29-30/2019)

Appendix A

Spring 2019 Assessment Monitoring 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 Unit 3 LF, Spring 2019 Project No. 19-01890

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)	32.53	Feet
Static water level measurement at time of sampling (Final Depth)	32.53	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/15/19 Water Column 3.65 Feet

Time Purged 1330 - 1342 One Casing Volume 0.6 Gallons

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

Field Sampling Data

Date Sampled 4/15/19

Time Sampled 1400

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 10.9 (mg/l)

Spec. Cond. 470 (µmhos/cm) Turbidity 5.0 (NTU)

Temp. 9.5 (°C) Eh 146 (mV)

Other NA

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

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

Weather Conditions During Sampling: 46° + cloudy wind SE 10

Sample Description: clear + odorless

Observations: DJA 4/15/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1334	7.5	460	9.5	11.2	NA	150	0.6
1338	7.5	460	9.5	11.1	NA	147	1.2
1342	7.5	470	9.5	10.9		146	1.8

DJA 4/15/19

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: 4/15/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy. Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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)	35.10	Feet
Static water level measurement at time of sampling (Final Depth)	35.10	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/15/19 Water Column 3.00 Feet

Time Purged 1200-1212 One Casing Volume 0.5 Gallons

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

Field Sampling Data

Date Sampled 4/15/19

Time Sampled 1230

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.2 (units) D.O 9.0 (mg/l)

Spec. Cond. 550 (µmhos/cm) Turbidity 2.4 (NTU)

Temp. 9.5 (°C) Eh 131 (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° + partly cloudy, wind W 5-10

Sample Description: clear + odorless

Observations: Collected Rinse Blank at this well.

DTA 4/15/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1204	7.1	570	10.0	9.0	NA	134	0.6
1208	7.2	560	9.5	9.0	NA	133	1.2
1212	7.2	550	9.5	9.0	NA	131	1.8

DTA 4/15/19

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: 4/15/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy. Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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)	36.65	Feet
Static water level measurement at time of sampling (Final Depth)	36.65	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/16/19 Water Column 3.01 Feet

Time Purged 1230-1242 One Casing Volume 0.5 Gallons

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

Field Sampling Data

Date Sampled 4/16/19

Time Sampled 1300

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 9.9 (mg/l)

Spec. Cond. 530 (µmhos/cm) Turbidity 3.1 (NTU)

Temp. 11.0 (°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: 50°+ sunny, wind NE 5

Sample Description: clear + odorless

Observations: measured water level on 4/15/19.

DTA 4/16/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1234	7.5	520	10.5	10.1	NA	175	0.6
1238	7.4	530	11.0	10.0	NA	162	1.2
1242	7.4	530	11.0	9.9	NA	150	1.8

DTA 4/16/19

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: 4/16/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy. Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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)	40.03	Feet
Static water level measurement at time of sampling (Final Depth)	40.03	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/16/19 Water Column 1.96 Feet

Time Purged 1320 - 1329 One Casing Volume 0.3 Gallons

Pump Rate 0.10 (GPM) / LPM Volume Purged 0.9 Gallons

Field Sampling Data

Date Sampled 4/16/19

Time Sampled 1350

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O 10.8 (mg/l)

Spec. Cond. 590 (µmhos/cm) Turbidity 4.0 (NTU)

Temp. 11.0 (°C) Eh 147 (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° & sunny, wind NE 5

Sample Description: clear & odorless

Observations: measured water level on 4/15/19.

DTA 4/16/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1323	7.3	590	11.0	11.0	NA	150	0.3
1326	7.3	590	11.0	10.8	NA	149	0.6
1329	7.3	590	11.0	10.8	NA	147	0.9
			DTA 4/16/19				

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: 4/16/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy. Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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 PC-6

Date Purged 4/16/19 Water Column 4.70 Feet

Time Purged 1605-1623 One Casing Volume 0.8 Gallons

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

Field Sampling Data

Date Sampled 4/16/19

Time Sampled 1640

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 6.9 (units) D.O 9.0 (mg/l)

Spec. Cond. 520 (µmhos/cm) Turbidity 2.1 (NTU)

Temp. 13.5 (°C) Eh 166 (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° & sunny, wind NW 10

Sample Description: clear & odorless

Observations: measured water level on 4/15/19.

DTA 4/16/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1611	7.0	520	14.0	8.6	NA	148	0.9
1617	6.9	520	13.5	8.9	NA	164	1.8
1623	6.9	520	13.5	9.0	NA	166	2.7
			DTA	4/16/19			

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: 4/16/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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) 33.88 Feet

Static water level measurement at time of sampling (Final Depth) 33.88 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID

Date Purged 4/16/19 Water Column 7.09 Feet

Time Purged 1115-1139 One Casing Volume 1.2 Gallons

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

Field Sampling Data

Date Sampled 4/16/19

Time Sampled 1150

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O 9.5 (mg/l)

Spec. Cond. 570 (µmhos/cm) Turbidity 1.9 (NTU)

Temp. 10.5 (°C) Eh 140 (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 NE 5

Sample Description: clear + odorless

Observations: DTA 4/16/19

measured water level on 4/15/19.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1123	7.3	570	10.5	9.6	NA	148	1.2
1131	7.3	570	10.5	9.5	NA	143	2.4
1139	7.4	570	10.5	9.5	NA	140	3.6

DTA 4/16/19

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: 4/16/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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)	39.03	Feet
Static water level measurement at time of sampling (Final Depth)	39.03	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/16/19 Water Column 9.50 Feet

Time Purged 1655-1725 One Casing Volume 1.5 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 4.5 Gallons

Field Sampling Data

Date Sampled 4/16/19

Time Sampled 1740

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.1 (units) D.O 8.5 (mg/l)

Spec. Cond. 620 (µmhos/cm) Turbidity 2.7 (NTU)

Temp. 11.5 (°C) Eh 180 (mV)

Other NA

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

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

Weather Conditions During Sampling: 63° + sunny, wind W 10

Sample Description: clear + odorless

Observations: measured water level on 4/15/19.

DTA 4/16/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1705	7.2	600	12.0	8.3	NA	141	1.5
1715	7.1	610	11.5	8.5	NA	164	3.0
1725	7.1	620	11.5	8.5	NA	180	4.5

DTA 4/16/19

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: 4/16/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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) 28.75 Feet

Static water level measurement at time of sampling (Final Depth) 28.75 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/15/19 Water Column 7.66 Feet

Time Purged 1435 - 1459 One Casing Volume 1.2 Gallons

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

Field Sampling Data

Date Sampled 4/15/19

Time Sampled 1520

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.1 (units) D.O 9.6 (mg/l)

Spec. Cond. 430 (µmhos/cm) Turbidity 2.5 (NTU)

Temp. 8.5 (°C) Eh 156 (mV)

Other NA

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

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

Weather Conditions During Sampling: 48°+ cloudy, Wind ~~SW 10~~ SE 10

Sample Description: clear + odorless

Observations:

DTA 4/15/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1443	7.0	430	8.5	9.9	NA	175	1.2
1451	7.1	430	8.5	9.7	NA	162	2.4
1459	7.1	430	8.5	9.6	NA	156	3.6

DTA 4/15/19

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: 4/15/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy. Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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) 29.59 Feet

Static water level measurement at time of sampling (Final Depth) 29.59 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/15/19 Water Column 7.93 Feet

Time Purged 1620 - 1647 One Casing Volume 1.3 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 4.05 Gallons

Field Sampling Data

Date Sampled 4/15/19

Time Sampled 1700

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 7.1 (mg/l)

Spec. Cond. 670 (µmhos/cm) Turbidity 4.6 (NTU)

Temp. 8.5 (°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: 48° + cloudy, wind E10

Sample Description: clear + odorless

Observations:

DTA 4/15/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1629	7.5	670	8.5	7.3	NA	155	1.35
1638	7.5	670	8.5	7.2	NA	152	2.70
1647	7.5	670	8.5	7.1	NA	150	4.05

DTA 4/15/19

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: 4/15/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy. Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

Monitoring Point ID P-137A Labeled P-137A

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)	31.90	Feet
Static water level measurement at time of sampling (Final Depth)	31.90	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PZ-6

Date Purged 4/16/19 Water Column 9.80 Feet

Time Purged 0930 - 1003 One Casing Volume 1.6 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 4.95 Gallons

Field Sampling Data

Date Sampled 4/16/19

Time Sampled 1020

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 4.5 (mg/l)

Spec. Cond. 640 (µmhos/cm) Turbidity 4.7 (NTU)

Temp. 9.0 (°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: 36° + sunny, wind NE 5

Sample Description: clear + odorless

Observations: measured water level on 4/15/19. 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)
0941	7.5	630	9.0	4.6	NA	144	1.65
0952	7.5	640	9.0	4.6	NA	144	3.30
1003	7.5	640	9.0	4.5	NA	144	4.95

DTA 4/16/19

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: 4/16/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy. Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

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)	28.84	Feet
Static water level measurement at time of sampling (Final Depth)	28.84	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/16/19 Water Column 8.11 Feet

Time Purged 0750 - 0817 One Casing Volume 1.3 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 4.05 Gallons

Field Sampling Data

Date Sampled 4/16/19

Time Sampled 0830

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.2 (units) D.O 4.9 (mg/l)

Spec. Cond. 730 (µmhos/cm) Turbidity 4.4 (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° + sunny, wind NE 5

Sample Description: clear + odorless

Observations: measured water level on 4/15/19.

DTA 4/16/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0759	7.3	730	9.0	5.4	NA	151	1.35
0808	7.3	730	9.0	5.1	NA	155	2.70
0817	7.2	730	9.0	4.9	NA	158	4.05

DTA 4/16/19

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: 4/16/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Spring 2019 Project No. 19-01890

Monitoring Point ID P-141 Labeled P-141

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) 31.19 Feet

Static water level measurement at time of sampling (Final Depth) 31.19 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4/15/19 Water Column 8.05 Feet

Time Purged 1530 - 1557 One Casing Volume 1.3 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 4.05 Gallons

Field Sampling Data

Date Sampled 4/15/19

Time Sampled 1610

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O 8.2 (mg/l)

Spec. Cond. 680 (µmhos/cm) Turbidity 7.2 (NTU)

Temp. 8.5 (°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: 48°+ cloudy, wind E10

Sample Description: clear + odorless

Observations: DJA 4/15/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1539	7.5	680	8.5	8.4	NA	164	1.35
1548	7.5	680	8.5	8.3	NA	155	2.70
1557	7.5	680	8.5	8.2	NA	153	4.05

DJA 4/15/19

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: 4/15/19

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

08 May 2019

Eric Ealy

Environmental Services-Water Minneapolis

250 Marquette Plaza

Minneapolis, MN 55401

cc:

RE: Sherco Unit 3 LF

Enclosed are the results of analyses for samples received by the laboratory on 04/17/2019 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

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 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Rinse		MED0168-01	Water	04/15/2019 11:40	04/17/2019 9:30
P-74-1		MED0168-03	Water	04/15/2019 12:30	04/17/2019 9:30
P-73A-1		MED0168-05	Water	04/15/2019 14:00	04/17/2019 9:30
P-125		MED0168-06	Water	04/15/2019 15:20	04/17/2019 9:30
P-141		MED0168-07	Water	04/15/2019 16:10	04/17/2019 9:30
P-134		MED0168-08	Water	04/15/2019 17:00	04/17/2019 9:30
P-138A		MED0168-10	Water	04/16/2019 8:30	04/17/2019 9:30
P-137A		MED0168-12	Water	04/16/2019 10:20	04/17/2019 9:30
Duplicate		MED0168-13	Water	04/16/2019 10:20	04/17/2019 9:30
P-117		MED0168-15	Water	04/16/2019 11:50	04/17/2019 9:30
P-75-1		MED0168-16	Water	04/16/2019 13:00	04/17/2019 9:30
P-97		MED0168-17	Water	04/16/2019 13:50	04/17/2019 9:30
P-98		MED0168-21	Water	04/16/2019 16:40	04/17/2019 9:30
P-120		MED0168-22	Water	04/16/2019 17:40	04/17/2019 9:30

Minneapolis Testing Laboratory
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Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Rinse

MED0168-01 (Water) - Chain of Custody Number: 2273472/2273473

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	BED0343	4/17/19 11:27	4/17/19 17:02	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 17:02	EPA 300.0	CRL
Sulfate	< 1.00	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 17:02	EPA 300.0	CRL
Wet Chemistry										
pH	6.86		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 11:09	SM 4500-H+ B	CRL
Total Dissolved Solids	< 20.0	20.0	mg/L		1	BED0338	4/17/19 12:32	4/17/19 12:32	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0337	4/17/19 11:19	4/17/19 11:19	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Barium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:32	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:02	EPA 200.7	HRD
Calcium	< 1.25	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:00	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:00	EPA 200.7	HRD

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Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Rinse

MED0168-01 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BED0520	4/25/19 10:20	4/25/19 14:36	EPA 245.1, 7470A	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 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-74-1

MED0168-03 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	20.8	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 17:42	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 17:42	EPA 300.0	CRL
Sulfate	17.7	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 17:42	EPA 300.0	CRL
Wet Chemistry										
pH	7.72		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 11:30	SM 4500-H+ B	CRL
Total Dissolved Solids	308	20.0	mg/L		1	BED0338	4/17/19 12:32	4/17/19 12:32	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0337	4/17/19 11:19	4/17/19 11:19	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.602	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Barium	93.6	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Chromium	1.08	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Selenium	0.514	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:36	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0752	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:07	EPA 200.7	HRD
Calcium	79.4	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:05	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:05	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-74-1

MED0168-03 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BED0520	4/25/19 10:20	4/25/19 14:38	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-73A-1

MED0168-05 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	18.2	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:05	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:05	EPA 300.0	CRL
Sulfate	17.2	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:05	EPA 300.0	CRL
Wet Chemistry										
pH	7.86		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 11:43	SM 4500-H+ B	CRL
Total Dissolved Solids	282	20.0	mg/L		1	BED0338	4/17/19 12:32	4/17/19 12:32	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0337	4/17/19 11:19	4/17/19 11:19	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.678	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Barium	55.0	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Chromium	0.646	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Selenium	0.695	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:48	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:23	EPA 200.7	HRD
Calcium	72.2	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:21	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:21	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-73A-1

MED0168-05 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BED0520	4/25/19 10:20	4/25/19 14:43	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-125

MED0168-06 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	19.4	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:26	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:26	EPA 300.0	CRL
Sulfate	14.5	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:26	EPA 300.0	CRL
Wet Chemistry										
pH	7.94		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 11:50	SM 4500-H+ B	CRL
Total Dissolved Solids	246	20.0	mg/L		1	BED0338	4/17/19 12:32	4/17/19 12:32	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0337	4/17/19 11:19	4/17/19 11:19	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.926	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Barium	56.2	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Chromium	1.00	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Selenium	0.557	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:52	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:28	EPA 200.7	HRD
Calcium	57.5	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:26	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:26	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-125

MED0168-06 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BED0520	4/25/19 10:20	4/25/19 14:45	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-141

MED0168-07 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	54.6	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:46	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:46	EPA 300.0	CRL
Sulfate	41.9	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 20:46	EPA 300.0	CRL
Wet Chemistry										
pH	7.84		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 11:54	SM 4500-H+ B	CRL
Total Dissolved Solids	402	20.0	mg/L		1	BED0338	4/17/19 12:32	4/17/19 12:32	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0337	4/17/19 11:19	4/17/19 11:19	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.947	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Barium	85.9	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Chromium	1.06	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Selenium	0.704	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 8:56	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0510	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:33	EPA 200.7	HRD
Calcium	91.5	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:31	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:31	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-141

MED0168-07 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BED0520	4/25/19 10:20	4/25/19 14:47	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-134

MED0168-08 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	42.4	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 21:07	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 21:07	EPA 300.0	CRL
Sulfate	33.7	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 21:07	EPA 300.0	CRL
Wet Chemistry										
pH	7.84		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 12:00	SM 4500-H+ B	CRL
Total Dissolved Solids	400	20.0	mg/L		1	BED0338	4/17/19 12:32	4/17/19 12:32	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0337	4/17/19 11:19	4/17/19 11:19	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	1.07	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Barium	93.1	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Chromium	0.544	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Selenium	0.615	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:00	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:38	EPA 200.7	HRD
Calcium	90.8	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:36	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:37	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-134

MED0168-08 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BED0520	4/25/19 10:20	4/25/19 14:48	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-138A

MED0168-10 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	48.8	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 21:48	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 21:48	EPA 300.0	CRL
Sulfate	30.6	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 21:48	EPA 300.0	CRL
Wet Chemistry										
pH	7.70		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 12:15	SM 4500-H+ B	CRL
Total Dissolved Solids	430	20.0	mg/L		1	BED0338	4/17/19 12:32	4/17/19 12:32	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0337	4/17/19 11:19	4/17/19 11:19	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	1.00	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Barium	107	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Selenium	0.544	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:04	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:43	EPA 200.7	HRD
Calcium	96.2	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:42	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:42	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-138A

MED0168-10 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BED0520	4/25/19 10:20	4/25/19 14:50	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-137A

MED0168-12 (Water) - Chain of Custody Number: 2273472/2273473

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	BED0343	4/17/19 11:27	4/17/19 22:28	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 22:28	EPA 300.0	CRL
Sulfate	76.3	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 22:28	EPA 300.0	CRL
Wet Chemistry										
pH	7.83		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 12:35	SM 4500-H+ B	CRL
Total Dissolved Solids	388	20.0	mg/L		1	BED0358	4/18/19 7:52	4/18/19 7:52	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0357	4/18/19 6:01	4/18/19 6:01	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.890	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Barium	96.7	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Chromium	1.27	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Selenium	1.03	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:08	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.109	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:49	EPA 200.7	HRD
Calcium	89.0	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:47	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:47	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-137A

MED0168-12 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BED0520	4/25/19 10:20	4/25/19 14:52	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Duplicate

MED0168-13 (Water) - Chain of Custody Number: 2273472/2273473

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	BED0343	4/17/19 11:27	4/17/19 22:49	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0343	4/17/19 11:27	4/17/19 22:49	EPA 300.0	CRL
Sulfate	76.3	1.00	mg/L		1	BED0343	4/17/19 11:27	4/17/19 22:49	EPA 300.0	CRL
Wet Chemistry										
pH	7.85		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 12:42	SM 4500-H+ B	CRL
Total Dissolved Solids	392	20.0	mg/L		1	BED0358	4/18/19 7:52	4/18/19 7:52	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0357	4/18/19 6:01	4/18/19 6:01	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.979	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Barium	96.1	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Chromium	1.35	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Selenium	0.980	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:12	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.110	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:54	EPA 200.7	HRD
Calcium	90.6	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:52	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:52	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Duplicate

MED0168-13 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BEE0042	5/2/19 8:29	5/2/19 13:19	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-117

MED0168-15 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	27.2	1.00	mg/L		1	BED0369	4/18/19 6:25	4/18/19 9:05	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0369	4/18/19 6:25	4/18/19 9:05	EPA 300.0	CRL
Sulfate	29.6	1.00	mg/L		1	BED0369	4/18/19 6:25	4/18/19 9:05	EPA 300.0	CRL
Wet Chemistry										
pH	7.82		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 12:56	SM 4500-H+ B	CRL
Total Dissolved Solids	312	20.0	mg/L		1	BED0358	4/18/19 7:52	4/18/19 7:52	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0357	4/18/19 6:01	4/18/19 6:01	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.953	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Barium	77.9	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Chromium	0.713	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Selenium	0.883	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:15	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:59	EPA 200.7	HRD
Calcium	78.0	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:57	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 14:57	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-117

MED0168-15 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BEE0042	5/2/19 8:29	5/2/19 13:26	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-75-1

MED0168-16 (Water) - Chain of Custody Number: 2273472/2273473

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	BED0369	4/18/19 6:25	4/18/19 9:26	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0369	4/18/19 6:25	4/18/19 9:26	EPA 300.0	CRL
Sulfate	27.0	1.00	mg/L		1	BED0369	4/18/19 6:25	4/18/19 9:26	EPA 300.0	CRL
Wet Chemistry										
pH	7.80		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 13:02	SM 4500-H+ B	CRL
Total Dissolved Solids	322	20.0	mg/L		1	BED0358	4/18/19 7:52	4/18/19 7:52	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0357	4/18/19 6:01	4/18/19 6:01	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.931	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Barium	84.5	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Chromium	0.576	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Selenium	0.712	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:19	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:04	EPA 200.7	HRD
Calcium	80.3	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:02	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:03	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-75-1

MED0168-16 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BEE0042	5/2/19 8:29	5/2/19 13:28	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-97

MED0168-17 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	28.8	1.00	mg/L		1	BED0369	4/18/19 6:25	4/18/19 9:46	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0369	4/18/19 6:25	4/18/19 9:46	EPA 300.0	CRL
Sulfate	29.1	1.00	mg/L		1	BED0369	4/18/19 6:25	4/18/19 9:46	EPA 300.0	CRL
Wet Chemistry										
pH	7.82		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 13:09	SM 4500-H+ B	CRL
Total Dissolved Solids	340	20.0	mg/L		1	BED0358	4/18/19 7:52	4/18/19 7:52	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0357	4/18/19 6:01	4/18/19 6:01	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.855	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Barium	85.5	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Chromium	0.827	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Selenium	1.30	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:23	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:09	EPA 200.7	HRD
Calcium	82.9	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:08	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:08	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-97

MED0168-17 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BEE0042	5/2/19 8:29	5/2/19 13:29	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-98

MED0168-21 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	23.0	1.00	mg/L		1	BED0369	4/18/19 6:25	4/18/19 11:08	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0369	4/18/19 6:25	4/18/19 11:08	EPA 300.0	CRL
Sulfate	18.5	1.00	mg/L		1	BED0369	4/18/19 6:25	4/18/19 11:08	EPA 300.0	CRL
Wet Chemistry										
pH	7.83		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 13:43	SM 4500-H+ B	CRL
Total Dissolved Solids	292	20.0	mg/L		1	BED0358	4/18/19 7:52	4/18/19 7:52	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0357	4/18/19 6:01	4/18/19 6:01	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.849	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Barium	80.5	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Chromium	0.581	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Selenium	0.559	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:35	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:25	EPA 200.7	HRD
Calcium	74.4	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:23	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:24	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-98

MED0168-21 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BEE0042	5/2/19 8:29	5/2/19 13:31	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-120

MED0168-22 (Water) - Chain of Custody Number: 2273472/2273473

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	BED0369	4/18/19 6:25	4/18/19 11:28	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BED0369	4/18/19 6:25	4/18/19 11:28	EPA 300.0	CRL
Sulfate	51.5	1.00	mg/L		1	BED0369	4/18/19 6:25	4/18/19 11:28	EPA 300.0	CRL
Wet Chemistry										
pH	7.82		pH Units	M_TTT	1	BED0340	4/17/19 10:17	4/17/19 13:50	SM 4500-H+ B	CRL
Total Dissolved Solids	352	20.0	mg/L		1	BED0358	4/18/19 7:52	4/18/19 7:52	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BED0357	4/18/19 6:01	4/18/19 6:01	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.874	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Barium	86.2	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Chromium	0.721	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Selenium	1.89	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BED0409	4/22/19 7:43	4/23/19 9:39	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.111	0.0500	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:30	EPA 200.7	HRD
Calcium	84.1	1.25	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:29	EPA 200.7	HRD
Lithium	< 0.0150	0.0150	mg/L		1	BED0408	4/22/19 7:40	4/23/19 15:29	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

P-120

MED0168-22 (Water) - Chain of Custody Number: 2273472/2273473

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Mercury										
Mercury	< 0.200	0.200	ug/L		1	BEE0042	5/2/19 8:29	5/2/19 13:33	EPA 245.1, 7470A	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0343 - Wet Prep										
Blank (BED0343-BLK1)				Prepared & Analyzed: 04/17/2019						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
Blank (BED0343-BLK2)				Prepared & Analyzed: 04/17/2019						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BED0343-BS1)				Prepared & Analyzed: 04/17/2019						
Chloride	24.8	1.00	mg/L	25.026		99.0	90-110			
Fluoride	3.44	0.750	mg/L	2.5000		137	90-110			M_LCS-H
Sulfate	50.1	1.00	mg/L	50.150		100	90-110			
LCS (BED0343-BS2)				Prepared & Analyzed: 04/17/2019						
Chloride	24.6	1.00	mg/L	25.026		98.3	90-110			
Fluoride	3.32	0.750	mg/L	2.5000		133	90-110			M_LCS-H
Sulfate	49.7	1.00	mg/L	50.150		99.2	90-110			
LCS (BED0343-BS3)				Prepared & Analyzed: 04/17/2019						
Chloride	24.6	1.00	mg/L	25.026		98.3	90-110			
Fluoride	3.29	0.750	mg/L	2.5000		132	90-110			M_LCS-H
Sulfate	49.0	1.00	mg/L	50.150		97.6	90-110			
Duplicate (BED0343-DUP1)		**Source: MED0168-02**		Prepared & Analyzed: 04/17/2019						
Chloride	38.9	1.00	mg/L		40.3			3.37	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	30.3	1.00	mg/L		31.3			3.29	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0343 - Wet Prep										
Duplicate (BED0343-DUP2)		**Source: MED0168-03**		Prepared & Analyzed: 04/17/2019						
Chloride	20.7	1.00	mg/L		20.8			0.492	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	17.5	1.00	mg/L		17.7			1.06	20	
Matrix Spike (BED0343-MS1)		**Source: MED0168-02**		Prepared & Analyzed: 04/17/2019						
Chloride	71.0	1.25	mg/L	31.283	40.3	98.3	80-120			
Fluoride	4.32	0.938	mg/L	3.1250	<0.938	138	80-120			M_MS
Sulfate	93.0	1.25	mg/L	62.688	31.3	98.4	80-120			
Matrix Spike (BED0343-MS2)		**Source: MED0168-03**		Prepared & Analyzed: 04/17/2019						
Chloride	51.4	1.25	mg/L	31.283	20.8	97.9	80-120			
Fluoride	4.30	0.938	mg/L	3.1250	<0.938	138	80-120			M_MS
Sulfate	79.6	1.25	mg/L	62.688	17.7	98.7	80-120			
Matrix Spike Dup (BED0343-MSD1)		**Source: MED0168-02**		Prepared & Analyzed: 04/17/2019						
Chloride	70.5	1.25	mg/L	31.283	40.3	96.5	80-120	0.818	20	
Fluoride	4.08	0.938	mg/L	3.1250	<0.938	130	80-120	5.89	20	M_MS
Sulfate	93.0	1.25	mg/L	62.688	31.3	98.5	80-120	0.0457	20	
Matrix Spike Dup (BED0343-MSD2)		**Source: MED0168-03**		Prepared & Analyzed: 04/17/2019						
Chloride	51.7	1.25	mg/L	31.283	20.8	98.8	80-120	0.526	20	
Fluoride	4.18	0.938	mg/L	3.1250	<0.938	134	80-120	3.04	20	M_MS
Sulfate	79.9	1.25	mg/L	62.688	17.7	99.3	80-120	0.494	20	
Batch BED0369 - Wet Prep										
Blank (BED0369-BLK1)				Prepared & Analyzed: 04/18/2019						
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 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0369 - Wet Prep										
LCS (BED0369-BS1)				Prepared & Analyzed: 04/18/2019						
Chloride	25.0	1.00	mg/L	25.026		100	90-110			
Fluoride	3.37	0.750	mg/L	2.5000		135	90-110			M_LCS-H
Sulfate	50.4	1.00	mg/L	50.150		100	90-110			
LCS (BED0369-BS2)				Prepared & Analyzed: 04/18/2019						
Chloride	24.6	1.00	mg/L	25.026		98.4	90-110			
Fluoride	3.44	0.750	mg/L	2.5000		138	90-110			M_LCS-H
Sulfate	49.4	1.00	mg/L	50.150		98.5	90-110			
Duplicate (BED0369-DUP1)		**Source: MED0168-15**		Prepared & Analyzed: 04/18/2019						
Chloride	27.0	1.00	mg/L		27.2			0.888	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	29.7	1.00	mg/L		29.6			0.226	20	
Matrix Spike (BED0369-MS1)		**Source: MED0168-15**		Prepared & Analyzed: 04/18/2019						
Chloride	58.0	1.25	mg/L	31.283	27.2	98.3	80-120			
Fluoride	4.11	0.938	mg/L	3.1250	<0.938	132	80-120			M_MS
Sulfate	91.0	1.25	mg/L	62.688	29.6	97.9	80-120			
Matrix Spike Dup (BED0369-MSD1)		**Source: MED0168-15**		Prepared & Analyzed: 04/18/2019						
Chloride	58.5	1.25	mg/L	31.283	27.2	100	80-120	0.884	20	
Fluoride	4.29	0.938	mg/L	3.1250	<0.938	137	80-120	4.14	20	M_MS
Sulfate	92.0	1.25	mg/L	62.688	29.6	99.6	80-120	1.15	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0337 - Wet Prep										
Blank (BED0337-BLK1)				Prepared & Analyzed: 04/17/2019						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BED0337-DUP1)			**Source: MED0168-02**	Prepared & Analyzed: 04/17/2019						
Total Suspended Solids	1.20	4.00	mg/L		<4.00				20	
Duplicate (BED0337-DUP2)			**Source: MED0168-03**	Prepared & Analyzed: 04/17/2019						
Total Suspended Solids	<4.00	4.00	mg/L		<4.00				20	
Batch BED0338 - Wet Prep										
Blank (BED0338-BLK1)				Prepared & Analyzed: 04/17/2019						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BED0338-DUP1)			**Source: MED0168-02**	Prepared & Analyzed: 04/17/2019						
Total Dissolved Solids	406	20.0	mg/L		422			3.86	20	
Duplicate (BED0338-DUP2)			**Source: MED0168-03**	Prepared & Analyzed: 04/17/2019						
Total Dissolved Solids	320	20.0	mg/L		308			3.82	20	
Batch BED0340 - Wet Prep										
LCS (BED0340-BS1)				Prepared & Analyzed: 04/17/2019						
pH	7.14		pH Units	7.0000		102	90-110			
LCS (BED0340-BS2)				Prepared & Analyzed: 04/17/2019						
pH	7.11		pH Units	7.0000		102	90-110			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0340 - Wet Prep										
Duplicate (BED0340-DUP1)		**Source: MED0168-02**		Prepared & Analyzed: 04/17/2019						
pH	7.63		pH Units		7.67			0.523	20	
Duplicate (BED0340-DUP2)		**Source: MED0168-11**		Prepared & Analyzed: 04/17/2019						
pH	7.81		pH Units		7.83			0.256	20	
Duplicate (BED0340-DUP3)		**Source: MED0168-21**		Prepared & Analyzed: 04/17/2019						
pH	7.82		pH Units		7.83			0.128	20	
Batch BED0357 - Wet Prep										
Blank (BED0357-BLK1)				Prepared & Analyzed: 04/18/2019						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BED0357-DUP1)		**Source: MED0168-12**		Prepared & Analyzed: 04/18/2019						
Total Suspended Solids	2.00	4.00	mg/L		1.60			22.2	20	M_D-RL
Duplicate (BED0357-DUP2)		**Source: MED0168-13**		Prepared & Analyzed: 04/18/2019						
Total Suspended Solids	2.40	4.00	mg/L		0.800			100	20	M_D-RL
Batch BED0358 - Wet Prep										
Blank (BED0358-BLK1)				Prepared & Analyzed: 04/18/2019						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BED0358-DUP1)		**Source: MED0168-12**		Prepared & Analyzed: 04/18/2019						
Total Dissolved Solids	390	20.0	mg/L		388			0.514	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0358 - Wet Prep										
Duplicate (BED0358-DUP2)		**Source: MED0168-13**		Prepared & Analyzed: 04/18/2019						
Total Dissolved Solids	380	20.0	mg/L		392			3.11	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0409 - EPA 200.2, EPA 3005										
Blank (BED0409-BLK1)				Prepared: 04/22/2019 Analyzed: 04/23/2019						
Barium	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Beryllium	<0.500	0.500	ug/L							
Cadmium	<0.100	0.100	ug/L							
Molybdenum	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Thallium	<0.500	0.500	ug/L							
Antimony	<0.500	0.500	ug/L							
LCS (BED0409-BS1)				Prepared: 04/22/2019 Analyzed: 04/23/2019						
Selenium	101	0.500	ug/L	100.00		101	85-115			
Cobalt	101	0.500	ug/L	100.00		101	85-115			
Cadmium	103	0.100	ug/L	100.00		103	85-115			
Barium	101	0.500	ug/L	100.00		101	85-115			
Beryllium	101	0.500	ug/L	100.00		101	85-115			
Thallium	101	0.500	ug/L	100.00		101	85-115			
Arsenic	99.8	0.500	ug/L	100.00		99.8	85-115			
Molybdenum	103	0.500	ug/L	100.00		103	85-115			
Chromium	101	0.500	ug/L	100.00		101	85-115			
Lead	102	0.500	ug/L	100.00		102	85-115			
Antimony	101	0.500	ug/L	100.00		101	85-115			
Duplicate (BED0409-DUP1)		**Source: MED0168-06**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Lead	0.0237	0.500	ug/L		<0.500				20	
Molybdenum	0.212	0.500	ug/L		0.157			29.8	20	M_D-RL
Selenium	0.369	0.500	ug/L		0.557			40.6	20	M_D-RL
Thallium	0.0491	0.500	ug/L		0.0118			123	20	M_D-RL
Antimony	0.0778	0.500	ug/L		0.0642			19.2	20	
Cadmium	<0.100	0.100	ug/L		<0.100				20	
Chromium	0.938	0.500	ug/L		1.00			6.41	20	
Beryllium	0.0454	0.500	ug/L		<0.500				20	
Barium	56.0	0.500	ug/L		56.2			0.336	20	
Arsenic	0.874	0.500	ug/L		0.926			5.74	20	
Cobalt	0.0390	0.500	ug/L		0.0300			26.0	20	M_D-RL

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Certification # MN-027-053-197
WI-999071150
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0409 - EPA 200.2, EPA 3005										
Duplicate (BED0409-DUP2)		**Source: MED0168-07**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Lead	0.0708	0.500	ug/L		0.0725			2.42	20	
Antimony	0.0458	0.500	ug/L		0.0666			37.2	20	M_D-RL
Molybdenum	0.140	0.500	ug/L		0.142			1.33	20	
Cadmium	<0.100	0.100	ug/L		<0.100				20	
Cobalt	0.354	0.500	ug/L		0.362			2.18	20	
Chromium	0.961	0.500	ug/L		1.06			9.49	20	
Beryllium	<0.500	0.500	ug/L		0.00833				20	
Barium	85.7	0.500	ug/L		85.9			0.304	20	
Thallium	0.0142	0.500	ug/L		0.0134			5.18	20	
Arsenic	0.756	0.500	ug/L		0.947			22.4	20	M_D
Selenium	0.547	0.500	ug/L		0.704			25.0	20	M_D
Matrix Spike (BED0409-MS1)		**Source: MED0168-06**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Cobalt	106	0.500	ug/L	100.00	0.0300	106	70-130			
Arsenic	106	0.500	ug/L	100.00	0.926	105	70-130			
Selenium	102	0.500	ug/L	100.00	0.557	102	70-130			
Chromium	106	0.500	ug/L	100.00	1.00	105	70-130			
Cadmium	104	0.100	ug/L	100.00	<0.100	104	70-130			
Barium	164	0.500	ug/L	100.00	56.2	108	70-130			
Thallium	99.5	0.500	ug/L	100.00	0.0118	99.5	70-130			
Beryllium	104	0.500	ug/L	100.00	<0.500	104	70-130			
Lead	99.5	0.500	ug/L	100.00	<0.500	99.5	70-130			
Antimony	105	0.500	ug/L	100.00	0.0642	105	70-130			
Molybdenum	103	0.500	ug/L	100.00	0.157	103	70-130			
Matrix Spike (BED0409-MS2)		**Source: MED0168-07**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Thallium	96.2	0.500	ug/L	100.00	0.0134	96.2	70-130			
Selenium	100	0.500	ug/L	100.00	0.704	99.3	70-130			
Molybdenum	102	0.500	ug/L	100.00	0.142	102	70-130			
Beryllium	97.9	0.500	ug/L	100.00	0.00833	97.9	70-130			
Cadmium	102	0.100	ug/L	100.00	<0.100	102	70-130			
Cobalt	104	0.500	ug/L	100.00	0.362	104	70-130			
Chromium	106	0.500	ug/L	100.00	1.06	105	70-130			
Barium	188	0.500	ug/L	100.00	85.9	102	70-130			
Lead	94.4	0.500	ug/L	100.00	0.0725	94.3	70-130			
Arsenic	105	0.500	ug/L	100.00	0.947	104	70-130			
Antimony	101	0.500	ug/L	100.00	0.0666	101	70-130			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0409 - EPA 200.2, EPA 3005										
Matrix Spike Dup (BED0409-MSD1)		**Source: MED0168-06**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Molybdenum	104	0.500	ug/L	100.00	0.157	104	70-130	0.875	20	
Selenium	101	0.500	ug/L	100.00	0.557	101	70-130	1.20	20	
Thallium	96.9	0.500	ug/L	100.00	0.0118	96.9	70-130	2.71	20	
Cobalt	104	0.500	ug/L	100.00	0.0300	104	70-130	2.10	20	
Lead	94.6	0.500	ug/L	100.00	<0.500	94.6	70-130	5.03	20	
Arsenic	106	0.500	ug/L	100.00	0.926	105	70-130	0.597	20	
Cadmium	102	0.100	ug/L	100.00	<0.100	102	70-130	2.67	20	
Beryllium	99.9	0.500	ug/L	100.00	<0.500	99.9	70-130	3.76	20	
Antimony	102	0.500	ug/L	100.00	0.0642	102	70-130	2.92	20	
Chromium	110	0.500	ug/L	100.00	1.00	109	70-130	3.77	20	
Barium	159	0.500	ug/L	100.00	56.2	103	70-130	2.83	20	
Matrix Spike Dup (BED0409-MSD2)		**Source: MED0168-07**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Cobalt	103	0.500	ug/L	100.00	0.362	103	70-130	1.14	20	
Chromium	107	0.500	ug/L	100.00	1.06	106	70-130	0.964	20	
Barium	191	0.500	ug/L	100.00	85.9	105	70-130	1.79	20	
Arsenic	104	0.500	ug/L	100.00	0.947	103	70-130	1.17	20	
Beryllium	103	0.500	ug/L	100.00	0.00833	103	70-130	4.91	20	
Cadmium	100	0.100	ug/L	100.00	<0.100	100	70-130	1.40	20	
Selenium	102	0.500	ug/L	100.00	0.704	101	70-130	1.83	20	
Molybdenum	105	0.500	ug/L	100.00	0.142	105	70-130	2.20	20	
Antimony	101	0.500	ug/L	100.00	0.0666	101	70-130	0.130	20	
Thallium	95.5	0.500	ug/L	100.00	0.0134	95.5	70-130	0.700	20	
Lead	92.2	0.500	ug/L	100.00	0.0725	92.2	70-130	2.31	20	
Batch BED0571 - EPA 200.2, EPA 3005										
Blank (BED0571-BLK1)				Prepared: 04/29/2019 Analyzed: 04/30/2019						
Lead	<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							
Molybdenum	<0.500	0.500	ug/L							
Thallium	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0571 - EPA 200.2, EPA 3005										
LCS (BED0571-BS1)				Prepared: 04/29/2019 Analyzed: 04/30/2019						
Lead	96.8	0.500	ug/L	100.00		96.8	85-115			
Arsenic	98.4	0.500	ug/L	100.00		98.4	85-115			
Molybdenum	102	0.500	ug/L	100.00		102	85-115			
Antimony	100	0.500	ug/L	100.00		100	85-115			
Barium	101	0.500	ug/L	100.00		101	85-115			
Selenium	99.8	0.500	ug/L	100.00		99.8	85-115			
Thallium	98.7	0.500	ug/L	100.00		98.7	85-115			
Duplicate (BED0571-DUP1)		**Source: MED0235-16**		Prepared: 04/29/2019 Analyzed: 04/30/2019						
Thallium	0.0810	0.500	ug/L		0.0117			150	20	M_D-RL
Antimony	0.126	0.500	ug/L		0.0737			52.2	20	M_D-RL
Selenium	3.84	0.500	ug/L		3.83			0.326	20	
Barium	66.2	0.500	ug/L		66.0			0.359	20	
Arsenic	0.695	0.500	ug/L		0.734			5.49	20	
Molybdenum	4.18	0.500	ug/L		4.27			2.01	20	
Lead	0.105	0.500	ug/L		0.0606			53.9	20	M_D-RL
Matrix Spike (BED0571-MS1)		**Source: MED0235-16**		Prepared: 04/29/2019 Analyzed: 04/30/2019						
Thallium	96.0	0.500	ug/L	100.00	0.0117	96.0	70-130			
Barium	171	0.500	ug/L	100.00	66.0	105	70-130			
Arsenic	105	0.500	ug/L	100.00	0.734	104	70-130			
Antimony	102	0.500	ug/L	100.00	0.0737	102	70-130			
Selenium	103	0.500	ug/L	100.00	3.83	99.1	70-130			
Molybdenum	108	0.500	ug/L	100.00	4.27	104	70-130			
Lead	92.9	0.500	ug/L	100.00	0.0606	92.8	70-130			
Matrix Spike Dup (BED0571-MSD1)		**Source: MED0235-16**		Prepared: 04/29/2019 Analyzed: 04/30/2019						
Antimony	100	0.500	ug/L	100.00	0.0737	100	70-130	2.02	20	
Selenium	104	0.500	ug/L	100.00	3.83	100	70-130	1.08	20	
Arsenic	105	0.500	ug/L	100.00	0.734	104	70-130	0.109	20	
Barium	168	0.500	ug/L	100.00	66.0	102	70-130	1.78	20	
Lead	91.2	0.500	ug/L	100.00	0.0606	91.1	70-130	1.83	20	
Molybdenum	108	0.500	ug/L	100.00	4.27	104	70-130	0.0610	20	
Thallium	95.0	0.500	ug/L	100.00	0.0117	95.0	70-130	1.04	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0408 - EPA 200.2, EPA 3005										
Blank (BED0408-BLK1)				Prepared: 04/22/2019 Analyzed: 04/23/2019						
Lithium	<0.0150	0.0150	mg/L							
Calcium	<1.25	1.25	mg/L							
Boron	<0.0500	0.0500	mg/L							
LCS (BED0408-BS1)				Prepared: 04/22/2019 Analyzed: 04/23/2019						
Lithium	1.03	0.0150	mg/L	1.0000		103	85-115			
Boron	1.01	0.0500	mg/L	1.0000		101	85-115			
Calcium	106	1.25	mg/L	100.00		106	85-115			
Duplicate (BED0408-DUP1)		**Source: MED0168-03**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Calcium	83.3	1.25	mg/L		79.4			4.83	20	
Boron	0.0750	0.0500	mg/L		0.0752			0.224	20	
Lithium	0.00474	0.0150	mg/L		0.00699			38.4	20	M_D-RL
Duplicate (BED0408-DUP2)		**Source: MED0168-05**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Lithium	0.00356	0.0150	mg/L		0.00392			9.72	20	
Boron	0.0514	0.0500	mg/L		0.0496			3.60	20	
Calcium	74.5	1.25	mg/L		72.2			3.08	20	
Matrix Spike (BED0408-MS1)		**Source: MED0168-03**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Calcium	189	1.25	mg/L	100.00	79.4	110	70-130			
Lithium	1.03	0.0150	mg/L	1.0000	0.00699	102	70-130			
Boron	1.08	0.0500	mg/L	1.0000	0.0752	100	70-130			
Matrix Spike (BED0408-MS2)		**Source: MED0168-05**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Calcium	181	1.25	mg/L	100.00	72.2	109	70-130			
Lithium	1.02	0.0150	mg/L	1.0000	0.00392	102	70-130			
Boron	1.07	0.0500	mg/L	1.0000	0.0496	102	70-130			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0408 - EPA 200.2, EPA 3005										
Matrix Spike Dup (BED0408-MSD1)		**Source: MED0168-03**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Boron	1.08	0.0500	mg/L	1.0000	0.0752	101	70-130	0.439	20	
Lithium	1.02	0.0150	mg/L	1.0000	0.00699	101	70-130	0.920	20	
Calcium	187	1.25	mg/L	100.00	79.4	108	70-130	0.922	20	
Matrix Spike Dup (BED0408-MSD2)		**Source: MED0168-05**		Prepared: 04/22/2019 Analyzed: 04/23/2019						
Calcium	180	1.25	mg/L	100.00	72.2	107	70-130	0.593	20	
Lithium	1.03	0.0150	mg/L	1.0000	0.00392	103	70-130	0.852	20	
Boron	1.05	0.0500	mg/L	1.0000	0.0496	101	70-130	0.976	20	
Batch BED0570 - EPA 200.2, EPA 3005										
Blank (BED0570-BLK1)				Prepared: 04/29/2019 Analyzed: 04/30/2019						
Calcium	<1.25	1.25	mg/L							
Boron	<0.0500	0.0500	mg/L							
LCS (BED0570-BS1)				Prepared: 04/29/2019 Analyzed: 04/30/2019						
Calcium	107	1.25	mg/L	100.00		107	85-115			
Boron	1.02	0.0500	mg/L	1.0000		102	85-115			
Duplicate (BED0570-DUP1)		**Source: MED0235-15**		Prepared: 04/29/2019 Analyzed: 04/30/2019						
Calcium	62.3	1.25	mg/L		61.6			1.13	20	
Boron	0.134	0.0500	mg/L		0.134			0.0656	20	
Matrix Spike (BED0570-MS1)		**Source: MED0235-15**		Prepared: 04/29/2019 Analyzed: 04/30/2019						
Boron	1.17	0.0500	mg/L	1.0000	0.134	104	70-130			
Calcium	172	1.25	mg/L	100.00	61.6	110	70-130			

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0570 - EPA 200.2, EPA 3005										
Matrix Spike Dup (BED0570-MSD1)		**Source: MED0235-15**		Prepared: 04/29/2019 Analyzed: 04/30/2019						
Boron	1.17	0.0500	mg/L	1.0000	0.134	103	70-130	0.0943	20	
Calcium	171	1.25	mg/L	100.00	61.6	110	70-130	0.226	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Mercury - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BED0520 - EPA 245.1, EPA 7470A										
Blank (BED0520-BLK1)				Prepared & Analyzed: 04/25/2019						
Mercury	<0.200	0.200	ug/L							
LCS (BED0520-BS1)				Prepared & Analyzed: 04/25/2019						
Mercury	2.69	0.200	ug/L	3.0030		89.4	85-115			
LCS (BED0520-BS2)				Prepared & Analyzed: 04/25/2019						
Mercury	2.68	0.200	ug/L	3.0030		89.2	85-115			
LCS (BED0520-BS3)				Prepared & Analyzed: 04/25/2019						
Mercury	2.67	0.200	ug/L	3.0030		89.0	85-115			
LCS (BED0520-BS4)				Prepared & Analyzed: 04/25/2019						
Mercury	2.75	0.200	ug/L	3.0030		91.7	85-115			
Duplicate (BED0520-DUP1)		**Source: MED0168-08**		Prepared & Analyzed: 04/25/2019						
Mercury	<0.200	0.200	ug/L		<0.200				20	
Matrix Spike (BED0520-MS1)		**Source: MED0168-08**		Prepared & Analyzed: 04/25/2019						
Mercury	2.81	0.200	ug/L	3.0030	<0.200	93.5	70-130			
Matrix Spike Dup (BED0520-MSD1)		**Source: MED0168-08**		Prepared & Analyzed: 04/25/2019						
Mercury	2.85	0.200	ug/L	3.0030	<0.200	94.9	70-130	1.54	20	
Batch BEE0042 - EPA 245.1, EPA 7470A										
Blank (BEE0042-BLK1)				Prepared & Analyzed: 05/02/2019						
Mercury	<0.200	0.200	ug/L							

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Mercury - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEE0042 - EPA 245.1, EPA 7470A										
LCS (BEE0042-BS1)				Prepared & Analyzed: 05/02/2019						
Mercury	2.77	0.200	ug/L	3.0030		92.4	85-115			
Duplicate (BEE0042-DUP1)		**Source: MED0168-13**		Prepared & Analyzed: 05/02/2019						
Mercury	<0.200	0.200	ug/L		<0.200				20	
Duplicate (BEE0042-DUP2)		**Source: MED0168-15**		Prepared & Analyzed: 05/02/2019						
Mercury	<0.200	0.200	ug/L		<0.200				20	
Matrix Spike (BEE0042-MS1)		**Source: MED0168-13**		Prepared & Analyzed: 05/02/2019						
Mercury	2.75	0.200	ug/L	3.0030	<0.200	91.7	70-130			
Matrix Spike (BEE0042-MS2)		**Source: MED0168-15**		Prepared & Analyzed: 05/02/2019						
Mercury	2.70	0.200	ug/L	3.0030	<0.200	89.9	70-130			
Matrix Spike Dup (BEE0042-MSD1)		**Source: MED0168-13**		Prepared & Analyzed: 05/02/2019						
Mercury	2.69	0.200	ug/L	3.0030	<0.200	89.7	70-130	2.20	20	
Matrix Spike Dup (BEE0042-MSD2)		**Source: MED0168-15**		Prepared & Analyzed: 05/02/2019						
Mercury	2.71	0.200	ug/L	3.0030	<0.200	90.2	70-130	0.248	20	

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 LF	
250 Marquette Plaza		**Reported:**
Minneapolis MN, 55401	Project Manager: Eric Ealy	05/08/2019 13:16

Qualifiers and Definitions

M_TTT	Sample received at the lab outside of required hold time.
M_MS	The percent recovery and/or RPD were outside the acceptance limits for the MS/MSD due to possible matrix interference and/or non-homogeneous sample matrix.
M_LCS-H	The recovery of this analyte in the LCS was above the control limits. The sample result may be biased high.
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

2273472

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:	David Katzner
Copy To:	
Purchase Order No.:	
Project Name:	Xcel Energy - Sherco Unit
Project Number:	3 LF, Spring 2019

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	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	GW-CCR+GW-A	GW-A	GW-CCR	LEA-A						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Rinse	WT				4/15/19	1140		4	1	1	2							✓										
2	P-139						1030		3	1	1	1								✓									
3	P-74-1						1230		4	1	1	2							✓										
4	P-73B-1						1325		3	1	1	1								✓									
5	P-73A-1						1400		4	1	1	2							✓										
6	P-125						1520		4	1	1	2							✓										
7	P-141						1610		2	1		1									✓								
8	P-134						1700		4	1	1	2							✓										
9	P-138B						1800		3	1	1	1								✓									
10	P-138A	WT				4/16/19	0830		4	1	1	2							✓										
11	P-137B						0925		3	1	1	1								✓									
12	P-137A						1020		4	1	1	2							✓										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	David Anderson / Pace	4/17/19	0930	[signature] / Xcel	4/17/19	0930				
pH strips: MDW402							M400841: 3.2	Y	Y	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 4/16/19

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.

F-ALL-C-010-rev.00, 09Nov2017

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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

2273473

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Xcel Energy	Report To: David Katzner	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 Unit 3	Pace Project Manager:
Requested Due Date/TAT:	Project Number: LE, Spring 2019	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+GW-A	GW-A	GW-CCR	LEA-A	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Duplicate	WT				4/16/19	1020		4	1	1	2						✓						
2	Leachate						1100		3	1	1	1										✓		
3	P-117						1150		4	1	1	2						✓						
4	P-75-1						1300		4	1	1	2						✓						
5	P-97						1350		4	1	1	2						✓						
6	P-76B-1						1455		3	1	1	1							✓					
7	P 76A-1						1520		3	1	1	1							✓					
8	P-99						1545		3	1	1	1							✓					
9	P-98						1640		4	1	1	2						✓						
10	P-120	✓				✓	1740		4	1	1	2						✓						
11																								
12	DJA 4/16/19																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	David Anderson Pace	4/17/19	0930	[signature] Xcel	4/17/19	0930	M 4.9°C
pH strips: MD00402							

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
M 4.9°C	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson — DATE Signed (MM/DD/YY): 4/16/19

*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-C-010-rev.00, 09Nov2017

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

May 07, 2019

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

RE: Project: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Dear Dave Anderson:
Enclosed are the analytical results for sample(s) received by the laboratory on April 19, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carin A. Ferris

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

Enclosures

cc: Harry S. Davis III, Xcel Energy
Eric Ealy, 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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

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
Florida: Cert E871149 SEKS WET
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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30290341001	**Rinse**	Water	04/15/19 11:40	04/19/19 11:10
30290341002	**P-74-1**	Water	04/15/19 12:30	04/19/19 11:10
30290341003	**P-73A-1**	Water	04/15/19 14:00	04/19/19 11:10
30290341004	**P-125**	Water	04/15/19 15:20	04/19/19 11:10
30290341005	**P-141**	Water	04/15/19 16:10	04/19/19 11:10
30290341006	**P-134**	Water	04/15/19 17:00	04/19/19 11:10
30290341007	**P-138A**	Water	04/16/19 08:30	04/19/19 11:10
30290341008	**P-137A**	Water	04/16/19 10:20	04/19/19 11:10
30290341009	**Duplicate**	Water	04/16/19 10:20	04/19/19 11:10
30290341010	**P-117**	Water	04/16/19 11:50	04/19/19 11:10
30290341011	**P-75-1**	Water	04/16/19 13:00	04/19/19 11:10
30290341012	**P-97**	Water	04/16/19 13:50	04/19/19 11:10
30290341013	**P-98**	Water	04/16/19 16:40	04/19/19 11:10
30290341014	**P-120**	Water	04/16/19 17:40	04/19/19 11:10

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SAMPLE ANALYTE COUNT

Project: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30290341001	**Rinse**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341002	**P-74-1**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341003	**P-73A-1**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341004	**P-125**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341005	**P-141**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341006	**P-134**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341007	**P-138A**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341008	**P-137A**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341009	**Duplicate**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341010	**P-117**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341011	**P-75-1**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341012	**P-97**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341013	**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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30290341014	**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
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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: Pace-MN Field Services Division
Date: May 07, 2019

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
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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: Pace-MN Field Services Division
Date: May 07, 2019

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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: Pace-MN Field Services Division
Date: May 07, 2019

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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Sample: Rinse **Lab ID: 30290341001** Collected: 04/15/19 11:40 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.266 ± 0.321 (0.490) C:NA T:86%**	pCi/L	05/02/19 22:43	13982-63-3	
Radium-228	EPA 904.0	**0.271 ± 0.361 (0.771) C:82% T:80%**	pCi/L	04/30/19 16:09	15262-20-1	
Total Radium	Total Radium Calculation	**0.537 ± 0.682 (1.26)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-74-1 **Lab ID: 30290341002** Collected: 04/15/19 12:30 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.233 ± 0.362 (0.626) C:NA T:94%**	pCi/L	05/02/19 22:43	13982-63-3	
Radium-228	EPA 904.0	**0.0443 ± 0.281 (0.645) C:80% T:88%**	pCi/L	04/30/19 16:09	15262-20-1	
Total Radium	Total Radium Calculation	**0.277 ± 0.643 (1.27)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-73A-1 **Lab ID: 30290341003** Collected: 04/15/19 14:00 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.114 ± 0.274 (0.528) C:NA T:95%**	pCi/L	05/02/19 22:43	13982-63-3	
Radium-228	EPA 904.0	**-0.00316 ± 0.252 (0.591) C:81% T:94%**	pCi/L	04/30/19 16:10	15262-20-1	
Total Radium	Total Radium Calculation	**0.114 ± 0.526 (1.12)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-125 **Lab ID: 30290341004** Collected: 04/15/19 15:20 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.761 ± 0.461 (0.505) C:NA T:96%**	pCi/L	05/02/19 22:43	13982-63-3	
Radium-228	EPA 904.0	**-0.0854 ± 0.353 (0.828) C:79% T:91%**	pCi/L	04/30/19 16:10	15262-20-1	
Total Radium	Total Radium Calculation	**0.761 ± 0.814 (1.33)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-141 **Lab ID: 30290341005** Collected: 04/15/19 16:10 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.445 ± 0.334 (0.172) C:NA T:85%**	pCi/L	05/02/19 22:43	13982-63-3	
Radium-228	EPA 904.0	**0.520 ± 0.351 (0.673) C:83% T:85%**	pCi/L	04/30/19 16:10	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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Sample: P-141 **Lab ID: 30290341005** Collected: 04/15/19 16:10 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.965 ± 0.685 (0.845)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-134 **Lab ID: 30290341006** Collected: 04/15/19 17:00 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.227 ± 0.316 (0.528) C:NA T:96%**	pCi/L	05/02/19 22:58	13982-63-3	
Radium-228	EPA 904.0	**0.397 ± 0.409 (0.853) C:76% T:85%**	pCi/L	04/30/19 16:10	15262-20-1	
Total Radium	Total Radium Calculation	**0.624 ± 0.725 (1.38)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-138A **Lab ID: 30290341007** Collected: 04/16/19 08:30 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 2.5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.123 ± 0.383 (0.741) C:NA T:99%**	pCi/L	05/02/19 22:58	13982-63-3	
Radium-228	EPA 904.0	**0.425 ± 0.322 (0.635) C:83% T:91%**	pCi/L	04/30/19 16:10	15262-20-1	
Total Radium	Total Radium Calculation	**0.548 ± 0.705 (1.38)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-137A **Lab ID: 30290341008** Collected: 04/16/19 10:20 Received: 04/19/19 11:10 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:93%**	pCi/L	05/02/19 22:58	13982-63-3	
Radium-228	EPA 904.0	**-0.163 ± 0.344 (0.824) C:77% T:88%**	pCi/L	04/30/19 16:10	15262-20-1	
Total Radium	Total Radium Calculation	**0.244 ± 0.638 (1.27)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: Duplicate **Lab ID: 30290341009** Collected: 04/16/19 10:20 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.490 ± 0.498 (0.754) C:NA T:79%**	pCi/L	05/02/19 22:58	13982-63-3	
Radium-228	EPA 904.0	**0.480 ± 0.432 (0.882) C:79% T:77%**	pCi/L	04/30/19 16:10	15262-20-1	
Total Radium	Total Radium Calculation	**0.970 ± 0.930 (1.64)**	pCi/L	05/07/19 12:52	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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Sample: P-117 **Lab ID: 30290341010** Collected: 04/16/19 11:50 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.584 ± 0.369 (0.158) C:NA T:93%**	pCi/L	05/02/19 22:58	13982-63-3	
Radium-228	EPA 904.0	**0.303 ± 0.311 (0.643) C:81% T:86%**	pCi/L	04/30/19 16:10	15262-20-1	
Total Radium	Total Radium Calculation	**0.887 ± 0.680 (0.801)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-75-1 **Lab ID: 30290341011** Collected: 04/16/19 13:00 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.225 ± 0.258 (0.153) C:NA T:94%**	pCi/L	05/02/19 22:58	13982-63-3	
Radium-228	EPA 904.0	**0.346 ± 0.306 (0.620) C:84% T:92%**	pCi/L	04/30/19 16:10	15262-20-1	
Total Radium	Total Radium Calculation	**0.571 ± 0.564 (0.773)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-97 **Lab ID: 30290341012** Collected: 04/16/19 13:50 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.270 ± 0.326 (0.497) C:NA T:88%**	pCi/L	05/02/19 23:14	13982-63-3	
Radium-228	EPA 904.0	**0.224 ± 0.269 (0.568) C:80% T:94%**	pCi/L	04/30/19 16:11	15262-20-1	
Total Radium	Total Radium Calculation	**0.494 ± 0.595 (1.07)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-98 **Lab ID: 30290341013** Collected: 04/16/19 16:40 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.519 ± 0.365 (0.176) C:NA T:85%**	pCi/L	05/02/19 23:14	13982-63-3	
Radium-228	EPA 904.0	**-0.0757 ± 0.336 (0.798) C:77% T:81%**	pCi/L	04/30/19 16:11	15262-20-1	
Total Radium	Total Radium Calculation	**0.519 ± 0.701 (0.974)**	pCi/L	05/07/19 12:52	7440-14-4	

Sample: P-120 **Lab ID: 30290341014** Collected: 04/16/19 17:40 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.596 ± 0.411 (0.439) C:NA T:93%**	pCi/L	05/02/19 23:14	13982-63-3	
Radium-228	EPA 904.0	**0.0459 ± 0.313 (0.719) C:78% T:87%**	pCi/L	04/30/19 16:11	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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

Sample: P-120 **Lab ID: 30290341014** Collected: 04/16/19 17:40 Received: 04/19/19 11:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.642 ± 0.724 (1.16)**	pCi/L	05/07/19 12:54	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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

QC Batch: 339458 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30290341001, 30290341002, 30290341003, 30290341004, 30290341005, 30290341006, 30290341007, 30290341008, 30290341009, 30290341010, 30290341011, 30290341012, 30290341013, 30290341014

METHOD BLANK: 1651965 Matrix: Water
Associated Lab Samples: 30290341001, 30290341002, 30290341003, 30290341004, 30290341005, 30290341006, 30290341007, 30290341008, 30290341009, 30290341010, 30290341011, 30290341012, 30290341013, 30290341014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.342 ± 0.389 (0.613) C:NA T:96%	pCi/L	05/02/19 22:43	

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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

QC Batch: 339576 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30290341001, 30290341002, 30290341003, 30290341004, 30290341005, 30290341006, 30290341007, 30290341008, 30290341009, 30290341010, 30290341011, 30290341012, 30290341013, 30290341014

METHOD BLANK: 1652360 Matrix: Water
Associated Lab Samples: 30290341001, 30290341002, 30290341003, 30290341004, 30290341005, 30290341006, 30290341007, 30290341008, 30290341009, 30290341010, 30290341011, 30290341012, 30290341013, 30290341014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0433 ± 0.317 (0.727) C:82% T:80%	pCi/L	04/30/19 16:08	

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: 19-01890, XCEL Energy Sherco U
Pace Project No.: 30290341

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

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical® www.pacelabs.com

2273474

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: 19-01890, Xcel Energy - Sherco Unit 3 LF, Spring 2019
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# : 30290341

30290341

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	Y/N: Analysis Test: RA-226 EPA 903.1	RA-228 EPA 904.0	Residual Cl	Pace Project No./ Lab I.D.
1	Rinse	WT				4/15/19	1140		2			2						✓	✓		001
2	P-74-1						1230		2			2						✓	✓		002
3	P-73A-1						1400		2			2						✓	✓		003
4	P-125						1520		2			2						✓	✓		004
5	P-141						1610		2			2						✓	✓		005
6	P-134						1700		2			2						✓	✓		006
7	~~P-138B~~ DUP 4/15/19	↓				↓															00
8	P-138A	WT				4/16/19	0830		2			2						✓	✓		007
9	P-137A						1020		2			2						✓	✓		008
10	Duplicate						1020		2			2						✓	✓		009
11	P-117						1150		2			2						✓	✓		010
12	P-75-1	↓				↓	1300		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.	David Anderson / Pace	4/17/19	1130		04/19/19	11:10	N/A	N	N	4

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

ORIGINAL

Page 16 of 18

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson DATE Signed (MM/DD/YY): 4/16/19

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.

CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical® www.pacelabs.com

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

Page: 2 of 2

2273475

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: 19-01890, Xcel Energy - Sherco Unit 3 LF, Spring 2019
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)

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	RA-226 EPA 903.1	RA-228 EPA 904.0	# 3029034141	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-97	WT				4/16/19	1350		2			2							✓	✓			012
2	P-98	↓				↓	1640		2			2							✓	✓			013
3	P-120	↓				↓	1740		2			2							✓	✓			014
4																							
5																							
6					DATA	4/16/19																	
7																							
8																							
9																							
10																							
11																							
12																							

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	4/17/19	1130	[illegible]	04-19-19	11:10	N/A	N	N	Y

1. RA-226 EPA 903.1
RA-228 EPA 904.0

ORIGINAL

Page 1 of 18

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: David Anderson
SIGNATURE of SAMPLER: David Anderson
DATE Signed (MM/DD/YY): 4/16/19

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-C-010-rev.00, 09Nov2017

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Xcel Energy

Project # 30290341

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

Label DK

LIMS Login

Tracking #: 4934 3729 4197

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# 10D2961

Date and Initials of person examining contents: DK 04-19-19

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 sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. added 2.5 ml HNO_3 to one bottle of Sample P-138A
All containers meet method preservation requirements.		✓		Initial when completed DK Date/time of preservation 04-19-19 14:45 Lot # of added preservative DL19-0361
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: DK Date: 04-19-19

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

Fall 2019 Assessment Monitoring 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 Unit 3 LF, Fall 2019 Project No. 19-02663

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)	30.74	Feet
Static water level measurement at time of sampling (Final Depth)	30.74	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/29/19 Water Column 5.44 Feet

Time Purged 1020-1047 One Casing Volume 0.9 Gallons

Pump Rate 0.10 (GPM) / LPM Volume Purged 2.7 Gallons

Field Sampling Data

Date Sampled 10/29/19

Time Sampled 1100

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.8 (units) D.O 10.1 (mg/l)

Spec. Cond. 400 (µmhos/cm) Turbidity 5.2 (NTU)

Temp. 9.0 (°C) Eh 163 (mV)

Other NA

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

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

Weather Conditions During Sampling: 30°+ sunny, wind W10

Sample Description: clear + odorless

Observations:

DJA 10/29/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1029	7.8	390	8.5	10.2	NA	170	0.9
1038	7.8	400	9.0	10.2	NA	166	1.8
1047	7.8	400	9.0	10.1	NA	163	2.7
			DJA	10/29/19			

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2019

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

Lead Technician Signature: David Anderson Date: 10/29/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

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)	33.30	Feet
Static water level measurement at time of sampling (Final Depth)	33.30	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/29/19 Water Column 4.80 Feet

Time Purged 0910-0934 One Casing Volume 0.8 Gallons

Pump Rate 0.1 (GPM) LPM Volume Purged 2.4 Gallons

Field Sampling Data

Date Sampled 10/29/19

Time Sampled 0950

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O 8.9 (mg/l)

Spec. Cond. 540 (µmhos/cm) Turbidity 4.4 (NTU)

Temp. 9.5 (°C) Eh 147 (mV)

Other NA

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

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

Weather Conditions During Sampling: 26° + sunny, wind NW 5-10

Sample Description: clear + odorless

Observations: collected Rinse Blank at this well.

DJA 10/29/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0918	7.6	550	9.5	8.8	NA	141	0.8
0926	7.6	540	9.5	8.9	NA	145	1.6
0934	7.6	540	9.5	8.9	NA	147	2.4

DJA 10/29/19

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: 10/29/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

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)	34.95	Feet
Static water level measurement at time of sampling (Final Depth)	34.95	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/30/19 Water Column 4.71 Feet

Time Purged 1340-1358 One Casing Volume 0.8 Gallons

Pump Rate 0.15 (GPM) LPM Volume Purged 2.7 Gallons

Field Sampling Data

Date Sampled 10/30/19

Time Sampled 1405

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

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

Spec. Cond. 670 (µmhos/cm) Turbidity 4.9 (NTU)

Temp. 9.5 (°C) Eh 166 (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°+ sunny, wind NW 10

Sample Description: clear + odorless

Observations:

DJA 10/30/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1346	7.6	670	9.5	7.9	NA	168	0.9
1352	7.6	670	9.5	7.8	NA	166	1.8
1358	7.6	670	9.5	7.8	NA	166	2.7

DJA 10/30/19

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: 10/30/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

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) 38.20 Feet

Static water level measurement at time of sampling (Final Depth) 38.20 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/30/19 Water Column 3.79 Feet

Time Purged 1420-1438 One Casing Volume 0.6 Gallons

Pump Rate 0.10 (GPM) / LPM Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 10/30/19

Time Sampled 1450

Sampling Equip. 1450 above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O 8.3 (mg/l)

Spec. Cond. 620 (µmhos/cm) Turbidity 5.2 (NTU)

Temp. 9.5 (°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: 32° + partly cloudy, wind NW 10

Sample Description: clear + odorless

Observations:

DJA 10/30/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1426	7.6	630	9.5	8.3	NA	175	0.6
1432	7.6	620	9.0	8.3	NA	171	1.2
1438	7.6	620	9.5	8.3	NA	170	1.8

DJA 10/30/19

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2019

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

Lead Technician Signature: David Anderson Date: 10/30/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

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)	36.83	Feet
Static water level measurement at time of sampling (Final Depth)	36.83	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/30/19 Water Column 6.52 Feet

Time Purged 1550 - 1620 One Casing Volume 1.1 Gallons

Pump Rate 0.12 (GPM) / LPM Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 10/30/19

Time Sampled 1630

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 7.6 (mg/l)

Spec. Cond. 530 (µmhos/cm) Turbidity 4.7 (NTU)

Temp. 12.5 (°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: 34° + partly cloudy, winds W 10

Sample Description: clear + odorless

Observations: ~~DJA~~ 10/30/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1600	7.8	530	12.0	9.4	NA	167	1.2
1610	7.8	530	12.5	8.1	NA	163	2.4
1620	7.7	530	12.5	7.6	NA	162	3.6
			~~DJA~~ 10/30/19				

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: 10/30/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

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) 32.04 Feet

Static water level measurement at time of sampling (Final Depth) 32.04 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PE-6

Date Purged 10/30/19 Water Column 8.93 Feet

Time Purged 1235 - 1305 One Casing Volume 1.5 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 4.5 Gallons

Field Sampling Data

Date Sampled 10/30/19

Time Sampled 1315

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 8.2 (mg/l)

Spec. Cond. 690 (µmhos/cm) Turbidity 4.4 (NTU)

Temp. 10.0 (°C) Eh 185 (mV)

Other NA

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

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

Weather Conditions During Sampling: 30°+ partly cloudy, wind NW10

Sample Description: clear + odorless

Observations:

DJA 10/30/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1245	7.8	690	10.0	8.2	NA	190	1.5
1255	7.7	690	10.0	8.2	NA	187	3.0
1305	7.7	690	10.0	8.2	NA	185	4.5

DJA 10/30/19

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: 10/30/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

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)	37.20	Feet
Static water level measurement at time of sampling (Final Depth)	37.20	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/30/19 Water Column 11.33 Feet

Time Purged 1640 - 1716 One Casing Volume 1.8 Gallons

Pump Rate 0.15 (GPM) LPM Volume Purged 5.4 Gallons

Field Sampling Data

Date Sampled 10/30/19

Time Sampled 1730

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O 7.4 (mg/l)

Spec. Cond. 610 (µmhos/cm) Turbidity 5.5 (NTU)

Temp. 10.5 (°C) Eh 167 (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° + partly cloudy, wind NW 10

Sample Description: clear + odorless

Observations: collected Duplicate at this well.

DJA 10/30/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1652	7.7	610	10.5	8.5	NA	169	1.8
1704	7.6	610	10.5	7.5	NA	168	3.6
1716	7.6	610	10.5	7.4	NA	167	5.4

DJA 10/30/19

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: 10/30/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

Monitoring Point ID P-125 Labeled P-125

Inside Diameter 2 (inches) Key # 2166 ☒ 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)	26.66	Feet
Static water level measurement at time of sampling (Final Depth)	26.66	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/29/19 Water Column 9.75 Feet

Time Purged 1210 - 1243 One Casing Volume 1.6 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 4.95 Gallons

Field Sampling Data

Date Sampled 10/29/19

Time Sampled 1250

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 9.0 (mg/l)

Spec. Cond. 540 (µmhos/cm) Turbidity 4.6 (NTU)

Temp. 9.5 (°C) Eh 163 (mV)

Other NA

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

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

Weather Conditions During Sampling: 34° + partly cloudy, wind NW 10

Sample Description: clear + odorless

Observations: DJA 10/29/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1221	7.8	540	9.5	9.0	NA	168	1.65
1232	7.7	540	9.5	9.0	NA	164	3.30
1243	7.7	540	9.5	9.0	NA	163	4.95

DJA 10/29/19

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: 10/29/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

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) 28.02 Feet

Static water level measurement at time of sampling (Final Depth) 28.02 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/29/19 Water Column 9.50 Feet

Time Purged 1400 – 1430 One Casing Volume 1.5 Gallons

Pump Rate 0.15 (GPM / LPM) Volume Purged 4.5 Gallons

Field Sampling Data

Date Sampled 10/29/19

Time Sampled 1440

Sampling Equip. shovepump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 7.5 (mg/l)

Spec. Cond. 650 (umhos/cm) Turbidity 4.8 (NTU)

Temp. 9.0 (°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: 35°+ sunny, wind NW 10

Sample Description: clear + odorless

Observations: DJA 10/29/19

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1410	7.7	650	9.0	7.4	NA	168	1.5
1420	7.7	650	9.0	7.5	NA	164	3.0
1430	7.7	650	9.0	7.5	NA	161	4.5

DJA 10/29/19

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2019

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

Lead Technician Signature: David Anderson Date: 10/29/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

Monitoring Point ID P-137A Labeled P-137A

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)	30.11	Feet
Static water level measurement at time of sampling (Final Depth)	30.11	Feet
Static Water Level Elevation Before Purging	NA	Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/30/19 Water Column 11.59 Feet

Time Purged 1005 - 1044 One Casing Volume 1.9 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 5.85 Gallons

Field Sampling Data

Date Sampled 10/30/19

Time Sampled 1050

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O 7.3 (mg/l)

Spec. Cond. 760 (µmhos/cm) Turbidity 8.7 (NTU)

Temp. 10.0 (°C) Eh 166 (mV)

Other NA

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

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

Weather Conditions During Sampling: 23°F sunny, wind NW 5

Sample Description: clear + odorless

Observations:

DJA 10/30/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1018	7.7	760	10.0	7.4	NA	168	1.95
1031	7.6	760	10.0	7.3	NA	166	3.90
1044	7.6	760	10.0	7.3	NA	166	5.85

DJA 10/30/19

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: 10/30/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client: Xcel Energy Project: Sherco Unit 3 LF, Fall 2019 Project No.: 19-02663

Monitoring Point ID: P-138A Labeled: P138A

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	36.95	Feet
Static water level measurement before purging (Start Depth)	27.17	Feet
Static water level measurement at time of sampling (Final Depth)	27.17	Feet
Static Water Level Elevation Before Purging	NA	Feet

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

Date Purged: 10/30/19 Water Column: 9.78 Feet

Time Purged: 0830-0903 One Casing Volume: 1.6 Gallons

Pump Rate: 0.15 (GPM) LPM Volume Purged: 4.95 Gallons

Field Sampling Data

Date Sampled: 10/30/19

Time Sampled: 0910

Sampling Equip.: above pump

Meter ID: MPS-5

Analyzed by: DJA

Field Parameter Measurements of Sample

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

Spec. Cond.: 760 (µmhos/cm) Turbidity: 8.7 (NTU)

Temp.: 10.0 (°C) Eh: 175 (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: 22°+ clear, wind NW 5

Sample Description: clear + odorless

Observations:

DJA 10/30/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0841	7.4	760	10.0	10.3	NA	179	1.65
0852	7.5	760	10.0	9.3	NA	176	3.30
0903	7.5	760	10.0	8.8	NA	175	4.95

DJA 10/30/19

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: 10/30/19

Pace Analytical® Field Services Division

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Unit 3 LF, Fall 2019 Project No. 19-02663

Monitoring Point ID P-141 Labeled P-141

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) 29.45 Feet

Static water level measurement at time of sampling (Final Depth) 29.45 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10/29/19 Water Column 9.79 Feet

Time Purged 1305-1338 One Casing Volume 1.6 Gallons

Pump Rate 0.15 (GPM) / LPM Volume Purged 4.95 Gallons

Field Sampling Data

Date Sampled 10/29/19

Time Sampled 1345

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O 8.3 (mg/l)

Spec. Cond. 660 (µmhos/cm) Turbidity 5.7 (NTU)

Temp. 8.5 (°C) Eh 197 (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 NW 10

Sample Description: clear + odorless

Observations:

DJA 10/29/19

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1316	7.8	660	8.5	8.4	NA	204	1.65
1327	7.8	660	8.5	8.4	NA	200	3.30
1338	7.7	660	8.5	8.3	NA	197	4.95

DJA 10/29/19

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: 10/29/19

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

26 November 2019

Eric Ealy

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 10/31/2019 10:00. 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: Eric Ealy	11/26/2019 09:25

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Rinse		MEJ0396-01	Water	10/29/2019 9:00	10/31/2019 10:00
P-74-1		MEJ0396-02	Water	10/29/2019 9:50	10/31/2019 10:00
P-73A-1		MEJ0396-03	Water	10/29/2019 11:00	10/31/2019 10:00
P-125		MEJ0396-05	Water	10/29/2019 12:50	10/31/2019 10:00
P-141		MEJ0396-06	Water	10/29/2019 13:45	10/31/2019 10:00
P-134		MEJ0396-07	Water	10/29/2019 14:40	10/31/2019 10:00
P-138A		MEJ0396-12	Water	10/30/2019 9:10	10/31/2019 10:00
P-137A		MEJ0396-14	Water	10/30/2019 10:50	10/31/2019 10:00
P-117		MEJ0396-17	Water	10/30/2019 13:15	10/31/2019 10:00
P-75-1		MEJ0396-18	Water	10/30/2019 14:05	10/31/2019 10:00
P-97		MEJ0396-19	Water	10/30/2019 14:50	10/31/2019 10:00
P-98		MEJ0396-21	Water	10/30/2019 16:30	10/31/2019 10:00
P-120		MEJ0396-22	Water	10/30/2019 17:30	10/31/2019 10:00
Duplicate		MEJ0396-23	Water	10/30/2019 17:30	10/31/2019 10:00

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: Eric Ealy	11/26/2019 09:25

Rinse

MEJ0396-01 (Water) - Chain of Custody Number: 2266780/2266777

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	BEJ0717	10/31/19 11:34	10/31/19 19:55	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 19:55	EPA 300.0	CRL
Sulfate	< 1.00	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 19:55	EPA 300.0	CRL
Wet Chemistry										
pH	6.12		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 13:36	SM 4500-H+ B	CRL
Total Dissolved Solids	< 20.0	20.0	mg/L		1	BEJ0720	11/1/19 8:47	11/1/19 8:47	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEJ0719	11/1/19 7:09	11/1/19 7:09	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:27	EPA 200.8	CRL
Barium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:27	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:27	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:27	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:17	EPA 200.7	HRD
Calcium	< 1.25	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:16	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: Eric Ealy	11/26/2019 09:25

P-74-1

MEJ0396-02 (Water) - Chain of Custody Number: 2266780/2266777

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	BEJ0717	10/31/19 11:34	10/31/19 20:15	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 20:15	EPA 300.0	CRL
Sulfate	26.2	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 20:15	EPA 300.0	CRL
Wet Chemistry										
pH	7.69		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 13:49	SM 4500-H+ B	CRL
Total Dissolved Solids	294	20.0	mg/L		1	BEJ0720	11/1/19 8:47	11/1/19 8:47	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEJ0719	11/1/19 7:09	11/1/19 7:09	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:31	EPA 200.8	CRL
Barium	93.0	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:31	EPA 200.8	CRL
Chromium	0.814	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:31	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:31	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0851	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:23	EPA 200.7	HRD
Calcium	82.8	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:21	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: Eric Ealy	11/26/2019 09:25

P-73A-1

MEJ0396-03 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	7.32	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 20:36	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 20:36	EPA 300.0	CRL
Sulfate	11.1	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 20:36	EPA 300.0	CRL
Wet Chemistry										
pH	7.89		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 13:56	SM 4500-H+ B	CRL
Total Dissolved Solids	204	20.0	mg/L		1	BEJ0720	11/1/19 8:47	11/1/19 8:47	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEJ0719	11/1/19 7:09	11/1/19 7:09	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:43	EPA 200.8	CRL
Barium	42.2	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:43	EPA 200.8	CRL
Chromium	0.509	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:43	EPA 200.8	CRL
Selenium	0.621	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:43	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:38	EPA 200.7	HRD
Calcium	57.4	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:36	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: Eric Ealy	11/26/2019 09:25

P-125

MEJ0396-05 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	28.0	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:16	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:16	EPA 300.0	CRL
Sulfate	14.0	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:16	EPA 300.0	CRL
Wet Chemistry										
pH	7.86		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 14:10	SM 4500-H+ B	CRL
Total Dissolved Solids	272	20.0	mg/L		1	BEJ0720	11/1/19 8:47	11/1/19 8:47	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEJ0719	11/1/19 7:09	11/1/19 7:09	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:47	EPA 200.8	CRL
Barium	61.1	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:47	EPA 200.8	CRL
Chromium	0.551	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:47	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:47	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:43	EPA 200.7	HRD
Calcium	73.2	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:41	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: Eric Ealy	11/26/2019 09:25

P-141

MEJ0396-06 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	45.6	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:37	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:37	EPA 300.0	CRL
Sulfate	27.7	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:37	EPA 300.0	CRL
Wet Chemistry										
pH	7.83		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 14:17	SM 4500-H+ B	CRL
Total Dissolved Solids	346	20.0	mg/L		1	BEJ0720	11/1/19 8:47	11/1/19 8:47	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEJ0719	11/1/19 7:09	11/1/19 7:09	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.540	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:51	EPA 200.8	CRL
Barium	79.5	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:51	EPA 200.8	CRL
Chromium	0.636	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:51	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:51	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:48	EPA 200.7	HRD
Calcium	86.7	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:46	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: Eric Ealy	11/26/2019 09:25

P-134

MEJ0396-07 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	35.5	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:57	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:57	EPA 300.0	CRL
Sulfate	27.1	1.00	mg/L		1	BEJ0717	10/31/19 11:34	10/31/19 21:57	EPA 300.0	CRL
Wet Chemistry										
pH	7.82		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 14:24	SM 4500-H+ B	CRL
Total Dissolved Solids	346	20.0	mg/L		1	BEJ0720	11/1/19 8:47	11/1/19 8:47	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEJ0719	11/1/19 7:09	11/1/19 7:09	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.653	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:55	EPA 200.8	CRL
Barium	83.3	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:55	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:55	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:55	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:53	EPA 200.7	HRD
Calcium	85.9	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:51	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: Eric Ealy	11/26/2019 09:25

P-138A

MEJ0396-12 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	49.1	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 12:18	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 12:18	EPA 300.0	CRL
Sulfate	28.6	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 12:18	EPA 300.0	CRL
Wet Chemistry										
pH	7.68		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 15:05	SM 4500-H+ B	CRL
Total Dissolved Solids	380	20.0	mg/L		1	BEJ0720	11/1/19 8:47	11/1/19 8:47	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEJ0719	11/1/19 7:09	11/1/19 7:09	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.655	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:59	EPA 200.8	CRL
Barium	117	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:59	EPA 200.8	CRL
Chromium	0.962	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:59	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 8:59	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:58	EPA 200.7	HRD
Calcium	95.2	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 12:57	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: Eric Ealy	11/26/2019 09:25

P-137A

MEJ0396-14 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	34.9	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 12:58	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 12:58	EPA 300.0	CRL
Sulfate	107	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 12:58	EPA 300.0	CRL
Wet Chemistry										
pH	7.77		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 15:19	SM 4500-H+ B	CRL
Total Dissolved Solids	444	20.0	mg/L		1	BEK0067	11/5/19 8:53	11/5/19 8:53	SM 2540C	HSD
Total Suspended Solids	6.80	4.00	mg/L		1	BEK0066	11/5/19 6:59	11/5/19 6:59	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.581	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:03	EPA 200.8	CRL
Barium	114	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:03	EPA 200.8	CRL
Chromium	3.43	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:03	EPA 200.8	CRL
Selenium	0.912	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:03	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.128	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:03	EPA 200.7	HRD
Calcium	102	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:02	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: Eric Ealy	11/26/2019 09:25

P-117

MEJ0396-17 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	43.4	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:00	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:00	EPA 300.0	CRL
Sulfate	25.5	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:00	EPA 300.0	CRL
Wet Chemistry										
pH	7.86		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 15:39	SM 4500-H+ B	CRL
Total Dissolved Solids	374	20.0	mg/L		1	BEK0067	11/5/19 8:53	11/5/19 8:53	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEK0066	11/5/19 6:59	11/5/19 6:59	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.591	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:07	EPA 200.8	CRL
Barium	90.6	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:07	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:07	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:07	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:09	EPA 200.7	HRD
Calcium	93.1	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:07	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: Eric Ealy	11/26/2019 09:25

P-75-1

MEJ0396-18 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	28.4	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:20	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:20	EPA 300.0	CRL
Sulfate	51.3	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:20	EPA 300.0	CRL
Wet Chemistry										
pH	7.83		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 15:47	SM 4500-H+ B	CRL
Total Dissolved Solids	394	20.0	mg/L		1	BEK0067	11/5/19 8:53	11/5/19 8:53	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEK0066	11/5/19 6:59	11/5/19 6:59	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.584	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:10	EPA 200.8	CRL
Barium	103	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:10	EPA 200.8	CRL
Chromium	0.850	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:10	EPA 200.8	CRL
Selenium	1.70	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:10	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.190	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:14	EPA 200.7	HRD
Calcium	92.4	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:12	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: Eric Ealy	11/26/2019 09:25

P-97

MEJ0396-19 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	30.9	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:40	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:40	EPA 300.0	CRL
Sulfate	27.6	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 14:40	EPA 300.0	CRL
Wet Chemistry										
pH	7.79		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 15:53	SM 4500-H+ B	CRL
Total Dissolved Solids	344	20.0	mg/L		1	BEK0067	11/5/19 8:53	11/5/19 8:53	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEK0066	11/5/19 6:59	11/5/19 6:59	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.557	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:14	EPA 200.8	CRL
Barium	90.3	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:14	EPA 200.8	CRL
Chromium	1.25	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:14	EPA 200.8	CRL
Selenium	0.591	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:14	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:19	EPA 200.7	HRD
Calcium	87.9	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:17	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: Eric Ealy	11/26/2019 09:25

P-98

MEJ0396-21 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	21.5	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 17:03	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 17:03	EPA 300.0	CRL
Sulfate	15.0	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 17:03	EPA 300.0	CRL
Wet Chemistry										
pH	7.87		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 16:13	SM 4500-H+ B	CRL
Total Dissolved Solids	288	20.0	mg/L		1	BEK0067	11/5/19 8:53	11/5/19 8:53	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEK0066	11/5/19 6:59	11/5/19 6:59	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.589	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:18	EPA 200.8	CRL
Barium	81.0	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:18	EPA 200.8	CRL
Chromium	0.650	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:18	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:18	EPA 200.8	CRL
Total Metals by ICP										
Boron	< 0.0500	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:24	EPA 200.7	HRD
Calcium	71.7	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:22	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: Eric Ealy	11/26/2019 09:25

P-120

MEJ0396-22 (Water) - Chain of Custody Number: 2266780/2266777

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	BEJ0718	10/31/19 12:38	11/1/19 17:24	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 17:24	EPA 300.0	CRL
Sulfate	42.8	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 17:24	EPA 300.0	CRL
Wet Chemistry										
pH	7.87		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 16:21	SM 4500-H+ B	CRL
Total Dissolved Solids	340	20.0	mg/L		1	BEK0067	11/5/19 8:53	11/5/19 8:53	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEK0066	11/5/19 6:59	11/5/19 6:59	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.626	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:30	EPA 200.8	CRL
Barium	85.1	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:30	EPA 200.8	CRL
Chromium	0.712	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:30	EPA 200.8	CRL
Selenium	1.27	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:30	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0908	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:39	EPA 200.7	HRD
Calcium	80.1	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:37	EPA 200.7	HRD

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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Unit 3 Landfill CCR	
250 Marquette Plaza		**Reported:**
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Duplicate

MEJ0396-23 (Water) - Chain of Custody Number: 2266780/2266777

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
Anions by Ion Chromatography										
Chloride	27.7	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 17:44	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 17:44	EPA 300.0	CRL
Sulfate	42.3	1.00	mg/L		1	BEJ0718	10/31/19 12:38	11/1/19 17:44	EPA 300.0	CRL
Wet Chemistry										
pH	7.88		pH Units	M_TTT	1	BEJ0716	10/31/19 11:32	10/31/19 16:28	SM 4500-H+ B	CRL
Total Dissolved Solids	354	20.0	mg/L		1	BEK0067	11/5/19 8:53	11/5/19 8:53	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BEK0066	11/5/19 6:59	11/5/19 6:59	SM 2540D	HSD
Total Metals by ICPMS										
Arsenic	0.555	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:34	EPA 200.8	CRL
Barium	84.3	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:34	EPA 200.8	CRL
Chromium	0.838	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:34	EPA 200.8	CRL
Selenium	1.26	0.500	ug/L		1	BEK0104	11/5/19 12:18	11/7/19 9:34	EPA 200.8	CRL
Total Metals by ICP										
Boron	0.0896	0.0500	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:44	EPA 200.7	HRD
Calcium	81.4	1.25	mg/L		1	BEK0103	11/5/19 12:16	11/6/19 13:42	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: Eric Ealy	11/26/2019 09:25

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEJ0717 - Wet Prep										
Blank (BEJ0717-BLK1)				Prepared & Analyzed: 10/31/2019						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
Blank (BEJ0717-BLK2)				Prepared & Analyzed: 10/31/2019						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BEJ0717-BS1)				Prepared & Analyzed: 10/31/2019						
Chloride	24.5	1.00	mg/L	25.026		98.0	90-110			
Fluoride	2.44	0.750	mg/L	2.5000		97.8	90-110			
Sulfate	49.1	1.00	mg/L	50.150		97.8	90-110			
LCS (BEJ0717-BS2)				Prepared & Analyzed: 10/31/2019						
Chloride	24.3	1.00	mg/L	25.026		97.0	90-110			
Fluoride	2.44	0.750	mg/L	2.5000		97.4	90-110			
Sulfate	48.8	1.00	mg/L	50.150		97.4	90-110			
LCS (BEJ0717-BS3)				Prepared & Analyzed: 10/31/2019						
Chloride	24.5	1.00	mg/L	25.026		97.8	90-110			
Fluoride	2.46	0.750	mg/L	2.5000		98.2	90-110			
Sulfate	49.3	1.00	mg/L	50.150		98.3	90-110			
LCS (BEJ0717-BS4)				Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	25.3	1.00	mg/L	25.026		101	90-110			
Fluoride	2.69	0.750	mg/L	2.5000		107	90-110			
Sulfate	51.2	1.00	mg/L	50.150		102	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: Eric Ealy	11/26/2019 09:25

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEJ0717 - Wet Prep										
Duplicate (BEJ0717-DUP1)		**Source: MEJ0396-02**		Prepared & Analyzed: 10/31/2019						
Chloride	13.3	1.00	mg/L		13.8			3.84	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	25.3	1.00	mg/L		26.2			3.54	20	
Duplicate (BEJ0717-DUP2)		**Source: MEJ0396-03**		Prepared & Analyzed: 10/31/2019						
Chloride	7.08	1.00	mg/L		7.32			3.29	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	10.9	1.00	mg/L		11.1			2.16	20	
Matrix Spike (BEJ0717-MS1)		**Source: MEJ0396-02**		Prepared & Analyzed: 10/31/2019						
Chloride	43.9	1.25	mg/L	31.283	13.8	96.0	80-120			
Fluoride	3.08	0.938	mg/L	3.1250	<0.938	98.4	80-120			
Sulfate	87.1	1.25	mg/L	62.688	26.2	97.2	80-120			
Matrix Spike (BEJ0717-MS2)		**Source: MEJ0396-03**		Prepared & Analyzed: 10/31/2019						
Chloride	38.1	1.25	mg/L	31.283	7.32	98.3	80-120			
Fluoride	3.38	0.938	mg/L	3.1250	<0.938	108	80-120			
Sulfate	73.6	1.25	mg/L	62.688	11.1	99.8	80-120			
Matrix Spike Dup (BEJ0717-MSD1)		**Source: MEJ0396-02**		Prepared & Analyzed: 10/31/2019						
Chloride	44.3	1.25	mg/L	31.283	13.8	97.3	80-120	0.899	20	
Fluoride	3.13	0.938	mg/L	3.1250	<0.938	100	80-120	1.89	20	
Sulfate	87.7	1.25	mg/L	62.688	26.2	98.1	80-120	0.596	20	
Matrix Spike Dup (BEJ0717-MSD2)		**Source: MEJ0396-03**		Prepared & Analyzed: 10/31/2019						
Chloride	38.6	1.25	mg/L	31.283	7.32	99.8	80-120	1.26	20	
Fluoride	3.22	0.938	mg/L	3.1250	<0.938	103	80-120	4.78	20	
Sulfate	74.5	1.25	mg/L	62.688	11.1	101	80-120	1.13	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: Eric Ealy	11/26/2019 09:25

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEJ0718 - Wet Prep										
Blank (BEJ0718-BLK1)				Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
Blank (BEJ0718-BLK2)				Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
LCS (BEJ0718-BS1)				Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	25.0	1.00	mg/L	25.026		100	90-110			
Fluoride	2.66	0.750	mg/L	2.5000		106	90-110			
Sulfate	50.6	1.00	mg/L	50.150		101	90-110			
LCS (BEJ0718-BS2)				Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	24.0	1.00	mg/L	25.026		95.8	90-110			
Fluoride	2.58	0.750	mg/L	2.5000		103	90-110			
Sulfate	48.4	1.00	mg/L	50.150		96.4	90-110			
LCS (BEJ0718-BS3)				Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	24.1	1.00	mg/L	25.026		96.2	90-110			
Fluoride	2.57	0.750	mg/L	2.5000		103	90-110			
Sulfate	48.6	1.00	mg/L	50.150		96.9	90-110			
Duplicate (BEJ0718-DUP1)		**Source: MEJ0396-22**		Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	27.7	1.00	mg/L		28.1			1.41	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	42.4	1.00	mg/L		42.8			1.10	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: Eric Ealy	11/26/2019 09:25

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEJ0718 - Wet Prep										
Duplicate (BEJ0718-DUP2)		**Source: MEJ0396-23**		Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	27.6	1.00	mg/L		27.7			0.264	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	42.0	1.00	mg/L		42.3			0.671	20	
Matrix Spike (BEJ0718-MS1)		**Source: MEJ0396-22**		Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	58.1	1.25	mg/L	31.283	28.1	96.0	80-120			
Fluoride	3.29	0.938	mg/L	3.1250	<0.938	105	80-120			
Sulfate	104	1.25	mg/L	62.688	42.8	97.2	80-120			
Matrix Spike (BEJ0718-MS2)		**Source: MEJ0396-23**		Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	59.6	1.25	mg/L	31.283	27.7	102	80-120			
Fluoride	3.45	0.938	mg/L	3.1250	<0.938	110	80-120			
Sulfate	107	1.25	mg/L	62.688	42.3	103	80-120			
Matrix Spike Dup (BEJ0718-MSD1)		**Source: MEJ0396-22**		Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	59.7	1.25	mg/L	31.283	28.1	101	80-120	2.81	20	
Fluoride	3.46	0.938	mg/L	3.1250	<0.938	111	80-120	5.18	20	
Sulfate	107	1.25	mg/L	62.688	42.8	103	80-120	3.32	20	
Matrix Spike Dup (BEJ0718-MSD2)		**Source: MEJ0396-23**		Prepared: 10/31/2019 Analyzed: 11/01/2019						
Chloride	59.0	1.25	mg/L	31.283	27.7	99.9	80-120	1.07	20	
Fluoride	3.44	0.938	mg/L	3.1250	<0.938	110	80-120	0.327	20	
Sulfate	106	1.25	mg/L	62.688	42.3	101	80-120	0.995	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: Eric Ealy	11/26/2019 09:25

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEJ0716 - Wet Prep										
LCS (BEJ0716-BS1)				Prepared & Analyzed: 10/31/2019						
pH	7.05		pH Units	7.0000		101	90-110			
LCS (BEJ0716-BS2)				Prepared & Analyzed: 10/31/2019						
pH	7.05		pH Units	7.0000		101	90-110			
Duplicate (BEJ0716-DUP1)		**Source: MEJ0395-01**		Prepared & Analyzed: 10/31/2019						
pH	7.38		pH Units		7.41			0.406	20	
Duplicate (BEJ0716-DUP2)		**Source: MEJ0396-02**		Prepared & Analyzed: 10/31/2019						
pH	7.66		pH Units		7.69			0.391	20	
Duplicate (BEJ0716-DUP3)		**Source: MEJ0396-11**		Prepared & Analyzed: 10/31/2019						
pH	7.81		pH Units		7.81			0.00	20	
Duplicate (BEJ0716-DUP4)		**Source: MEJ0396-21**		Prepared & Analyzed: 10/31/2019						
pH	7.87		pH Units		7.87			0.00	20	
Batch BEJ0719 - Wet Prep										
Blank (BEJ0719-BLK1)				Prepared & Analyzed: 11/01/2019						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BEJ0719-DUP1)		**Source: MEJ0396-02**		Prepared & Analyzed: 11/01/2019						
Total Suspended Solids	<4.00	4.00	mg/L		0.400				20	
Duplicate (BEJ0719-DUP2)		**Source: MEJ0396-03**		Prepared & Analyzed: 11/01/2019						
Total Suspended Solids	0.800	4.00	mg/L		0.400			66.7	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: Eric Ealy	11/26/2019 09:25

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEJ0720 - Wet Prep										
Blank (BEJ0720-BLK1)				Prepared & Analyzed: 11/01/2019						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BEJ0720-DUP1)			**Source: MEJ0396-02**	Prepared & Analyzed: 11/01/2019						
Total Dissolved Solids	306	20.0	mg/L		294			4.00	20	
Duplicate (BEJ0720-DUP2)			**Source: MEJ0396-03**	Prepared & Analyzed: 11/01/2019						
Total Dissolved Solids	200	20.0	mg/L		204			1.98	20	
Batch BEK0066 - Wet Prep										
Blank (BEK0066-BLK1)				Prepared & Analyzed: 11/05/2019						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BEK0066-DUP1)			**Source: MEJ0396-14**	Prepared & Analyzed: 11/05/2019						
Total Suspended Solids	7.60	4.00	mg/L		6.80			11.1	20	
Duplicate (BEK0066-DUP2)			**Source: MEK0014-02**	Prepared & Analyzed: 11/05/2019						
Total Suspended Solids	6.80	4.00	mg/L		6.00			12.5	20	
Batch BEK0067 - Wet Prep										
Blank (BEK0067-BLK1)				Prepared & Analyzed: 11/05/2019						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BEK0067-DUP1)			**Source: MEJ0396-14**	Prepared & Analyzed: 11/05/2019						
Total Dissolved Solids	456	20.0	mg/L		444			2.67	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: Eric Ealy	11/26/2019 09:25

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEK0104 - EPA 200.2, EPA 3005										
Blank (BEK0104-BLK1)				Prepared: 11/05/2019 Analyzed: 11/07/2019						
Arsenic	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
LCS (BEK0104-BS1)				Prepared: 11/05/2019 Analyzed: 11/07/2019						
Selenium	97.1	0.500	ug/L	100.00		97.1	85-115			
Chromium	95.7	0.500	ug/L	100.00		95.7	85-115			
Barium	101	0.500	ug/L	100.00		101	85-115			
Arsenic	97.4	0.500	ug/L	100.00		97.4	85-115			
Duplicate (BEK0104-DUP1)		**Source: MEJ0396-05**		Prepared: 11/05/2019 Analyzed: 11/07/2019						
Arsenic	0.582	0.500	ug/L		0.463			22.7	20	M_D
Chromium	0.548	0.500	ug/L		0.551			0.508	20	
Selenium	0.202	0.500	ug/L		0.249			21.0	20	M_D-RL
Barium	65.8	0.500	ug/L		61.1			7.56	20	
Duplicate (BEK0104-DUP2)		**Source: MEJ0396-06**		Prepared: 11/05/2019 Analyzed: 11/07/2019						
Barium	79.7	0.500	ug/L		79.5			0.304	20	
Chromium	0.599	0.500	ug/L		0.636			6.07	20	
Selenium	0.275	0.500	ug/L		0.330			18.0	20	
Arsenic	0.522	0.500	ug/L		0.540			3.30	20	
Matrix Spike (BEK0104-MS1)		**Source: MEJ0396-05**		Prepared: 11/05/2019 Analyzed: 11/07/2019						
Chromium	94.9	0.500	ug/L	100.00	0.551	94.3	70-130			
Arsenic	102	0.500	ug/L	100.00	0.463	102	70-130			
Barium	175	0.500	ug/L	100.00	61.1	114	70-130			
Selenium	98.1	0.500	ug/L	100.00	0.249	97.8	70-130			

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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: Eric Ealy	11/26/2019 09:25

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEK0104 - EPA 200.2, EPA 3005										
Matrix Spike (BEK0104-MS2)		**Source: MEJ0396-06**		Prepared: 11/05/2019 Analyzed: 11/07/2019						
Selenium	101	0.500	ug/L	100.00	0.330	101	70-130			
Chromium	95.5	0.500	ug/L	100.00	0.636	94.8	70-130			
Barium	189	0.500	ug/L	100.00	79.5	109	70-130			
Arsenic	104	0.500	ug/L	100.00	0.540	104	70-130			
Matrix Spike Dup (BEK0104-MSD1)		**Source: MEJ0396-05**		Prepared: 11/05/2019 Analyzed: 11/07/2019						
Arsenic	103	0.500	ug/L	100.00	0.463	102	70-130	0.816	20	
Selenium	101	0.500	ug/L	100.00	0.249	100	70-130	2.57	20	
Chromium	94.8	0.500	ug/L	100.00	0.551	94.3	70-130	0.0654	20	
Barium	175	0.500	ug/L	100.00	61.1	114	70-130	0.166	20	
Matrix Spike Dup (BEK0104-MSD2)		**Source: MEJ0396-06**		Prepared: 11/05/2019 Analyzed: 11/07/2019						
Selenium	96.9	0.500	ug/L	100.00	0.330	96.6	70-130	4.16	20	
Arsenic	100	0.500	ug/L	100.00	0.540	99.6	70-130	4.10	20	
Chromium	91.7	0.500	ug/L	100.00	0.636	91.1	70-130	3.99	20	
Barium	180	0.500	ug/L	100.00	79.5	100	70-130	4.81	20	
Batch BEK0195 - EPA 200.2, EPA 3005										
Blank (BEK0195-BLK1)				Prepared: 11/11/2019 Analyzed: 11/25/2019						
Arsenic	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
LCS (BEK0195-BS1)				Prepared: 11/11/2019 Analyzed: 11/25/2019						
Arsenic	96.0	0.500	ug/L	100.00		96.0	85-115			
Barium	102	0.500	ug/L	100.00		102	85-115			
Selenium	97.9	0.500	ug/L	100.00		97.9	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: Eric Ealy	11/26/2019 09:25

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEK0195 - EPA 200.2, EPA 3005										
Duplicate (BEK0195-DUP1)		**Source: MEK0039-01**		Prepared: 11/11/2019 Analyzed: 11/25/2019						
Arsenic	0.383	0.500	ug/L		0.372			3.02	20	
Barium	14.3	0.500	ug/L		14.2			0.697	20	
Selenium	0.152	0.500	ug/L		0.281			59.9	20	M_D-RL
Matrix Spike (BEK0195-MS1)		**Source: MEK0039-01**		Prepared: 11/11/2019 Analyzed: 11/25/2019						
Barium	121	0.500	ug/L	100.00	14.2	107	70-130			
Selenium	96.7	0.500	ug/L	100.00	0.281	96.4	70-130			
Arsenic	98.0	0.500	ug/L	100.00	0.372	97.7	70-130			
Matrix Spike Dup (BEK0195-MSD1)		**Source: MEK0039-01**		Prepared: 11/11/2019 Analyzed: 11/25/2019						
Barium	116	0.500	ug/L	100.00	14.2	102	70-130	3.98	20	
Selenium	97.6	0.500	ug/L	100.00	0.281	97.3	70-130	0.851	20	
Arsenic	97.9	0.500	ug/L	100.00	0.372	97.5	70-130	0.145	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: Eric Ealy	11/26/2019 09:25

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEK0103 - EPA 200.2, EPA 3005										
Blank (BEK0103-BLK1)				Prepared: 11/05/2019 Analyzed: 11/06/2019						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							
LCS (BEK0103-BS1)				Prepared: 11/05/2019 Analyzed: 11/06/2019						
Boron	1.01	0.0500	mg/L	1.0000		101	85-115			
Calcium	107	1.25	mg/L	100.00		107	85-115			
Duplicate (BEK0103-DUP1)		**Source: MEJ0396-02**		Prepared: 11/05/2019 Analyzed: 11/06/2019						
Boron	0.0854	0.0500	mg/L		0.0851			0.337	20	
Calcium	82.0	1.25	mg/L		82.8			0.884	20	
Duplicate (BEK0103-DUP2)		**Source: MEJ0396-03**		Prepared: 11/05/2019 Analyzed: 11/06/2019						
Boron	0.0334	0.0500	mg/L		0.0335			0.465	20	
Calcium	57.8	1.25	mg/L		57.4			0.667	20	
Matrix Spike (BEK0103-MS1)		**Source: MEJ0396-02**		Prepared: 11/05/2019 Analyzed: 11/06/2019						
Boron	1.10	0.0500	mg/L	1.0000	0.0851	102	70-130			
Calcium	192	1.25	mg/L	100.00	82.8	109	70-130			
Matrix Spike (BEK0103-MS2)		**Source: MEJ0396-03**		Prepared: 11/05/2019 Analyzed: 11/06/2019						
Boron	1.06	0.0500	mg/L	1.0000	0.0335	102	70-130			
Calcium	164	1.25	mg/L	100.00	57.4	106	70-130			
Matrix Spike Dup (BEK0103-MSD1)		**Source: MEJ0396-02**		Prepared: 11/05/2019 Analyzed: 11/06/2019						
Boron	1.13	0.0500	mg/L	1.0000	0.0851	105	70-130	2.65	20	
Calcium	192	1.25	mg/L	100.00	82.8	109	70-130	0.190	20	
Matrix Spike Dup (BEK0103-MSD2)		**Source: MEJ0396-03**		Prepared: 11/05/2019 Analyzed: 11/06/2019						
Boron	1.07	0.0500	mg/L	1.0000	0.0335	104	70-130	1.73	20	
Calcium	165	1.25	mg/L	100.00	57.4	108	70-130	0.806	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: Eric Ealy	11/26/2019 09:25

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BEK0194 - EPA 200.2, EPA 3005										
Blank (BEK0194-BLK1)				Prepared: 11/11/2019 Analyzed: 11/12/2019						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							
LCS (BEK0194-BS1)				Prepared: 11/11/2019 Analyzed: 11/12/2019						
Calcium	106	1.25	mg/L	100.00		106	85-115			
Boron	0.983	0.0500	mg/L	1.0000		98.3	85-115			
Duplicate (BEK0194-DUP1)		**Source: MEK0023-03**		Prepared: 11/11/2019 Analyzed: 11/12/2019						
Boron	0.0517	0.0500	mg/L		0.0529			2.22	20	
Calcium	96.4	1.25	mg/L		99.2			2.84	20	
Matrix Spike (BEK0194-MS1)		**Source: MEK0023-03**		Prepared: 11/11/2019 Analyzed: 11/12/2019						
Calcium	199	1.25	mg/L	100.00	99.2	99.3	70-130			
Boron	1.07	0.0500	mg/L	1.0000	0.0529	102	70-130			
Matrix Spike Dup (BEK0194-MSD1)		**Source: MEK0023-03**		Prepared: 11/11/2019 Analyzed: 11/12/2019						
Calcium	201	1.25	mg/L	100.00	99.2	102	70-130	1.29	20	
Boron	1.06	0.0500	mg/L	1.0000	0.0529	100	70-130	1.38	20	

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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: Eric Ealy	11/26/2019 09:25

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

2266780

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Xcel Energy	Report To: David Kotzner	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 Unit 3	Pace Project Manager:
Requested Due Date/TAT:	Project Number: LF, Fall 2019	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	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	Y/N	Analysis Test: GW-CCR+GW-A	GW-A	GW-CCR	LEA-A	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Rinse	WT				10/29/19	0900		4	1	1	2						✓						
2	P-74-1						0950		4	1	1	2						✓						
3	P-73A-1						1100		4	1	1	2						✓						
4	P-73B-1						1135		3	1	9	1							✓					
5	P-125						1250		4	1	1	2						✓						
6	P-141						1345		2	1		1								✓				
7	P-134						1440		4	1	1	2						✓						
8	P-139						1530		3	1	1	1							✓					
9	Seeley Well						1610		3	1	1	1							✓					
10	P-76B-1						1725		3	1	1	1							✓					
11	P-76A-1	↓				↓	1750		3	1	1	1							✓					
12	P-138A	WT				10/30/19	0910		4	1	1	2						✓						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	David Anderson / Pace	10/31/19	1000	[signature] / Xcel	10/31/19	1000

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.0 °C	Y	Y	Y

pH strips. MPW-102

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson

DATE Signed (MM/DD/YY): 10/30/19

*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.

2266777

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:	David Katzner
Copy To:	
Purchase Order No.:	
Project Name:	Xcel Energy - Sherco Unit 3
Project Number:	LF, Fall 2019

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	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+GW-A	GW-A	GW-CCR	LEA-A	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-138B	WT				10/30/19	0950		3	1	1	1							✓				
2	P-137A						1050		4	1	1	2						✓					
3	P-137B						1125		3	1	1	1							✓				
4	R Leachate						1215		3	1	1	1									✓		
5	P-117						1315		4	1	1	2						✓					
6	P-7.5-1						1405		4	1	1	2						✓					
7	P-97						1450		4	1	1	2						✓					
8	P-99						1535		3	1	1	1							✓				
9	P-98						1630		4	1	1	2						✓					
10	P-120						1730		4	1	1	2						✓					
11	Duplicate	↓				↓	1730		4	1	1	2						✓					
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	David Anderson / Pace	10/31/19	1000	Xcel	10/31/19	1000

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.6-0.2=1.4	X	X	X

pH strips MD05402

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson

DATE Signed (MM/DD/YY): 10/30/19

*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 21, 2019

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

RE: Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Dear Dave Anderson:
Enclosed are the analytical results for sample(s) received by the laboratory on November 04, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carin A. Ferris

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

Enclosures

cc: Eric Ealy, 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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Pace Analytical Services Pennsylvania
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
Florida: Cert E871149 SEKS WET
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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30333423001	**Rinse CCR-P3**	Water	10/21/19 10:40	11/04/19 09:40
30333423002	**P-150**	Water	10/21/19 11:30	11/04/19 09:40
30333423003	**P-151**	Water	10/21/19 13:00	11/04/19 09:40
30333423004	**P-152A**	Water	10/21/19 14:10	11/04/19 09:40
30333423005	**P-130**	Water	10/21/19 15:35	11/04/19 09:40
30333423006	**P-131**	Water	10/21/19 16:50	11/04/19 09:40
30333423007	**P-132**	Water	10/21/19 18:00	11/04/19 09:40
30333423008	**P-165**	Water	10/22/19 09:00	11/04/19 09:40
30333423009	**P-154A**	Water	10/22/19 10:30	11/04/19 09:40
30333423010	**Duplicate CCR-P3**	Water	10/22/19 10:30	11/04/19 09:40
30333423011	**P-153**	Water	10/22/19 11:40	11/04/19 09:40
30333423012	**P-162**	Water	10/22/19 13:00	11/04/19 09:40
30333423013	**P-163**	Water	10/22/19 14:00	11/04/19 09:40
30333423014	**P-164**	Water	10/22/19 14:50	11/04/19 09:40
30333423015	**P-156**	Water	10/22/19 16:00	11/04/19 09:40
30333423016	**P-01A-1**	Water	10/22/19 16:45	11/04/19 09:40
30333423017	**P-155**	Water	10/22/19 17:50	11/04/19 09:40
30333423018	**P-17**	Water	10/23/19 09:00	11/04/19 09:40
30333423019	**Rinse CCR-BAP**	Water	10/23/19 09:20	11/04/19 09:40
30333423020	**P-158**	Water	10/23/19 09:50	11/04/19 09:40
30333423021	**P-157**	Water	10/23/19 10:50	11/04/19 09:40
30333423022	**Duplicate CCR-BAP**	Water	10/23/19 10:50	11/04/19 09:40
30333423023	**P-23**	Water	10/23/19 12:20	11/04/19 09:40
30333423024	**P-22**	Water	10/23/19 13:40	11/04/19 09:40

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SAMPLE ANALYTE COUNT

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30333423001	**Rinse CCR-P3**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423002	**P-150**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423003	**P-151**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423004	**P-152A**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423005	**P-130**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423006	**P-131**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423007	**P-132**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423008	**P-165**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423009	**P-154A**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423010	**Duplicate CCR-P3**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423011	**P-153**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423012	**P-162**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423013	**P-163**	EPA 903.1	MK1	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423014	**P-164**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423015	**P-156**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423016	**P-01A-1**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423017	**P-155**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423018	**P-17**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423019	**Rinse CCR-BAP**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423020	**P-158**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423021	**P-157**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423022	**Duplicate CCR-BAP**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423023	**P-23**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30333423024	**P-22**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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PROJECT NARRATIVE

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: Pace-MN Field Services Division
Date: November 21, 2019

General Information:
24 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:

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PROJECT NARRATIVE

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: Pace-MN Field Services Division
Date: November 21, 2019

General Information:
24 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:

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PROJECT NARRATIVE

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: Pace-MN Field Services Division
Date: November 21, 2019

General Information:
24 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.

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Sample: Rinse CCR-P3 **Lab ID: 30333423001** Collected: 10/21/19 10:40 Received: 11/04/19 09:40 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 ± 0.312 (0.502) C:NA T:85%**	pCi/L	11/21/19 11:15	13982-63-3	
Radium-228	EPA 904.0	**0.0567 ± 0.384 (0.872) C:80% T:94%**	pCi/L	11/20/19 15:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.193 ± 0.696 (1.37)**	pCi/L	11/21/19 13:56	7440-14-4	

Sample: P-150 **Lab ID: 30333423002** Collected: 10/21/19 11:30 Received: 11/04/19 09:40 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 ± 0.340 (0.567) C:NA T:95%**	pCi/L	11/21/19 11:15	13982-63-3	
Radium-228	EPA 904.0	**0.363 ± 0.426 (0.898) C:79% T:82%**	pCi/L	11/20/19 15:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.607 ± 0.766 (1.47)**	pCi/L	11/21/19 13:56	7440-14-4	

Sample: P-151 **Lab ID: 30333423003** Collected: 10/21/19 13:00 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0694 ± 0.360 (0.747) C:NA T:92%**	pCi/L	11/21/19 11:15	13982-63-3	
Radium-228	EPA 904.0	**0.526 ± 0.387 (0.754) C:80% T:84%**	pCi/L	11/20/19 15:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.595 ± 0.747 (1.50)**	pCi/L	11/21/19 13:56	7440-14-4	

Sample: P-152A **Lab ID: 30333423004** Collected: 10/21/19 14:10 Received: 11/04/19 09:40 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 ± 0.291 (0.470) C:NA T:96%**	pCi/L	11/21/19 11:15	13982-63-3	
Radium-228	EPA 904.0	**0.839 ± 0.441 (0.788) C:75% T:88%**	pCi/L	11/20/19 15:54	15262-20-1	
Total Radium	Total Radium Calculation	**0.839 ± 0.732 (1.26)**	pCi/L	11/21/19 13:56	7440-14-4	

Sample: P-130 **Lab ID: 30333423005** Collected: 10/21/19 15:35 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.266 ± 0.452 (0.798) C:NA T:89%**	pCi/L	11/21/19 11:15	13982-63-3	
Radium-228	EPA 904.0	**0.537 ± 0.382 (0.747) C:77% T:94%**	pCi/L	11/20/19 15:54	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Sample: P-130 **Lab ID: 30333423005** Collected: 10/21/19 15:35 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.803 ± 0.834 (1.55)**	pCi/L	11/21/19 13:56	7440-14-4	

Sample: P-131 **Lab ID: 30333423006** Collected: 10/21/19 16:50 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0591 ± 0.384 (0.774) C:NA T:96%**	pCi/L	11/21/19 11:15	13982-63-3	
Radium-228	EPA 904.0	**0.603 ± 0.406 (0.781) C:79% T:88%**	pCi/L	11/20/19 15:54	15262-20-1	
Total Radium	Total Radium Calculation	**0.662 ± 0.790 (1.56)**	pCi/L	11/21/19 13:56	7440-14-4	

Sample: P-132 **Lab ID: 30333423007** Collected: 10/21/19 18:00 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0588 ± 0.346 (0.706) C:NA T:96%**	pCi/L	11/21/19 13:12	13982-63-3	
Radium-228	EPA 904.0	**0.560 ± 0.370 (0.707) C:76% T:91%**	pCi/L	11/20/19 12:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.619 ± 0.716 (1.41)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-165 **Lab ID: 30333423008** Collected: 10/22/19 09:00 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.181 ± 0.488 (0.906) C:NA T:97%**	pCi/L	11/21/19 13:12	13982-63-3	
Radium-228	EPA 904.0	**0.164 ± 0.334 (0.736) C:78% T:87%**	pCi/L	11/20/19 12:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.345 ± 0.822 (1.64)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-154A **Lab ID: 30333423009** Collected: 10/22/19 10:30 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0561 ± 0.330 (0.673) C:NA T:102%**	pCi/L	11/21/19 13:12	13982-63-3	
Radium-228	EPA 904.0	**0.589 ± 0.406 (0.781) C:75% T:84%**	pCi/L	11/20/19 12:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.645 ± 0.736 (1.45)**	pCi/L	11/21/19 14:29	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Sample: Duplicate CCR-P3 **Lab ID: 30333423010** Collected: 10/22/19 10:30 Received: 11/04/19 09:40 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 ± 0.334 (0.558) C:NA T:92%**	pCi/L	11/21/19 13:12	13982-63-3	
Radium-228	EPA 904.0	**0.462 ± 0.422 (0.868) C:78% T:91%**	pCi/L	11/20/19 12:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.702 ± 0.756 (1.43)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-153 **Lab ID: 30333423011** Collected: 10/22/19 11:40 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.0576 ± 0.263 (0.620) C:NA T:95%**	pCi/L	11/21/19 13:12	13982-63-3	
Radium-228	EPA 904.0	**0.137 ± 0.383 (0.858) C:78% T:83%**	pCi/L	11/20/19 12:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.137 ± 0.646 (1.48)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-162 **Lab ID: 30333423012** Collected: 10/22/19 13:00 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.0646 ± 0.295 (0.600) C:NA T:93%**	pCi/L	11/21/19 13:12	13982-63-3	
Radium-228	EPA 904.0	**0.689 ± 0.366 (0.658) C:79% T:96%**	pCi/L	11/20/19 12:25	15262-20-1	
Total Radium	Total Radium Calculation	**0.689 ± 0.661 (1.26)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-163 **Lab ID: 30333423013** Collected: 10/22/19 14:00 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.0547 ± 0.356 (0.772) C:NA T:100%**	pCi/L	11/21/19 13:12	13982-63-3	
Radium-228	EPA 904.0	**0.0497 ± 0.387 (0.890) C:70% T:75%**	pCi/L	11/20/19 12:25	15262-20-1	
Total Radium	Total Radium Calculation	**0.0497 ± 0.743 (1.66)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-164 **Lab ID: 30333423014** Collected: 10/22/19 14:50 Received: 11/04/19 09:40 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 ± 0.316 (0.708) C:NA T:89%**	pCi/L	11/21/19 13:26	13982-63-3	
Radium-228	EPA 904.0	**1.02 ± 0.468 (0.793) C:81% T:78%**	pCi/L	11/20/19 12:25	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Sample: P-164 **Lab ID: 30333423014** Collected: 10/22/19 14:50 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**1.02 ± 0.784 (1.50)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-156 **Lab ID: 30333423015** Collected: 10/22/19 16:00 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0570 ± 0.403 (0.804) C:NA T:95%**	pCi/L	11/21/19 13:26	13982-63-3	
Radium-228	EPA 904.0	**0.439 ± 0.394 (0.805) C:78% T:85%**	pCi/L	11/20/19 12:25	15262-20-1	
Total Radium	Total Radium Calculation	**0.496 ± 0.797 (1.61)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-01A-1 **Lab ID: 30333423016** Collected: 10/22/19 16:45 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.45 ± 0.636 (0.540) C:NA T:92%**	pCi/L	11/21/19 13:26	13982-63-3	
Radium-228	EPA 904.0	**0.867 ± 0.380 (0.624) C:85% T:92%**	pCi/L	11/20/19 12:25	15262-20-1	
Total Radium	Total Radium Calculation	**2.32 ± 1.02 (1.16)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-155 **Lab ID: 30333423017** Collected: 10/22/19 17:50 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.128 ± 0.293 (0.473) C:NA T:95%**	pCi/L	11/21/19 13:26	13982-63-3	
Radium-228	EPA 904.0	**0.527 ± 0.393 (0.772) C:83% T:78%**	pCi/L	11/20/19 12:25	15262-20-1	
Total Radium	Total Radium Calculation	**0.655 ± 0.686 (1.25)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-17 **Lab ID: 30333423018** Collected: 10/23/19 09:00 Received: 11/04/19 09:40 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 ± 0.295 (0.662) C:NA T:87%**	pCi/L	11/21/19 13:26	13982-63-3	
Radium-228	EPA 904.0	**0.713 ± 0.419 (0.779) C:78% T:84%**	pCi/L	11/20/19 12:25	15262-20-1	
Total Radium	Total Radium Calculation	**0.713 ± 0.714 (1.44)**	pCi/L	11/21/19 14:29	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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Sample: Rinse CCR-BAP **Lab ID: 30333423019** Collected: 10/23/19 09:20 Received: 11/04/19 09:40 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 ± 0.259 (0.417) C:NA T:98%**	pCi/L	11/21/19 13:26	13982-63-3	
Radium-228	EPA 904.0	**0.769 ± 0.474 (0.893) C:76% T:74%**	pCi/L	11/20/19 12:26	15262-20-1	
Total Radium	Total Radium Calculation	**0.769 ± 0.733 (1.31)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-158 **Lab ID: 30333423020** Collected: 10/23/19 09:50 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.552 ± 0.438 (0.569) C:NA T:93%**	pCi/L	11/21/19 13:26	13982-63-3	
Radium-228	EPA 904.0	**0.607 ± 0.416 (0.801) C:77% T:78%**	pCi/L	11/20/19 12:26	15262-20-1	
Total Radium	Total Radium Calculation	**1.16 ± 0.854 (1.37)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-157 **Lab ID: 30333423021** Collected: 10/23/19 10:50 Received: 11/04/19 09:40 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 ± 0.361 (0.763) C:NA T:97%**	pCi/L	11/21/19 13:26	13982-63-3	
Radium-228	EPA 904.0	**0.618 ± 0.396 (0.749) C:78% T:83%**	pCi/L	11/20/19 12:27	15262-20-1	
Total Radium	Total Radium Calculation	**0.618 ± 0.757 (1.51)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: Duplicate CCR-BAP **Lab ID: 30333423022** Collected: 10/23/19 10:50 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0691 ± 0.315 (0.508) C:NA T:88%**	pCi/L	11/21/19 13:39	13982-63-3	
Radium-228	EPA 904.0	**0.725 ± 0.422 (0.774) C:75% T:81%**	pCi/L	11/20/19 12:27	15262-20-1	
Total Radium	Total Radium Calculation	**0.794 ± 0.737 (1.28)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-23 **Lab ID: 30333423023** Collected: 10/23/19 12:20 Received: 11/04/19 09:40 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 (0.422) C:NA T:95%**	pCi/L	11/21/19 13:39	13982-63-3	
Radium-228	EPA 904.0	**0.566 ± 0.466 (0.941) C:75% T:81%**	pCi/L	11/20/19 12:27	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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

Sample: P-23 **Lab ID: 30333423023** Collected: 10/23/19 12:20 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.623 ± 0.728 (1.36)**	pCi/L	11/21/19 14:29	7440-14-4	

Sample: P-22 **Lab ID: 30333423024** Collected: 10/23/19 13:40 Received: 11/04/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0627 ± 0.286 (0.461) C:NA T:88%**	pCi/L	11/21/19 13:39	13982-63-3	
Radium-228	EPA 904.0	**0.645 ± 0.456 (0.889) C:75% T:78%**	pCi/L	11/20/19 12:27	15262-20-1	
Total Radium	Total Radium Calculation	**0.708 ± 0.742 (1.35)**	pCi/L	11/21/19 14:29	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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

QC Batch: 369894 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30333423001, 30333423002, 30333423003, 30333423004, 30333423005, 30333423006

METHOD BLANK: 1794441 Matrix: Water
Associated Lab Samples: 30333423001, 30333423002, 30333423003, 30333423004, 30333423005, 30333423006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.104 ± 0.322 (0.731) C:NA T:92%	pCi/L	11/21/19 10:49	

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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

QC Batch: 369897 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30333423007, 30333423008, 30333423009, 30333423010, 30333423011, 30333423012, 30333423013, 30333423014, 30333423015, 30333423016, 30333423017, 30333423018, 30333423019, 30333423020, 30333423021, 30333423022, 30333423023, 30333423024

METHOD BLANK: 1794446 Matrix: Water
Associated Lab Samples: 30333423007, 30333423008, 30333423009, 30333423010, 30333423011, 30333423012, 30333423013, 30333423014, 30333423015, 30333423016, 30333423017, 30333423018, 30333423019, 30333423020, 30333423021, 30333423022, 30333423023, 30333423024

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.250 ± 0.354 (0.599) C:NA T:92%	pCi/L	11/21/19 13:12	

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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

QC Batch: 369900 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30333423007, 30333423008, 30333423009, 30333423010, 30333423011, 30333423012, 30333423013, 30333423014, 30333423015, 30333423016, 30333423017, 30333423018, 30333423019, 30333423020, 30333423021, 30333423022, 30333423023, 30333423024

METHOD BLANK: 1794452 Matrix: Water
Associated Lab Samples: 30333423007, 30333423008, 30333423009, 30333423010, 30333423011, 30333423012, 30333423013, 30333423014, 30333423015, 30333423016, 30333423017, 30333423018, 30333423019, 30333423020, 30333423021, 30333423022, 30333423023, 30333423024

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.233 ± 0.289 (0.612) C:81% T:98%	pCi/L	11/20/19 12:28	

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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

QC Batch: 369895 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30333423001, 30333423002, 30333423003, 30333423004, 30333423005, 30333423006

METHOD BLANK: 1794442 Matrix: Water
Associated Lab Samples: 30333423001, 30333423002, 30333423003, 30333423004, 30333423005, 30333423006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.185 ± 0.287 (0.620) C:84% T:90%	pCi/L	11/20/19 12:28	

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: 19-02662, Xcel Energy-Sherco P
Pace Project No.: 30333423

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

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CHAIN-O… The Chain-of-Cus…ent …tely.

WO# : 30333423

30333423

Page: 1 of 2

2266771

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:	19-02662, Xcel Energy -
Project Number:	Sherco Ponds, Fall 2019

Invoice Information:

Attention:	Ciara Ruikkie
Company Name:	Pace MN Field Services
Address:	
Pace Quote Reference:	Tom Halverson
Pace Project Manager:	Corin 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

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	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	Rinse CCR-P3	WT				10/21/19	1040		2			2						✓	✓		001
2	P-150						1130		2			2						✓	✓		002
3	P-151						1300		2			2						✓	✓		003
4	P-152A						1410		2			2						✓	✓		004
5	P-130						1535		2			2						✓	✓		005
6	P-131						1650		2			2						✓	✓		006
7	P-132	↓				↓	1800		2			2						✓	✓		007
8	P-165	WT				10/22/19	0900		2			2						✓	✓		008
9	P-154A						1030		2			2						✓	✓		009
10	Duplicate CCR-P3						1030		2			2						✓	✓		010
11	P-153						1140		2			2						✓	✓		011
12	P-162	↓				↓	1300		2			2						✓	✓		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
① client needs to analyze for: Radium 226+228 pCi/L combined.	David Anderson Pace	10/31/19	1130	Ben Mueller	11-4-19	0940

SAMPLE CONDITIONS

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

Page 20 of 22

RA-226 EPA 903.1
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): 10/22/19

*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-C-010-rev.00, 09Nov2017

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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.

#30333423

Page: 2 of 2

2266769

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Xcel Energy	Report To: David Anderson	Attention: Ciara Ruikkie
Address: c/o Pace MN Field	Copy To:	Company Name: Pace MN Field Services
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference: Tom Halverson
Phone: Fax:	Project Name: 19-02662, Xcel Energy -	Pace Project Manager: Carin Ferris
Requested Due Date/TAT:	Project Number: Sherco Ponds, Fall 2019	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	RA-226 EPA 903.1	RA-228 EPA 904.0	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	P-163	WT				10/23/19	1400		2			2							✓	✓		013
2	P-164						1450		2			2							✓	✓		014
3	P-156						1600		2			2							✓	✓		015
4	P-01A-1						1645		2			2							✓	✓		016
5	P-155						1750		2			2							✓	✓		017
6	P-17	WT				10/23/19	0900		2			2							✓	✓		018
7	Rinse CCR-BAP						0920		2			2							✓	✓		019
8	P-158						0950		2			2							✓	✓		020
9	P-157						1050		2			2							✓	✓		021
10	Duplicate CCR-BAP						1050		2			2							✓	✓		022
11	P-23						1220		2			2							✓	✓		023
12	P-22						1340		2			2							✓	✓		024

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	10/31/19	1130		11-4-19	0940	N/A	N	N	Y
(2) RA-226 EPA 903.1 RA-226 EPA 904.0										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: David Anderson

SIGNATURE of SAMPLER: David Anderson DATE Signed (MM/DD/YY): 10/23/19

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

Pace Analytical

Client Name: Xcel Energy Project # 30333423

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

Label BLM
LIMS Login BLM

Tracking #: 4934 3734 0577

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 N/A °C Correction Factor: ~ °C Final Temp: ~ °C

Temp should be above freezing to 6°C

pH paper Lot# 10042481 Date and initials of person examining contents: BLM 11-5-19

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:	✓	≠	BM	11. 11-5-19
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed: BLM Date/time of preservation:
				Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: BLM Date: 11-5-19

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.