

2018 CCR ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

SCRUBBER SOLIDS POND No. 3

Sherburne County (Sherco) Generating Plant
Becker, Minnesota

Prepared for:

Northern States Power Company, a Minnesota Corporation

January 30, 2019



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AND CORRECTIVE ACTION REPORT

Scrubber Solids Pond No. 3

Becker, Minnesota

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

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

Signature of Preparer:



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

Date: January 30, 2019

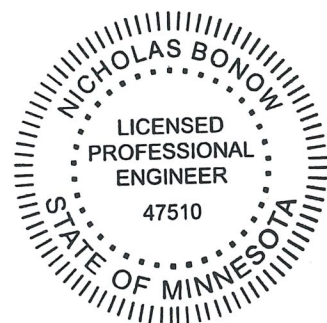


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1. INTRODUCTION

This report presents the documentation of the status of groundwater monitoring and corrective action for the year 2018 (YR2018) for Scrubber Solids Pond No. 3 (Pond 3) at the Sherburne County Generating Plant (Sherco) located in Becker, Minnesota. Pond 3 is owned and operated by Northern States Power Company, a Minnesota Corporation (NSPM).

Pond 3 is an existing coal combustion residuals (CCR) impoundment and is required to comply with provisions of the U.S. Code of Federal Regulations (CFR), Title 40, Parts 257 and 261 relating to disposal of coal combustion residuals from electric utilities. In particular, this report addresses the requirements of 40 CFR Section 257.90(e), annual groundwater monitoring and corrective action for YR2018.

This report has been prepared in general accordance with the reporting procedures outlined in the Sherco Scrubber Solids Pond No. 3 CCR Groundwater Sampling Plan (NSPM, 2017b). Any deviations from the requirements of the Groundwater Sampling Plan are described in subsequent sections of this report.

1.1 Annual Groundwater Monitoring Report Requirements

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

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

- (1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;*
- (2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;*
- (3) In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;*
- (4) A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and*
- (5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.*

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

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

2. SITE DESCRIPTION

Pond 3 is located in the City of Becker, Sherburne County, Minnesota. Pond 3 is approximately 115 acres in size and is part of a larger generating plant site. Phased construction resulted in the northern half of Pond No. 3 to become operational in 2004 and the southern half in 2010. The Pond 3 location is shown on Figure 1 and an aerial photograph and site layout map for Pond 3 are shown on Figure 2.

2.1 Site Hydrogeology

The site hydrogeology is discussed in more detail in the Pond 3 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 Facility 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 west-southwest beneath the Facility, where it discharges into the Mississippi River. The till layer exhibits variable thickness and is absent in some locations, and no perched groundwater conditions have been identified above the till. Groundwater travel velocities are estimated at 331 feet/year.

The conceptual model for the hypothetical (or potential) release of a constituent of concern (COC) from Pond 3 focuses on groundwater as the transport mechanism. The water table beneath Pond 3 is typically below the glacial till layer identified in Section 2.1.2. Exfiltration from Pond 3 area is anticipated to move vertically downward from the base of the pond until it reaches the water table and/or till contact. If the exfiltration first contacts the till, it may flow through the till in the downgradient direction, but may also flow locally along the till contact to a zone of higher permeability within the till or a discontinuity of the till until it reaches the water table. The lack of an identifiable perched zone above the till indicates that flow along the top of the till is minimal. Upon reaching the water table, a COC would likely travel mainly horizontally toward the west-southwest and towards the Mississippi River.

3. MONITORING RESULTS

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

3.1 Compliance with §257.90(e)

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

The area of Pond 3 and all upgradient and downgradient monitoring well locations included in the Pond 3 CCR groundwater monitoring system are shown on Figure 2. Figure 2 also includes labels for the well identification numbers that are part of the groundwater monitoring system for Pond 3. A summary of the monitoring wells included in the Pond 3 CCR Groundwater Monitoring System is included in Table 1.

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

No monitoring wells that are part of the groundwater monitoring system for Pond 3 were installed or decommissioned during YR2018.

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

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

Assessment Monitoring Data

As discussed in a Technical Memorandum dated April 13, 2018 (Carlson McCain, 2018c), NSPM initiated an assessment monitoring program at Pond 3 during YR2018. Pursuant to the assessment monitoring requirements listed in §257.95, the following groundwater sampling events were conducted during YR2018:

- Pursuant to §257.95(b), the initial assessment monitoring samples were collected within 90 days of triggering the assessment monitoring program. These samples were collected during the spring monitoring event, which occurred between April 16 and April 18, 2018. The samples were analyzed for Appendix IV constituents, as required by §257.95(b), as well as Appendix III constituents. Laboratory reports and field datasheets for the spring monitoring event are included in this report as Appendix A.
- Pursuant to §257.95(d)(1), all wells in the groundwater monitoring system were resampled within 90 days of obtaining the validated results of the initial assessment monitoring sampling. The results of the initial assessment monitoring sampling were received from the laboratory on May 16, 2018 and resampling was conducted between July 31 and August 2, 2018 (summer monitoring event). The resampling included analyzing for all Appendix III

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

- Pursuant to the semiannual sampling requirement in §257.95(d)(1), all wells in the groundwater monitoring system were resampled between October 31 and November 1, 2018 (fall monitoring event) and analyzed for the same constituents as the summer event (i.e. all Appendix III constituents and only those Appendix IV constituents detected during the initial assessment monitoring event). Laboratory reports and field datasheets for the fall monitoring event are included in this report as Appendix C.

Background Concentrations and Groundwater Protection Standards

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

- Background Concentrations: The background wells at Pond 3 include P-130, P-131, P-150, P-151A, P-152A, P-153 and P-154A 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 to 63.2	NA
	Calcium, total (mg/L)	25 to 212	NA
	Chloride, total (mg/L)	<1.0 to 37.8	NA
	Fluoride, total (mg/L)	<0.750	NA
	pH (lab) (pH)	7.34 to 8.2	NA
	Sulfate, total (mg/L)	2.53 to 43.6	NA
	Total Dissolved Solids (mg/L)	86 to 496	NA
Appendix IV Parameters	Antimony, total (mg/L)	<0.0005	0.006
	Arsenic, total (mg/L)	<0.0005 to 0.0121	0.01
	Barium, total (mg/L)	<0.05 to 0.356	2
	Beryllium, total (mg/L)	<0.0005	0.004
	Cadmium, total (mg/L)	<0.0005	0.05
	Chromium, total (mg/L)	0.0005 to 0.0639	0.1
	Cobalt, total (mg/L)	<0.0005 to 0.0298	0.006
	Fluoride, total (mg/L)	<0.750	4
	Lead, total (mg/L)	<0.0005 to 0.0121	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 to 0.0024	0.1
	Radium, 226 and 228 combined (pCi/L)	<0.905 to 2.74	5
	Selenium, total (mg/L)	<0.0005 to 0.0033	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.

Statistical Analysis

Statistical analysis was performed on the YR2018 monitoring data using the procedures described in Pond 3's Statistical Analysis Plan (NSPM, 2017a), and demonstrates compliance with §257.95(e), §257.95(f), and §257.95(g) as described below:

1. Subpart §257.95(e) (paraphrased): If the concentrations of all Appendix III and Appendix IV constituents are shown to be at or below background values for two consecutive monitoring events, the owner or operator may return to detection monitoring of the CCR unit.
 - a. Based on statistical comparisons of compliance data to background data for Appendix III and Appendix IV constituents, concentrations of one or more constituents continue to exceed background values, therefore Pond 3 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 Pond 3 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 Pond 3 during the spring and fall of 2018 monitoring events are shown on the water table elevation contour maps in Figures 3 and 4, respectively. The contours were derived from water level measurements from the wells included in the CCR groundwater monitoring system for Pond 3 along with additional water level piezometers near Pond 3. For both of the events, the flow direction was generally to the west-southwest. The flow direction is consistent with historical data from over 20 years of monitoring at the facility and is also consistent with the regional groundwater flow direction towards the Mississippi river.

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

Pond 3 transitioned from the detection monitoring program (§257.94) to the assessment monitoring program (§257.95) as described in Technical Memorandums 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-132	Sulfate
P-162	Boron, Sulfate
P-163	Boron, Sulfate

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

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

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

4. DISCUSSION

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

Pursuant to the rule requirements, Section 4.1 below discusses the key actions completed for the groundwater monitoring program at Pond 3; Section 4.2 discusses the any problems encountered with the groundwater monitoring and actions to resolve such problems; and Section 4.3 discusses key activities that may occur in the upcoming year.

4.1 Key Actions Completed

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

- Within 90 days after completing sampling and analysis as required by §257.93(h)(2), NSPM reported in a Technical Memorandum, dated January 15, 2018 (Carlson McCain, 2018a), that one or more monitoring wells exhibited an SSI for one or more Appendix III constituents; and that NSPM will establish an assessment monitoring program or document that the SSI resulted from an alternative source. The Technical Memorandum was placed on Pond 3’s publicly available website on January 15, 2018.
- The 2017 Annual CCR Groundwater Monitoring and Corrective Report (Carlson McCain, 2018b) was completed and placed on Pond 3’s publicly available website by January 31, 2018.
- A Technical Memorandum dated April 13, 2018 (Carlson McCain, 2018c), which documented that an alternate source demonstration (ASD) for Pond 3 was initiated but was not completed by April 15, 2018, was placed in Pond 3’s operating record on April 13, 2018.
- Initiation of the assessment monitoring program including sampling and analyzing for all Appendix IV constituents at each background and downgradient well during the spring monitoring event in April 2018 as required by §257.95(b);
- Monitoring wells were resampled during the summer between July 31 and August 2, 2018 and analyzed for all Appendix III constituents and only those Appendix IV constituents that were detected during the initial assessment monitoring event (i.e. spring 2018 event) as required by §257.95(d)(1);
- Monitoring wells were resampled during the fall between October 31 and November 1, 2018 and analyzed for all Appendix III constituents and only those Appendix IV constituents that were detected during the spring 2018 event as part of semiannual sampling required by §257.95(d)(1);
- Laboratory reports and field datasheets for the spring, summer and fall sampling events were placed in the operating record on July 27, 2018, August 29, 2018 and December 6, 2018, respectively;
- Pursuant to §257.95(d)(2), groundwater protection standards were established for all Appendix IV constituents;
- Statistical evaluation of the monitoring data was conducted to demonstrate compliance with §257.95(e) through (g); and
- The CCR Groundwater Sampling Plan for Pond 3 (NSPM, 2018) was revised on December 27, 2018.

4.2 Problems

4.2.1 Problems Encountered

Water level measurements and samples were obtained as many as two days apart during the spring and summer monitoring events due to scheduling constraints with the sampling contractor. This is a deviation from the CCR Groundwater Sampling Plan (NSPM, 2017b), which states that the sampling crew will take initial water level measurements within a 24-hour timeframe to provide comparable numbers by which to calculate the groundwater gradient.

The primary objective of the water level measurements is to ensure an accurate computation of the groundwater gradient in order to verify monitoring assumptions regarding background and downgradient well locations. The groundwater elevation and flow direction at Pond 3 is well-understood based on the decades-long history of groundwater monitoring at Pond 3, and provides baseline water levels that can be readily compared with new observations to identify anomalies that may result from more widely spaced measurements. Time concentration plots were reviewed for YR2018 static water levels and water table elevations and no anomalies were observed, suggesting that the more widely spaced water level measurements did not impact the calculation of the groundwater gradient during YR2018.

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

4.2.2 Resolution of Problems

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

4.3 Key Activities for 2019

The following key actions are anticipated at Pond 3 in the year 2019:

1. Routine, semi-annual assessment monitoring events at monitoring system wells are planned in the spring between March 15 and May 15, 2019 and in the fall between September 15 and November 15, 2019.
2. Statistical analysis of monitoring results will be conducted to demonstrate compliance with §257.95(e) through (g).

5.0 REFERENCES

Carlson McCain, 2017. CCR Groundwater Monitoring System Certification, Scrubber Solids Pond No. 3, Sherco Generating Plant, prepared for Northern States Power Company, A Minnesota Corporation, October 16, 2017.

Carlson McCain, 2018a. SSI Determination – Scrubber Solids Pond No. 3, Prepared for NSPM Environmental Services, Carlson McCain, Inc., January 15, 2018.

Carlson McCain, 2018b. CCR Annual Groundwater and Corrective Action Monitoring Report, Scrubber Solids Pond No. 3, Sherco Generating Plant, prepared for Northern States Power Company, A Minnesota Corporation, January 29, 2018.

Carlson McCain, 2018c. Alternate Source Demonstration Update – Scrubber Solids Pond No. 3, Prepared for NSPM Environmental Services, Carlson McCain, Inc., April 13, 2018.

NSPM, 2017a. Statistical Analysis Plan, Scrubber Solids Pond No. 3, Northern States Power Company, a Minnesota Corporation, October 16, 2017.

NSPM, 2017b. Scrubber Solids Pond No. 3 CCR Ground Water Sampling Plan. Northern States Power Company, a Minnesota Corporation, October 17, 2017.

NSPM, 2018. Scrubber Solids Pond No. 3 CCR Ground Water Sampling Plan Revision #1. Northern States Power Company, a Minnesota Corporation, December 27, 2018.

Tables

Table 1
CCR Groundwater Monitoring System
Scrubber Solids Pond No. 3

Well ID	Minnesota Unique Well ID	Date Installed	Location Site Coordinates (ft)		Elevation Top of Riser Pipe	Well Type	Screen Length (ft)	Elevation Top of Screen	Elevation Bottom of Screen	Monitoring Status	Hydrologic Location
			Easting	Northing							
P-130	722085	5/12/05	2031446.8	865871.1	965.59	Vertical	10	931	921	Routine Semi-annual	Up-gradient
P-131	722086	5/16/05	2033046.4	865133.3	966.03	Vertical	10	931	921	Routine Semi-annual	Up-gradient
P-132	722087	5/11/05	2031594.6	862211.7	955.96	Vertical	10	931	921	Routine Semi-annual	Down-Gradient
P-150	806320	10/7/14	2032983.1	867047.3	964.41	Vertical	10	938	928	Routine Semi-annual	Up-gradient
P-151	806315	10/9/14	2032644.2	865848.2	942.44	Vertical	10	932	922	Routine Semi-annual	Up-gradient
P-152A	806318	10/10/14	2031471.6	866696.4	965.87	Vertical	10	934	924	Routine Semi-annual	Up-gradient
P-153	806314	10/13/14	2032310.4	864158.5	944.94	Vertical	10	931	921	Routine Semi-annual	Up-gradient
P-154A	806316	10/15/14	2032966.3	862868.4	961.44	Vertical	10	922	912	Routine Semi-annual	Up-gradient
P-162	822156	7/25/16	2030610	864631.7	1020.9	Angled	20	929	916	Routine Semi-annual	Down-Gradient
P-163	822157	7/19/16	2030604	863992	1024.98	Angled	20	927	914	Routine Semi-annual	Down-Gradient
P-164	822158	7/14/16	2030610	863059.5	1020.49	Angled	20	928	916	Routine Semi-annual	Down-Gradient
P-165	822159	7/12/16	2030714	862215.8	957.13	Vertical	10	927	917	Routine Semi-annual	Down-Gradient

*Notes:

Elevation is feet above mean sea level

Table 2
Summary of Data Collected
Sherco Scrubber Solids Pond No. 3

Upgradient Wells				
Well ID	Number of Samples	Sample Dates		
		Spring 2018 ¹	Summer 2018 ²	Fall 2018 ³
P-130	3	4/17/2018	8/1/2018	10/31/2018
P-131	3	4/16/2018	7/31/2018	10/31/2018
P-150	3	4/17/2018	8/1/2018	11/1/2018
P-151	3	4/17/2018	8/1/2018	11/1/2018
P-152A	3	4/18/2018	8/1/2018	10/31/2018
P-153	3	4/17/2018	8/2/2018	11/1/2018
P-154A	3	4/17/2018	8/1/2018	11/1/2018

Downgradient Wells				
Well ID	Number of Samples	Sample Dates		
		Spring 2018 ¹	Summer 2018 ²	Fall 2018 ³
P-132	3	4/17/2018	8/2/2018	10/31/2018
P-162	3	4/16/2018	8/2/2018	10/31/2018
P-163	3	4/16/2018	8/2/2018	10/31/2018
P-164	3	4/16/2018	8/2/2018	10/31/2018
P-165	3	4/17/2018	8/2/2018	11/1/2018

¹ Initial assessment monitoring event sampled and analyzed for appendix IV of §257 constituents as required by §257.95(b). Appendix III of §257 constituents were also analyzed.

² Assessment monitoring 90-day resample event sampled and analyzed for appendix III of §257 and those appendix IV of §257 constituents detected during Spring 2018 as required by §257.95(d)(1).

³ Assessment monitoring semiannual resample event sampled and analyzed for appendix III of §257 and those appendix IV of §257 constituents detected during Spring 2018 as required by §257.95(d)(1).

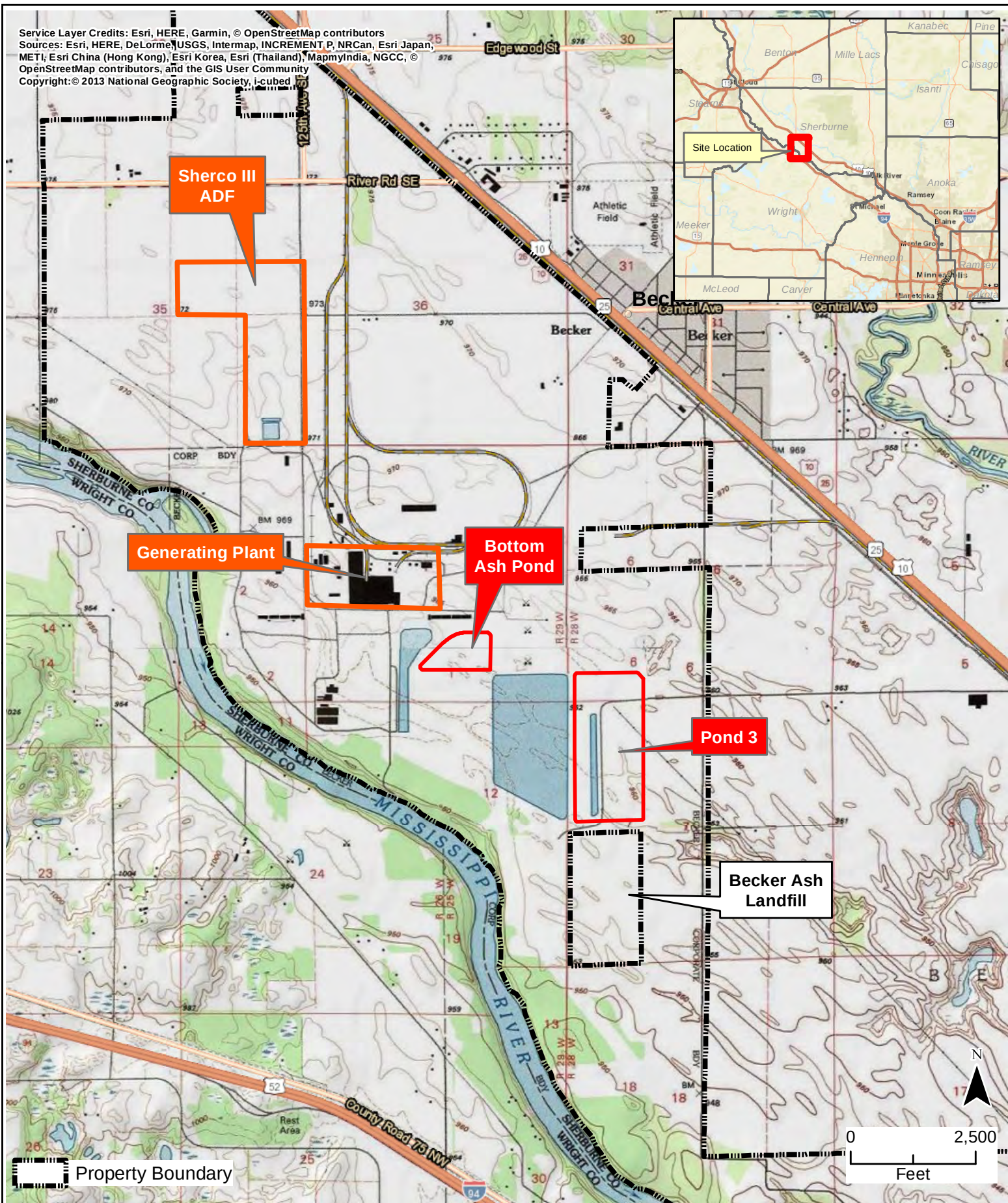
Table 3
Count of Parameters Analyzed by Well
Sherco Scrubber Solids Pond No.3

Appendix III Parameters												
Parameter	Well ID and Number of Samples											
	P-130	P-131	P-132	P-150	P-151	P-152a	P-153	P-154a	P-162	P-163	P-164	P-165
Boron, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Calcium, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Chloride, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Fluoride, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
pH (lab) (pH)	3	3	3	3	3	3	3	3	3	3	3	3
Sulfate, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Total Dissolved Solids (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3

Appendix IV Parameters												
Parameter	Well ID and Number of Samples											
	P-130	P-131	P-132	P-150	P-151	P-152a	P-153	P-154a	P-162	P-163	P-164	P-165
Antimony, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Arsenic, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Barium, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Beryllium, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Cadmium, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Chromium, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Cobalt, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Lead, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Lithium Total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Mercury, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Molybdenum, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Selenium, total (mg/L)	3	3	3	3	3	3	3	3	3	3	3	3
Thallium, total (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1
Radium, 226 and 228 combined (pCi/L)	3	3	3	3	3	3	3	3	3	3	3	3

Figures

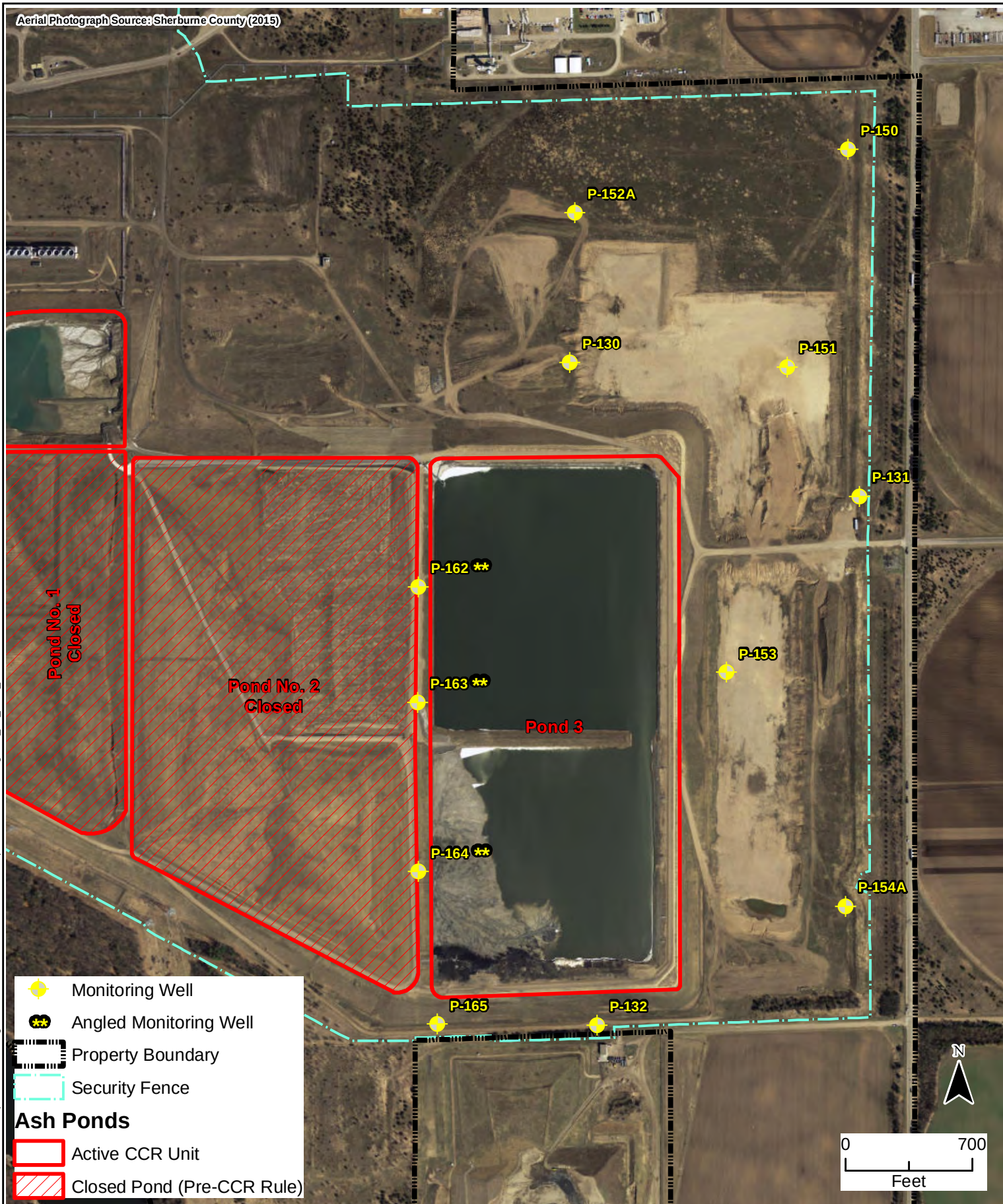
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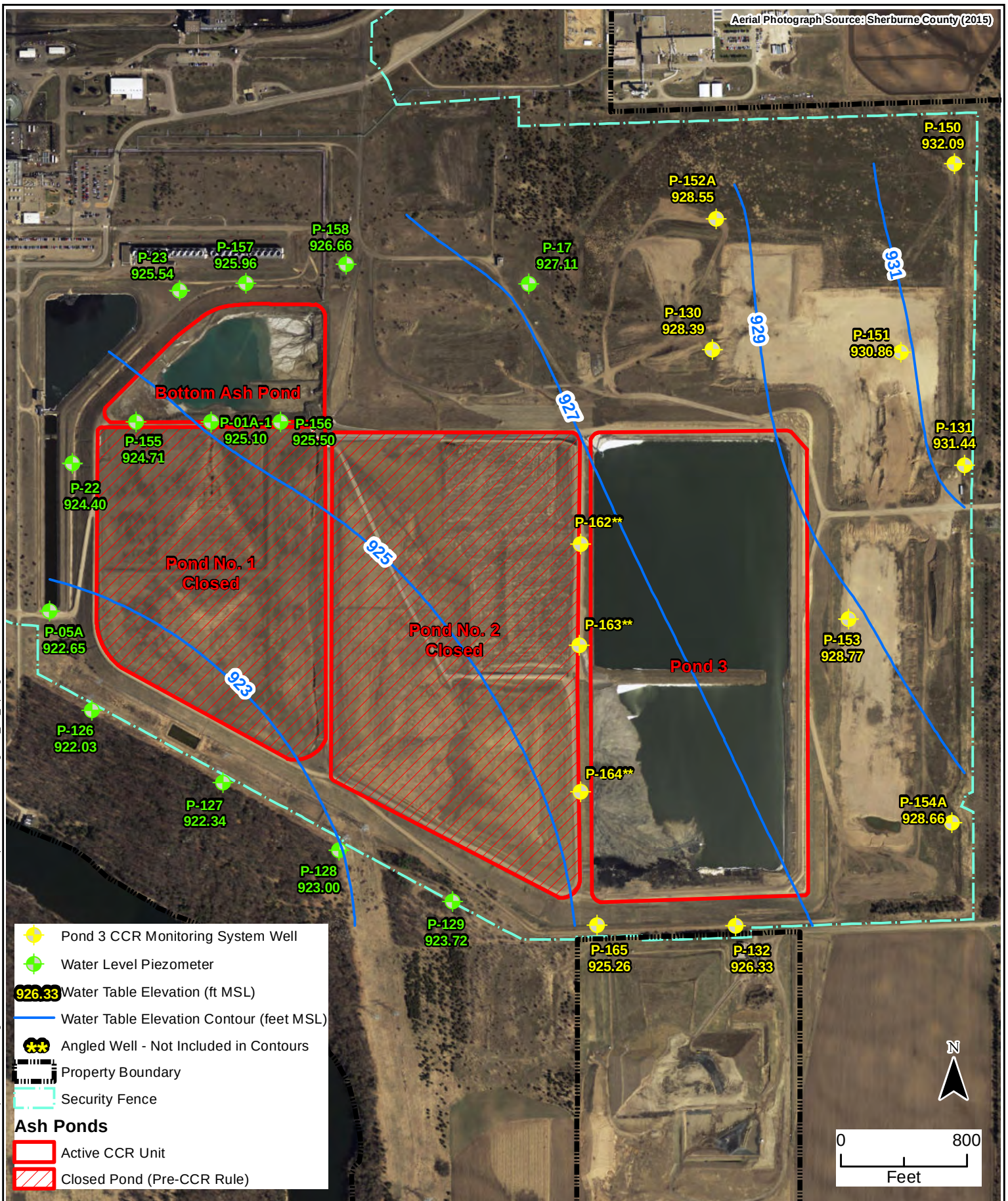


CCR ANNUAL GROUNDWATER
 MONITORING REPORT
 Scrubber Solids Pond No. 3
 Sherburne County Generating Plant
 Becker, Minnesota

FIGURE 1
 SITE
 LOCATION MAP







CCR ANNUAL GROUNDWATER
MONITORING REPORT
Scrubber Solids Pond No. 3
Sherburne County Generating Plant
Becker, Minnesota

FIGURE 3
WATER TABLE
ELEVATION CONTOUR
MAP (04/16-18/2018)





CCR ANNUAL GROUNDWATER
MONITORING REPORT
Scrubber Solids Pond No. 3
Sherburne County Generating Plant
Becker, Minnesota

FIGURE 4
WATER TABLE
ELEVATION CONTOUR
MAP (10/29-11/1/2018)

Appendix A

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

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-130 Labeled P130

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 46.84 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 4-17-18

Water Column 9.64 Feet

Time Purged 1625-1649

One Casing Volume 1.6 Gallons

Pump Rate 0.2 GPM / LPM

Volume Purged 4.8 Gallons

Field Sampling Data

Date Sampled 4-17-18

Time Sampled 1700

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.0 (units) D.O. 10.4 (mg/l)

Spec. Cond. 610 (µmhos/cm) Turbidity 5.9 (NTU)

Temp. 11.0 (°C) Eh 109 (mV)

Other NA

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

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

Weather Conditions During Sampling: 39° + sunny, wind N10

Sample Description: clear + odorless

Observations: DJA 4/17/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1633	7.0	600	11.0	10.4	NA	106	1.6
1641	7.0	600	11.0	10.5	NA	108	3.2
1649	7.0	610	11.0	10.4	NA	109	4.8
<u>DJA 4/17/18</u>							

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: 4/17/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-131 Labeled P131

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 48.55 Feet

Static water level measurement before purging (Start Depth) 34.59 Feet

Static water level measurement at time of sampling (Final Depth) 34.59 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-16-18 Water Column 13.96 Feet

Time Purged 1700-1736 One Casing Volume 2.3 Gallons

Pump Rate 0.2 GPM / LPM Volume Purged 7.2 Gallons

Field Sampling Data

Date Sampled 4-16-18

Time Sampled 1750

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O. 9.4 (mg/l)

Spec. Cond. 590 (µmhos/cm) Turbidity 4.3 (NTU)

Temp. 10.0 (°C) Eh 114 (mV)

Other NA

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

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

Weather Conditions During Sampling: 37° + sunny, wind N 15-20

Sample Description: cl/egl + ocl/egl

Observations: DJA 4/16/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1712	7.4	590	10.0	9.3	NA	122	2.4
1724	7.4	590	10.0	9.4	NA	111	4.8
1736	7.4	590	10.0	9.4	NA	114	7.2
<u>DJA 4/16/18</u>							

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: 4/16/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-132 Labeled P132

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 36.51 Feet

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

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

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-17-18 Water Column 6.88 Feet

Time Purged 0915-0933 One Casing Volume 1.1 Gallons

Pump Rate 0.2 GPM / LPM Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 4-17-18

Time Sampled 0945

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

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

Spec. Cond. 700 (umhos/cm) Turbidity 7.6 (NTU)

Temp. 10.5 (°C) Eh 157 (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 N10

Sample Description: clear + odorless

Observations: DJA 4/17/18

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0921	7.0	700	10.0	9.3	NA	153	1.2
0927	6.9	700	10.5	9.6	NA	155	2.4
0933	6.9	700	10.5	9.0	NA	157	3.6
<u>DJA 4/17/18</u>							

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: 4-17-18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-150 Labeled 806320

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 36.66 Feet

Static water level measurement before purging (Start Depth) 32.32 Feet

Static water level measurement at time of sampling (Final Depth) 32.32 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump

Pump ID PC-6

Date Purged 4-17-18

Water Column 4.34 Feet

Time Purged 1250-1302

One Casing Volume 0.7 Gallons

Pump Rate 0.2 GPM / LPM

Volume Purged 2.4 Gallons

Field Sampling Data

Date Sampled 4-17-18

Time Sampled 1315

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O. 8.4 (mg/l)

Spec. Cond. 480 (umhos/cm) Turbidity 4.7 (NTU)

Temp. 10.5 (°C) Eh 93 (mV)

Other NA

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

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

Weather Conditions During Sampling: 33° + sunny, wind N10

Sample Description: clear + odorless

Observations: pump pushed out some ice ft.

DJA 4/17/18

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1254	7.7	480	10.5	8.3	NA	95	0.8
1258	7.6	480	10.5	8.4	NA	94	1.6
1302	7.6	480	10.5	8.4	NA	93	2.4
<u>DJA 4/17/18</u>							

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: 4/17/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-151 Labeled 806315

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 20.16 Feet

Static water level measurement before purging (Start Depth) 11.58 Feet

Static water level measurement at time of sampling (Final Depth) 11.58 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump peristaltic Pump ID PC-6

Date Purged 4-17-18 Water Column 8.58 Feet

Time Purged 1425-1446 One Casing Volume 1.4 Gallons

Pump Rate 0.2 GPM/LPM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 4-17-18

Time Sampled 1500

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.1 (units) D.O. 10.8 (mg/l)

Spec. Cond. 330 (µmhos/cm) Turbidity 22.4 (NTU)

Temp. 7.0 (°C) Eh 151 (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 N 10

Sample Description: clear + odorless

Observations: Bladder discharge frozen, used peristaltic pump.
DJA 4/17/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1432	7.2	320	7.0	11.0	NA	146	1.4
1439	7.1	330	7.0	10.9	NA	148	2.8
1446	7.1	330	7.0	10.8	NA	151	4.2
<u>DJA 4/17/18</u>							

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: 4-17-18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-152a Labeled 806318

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 42.18 Feet

Static water level measurement before purging (Start Depth) 37.32 Feet

Static water level measurement at time of sampling (Final Depth) 37.32 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump

Pump ID PC-6

Date Purged 4-18-18

Water Column 4.86 Feet

Time Purged 0820-0832

One Casing Volume 0.8 Gallons

Pump Rate 0.2 GPM / LPM

Volume Purged 2.4 Gallons

Field Sampling Data

Date Sampled 4-18-18

Time Sampled 0840

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O. 4.5 (mg/l)

Spec. Cond. 390 (umhos/cm) Turbidity 5.2 (NTU)

Temp. 9.5 (°C) Eh 107 (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° + cloudy, wind 10

Sample Description: clear + odorless

Observations: DJA 4/18/18

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0824	7.6	390	9.5	4.7	NA	93	0.8
0828	7.6	390	9.5	4.6	NA	100	1.6
0832	7.6	390	9.5	4.5	NA	107	2.4

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: 4/18/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-153 Labeled 806314

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 23.63 Feet

Static water level measurement before purging (Start Depth) 16.17 Feet

Static water level measurement at time of sampling (Final Depth) 16.17 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump

Pump ID PC-6

Date Purged 4-17-18

Water Column 7.46 Feet

Time Purged 1525-1543

One Casing Volume 1.2 Gallons

Pump Rate 0.2 GPM / LPM

Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 4-17-18

Time Sampled 1550

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.9 (units) D.O. 11.0 (mg/l)

Spec. Cond. 180 (µmhos/cm) Turbidity 6.4 (NTU)

Temp. 9.0 (°C) Eh 96 (mV)

Other NA

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

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

Weather Conditions During Sampling: 37° + sunny, wind N10

Sample Description: Clear + odorless

Observations: DJA 4/17/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1531	8.0	180	9.0	11.0	NA	86	1.2
1537	7.9	180	9.0	11.1	NA	93	2.4
1543	7.9	180	9.0	11.0	NA	96	3.6

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson

Date: 4/17/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-154a Labeled 806316

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 49.53 Feet

Static water level measurement before purging (Start Depth) 32.78 Feet

Static water level measurement at time of sampling (Final Depth) 32.78 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump

Pump ID PC-6

Date Purged 4-17-18

Water Column 16.75 Feet

Time Purged 1010-1052

One Casing Volume 2.7 Gallons

Pump Rate 0.2 GPM / LPM

Volume Purged 8.4 Gallons

Field Sampling Data

Date Sampled 4-17-18

Time Sampled 1100

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O. 4.2 (mg/l)

Spec. Cond. 560 (umhos/cm) Turbidity 4.9 (NTU)

Temp. 10.0 (°C) Eh 87 (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 10

Sample Description: elect + 0405/155

Observations: DTA 4-17-18

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1024	7.3	550	10.0	4.2	NA	95	2.8
1038	7.4	550	10.0	4.3	NA	91	5.6
1052	7.4	560	10.0	4.2	NA	87	8.4

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: 4-17-18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-162 Labeled 822156

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 166 Feet (estimate)

Static water level measurement before purging (Start Depth) 148.78 Feet (estimate)

Static water level measurement at time of sampling (Final Depth) 148.78 Feet (estimate)

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump truck Pump ID PC-6

Date Purged 4-16-18 Water Column 17.22 Feet

Time Purged 1335-1356 One Casing Volume 2.8 Gallons

Pump Rate 0.4 GPM/LPM Volume Purged 8.4 Gallons

Field Sampling Data

Date Sampled 4-16-18

Time Sampled 1410

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 6.9 (units) D.O. 5.8 (mg/l)

Spec. Cond. 890 (umhos/cm) Turbidity 4.6 (NTU)

Temp. 8.5 (°C) Eh 93 (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° + cloudy, wind NW 10-15

Sample Description: clear + odorless

Observations: DTA 4/16/18

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1342	6.9	880	8.5	6.3	NA	91	2.8
1349	6.9	890	8.5	6.0	NA	92	5.6
1356	6.9	890	8.5	5.8	NA	93	8.4
<u>DTA 4/16/18</u>							

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: 4/16/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project ShercoCCR, April Project No. 18-00455

Monitoring Point ID P-163 Labeled 822157

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 176 Feet (estimate)

Static water level measurement before purging (Start Depth) 158.15 Feet (estimate)

Static water level measurement at time of sampling (Final Depth) 158.15 Feet (estimate)

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump

Pump ID PC-6

Date Purged 4-16-18

Water Column 17.85 Feet

Time Purged 1435-1459

One Casing Volume 2.9 Gallons

Pump Rate 0.4

GPM / LPM

Volume Purged 9.6 Gallons

Field Sampling Data

Date Sampled 4-16-18

Time Sampled 1510

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O. 9.0 (mg/l)

Spec. Cond. 990 (µmhos/cm) Turbidity 55.0 (NTU)

Temp. 7.5 (°C) Eh 80 (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 15-20.

Sample Description: clear + odorless

Observations: DATA 4/16/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1443	7.3	1000	7.5	9.2	NA	75	3.2
1451	7.3	990	7.5	9.1	NA	79	6.4
1459	7.3	990	7.5	9.0	NA	80	9.6

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson

Date: 4/16/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-164 Labeled 822/58

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 166 Feet (estimate)

Static water level measurement before purging (Start Depth) 151.93 Feet (estimate)

Static water level measurement at time of sampling (Final Depth) 151.93 Feet (estimate)

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 4-16-18 Water Column 14.07 Feet

Time Purged 1600-1618 One Casing Volume 2.3 Gallons

Pump Rate 0.4 GPM/LPM Volume Purged 7.2 Gallons

Field Sampling Data

Date Sampled 4-16-18 Time Sampled 1630

Sampling Equip. above pump Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O. 6.9 (mg/l)

Spec. Cond. 550 (µmhos/cm) Turbidity 4.5 (NTU)

Temp. 11.0 (°C) Eh 92 (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° + partly cloudy, wind NW 20

Sample Description: clear + odorless

Observations: DJA 4-16-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1606	7.7	550	11.0	7.1	NA	87	2.4
1612	7.7	550	11.0	6.9	NA	90	4.8
1618	7.6	550	11.0	6.9	NA	92	7.2
<u>DJA 4/16/18</u>							

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: 4/16/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

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

Monitoring Point ID P-165 Labeled 822159

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 40.32 Feet

Static water level measurement before purging (Start Depth) 31.87 Feet

Static water level measurement at time of sampling (Final Depth) 31.87 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Grundfos Pump ID PC-6

Date Purged 4-17-18 Water Column 8.45 Feet

Time Purged 1135-1156 One Casing Volume 1.4 Gallons

Pump Rate 0.2 GPM / LPM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 4-17-18

Time Sampled 1205

Sampling Equip. above pump

Meter ID mps-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.5 (units) D.O. 8.9 (mg/l)

Spec. Cond. 510 (µmhos/cm) Turbidity 14.5 (NTU)

Temp. 12.5 (°C) Eh 93 (mV)

Other NA

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

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

Weather Conditions During Sampling: 29° + sunny, wind N10

Sample Description: clear & odorless

Observations: Bladder pump not working, used Grundfos.
DJA 4/17/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1142	7.5	510	12.0	9.1	NA	99	1.4
1149	7.5	510	12.0	8.9	NA	95	2.8
1156	7.5	510	12.5	8.9	NA	93	4.2
<u>DJA 4-17-18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 07/25/2018

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

Lead Technician Signature: David Anderson

Date: 4-17-18



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

27 July 2018

Charles A Donkers

Environmental Services-Water Minneapolis

250 Marquette Plaza

Minneapolis, MN 55401

RE: Sherco Pond 3 CCR

cc:

Enclosed are the results of analyses for samples received by the laboratory on 04/19/2018 06:00. 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

Environmental Services-Water Minneapolis
 250 Marquette Plaza
 Minneapolis MN, 55401

Project Name/Location: Sherco Pond 3 CCR

Project Manager: Charles A Donkers

Reported:

07/27/2018 13:09

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
P-162		MDD0177-01	Water	04/16/2018 14:10	04/19/2018 6:00
P-163		MDD0177-02	Water	04/16/2018 15:10	04/19/2018 6:00
P-164		MDD0177-03	Water	04/16/2018 16:30	04/19/2018 6:00
P-131		MDD0177-04	Water	04/16/2018 17:50	04/19/2018 6:00
P-165		MDD0177-05	Water	04/17/2018 12:05	04/19/2018 6:00
P-132		MDD0177-06	Water	04/17/2018 9:45	04/19/2018 6:00
P-154a		MDD0177-07	Water	04/17/2018 11:00	04/19/2018 6:00
P-150		MDD0177-08	Water	04/17/2018 13:15	04/19/2018 6:00
P-151		MDD0177-09	Water	04/17/2018 15:00	04/19/2018 6:00
P-153		MDD0177-10	Water	04/17/2018 15:50	04/19/2018 6:00
P-130		MDD0177-11	Water	04/17/2018 17:00	04/19/2018 6:00
P-152a		MDD0177-13	Water	04/18/2018 8:40	04/19/2018 6:00

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

P-162

MDD0177-01 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	23.5	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 11:44	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 11:44	EPA 300.0	CRL
Sulfate	79.0	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 11:44	EPA 300.0	CRL

Wet Chemistry

pH	7.80		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 9:39	SM 4500-H+ B	CRL
Total Dissolved Solids	520	20.0	mg/L		1	BDD0374	4/19/18 9:30	4/19/18 9:30	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0373	4/19/18 7:49	4/19/18 7:49	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.577	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Barium	57.1	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Chromium	4.18	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Molybdenum	3.87	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Selenium	3.37	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:14	EPA 200.8	CRL

Total Metals by ICP

Boron	0.168	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:47	EPA 200.7	HRD
Calcium	98.8	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:45	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:45	EPA 200.7	HRD

Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

P-162

MDD0177-01 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:17	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

P-163

MDD0177-02 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	11.6	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:04	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:04	EPA 300.0	CRL
Sulfate	166	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:04	EPA 300.0	CRL

Wet Chemistry

pH	7.75		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 9:42	SM 4500-H+ B	CRL
Total Dissolved Solids	656	20.0	mg/L		1	BDD0374	4/19/18 9:30	4/19/18 9:30	SM 2540C	HSD
Total Suspended Solids	46.4	4.00	mg/L		1	BDD0373	4/19/18 7:49	4/19/18 7:49	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.967	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Barium	110	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Cobalt	1.13	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Chromium	32.5	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Molybdenum	1.94	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Lead	0.535	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Selenium	32.3	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:18	EPA 200.8	CRL

Total Metals by ICP

Boron	0.408	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:51	EPA 200.7	HRD
Calcium	145	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:50	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:50	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

P-163

MDD0177-02 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:18	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

P-164

MDD0177-03 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	8.33	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:24	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:24	EPA 300.0	CRL
Sulfate	31.4	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:24	EPA 300.0	CRL

Wet Chemistry

pH	8.04		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 9:46	SM 4500-H+ B	CRL
Total Dissolved Solids	302	20.0	mg/L		1	BDD0374	4/19/18 9:30	4/19/18 9:30	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0373	4/19/18 7:49	4/19/18 7:49	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Barium	42.3	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Chromium	4.01	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Selenium	1.13	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:22	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:57	EPA 200.7	HRD
Calcium	76.3	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:55	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 12:55	EPA 200.7	HRD

Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

P-164

MDD0177-03 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:20	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

P-131

MDD0177-04 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	19.4	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:45	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:45	EPA 300.0	CRL
Sulfate	28.6	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 12:45	EPA 300.0	CRL

Wet Chemistry

pH	7.93		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 9:54	SM 4500-H+ B	CRL
Total Dissolved Solids	326	20.0	mg/L		1	BDD0374	4/19/18 9:30	4/19/18 9:30	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0373	4/19/18 7:49	4/19/18 7:49	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.585	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Barium	79.3	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Chromium	0.740	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:26	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:02	EPA 200.7	HRD
Calcium	75.8	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:00	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:00	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

P-131

MDD0177-04 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:22	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

P-165

MDD0177-05 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	3.84	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:05	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:05	EPA 300.0	CRL
Sulfate	24.4	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:05	EPA 300.0	CRL

Wet Chemistry

pH	7.94		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 9:57	SM 4500-H+ B	CRL
Total Dissolved Solids	270	20.0	mg/L		1	BDD0374	4/19/18 9:30	4/19/18 9:30	SM 2540C	HSD
Total Suspended Solids	7.20	4.00	mg/L		1	BDD0373	4/19/18 7:49	4/19/18 7:49	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Barium	39.0	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Cobalt	0.640	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Chromium	4.77	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Selenium	0.679	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:29	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:07	EPA 200.7	HRD
Calcium	69.9	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:05	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:05	EPA 200.7	HRD

Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-05 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:23	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDD0177-06 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	2.84	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:26	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:26	EPA 300.0	CRL
Sulfate	58.7	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:26	EPA 300.0	CRL

Wet Chemistry

pH	7.77		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 10:04	SM 4500-H+ B	CRL
Total Dissolved Solids	414	20.0	mg/L		1	BDD0374	4/19/18 9:30	4/19/18 9:30	SM 2540C	HSD
Total Suspended Solids	4.00	4.00	mg/L		1	BDD0373	4/19/18 7:49	4/19/18 7:49	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Barium	46.2	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Chromium	3.68	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Selenium	0.870	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:33	EPA 200.8	CRL

Total Metals by ICP

Boron	0.0609	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:12	EPA 200.7	HRD
Calcium	96.8	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:10	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:10	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-06 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:25	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

P-154a

MDD0177-07 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	23.5	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:46	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:46	EPA 300.0	CRL
Sulfate	40.3	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 13:46	EPA 300.0	CRL

Wet Chemistry

pH	8.02		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 10:08	SM 4500-H+ B	CRL
Total Dissolved Solids	332	20.0	mg/L		1	BDD0374	4/19/18 9:30	4/19/18 9:30	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0373	4/19/18 7:49	4/19/18 7:49	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	1.12	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Barium	54.3	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Chromium	0.668	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Molybdenum	0.722	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:37	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:17	EPA 200.7	HRD
Calcium	72.6	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:15	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:15	EPA 200.7	HRD

Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-07 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:27	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-08 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	50.1	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:06	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:06	EPA 300.0	CRL
Sulfate	4.29	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:06	EPA 300.0	CRL

Wet Chemistry

pH	7.99		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 10:12	SM 4500-H+ B	CRL
Total Dissolved Solids	242	20.0	mg/L		1	BDD0406	4/20/18 9:00	4/20/18 9:00	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0405	4/20/18 7:00	4/20/18 7:00	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.555	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Barium	49.7	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Chromium	0.653	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:49	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:32	EPA 200.7	HRD
Calcium	51.0	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:31	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:31	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-08 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:28	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDD0177-09 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	12.2	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:27	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:27	EPA 300.0	CRL
Sulfate	14.3	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:27	EPA 300.0	CRL

Wet Chemistry

pH	8.08		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 10:15	SM 4500-H+ B	CRL
Total Dissolved Solids	200	20.0	mg/L		1	BDD0406	4/20/18 9:00	4/20/18 9:00	SM 2540C	HSD
Total Suspended Solids	20.0	4.00	mg/L		1	BDD0405	4/20/18 7:00	4/20/18 7:00	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.598	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Barium	45.2	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Cobalt	2.06	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Chromium	1.80	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Lead	0.845	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:53	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:37	EPA 200.7	HRD
Calcium	49.7	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:35	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:35	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-09 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:30	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-10 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:47	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:47	EPA 300.0	CRL
Sulfate	2.73	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 14:47	EPA 300.0	CRL

Wet Chemistry

pH	8.23		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 10:18	SM 4500-H+ B	CRL
Total Dissolved Solids	104	20.0	mg/L		1	BDD0406	4/20/18 9:00	4/20/18 9:00	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0405	4/20/18 7:00	4/20/18 7:00	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.920	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Barium	15.6	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Chromium	0.958	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Molybdenum	0.542	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 10:57	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:42	EPA 200.7	HRD
Calcium	25.2	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:40	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:40	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-10 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:35	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

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MDD0177-11 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 16:50	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 16:50	EPA 300.0	CRL
Sulfate	11.1	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 16:50	EPA 300.0	CRL

Wet Chemistry

pH	7.57		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 10:34	SM 4500-H+ B	CRL
Total Dissolved Solids	476	20.0	mg/L		1	BDD0406	4/20/18 9:00	4/20/18 9:00	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0405	4/20/18 7:00	4/20/18 7:00	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Barium	104	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Chromium	1.29	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:01	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:47	EPA 200.7	HRD
Calcium	124	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:45	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:45	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

P-130

MDD0177-11 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:37	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

P-152a

MDD0177-13 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 17:31	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 17:31	EPA 300.0	CRL
Sulfate	6.12	1.00	mg/L		1	BDD0375	4/19/18 8:04	4/19/18 17:31	EPA 300.0	CRL

Wet Chemistry

pH	7.95		pH Units	M_TTT	1	BDD0376	4/19/18 8:09	4/19/18 10:41	SM 4500-H+ B	CRL
Total Dissolved Solids	222	20.0	mg/L		1	BDD0406	4/20/18 9:00	4/20/18 9:00	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDD0405	4/20/18 7:00	4/20/18 7:00	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Barium	38.6	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Beryllium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Cadmium	< 0.100	0.100	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Cobalt	0.621	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Chromium	0.672	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Antimony	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL
Thallium	< 0.500	0.500	ug/L		1	BDD0438	4/23/18 9:23	4/24/18 11:09	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:57	EPA 200.7	HRD
Calcium	55.6	0.500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:55	EPA 200.7	HRD
Lithium	< 0.0500	0.0500	mg/L		1	BDD0437	4/23/18 9:19	4/25/18 13:55	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

P-152a

MDD0177-13 (Water) - Chain of Custody Number: 2201222/2201225

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Mercury

Mercury	< 0.200	0.200	ug/L		1	BDE0115	5/7/18 9:13	5/7/18 14:40	EPA 245.1, 7470A	HRD
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Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0375 - Wet Prep

Blank (BDD0375-BLK1)				Prepared & Analyzed: 04/19/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

Blank (BDD0375-BLK2)				Prepared & Analyzed: 04/19/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

LCS (BDD0375-BS1)				Prepared & Analyzed: 04/19/2018						
Chloride	22.9	1.00	mg/L	25.000		91.7	90-110			
Fluoride	4.85	0.750	mg/L	5.0000		96.9	90-110			
Sulfate	95.9	1.00	mg/L	100.00		95.9	90-110			

LCS (BDD0375-BS2)				Prepared & Analyzed: 04/19/2018						
Chloride	22.8	1.00	mg/L	25.000		91.2	90-110			
Fluoride	4.60	0.750	mg/L	5.0000		92.0	90-110			
Sulfate	94.7	1.00	mg/L	100.00		94.7	90-110			

LCS (BDD0375-BS3)				Prepared & Analyzed: 04/19/2018						
Chloride	23.7	1.00	mg/L	25.000		94.9	90-110			
Fluoride	4.53	0.750	mg/L	5.0000		90.6	90-110			
Sulfate	95.2	1.00	mg/L	100.00		95.2	90-110			

Duplicate (BDD0375-DUP1)				Source: MDD0177-10		Prepared & Analyzed: 04/19/2018				
Chloride	0.478	1.00	mg/L		0.491			2.68	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	2.74	1.00	mg/L		2.73			0.293	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0375 - Wet Prep

Duplicate (BDD0375-DUP2)	Source: MDD0177-13			Prepared & Analyzed: 04/19/2018						
Chloride	0.800	1.00	mg/L		0.783			2.15	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	6.08	1.00	mg/L		6.12			0.656	20	

Matrix Spike (BDD0375-MS1)	Source: MDD0177-10			Prepared & Analyzed: 04/19/2018						
Chloride	11.6	1.00	mg/L	12.500	0.491	88.8	80-120			
Fluoride	2.39	0.750	mg/L	2.5000	<0.750	95.4	80-120			
Sulfate	50.2	1.00	mg/L	50.000	2.73	94.9	80-120			

Matrix Spike (BDD0375-MS2)	Source: MDD0177-13			Prepared & Analyzed: 04/19/2018						
Chloride	11.7	1.00	mg/L	12.500	0.783	87.6	80-120			
Fluoride	2.25	0.750	mg/L	2.5000	<0.750	90.2	80-120			
Sulfate	52.6	1.00	mg/L	50.000	6.12	92.9	80-120			

Matrix Spike Dup (BDD0375-MSD1)	Source: MDD0177-10			Prepared & Analyzed: 04/19/2018						
Chloride	11.6	1.00	mg/L	12.500	0.491	89.0	80-120	0.276	20	
Fluoride	2.40	0.750	mg/L	2.5000	<0.750	95.8	80-120	0.376	20	
Sulfate	50.2	1.00	mg/L	50.000	2.73	94.9	80-120	0.0618	20	

Matrix Spike Dup (BDD0375-MSD2)	Source: MDD0177-13			Prepared & Analyzed: 04/19/2018						
Chloride	11.9	1.00	mg/L	12.500	0.783	89.0	80-120	1.40	20	
Fluoride	2.31	0.750	mg/L	2.5000	<0.750	92.2	80-120	2.28	20	
Sulfate	53.7	1.00	mg/L	50.000	6.12	95.2	80-120	2.12	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0373 - Wet Prep

Blank (BDD0373-BLK1)	Prepared & Analyzed: 04/19/2018									
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDD0373-DUP1)	Source: MDD0177-01 Prepared & Analyzed: 04/19/2018									
Total Suspended Solids	<4.00	4.00	mg/L		0.400				20	

Batch BDD0374 - Wet Prep

Blank (BDD0374-BLK1)	Prepared & Analyzed: 04/19/2018									
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDD0374-DUP1)	Source: MDD0177-01 Prepared & Analyzed: 04/19/2018									
Total Dissolved Solids	506	20.0	mg/L		520			2.73	20	

Batch BDD0376 - Wet Prep

LCS (BDD0376-BS1)	Prepared & Analyzed: 04/19/2018									
pH	7.16		pH Units	7.0000		102	90-110			
Duplicate (BDD0376-DUP1)	Source: MDD0177-01 Prepared & Analyzed: 04/19/2018									
pH	7.74		pH Units	7.80				0.772	20	
Duplicate (BDD0376-DUP2)	Source: MDD0177-11 Prepared & Analyzed: 04/19/2018									
pH	7.54		pH Units	7.57				0.397	20	

Batch BDD0405 - Wet Prep

Blank (BDD0405-BLK1)	Prepared & Analyzed: 04/20/2018									
Total Suspended Solids	<4.00	4.00	mg/L							

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0405 - Wet Prep

Duplicate (BDD0405-DUP1)	Source: MDD0177-08		Prepared & Analyzed: 04/20/2018							
Total Suspended Solids	0.800	4.00	mg/L		0.400			66.7	20	M_D-RL

Batch BDD0406 - Wet Prep

Blank (BDD0406-BLK1)			Prepared & Analyzed: 04/20/2018							
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDD0406-DUP1)	Source: MDD0177-08		Prepared & Analyzed: 04/20/2018							
Total Dissolved Solids	258	20.0	mg/L		242			6.40	20	

Batch BDD0433 - Wet Prep

Blank (BDD0433-BLK1)			Prepared & Analyzed: 04/23/2018							
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDD0433-DUP1)	Source: MDD0177-18		Prepared & Analyzed: 04/23/2018							
Total Suspended Solids	0.400	4.00	mg/L		<4.00				20	

Batch BDD0434 - Wet Prep

Blank (BDD0434-BLK1)			Prepared & Analyzed: 04/23/2018							
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDD0434-DUP1)	Source: MDD0177-18		Prepared & Analyzed: 04/23/2018							
Total Dissolved Solids	580	20.0	mg/L		580			0.00	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0438 - EPA 200.2, EPA 3005

Blank (BDD0438-BLK1)

Prepared: 04/23/2018 Analyzed: 04/24/2018

Beryllium	<0.500	0.500	ug/L
Selenium	<0.500	0.500	ug/L
Molybdenum	<0.500	0.500	ug/L
Cobalt	<0.500	0.500	ug/L
Cadmium	<0.100	0.100	ug/L
Chromium	<0.500	0.500	ug/L
Arsenic	<0.500	0.500	ug/L
Thallium	<0.500	0.500	ug/L
Barium	<0.500	0.500	ug/L
Antimony	<0.500	0.500	ug/L
Lead	<0.500	0.500	ug/L

Blank (BDD0438-BLK2)

Prepared: 04/23/2018 Analyzed: 04/24/2018

Lead	<0.500	0.500	ug/L
Thallium	<0.500	0.500	ug/L
Cobalt	<0.500	0.500	ug/L
Cadmium	<0.100	0.100	ug/L
Selenium	<0.500	0.500	ug/L
Barium	<0.500	0.500	ug/L
Chromium	<0.500	0.500	ug/L
Arsenic	<0.500	0.500	ug/L
Beryllium	<0.500	0.500	ug/L
Antimony	<0.500	0.500	ug/L
Molybdenum	<0.500	0.500	ug/L

LCS (BDD0438-BS1)

Prepared: 04/23/2018 Analyzed: 04/24/2018

Arsenic	97.4	0.500	ug/L	100.00	97.4	85-115
Thallium	98.3	0.500	ug/L	100.00	98.3	85-115
Selenium	97.9	0.500	ug/L	100.00	97.9	85-115
Beryllium	94.1	0.500	ug/L	100.00	94.1	85-115
Barium	97.9	0.500	ug/L	100.00	97.9	85-115
Lead	97.9	0.500	ug/L	100.00	97.9	85-115
Chromium	101	0.500	ug/L	100.00	101	85-115
Cobalt	99.3	0.500	ug/L	100.00	99.3	85-115
Cadmium	101	0.100	ug/L	100.00	101	85-115
Antimony	98.5	0.500	ug/L	100.00	98.5	85-115
Molybdenum	97.2	0.500	ug/L	100.00	97.2	85-115

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0438 - EPA 200.2, EPA 3005

LCS (BDD0438-BS2)

Prepared: 04/23/2018 Analyzed: 04/24/2018

Lead	104	0.500	ug/L	100.00		104	85-115			
Barium	104	0.500	ug/L	100.00		104	85-115			
Beryllium	101	0.500	ug/L	100.00		101	85-115			
Arsenic	100	0.500	ug/L	100.00		100	85-115			
Selenium	96.9	0.500	ug/L	100.00		96.9	85-115			
Cadmium	99.6	0.100	ug/L	100.00		99.6	85-115			
Antimony	104	0.500	ug/L	100.00		104	85-115			
Molybdenum	103	0.500	ug/L	100.00		103	85-115			
Thallium	104	0.500	ug/L	100.00		104	85-115			
Chromium	98.8	0.500	ug/L	100.00		98.8	85-115			
Cobalt	97.9	0.500	ug/L	100.00		97.9	85-115			

Duplicate (BDD0438-DUP1)

Source: MDD0177-04

Prepared: 04/23/2018 Analyzed: 04/24/2018

Molybdenum	0.277	0.500	ug/L		0.195			34.9	20	M_D-RL
Cobalt	0.0541	0.500	ug/L		0.0444			19.6	20	
Barium	77.7	0.500	ug/L		79.3			2.01	20	
Antimony	0.0736	0.500	ug/L		<0.500				20	
Cadmium	<0.100	0.100	ug/L		<0.100				20	
Arsenic	0.630	0.500	ug/L		0.585			7.34	20	
Selenium	0.292	0.500	ug/L		0.314			7.24	20	
Beryllium	0.144	0.500	ug/L		<0.500				20	
Chromium	0.783	0.500	ug/L		0.740			5.63	20	
Thallium	0.0755	0.500	ug/L		<0.500				20	
Lead	0.0715	0.500	ug/L		0.0324			75.3	20	M_D-RL

Duplicate (BDD0438-DUP2)

Source: MDD0177-05

Prepared: 04/23/2018 Analyzed: 04/24/2018

Arsenic	0.502	0.500	ug/L		0.497			0.876	20	
Barium	39.3	0.500	ug/L		39.0			0.688	20	
Beryllium	0.0229	0.500	ug/L		0.0254			10.1	20	
Thallium	<0.500	0.500	ug/L		<0.500				20	
Cadmium	<0.100	0.100	ug/L		<0.100				20	
Cobalt	0.548	0.500	ug/L		0.640			15.5	20	
Chromium	4.71	0.500	ug/L		4.77			1.30	20	
Molybdenum	0.417	0.500	ug/L		0.436			4.46	20	
Lead	0.257	0.500	ug/L		0.255			0.778	20	
Selenium	0.629	0.500	ug/L		0.679			7.65	20	
Antimony	0.0547	0.500	ug/L		0.0338			47.2	20	M_D-RL

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0438 - EPA 200.2, EPA 3005

Duplicate (BDD0438-DUP3)		Source: MDD0177-06		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Arsenic	0.396	0.500	ug/L		0.385			2.65	20	
Cadmium	<0.100	0.100	ug/L		<0.100				20	
Barium	46.7	0.500	ug/L		46.2			1.04	20	
Cobalt	0.214	0.500	ug/L		0.201			6.07	20	
Selenium	0.842	0.500	ug/L		0.870			3.26	20	
Thallium	<0.500	0.500	ug/L		<0.500				20	
Chromium	3.86	0.500	ug/L		3.68			4.89	20	
Beryllium	<0.500	0.500	ug/L		0.00572				20	
Lead	0.0851	0.500	ug/L		0.0876			2.96	20	
Antimony	<0.500	0.500	ug/L		<0.500				20	
Molybdenum	0.379	0.500	ug/L		0.384			1.40	20	

Matrix Spike (BDD0438-MS1)		Source: MDD0177-04		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Arsenic	105	0.500	ug/L	100.00	0.585	105	70-130			
Thallium	99.7	0.500	ug/L	100.00	<0.500	99.7	70-130			
Selenium	99.9	0.500	ug/L	100.00	0.314	99.6	70-130			
Lead	97.5	0.500	ug/L	100.00	0.0324	97.4	70-130			
Chromium	106	0.500	ug/L	100.00	0.740	105	70-130			
Beryllium	105	0.500	ug/L	100.00	<0.500	105	70-130			
Molybdenum	104	0.500	ug/L	100.00	0.195	104	70-130			
Cobalt	103	0.500	ug/L	100.00	0.0444	103	70-130			
Barium	185	0.500	ug/L	100.00	79.3	106	70-130			
Antimony	105	0.500	ug/L	100.00	<0.500	105	70-130			
Cadmium	102	0.100	ug/L	100.00	<0.100	102	70-130			

Matrix Spike (BDD0438-MS2)		Source: MDD0177-05		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Arsenic	103	0.500	ug/L	100.00	0.497	103	70-130			
Beryllium	101	0.500	ug/L	100.00	0.0254	101	70-130			
Antimony	105	0.500	ug/L	100.00	0.0338	105	70-130			
Cadmium	102	0.100	ug/L	100.00	<0.100	102	70-130			
Cobalt	103	0.500	ug/L	100.00	0.640	102	70-130			
Molybdenum	102	0.500	ug/L	100.00	0.436	102	70-130			
Chromium	109	0.500	ug/L	100.00	4.77	104	70-130			
Barium	145	0.500	ug/L	100.00	39.0	106	70-130			
Lead	97.7	0.500	ug/L	100.00	0.255	97.5	70-130			
Selenium	100	0.500	ug/L	100.00	0.679	99.8	70-130			
Thallium	100	0.500	ug/L	100.00	<0.500	100	70-130			

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0438 - EPA 200.2, EPA 3005

Matrix Spike (BDD0438-MS3)		Source: MDD0177-06		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Chromium	105	0.500	ug/L	100.00	3.68	102	70-130			
Beryllium	99.2	0.500	ug/L	100.00	0.00572	99.2	70-130			
Lead	93.2	0.500	ug/L	100.00	0.0876	93.1	70-130			
Selenium	101	0.500	ug/L	100.00	0.870	99.7	70-130			
Cadmium	101	0.100	ug/L	100.00	<0.100	101	70-130			
Molybdenum	101	0.500	ug/L	100.00	0.384	101	70-130			
Barium	149	0.500	ug/L	100.00	46.2	103	70-130			
Antimony	101	0.500	ug/L	100.00	<0.500	101	70-130			
Thallium	96.4	0.500	ug/L	100.00	<0.500	96.4	70-130			
Cobalt	99.7	0.500	ug/L	100.00	0.201	99.5	70-130			
Arsenic	103	0.500	ug/L	100.00	0.385	103	70-130			

Matrix Spike Dup (BDD0438-MSD1)		Source: MDD0177-04		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Chromium	103	0.500	ug/L	100.00	0.740	103	70-130	2.18	20	
Antimony	104	0.500	ug/L	100.00	<0.500	104	70-130	0.695	20	
Arsenic	106	0.500	ug/L	100.00	0.585	105	70-130	0.556	20	
Beryllium	102	0.500	ug/L	100.00	<0.500	102	70-130	2.70	20	
Molybdenum	104	0.500	ug/L	100.00	0.195	104	70-130	0.518	20	
Cobalt	101	0.500	ug/L	100.00	0.0444	101	70-130	2.11	20	
Cadmium	101	0.100	ug/L	100.00	<0.100	101	70-130	1.18	20	
Lead	97.6	0.500	ug/L	100.00	0.0324	97.5	70-130	0.0785	20	
Selenium	99.0	0.500	ug/L	100.00	0.314	98.6	70-130	0.997	20	
Thallium	99.2	0.500	ug/L	100.00	<0.500	99.2	70-130	0.520	20	
Barium	184	0.500	ug/L	100.00	79.3	105	70-130	0.478	20	

Matrix Spike Dup (BDD0438-MSD2)		Source: MDD0177-05		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Molybdenum	106	0.500	ug/L	100.00	0.436	106	70-130	4.02	20	
Antimony	107	0.500	ug/L	100.00	0.0338	107	70-130	1.52	20	
Cadmium	100	0.100	ug/L	100.00	<0.100	100	70-130	1.42	20	
Beryllium	104	0.500	ug/L	100.00	0.0254	104	70-130	2.77	20	
Selenium	101	0.500	ug/L	100.00	0.679	100	70-130	0.652	20	
Barium	148	0.500	ug/L	100.00	39.0	109	70-130	2.08	20	
Arsenic	108	0.500	ug/L	100.00	0.497	107	70-130	3.89	20	
Thallium	103	0.500	ug/L	100.00	<0.500	103	70-130	2.75	20	
Lead	101	0.500	ug/L	100.00	0.255	101	70-130	3.64	20	
Cobalt	103	0.500	ug/L	100.00	0.640	103	70-130	0.377	20	
Chromium	109	0.500	ug/L	100.00	4.77	104	70-130	0.238	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0438 - EPA 200.2, EPA 3005

Matrix Spike Dup (BDD0438-MSD3)		Source: MDD0177-06		Prepared: 04/23/2018 Analyzed: 04/24/2018						
Thallium	98.1	0.500	ug/L	100.00	<0.500	98.1	70-130	1.72	20	
Cadmium	104	0.100	ug/L	100.00	<0.100	104	70-130	2.72	20	
Molybdenum	103	0.500	ug/L	100.00	0.384	103	70-130	1.87	20	
Beryllium	102	0.500	ug/L	100.00	0.00572	102	70-130	3.07	20	
Selenium	101	0.500	ug/L	100.00	0.870	99.6	70-130	0.0309	20	
Antimony	104	0.500	ug/L	100.00	<0.500	104	70-130	2.83	20	
Cobalt	103	0.500	ug/L	100.00	0.201	102	70-130	2.81	20	
Arsenic	106	0.500	ug/L	100.00	0.385	106	70-130	2.78	20	
Chromium	109	0.500	ug/L	100.00	3.68	105	70-130	3.35	20	
Lead	95.3	0.500	ug/L	100.00	0.0876	95.2	70-130	2.21	20	
Barium	152	0.500	ug/L	100.00	46.2	106	70-130	2.08	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0437 - EPA 200.2, EPA 3005

Blank (BDD0437-BLK1)				Prepared: 04/23/2018 Analyzed: 04/25/2018						
Lithium	<0.0500	0.0500	mg/L							
Boron	<0.0500	0.0500	mg/L							
Calcium	<0.500	0.500	mg/L							

Blank (BDD0437-BLK2)				Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	<0.0500	0.0500	mg/L							
Calcium	<0.500	0.500	mg/L							
Lithium	<0.0500	0.0500	mg/L							

LCS (BDD0437-BS1)				Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	1.01	0.0500	mg/L	1.0000		101	85-115			
Calcium	104	0.500	mg/L	100.00		104	85-115			
Lithium	1.00	0.0500	mg/L	1.0000		100	85-115			

LCS (BDD0437-BS2)				Prepared: 04/23/2018 Analyzed: 04/25/2018						
Calcium	101	0.500	mg/L	100.00		101	85-115			
Boron	0.976	0.0500	mg/L	1.0000		97.6	85-115			
Lithium	0.977	0.0500	mg/L	1.0000		97.7	85-115			

Duplicate (BDD0437-DUP1)				Source: MDD0177-01		Prepared: 04/23/2018 Analyzed: 04/25/2018				
Boron	0.170	0.0500	mg/L		0.168			1.16	20	
Calcium	98.5	0.500	mg/L		98.8			0.371	20	
Lithium	<0.0500	0.0500	mg/L		<0.0500				20	

Duplicate (BDD0437-DUP2)				Source: MDD0177-02		Prepared: 04/23/2018 Analyzed: 04/25/2018				
Calcium	144	0.500	mg/L		145			0.827	20	
Boron	0.403	0.0500	mg/L		0.408			1.12	20	
Lithium	<0.0500	0.0500	mg/L		<0.0500				20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		07/27/2018 13:09
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0437 - EPA 200.2, EPA 3005

Duplicate (BDD0437-DUP3)		Source: MDD0177-03		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Lithium	<0.0500	0.0500	mg/L		<0.0500				20	
Calcium	76.5	0.500	mg/L		76.3			0.331	20	
Boron	0.0360	0.0500	mg/L		0.0381			5.53	20	
Matrix Spike (BDD0437-MS1)		Source: MDD0177-01		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	1.20	0.0500	mg/L	1.0000	0.168	103	70-130			
Calcium	207	0.500	mg/L	100.00	98.8	109	70-130			
Lithium	1.01	0.0500	mg/L	1.0000	<0.0500	101	75-125			
Matrix Spike (BDD0437-MS2)		Source: MDD0177-02		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Calcium	254	0.500	mg/L	100.00	145	108	70-130			
Lithium	0.993	0.0500	mg/L	1.0000	<0.0500	99.3	75-125			
Boron	1.44	0.0500	mg/L	1.0000	0.408	104	70-130			
Matrix Spike (BDD0437-MS3)		Source: MDD0177-03		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Lithium	0.971	0.0500	mg/L	1.0000	<0.0500	97.1	75-125			
Boron	1.04	0.0500	mg/L	1.0000	0.0381	100	70-130			
Calcium	175	0.500	mg/L	100.00	76.3	99.2	70-130			
Matrix Spike Dup (BDD0437-MSD1)		Source: MDD0177-01		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Boron	1.19	0.0500	mg/L	1.0000	0.168	103	70-130	0.624	20	
Lithium	0.996	0.0500	mg/L	1.0000	<0.0500	99.6	75-125	1.10	20	
Calcium	204	0.500	mg/L	100.00	98.8	106	70-130	1.46	20	
Matrix Spike Dup (BDD0437-MSD2)		Source: MDD0177-02		Prepared: 04/23/2018 Analyzed: 04/25/2018						
Calcium	246	0.500	mg/L	100.00	145	100	70-130	3.22	20	
Lithium	0.967	0.0500	mg/L	1.0000	<0.0500	96.7	75-125	2.67	20	
Boron	1.43	0.0500	mg/L	1.0000	0.408	102	70-130	1.13	20	

Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDD0437 - EPA 200.2, EPA 3005

Matrix Spike Dup (BDD0437-MSD3)	Source: MDD0177-03			Prepared: 04/23/2018 Analyzed: 04/25/2018						
Lithium	0.967	0.0500	mg/L	1.0000	<0.0500	96.7	75-125	0.427	20	
Calcium	174	0.500	mg/L	100.00	76.3	98.2	70-130	0.558	20	
Boron	1.03	0.0500	mg/L	1.0000	0.0381	99.3	70-130	1.17	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	07/27/2018 13:09

Mercury - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDE0115 - EPA 245.1, EPA 7470A

Blank (BDE0115-BLK1)				Prepared & Analyzed: 05/07/2018						
Mercury	<0.200	0.200	ug/L							
LCS (BDE0115-BS1)				Prepared & Analyzed: 05/07/2018						
Mercury	2.63	0.200	ug/L	3.0000		87.5	85-115			
Duplicate (BDE0115-DUP1)				Source: MDD0177-07		Prepared & Analyzed: 05/07/2018				
Mercury	<0.200	0.200	ug/L		<0.200			20		
Duplicate (BDE0115-DUP2)				Source: MDD0177-08		Prepared & Analyzed: 05/07/2018				
Mercury	<0.200	0.200	ug/L		<0.200			20		
Matrix Spike (BDE0115-MS1)				Source: MDD0177-07		Prepared & Analyzed: 05/07/2018				
Mercury	2.60	0.200	ug/L	3.0000	<0.200	86.5	70-130			
Matrix Spike (BDE0115-MS2)				Source: MDD0177-08		Prepared & Analyzed: 05/07/2018				
Mercury	2.50	0.200	ug/L	3.0000	<0.200	83.2	70-130			
Matrix Spike Dup (BDE0115-MSD1)				Source: MDD0177-07		Prepared & Analyzed: 05/07/2018				
Mercury	2.56	0.200	ug/L	3.0000	<0.200	85.4	70-130	1.24	20	
Matrix Spike Dup (BDE0115-MSD2)				Source: MDD0177-08		Prepared & Analyzed: 05/07/2018				
Mercury	2.60	0.200	ug/L	3.0000	<0.200	86.7	70-130	4.07	20	

Environmental Services-Water Minneapolis
250 Marquette Plaza
Minneapolis MN, 55401

Project Name/Location: Sherco Pond 3 CCR

Project Manager: Charles A Donkers

Reported:

07/27/2018 13:09

Qualifiers and Definitions

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



CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company: Xcel Energy
 Address: Environmental services
 m-p-7
 Email To:
 Phone:
 Fax:
 Requested Due Date/TAT:

Section B Required Project Information:

Report To: Chuck Denkers
 Copy To:
 Purchase Order No.:
 Project Name: Sherco CCR, April 2018
 Project Number:

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:

Page: 2 of 2

2201222

Section D Required Client Information		Matrix Codes MATRIX / CODE		SAMPLE TYPE (G=GRAB C=COMP)		COLLECTED		SAMPLE TEMP AT COLLECTION		# OF CONTAINERS		Preservatives		Requested Analysis Filtered (Y/N)		Pace Project No./ Lab I.D.			
ITEM #	SAMPLE ID (A-Z, 0-9 / -)	Matrix Codes Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	MATRIX / CODE DW WT WW P SL OL WP AR TS OT	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Y/N	Analysis Test ↑ GW-CCR	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)	
1	P-162		WT	4/18/18	1410					4	112								
2	P-163		WT	4/18/18	1510					4	112								
3	P-164		WT	4/18/18	1630					4	112								
4	P-165 (x) Dissolved		WT	4/17/18	1205					4	112								
5	P-132		WT	4/18/18	0945					4	112								
6	P-154d		WT	4/18/18	1100					4	112								
7	P-150		WT	4/18/18	1315					4	112								
8	P-151		WT	4/18/18	1500					4	112								
9	P-153		WT	4/18/18	1550					4	112								
10	P-130		WT	4/18/18	1700					4	112								
11	P-17		WT	4/18/18	1820					4	112								
12																			
ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION		DATE		TIME		ACCEPTED BY / AFFILIATION		DATE		TIME		SAMPLE CONDITIONS					
1. Sherco III well also, analyzed for GW-A list in the Spring.		David Andersen / Pace		4/18/18		1350		David Andersen		4/18/18		0000		Temp in °C: 2		Received on Ice (Y/N):		Custody Sealed Cooler (Y/N):	
2. Sherco NPDES well also, analyzed for GW-B list in the Spring. Noted next to Item #.																			

PRINT Name of SAMPLER: David Andersen
 SIGNATURE of SAMPLER: David Andersen
 DATE Signed (MM/DD/YYYY): 4-17-18



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
 2201225

Section A Required Client Information: Company: <u>Xcel Energy</u> Address: <u>Environmental Services</u> MP-7 Email To: Phone: Fax: Requested Due Date/TAT:		Section B Required Project Information: Report To: <u>Chuck Donkers</u> Copy To: Purchase Order No.: Project Name: <u>Sherco</u> Project Number: <u>April 2018</u>		Section C Invoice Information: Attention: <u>Steve Davis</u> Company Name: Address: Pace Quote Reference: Pace Project Manager: Pace Profile #:	
Regulatory Agency: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER		Site Location: STATE:		Pace Project No./ Lab I.D.:	

ITEM #	Matrix Codes MATRIX / CODE	SAMPLE ID (A-Z, 0-9 / -)	Matrix Codes DW WT WW P SL OL WP AR TS OT	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Y/N	Requested Analysis Filtered (Y/N)												Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					COMPOSITE START	COMPOSITE END/GRAB																			
1		P-1524		WT		4/18/18 0840		4	Unpreserved																
2		P-158				1000		4	H ₂ SO ₄																
3		P-157				1100		4	HNO ₃																
4		P-23				1230		4	HCl																
5		Duplicate				1230		4	NaOH																
6		P-22				1340		4	Na ₂ S ₂ O ₃																
7									Other																
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
							Received on	Temp in °C	Sealed Cooler	Custody
1 Sherco III well also, analyzed for GW-A list in the spring.	David Anderson / Pace	4/18/18	1350	AD/Xcel	4/18/18	0600	4/18/18	4/18/18		
2 Sherco NPDES well also, analyzed for GW-B list in the spring. Noted next to Item #.	David Anderson									

ORIGINAL
 ptg
 m200308

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

May 15, 2018

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

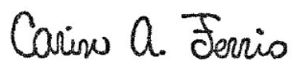
RE: Project: 18-00455,Xcel Energy
Pace Project No.: 30250570

Dear Dave Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 24, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

Method: EPA 903.1

Description: 903.1 Radium 226

Client: Pace-MN Field Services Division

Date: May 15, 2018

General Information:

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

Hold Time:

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

Method Blank:

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

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

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

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

Method: EPA 904.0

Description: 904.0 Radium 228

Client: Pace-MN Field Services Division

Date: May 15, 2018

General Information:

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

Hold Time:

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

Method Blank:

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

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

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

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

Method: Total Radium Calculation

Description: Total Radium 228+226

Client: Pace-MN Field Services Division

Date: May 15, 2018

General Information:

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

Hold Time:

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

Method Blank:

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

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

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

Additional Comments:

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

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

Sample: P-120 **Lab ID: 30250570001** Collected: 04/02/18 12:35 Received: 04/24/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample IDs were not present on the sample containers, collection dates and times match.

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

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

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

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

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

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

Sample: P-117		Lab ID: 30250570005	Collected: 04/02/18 16:50	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-228	EPA 904.0	0.291 ± 0.325 (0.679) C:75% T:84%	pCi/L	05/11/18 14:26	15262-20-1	
Total Radium	Total Radium Calculation	0.463 ± 0.622 (1.21)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-74-1		Lab ID: 30250570006	Collected: 04/02/18 17:40	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.310 ± 0.324 (0.875) C:NA T:83%	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	0.711 ± 0.352 (0.596) C:79% T:85%	pCi/L	05/11/18 14:26	15262-20-1	
Total Radium	Total Radium Calculation	0.711 ± 0.676 (1.47)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-73a-1		Lab ID: 30250570007	Collected: 04/02/18 18:40	Received: 04/24/18 10:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0551 ± 0.252 (0.512)		pCi/L	05/08/18 20:13	13982-63-3	
		C:NA T:93%					
Radium-228	EPA 904.0	0.369 ± 0.282 (0.546)		pCi/L	05/11/18 14:26	15262-20-1	
		C:80% T:89%					
Total Radium	Total Radium Calculation	0.424 ± 0.534 (1.06)		pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-125		Lab ID: 30250570008	Collected: 04/03/18 09:15	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0573 ± 0.262 (0.155) C:NA T:94%	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	0.608 ± 0.377 (0.710) C:81% T:83%	pCi/L	05/11/18 11:57	15262-20-1	
Total Radium	Total Radium Calculation	0.665 ± 0.639 (0.865)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-162		Lab ID: 30250570009	Collected: 04/16/18 14:10	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.183 ± 0.279 (0.449) C:NA T:91%	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	0.379 ± 0.367 (0.757) C:82% T:85%	pCi/L	05/11/18 12:53	15262-20-1	
Total Radium	Total Radium Calculation	0.562 ± 0.646 (1.21)	pCi/L	05/15/18 10:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

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

Sample: P-163		Lab ID: 30250570010	Collected: 04/16/18 15:10	Received: 04/24/18 10:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.193 ± 0.294 (0.174) C:NA T:83%		pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	0.348 ± 0.340 (0.700) C:82% T:83%		pCi/L	05/11/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	0.541 ± 0.634 (0.874)		pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-164		Lab ID: 30250570011	Collected: 04/16/18 16:30	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.554 ± 0.440 (0.572) C:NA T:85%	pCi/L	05/08/18 20:13	13982-63-3	
Radium-228	EPA 904.0	0.235 ± 0.349 (0.753) C:84% T:88%	pCi/L	05/11/18 13:30	15262-20-1	
Total Radium	Total Radium Calculation	0.789 ± 0.789 (1.33)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-131		Lab ID: 30250570012	Collected: 04/16/18 17:50	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.060 ± 0.312 (0.722) C:NA T:86%	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	0.807 ± 0.379 (0.650) C:83% T:89%	pCi/L	05/11/18 11:57	15262-20-1	
Total Radium	Total Radium Calculation	0.807 ± 0.691 (1.37)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-165		Lab ID: 30250570013	Collected: 04/17/18 12:05	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.105 ± 0.291 (0.564) C:NA T:96%	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	0.354 ± 0.372 (0.774) C:79% T:85%	pCi/L	05/11/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	0.459 ± 0.663 (1.34)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-132		Lab ID: 30250570014	Collected: 04/17/18 09:45	Received: 04/24/18 10:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.414 ± 0.388 (0.550) C:NA T:85%		pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	0.291 ± 0.330 (0.694) C:81% T:91%		pCi/L	05/11/18 11:57	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

Sample: P-132		Lab ID: 30250570014	Collected: 04/17/18 09:45	Received: 04/24/18 10:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	0.705 ± 0.718 (1.24)		pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-154a		Lab ID: 30250570015	Collected: 04/17/18 11:00	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.296 ± 0.350 (0.551) C:NA T:88%	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	0.682 ± 0.415 (0.777) C:82% T:81%	pCi/L	05/11/18 15:06	15262-20-1	
Total Radium	Total Radium Calculation	0.978 ± 0.765 (1.33)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-150		Lab ID: 30250570016	Collected: 04/17/18 13:15	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.166 ± 0.325 (0.594) C:NA T:91%	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	0.610 ± 0.456 (0.905) C:79% T:78%	pCi/L	05/11/18 15:07	15262-20-1	
Total Radium	Total Radium Calculation	0.776 ± 0.781 (1.50)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-151		Lab ID: 30250570017	Collected: 04/17/18 15:00	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.281 ± 0.332 (0.522) C:NA T:92%	pCi/L	05/08/18 20:27	13982-63-3	
Radium-228	EPA 904.0	0.165 ± 0.327 (0.720) C:83% T:87%	pCi/L	05/11/18 15:07	15262-20-1	
Total Radium	Total Radium Calculation	0.446 ± 0.659 (1.24)	pCi/L	05/15/18 10:42	7440-14-4	

Sample: P-153		Lab ID: 30250570018	Collected: 04/17/18 15:50	Received: 04/24/18 10:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.375 ± 0.389 (0.580) C:NA T:87%		pCi/L	05/08/18 20:41	13982-63-3	
Radium-228	EPA 904.0	-0.166 ± 0.329 (0.796) C:81% T:85%		pCi/L	05/11/18 15:07	15262-20-1	
Total Radium	Total Radium Calculation	0.375 ± 0.718 (1.38)		pCi/L	05/15/18 10:42	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

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

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

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

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

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

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

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

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

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

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

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

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ANALYTICAL RESULTS - RADIOCHEMISTRY

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

Sample: P-157		Lab ID: 30250570023	Collected: 04/18/18 11:00	Received: 04/24/18 10:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	0.730 ± 0.661 (1.16)		pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-23		Lab ID: 30250570024	Collected: 04/18/18 12:30	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.130 ± 0.296 (0.477) C:NA T:90%	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	0.264 ± 0.368 (0.789) C:80% T:82%	pCi/L	05/11/18 11:15	15262-20-1	
Total Radium	Total Radium Calculation	0.394 ± 0.664 (1.36)	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-22		Lab ID: 30250570025	Collected: 04/18/18 13:40	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.442 (0.904) C:NA T:95%	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	0.00902 ± 0.328 (0.762) C:79% T:78%	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	0.00902 ± 0.770 (1.67)	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-156		Lab ID: 30250570026	Collected: 04/18/18 15:10	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.063 ± 0.410 (0.889) C:NA T:88%	pCi/L	05/08/18 20:56	13982-63-3	
Radium-228	EPA 904.0	-0.00613 ± 0.361 (0.836) C:81% T:79%	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	0.000 ± 0.771 (1.73)	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-01a-1		Lab ID: 30250570027	Collected: 04/18/18 16:40	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.130 ± 0.297 (0.479) C:NA T:86%	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	0.291 ± 0.350 (0.738) C:82% T:77%	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	0.421 ± 0.647 (1.22)	pCi/L	05/15/18 10:56	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

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

Sample: P-155		Lab ID: 30250570028	Collected: 04/18/18 17:40	Received: 04/24/18 10:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.321 ± 0.418 (0.690) C:NA T:92%		pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	0.316 ± 0.393 (0.834) C:82% T:72%		pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	0.637 ± 0.811 (1.52)		pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-134		Lab ID: 30250570029	Collected: 04/19/18 10:15	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0711 ± 0.325 (0.523) C:NA T:81%	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	0.445 ± 0.323 (0.627) C:82% T:84%	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	0.516 ± 0.648 (1.15)	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-141		Lab ID: 30250570030	Collected: 04/19/18 11:10	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.260 ± 0.313 (0.478) C:NA T:83%	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	0.574 ± 0.377 (0.716) C:77% T:81%	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	0.834 ± 0.690 (1.19)	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-138A		Lab ID: 30250570031	Collected: 04/19/18 12:30	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.215 ± 0.329 (0.528) C:NA T:79%	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	0.262 ± 0.302 (0.633) C:79% T:88%	pCi/L	05/11/18 11:16	15262-20-1	
Total Radium	Total Radium Calculation	0.477 ± 0.631 (1.16)	pCi/L	05/15/18 10:56	7440-14-4	

Sample: P-137A		Lab ID: 30250570032	Collected: 04/19/18 14:25	Received: 04/24/18 10:30	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.264 ± 0.319 (0.486) C:NA T:86%	pCi/L	05/08/18 21:09	13982-63-3	
Radium-228	EPA 904.0	0.101 ± 0.309 (0.696) C:82% T:79%	pCi/L	05/11/18 11:17	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

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

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

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

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

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

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

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

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

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 18-00455,Xcel Energy

Pace Project No.: 30250570

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Section A
Required Client Information:

Company: Xcel Energy
Address: 40 PaceMN Field
Email To: _____
Phone: _____ Fax: _____
Requested Due Date/TAT: _____

Section B
Required Project Information:

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

Attention: Eiera Ruikkie
Company Name: PaceMN Field Services
Address: _____
Pace Quote Reference: Tom Halverson
Pace Project Manager: Cath Ferris
Pace Profile #: _____

REGULATORY AGENCY
NPDES ☐ GROUND WATER ☐ DRINKING WATER
UST ☐ RORA ☐ OTHER ☐

Site Location: _____
STATE: _____

Page: 1 of 3
2201227

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Y/N	Requested Analysis Filtered (Y/N)												Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
					COMPOSITE START	COMPOSITE END/GRAB	DATE	TIME			Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

ADDITIONAL COMMENTS

① client needs to analyze for: Radium 226 + 228 pCi/L
combined.

RELINQUISHED BY / AFFILIATION David Anderson **DATE** 4/3/18

ACCEPTED BY / AFFILIATION David Anderson **DATE** 4/3/18

SAMPLE CONDITIONS
Received on _____
Sealed Cooler (Y/N) _____
Custody (Y/N) _____
Temp in °C _____

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: David Anderson
SIGNATURE of SAMPLER: David Anderson **DATE SIGNED** 4/3/18

ORIGINAL
② RA-226 EPA 903.1
RA-228 EPA 904.0

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: <u>Xcel Energy</u>		Report To: <u>David Anderson</u>		Attention: <u>Clara Puikkle</u>	
Address: <u>c/o Pace MNL Field</u>		Copy To:		Company Name: <u>Pace MNL Field Services</u>	
Email To:		Purchase Order No.:		Address:	
Phone:		Project Name: <u>18-00455, Xcel Energy -</u>		Pace Quote Reference: <u>Tom Halverson</u>	
Fax:		Project Number: <u>Shenandoah, April 2018</u>		Pace Project Manager: <u>Carla Fetris</u>	
Requested Due Date/TAT:				Pace Profile #:	

Section C
30 250 570

Section B
Invoice Information:

Section A
Required Client Information:

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

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE DW WT Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test ↑ Y/N	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.	
					COMPOSITE START	COMPOSITE END/GRAB							Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other							
1	P-162		WT			4/1/18	1410				2														PA-226EPA903.1 PA-228EPA904.0		009
2	P-163						1510				2															010	
3	P-164						1630				2															011	
4	P-131						1750				2															012	
5	P-165		WT			4/1/18	1205				2															013	
6	P-132						0945				2															014	
7	P-154						1100				2															015	
8	P-150						1315				2															016	
9	P-151						1500				2															017	
10	P-153						1550				2															018	
11	P-130						1700				2															019	
12	P-17						1820				2															020	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		SAMPLE CONDITIONS	
	DATE	TIME	DATE	TIME	DATE	TIME
① client needs to analyze for:	David Anderson / Pace	4/20/18 1200	Slab 8 - 1st flr	14C 4/20/18 1010	-	2
Radium 226 + 228 pCi/L combined.						

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on	Custody	Samples Inlet
PRINT Name of SAMPLER: <u>David Anderson</u>					
SIGNATURE of SAMPLER: <u>David Anderson</u>					
DATE Signed (MM/DD/YYYY): <u>4-17-18</u>					

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: **3** of **3**

30 250 570

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Xcel Energy	Report To: David Anderson	Attention: Clara Ruikkie	Company Name: Pace MN Field Services		
Address: c/o Pace MN Field	Copy To:	Purchase Order No.:	Address:		
Email To:		Project Name: 18-00455, Xcel Energy -	Pace Quote Reference: Tom Halverson		
Phone:	Fax:	Policy Number: Shoreco CCR, April 2018	Pace Project Manager: Catin Feltis		
Requested Due Date/TAT:			Pace Profile #:		

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

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE TYPE (G=GRAB C=COMP) (see valid codes to left)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test Y/N	Requested Analysis Filtered (Y/N)		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB								
1	P-1524	DW	WT			4/18/18 0846	2	Unpreserved					021
2	P-158	WW				1000	2	H ₂ SO ₄					022
3	P-157	P				1100	2	HCl					023
4	P-23	SL				1230	2	HNO ₃					024
5	P-23	Oil				1340	2	H ₂ SO ₄					025
6	P-156	WP				1510	2	NaOH					026
7	P-014-1	AR				1640	2	NaOH					027
8	P-155	TS				1740	2	Other					028
9	P-134	OT				4/19/18 1015	2	Unpreserved					029
10	P-141					1110	2	H ₂ SO ₄					030
11	P-138A					1230	2	HCl					031
12	P-137A					1425	2	Unpreserved					032

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	David Anderson / Pace	4/20/18	1200	David Anderson / Pace	4/20/18	1200	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on	Custody	Sealed Cooler	Samples Intact
PRINT Name of SAMPLER: David Anderson						
SIGNATURE of SAMPLER: David Anderson						
DATE Signed (MM/DD/YYYY): 4/19/18						

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Xcel Energy

Project #

30250570

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

Tracking #: 7475 9639 3415

Label <u>DS</u>
LIMS Login <u>BLM</u>

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

Thermometer Used NA Type of Ice: Wet Blue None

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

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
Chain of Custody Present:	☒	☐	☐	<u>10D3G71</u>	<u>DS 4-24-18</u>
Chain of Custody Filled Out:	☒	☐	☐		
Chain of Custody Relinquished:	☒	☐	☐		
Sampler Name & Signature on COC:	☒	☐	☐		
Sample Labels match COC:	☐	☒	☐		
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	☒	☐	☐		
Short Hold Time Analysis (<72hr remaining):	☐	☒	☐		
Rush Turn Around Time Requested:	☐	☒	☐		
Sufficient Volume:	☒	☐	☐		
Correct Containers Used:	☒	☐	☐		
-Pace Containers Used:	☒	☐	☐		
Containers Intact:	☒	☐	☐		
Orthophosphate field filtered	☐	☐	☒		
Hex Cr Aqueous Compliance/NPDES sample field filtered	☐	☐	☒		
Organic Samples checked for dechlorination:	☐	☐	☒		
Filtered volume received for Dissolved tests	☐	☐	☒		
All containers have been checked for preservation.	☒	☐	☐		
All containers needing preservation are found to be in compliance with EPA recommendation.	☒	☐	☐		
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>DS</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	☐	☐	☒		
Trip Blank Present:	☐	☐	☒		
Trip Blank Custody Seals Present	☐	☐	☒		
Rad Aqueous Samples Screened > 0.5 mrem/hr	☒	☐	☐	Initial when completed: <u>DS</u>	Date: <u>4-24-18</u>

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

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

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

Appendix B

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

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 Project No. 18-00929

Monitoring Point ID P-130 Labeled P130

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 46.84 Feet

Static water level measurement before purging (Start Depth) 37.95 Feet

Static water level measurement at time of sampling (Final Depth) 37.95 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 8-1-18 Water Column 8.89 Feet

Time Purged 1655-1716 One Casing Volume 1.4 Gallons

Pump Rate 0.2 GPM / PM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 8-1-18

Time Sampled 1730

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 6.9 (units) D.O. 6.8 (mg/l)

Spec. Cond. 750 (µmhos/cm) Turbidity 1.9 (NTU)

Temp. 11.5 (°C) Eh 194 (mV)

Other NA

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

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

Weather Conditions During Sampling: 67°+ cloudy, wind NW 10

Sample Description: clear + odorless

Observations: DJA 8-1-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1702	7.0	750	11.5	6.9	NA	190	1.4
1709	6.9	750	11.5	6.8	NA	193	2.8
1716	6.9	750	11.5	6.8	NA	194	4.2
<u>DJA 8-1-18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson

Date: 8-1-18

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 Project No. 18-00929

Monitoring Point ID P-131 Labeled P131

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 48.55 Feet

Static water level measurement before purging (Start Depth) 36.32 Feet

Static water level measurement at time of sampling (Final Depth) 36.32 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 7-31-18 Water Column 12.23 Feet

Time Purged 0955-1034 One Casing Volume 2.0 Gallons

Pump Rate 0.15 GPM / LPM Volume Purged 6.0 Gallons

Field Sampling Data

Date Sampled 7-31-18

Time Sampled 1045

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O. 7.9 (mg/l)

Spec. Cond. 540 (µmhos/cm) Turbidity 3.3 (NTU)

Temp. 11.5 (°C) Eh 113 (mV)

Other NA

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

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

Weather Conditions During Sampling: 70° + sunny, wind W-5

Sample Description: clear + odorless

Observations: 7/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1008	7.0	540	11.5	7.9	NA	152	2.0
1021	7.2	540	11.5	7.9	NA	126	4.0
1034	7.3	540	11.5	7.9	NA	113	6.0

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

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

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 Project No. 18-00929

Monitoring Point ID P-132 Labeled P132

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 36.51 Feet

Static water level measurement before purging (Start Depth) 30.09 Feet

Static water level measurement at time of sampling (Final Depth) 30.09 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 8-2-18 Water Column 6.42 Feet

Time Purged 1650-1711 One Casing Volume 1.0 Gallons

Pump Rate 0.15 GPM / LPM Volume Purged 3.15 Gallons

Field Sampling Data

Date Sampled 8-2-18

Time Sampled 1725

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.1 (units) D.O. 8.0 (mg/l)

Spec. Cond. 640 (µmhos/cm) Turbidity 2.8 (NTU)

Temp. 11.0 (°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: 73° + partly cloudy, wind 510

Sample Description: clear + odorless

Observations: DTA 8/2/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1657	7.2	640	11.5	8.2	NA	165	1.05
1704	7.1	640	11.0	8.0	NA	166	2.10
1711	7.1	640	11.0	8.0	NA	167	3.15
<u>DTA 8/2/18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/26/2018

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

Lead Technician Signature: David Anderson Date: 8/2/18

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 Project No. 18-00929
 Monitoring Point ID P-150 Labeled 806320
 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 36.66 Feet
 Static water level measurement before purging (Start Depth) 33.59 Feet
 Static water level measurement at time of sampling (Final Depth) 33.59 Feet
 Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6
 Date Purged 8-1-18 Water Column 3.07 Feet
 Time Purged 1405-1414 One Casing Volume 0.5 Gallons
 Pump Rate 0.2 GPM / LPM Volume Purged 1.8 Gallons

Field Sampling Data

Date Sampled 8-1-18
 Time Sampled 1425
 Sampling Equip. above pump
 Meter ID MPS-5
 Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O. 7.5 (mg/l)
 Spec. Cond. 470 (µmhos/cm) Turbidity 2.7 (NTU)
 Temp. 13.0 (°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: 70° + cloudy, wind W 10
 Sample Description: clear + odorless
 Observations: DTA 8-1-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1408	7.5	470	13.5	8.0	NA	155	0.6
1411	7.4	470	13.0	7.7	NA	159	1.2
1414	7.4	470	13.0	7.5	NA	163	1.8
<u>DTA 8/1/18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

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

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 Project No. 18-00929

Monitoring Point ID P-151 Labeled 806315

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 20.16 Feet

Static water level measurement before purging (Start Depth) 12.93 Feet

Static water level measurement at time of sampling (Final Depth) 12.93 Feet

Static Water Level Elevation Before Purging NA Feet

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

Date Purged 8-1-18 Water Column 7.23 Feet

Time Purged 1230-1310 One Casing Volume 1.2 Gallons

Pump Rate 0.15 GPM / LPM Volume Purged 6.0 Gallons

Field Sampling Data

Date Sampled 8-1-18

Time Sampled 1320

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

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

Spec. Cond. 380 (µmhos/cm) Turbidity 5.0 (NTU)

Temp. 14.5 (°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: 68° + cloudy, wind w10

Sample Description: clear + odorless

Observations: Bladder pump not working, used peristaltic pump

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1238	6.7	380	14.5	7.7	NA	190	1.2
1246	7.0	380	14.5	7.8	NA	181	2.4
1254	7.2	380	14.5	7.8	NA	168	3.6
1302	7.2	380	14.5	7.8	12.8	162	4.8
1310	7.3	380	14.5	7.7	6.5	156	6.0

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

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

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

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 CCR, Summer 2018 Project No. 18-00929

Monitoring Point ID P-152d Labeled 806318

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 42.18 Feet

Static water level measurement before purging (Start Depth) 38.14 Feet

Static water level measurement at time of sampling (Final Depth) 38.14 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 8-1-18 Water Column 4.04 Feet

Time Purged 1600-1615 One Casing Volume 0.7 Gallons

Pump Rate 0.15 GPM / PM Volume Purged 2.25 Gallons

Field Sampling Data

Date Sampled 8-1-18

Time Sampled 1640

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O. 8.6 (mg/l)

Spec. Cond. 380 (µmhos/cm) Turbidity 2.3 (NTU)

Temp. 12.0 (°C) Eh 181 (mV)

Other NA

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

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

Weather Conditions During Sampling: 67° + cloudy, wind NW 10

Sample Description: clear + odorless

Observations: collected duplicate at this well.

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1605	7.5	380	12.0	8.6	NA	167	0.75
1610	7.4	380	12.0	8.6	NA	173	1.50
1615	7.4	380	12.0	8.6	NA	181	2.25
DTA 8-1-18							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

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

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 Project No. 18-00929

Monitoring Point ID P-153 Labeled 806314

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 23.63 Feet

Static water level measurement before purging (Start Depth) 17.19 Feet

Static water level measurement at time of sampling (Final Depth) 17.19 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 8-2-18 Water Column 6.44 Feet

Time Purged 1740-1801 One Casing Volume 1.0 Gallons

Pump Rate 0.15 GPM / LPM Volume Purged 3.15 Gallons

Field Sampling Data

Date Sampled 8-2-18

Time Sampled 1815

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. 190 (µmhos/cm) Turbidity 3.4 (NTU)

Temp. 12.5 (°C) Eh 143 (mV)

Other NA

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

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

Weather Conditions During Sampling: 73° + sunny, wind 510

Sample Description: clear + odorless

Observations: DJA 8/2/18

Stabilization Test

Time	pH (Units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1747	7.5	190	12.5	8.9	NA	158	1.05
1754	7.6	190	12.5	8.9	NA	149	2.10
1801	7.6	190	12.5	8.9	NA	143	3.15
<u>DJA 8/2/18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 8/2/18

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP Pond 3 CCR, Summer 2018 Project No. 18-00929

Monitoring Point ID P-154a Labeled 806316

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 49.53 Feet

Static water level measurement before purging (Start Depth) 34.19 Feet

Static water level measurement at time of sampling (Final Depth) 34.19 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 8-1-18 Water Column 15.34 Feet

Time Purged 1445-1524 One Casing Volume 2.5 Gallons

Pump Rate 0.2 GPM / PM Volume Purged 7.8 Gallons

Field Sampling Data

Date Sampled 8-1-18

Time Sampled 1535

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O. 3.5 (mg/l)

Spec. Cond. 510 (µmhos/cm) Turbidity 2.9 (NTU)

Temp. 11.0 (°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: 68° + cloudy, wind NW 10

Sample Description: clear + odorless

Observations: DTA 8/1/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1458	7.7	500	11.0	3.4	NA	160	2.6
1511	7.6	510	11.0	3.4	NA	161	5.2
1524	7.6	510	11.0	3.5	NA	167	7.8
<u>DTA 8/1/18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

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

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP Pond 3 CCR, Summer 2018 Project No. 18-00929

Monitoring Point ID P-162 Labeled 822156

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 166 Feet (estimate)

Static water level measurement before purging (Start Depth) 148.78 Feet (estimate)

Static water level measurement at time of sampling (Final Depth) 148.78 Feet (estimate)

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump (keck) Pump ID PC-6

Date Purged 8-2-18 Water Column 17.22 Feet

Time Purged 1300-1330 One Casing Volume 2.8 Gallons

Pump Rate 0.3 GPM / LPM Volume Purged 9.0 Gallons

Field Sampling Data

Date Sampled 8-2-18

Time Sampled 1340

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.4 (units) D.O. 3.4 (mg/l)

Spec. Cond. 790 (µmhos/cm) Turbidity 4.9 (NTU)

Temp. 11.5 (°C) Eh 154 (mV)

Other NA

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

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

Weather Conditions During Sampling: 66° + cloudy, wind E 10

Sample Description: clear + odorless

Observations: DJA 8/2/18

Stabilization Test

Time	pH (Units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1310	7.5	760	12.0	3.6	NA	155	3.0
1320	7.5	790	11.5	3.4	NA	154	6.0
1330	7.4	790	11.5	3.4	NA	154	9.0
<u>DJA 8/2/18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 8/2/18

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 Project No. 18-00929

Monitoring Point ID P-163 Labeled 822157

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 176 Feet (estimate)

Static water level measurement before purging (Start Depth) 158.15 Feet (estimate)

Static water level measurement at time of sampling (Final Depth) 158.15 Feet (estimate)

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump (keck) Pump ID PC-6

Date Purged 8-2-18 Water Column 17.85 Feet

Time Purged 1400-1430 One Casing Volume 2.9 Gallons

Pump Rate 0.3 GPM / LPM Volume Purged 9.0 Gallons

Field Sampling Data

Date Sampled 8-2-18

Time Sampled 1440

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O. 6.8 (mg/l)

Spec. Cond. 960 (umhos/cm) Turbidity 28.4 (NTU)

Temp. 15.0 (°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: 68° + cloudy, wind E 10

Sample Description: clear + odorless

Observations: DJA 8-2-18

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1410	7.3	970	15.0	7.0	NA	150	3.0
1420	7.3	960	15.0	6.9	NA	152	6.0
1430	7.3	960	15.0	6.8	NA	156	9.0
<u>DJA 8/2/18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 8/2/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 Project No. 18-00929

Monitoring Point ID P-164 Labeled 822158

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 166 Feet (estimate)

Static water level measurement before purging (Start Depth) 151.93 Feet (estimate)

Static water level measurement at time of sampling (Final Depth) 151.93 Feet (estimate)

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump (keck) Pump ID PC-6

Date Purged 8-2-18 Water Column 14.07 Feet

Time Purged 1500-1524 One Casing Volume 2.3 Gallons

Pump Rate 0.3 GPM / LPM Volume Purged 7.2 Gallons

Field Sampling Data

Date Sampled 8-2-18

Time Sampled 1535

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.3 (units) D.O. 5.8 (mg/l)

Spec. Cond. 530 (µmhos/cm) Turbidity 3.6 (NTU)

Temp. 13.5 (°C) Eh 132 (mV)

Other NA

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

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

Weather Conditions During Sampling: 72° + partly cloudy, wind E10

Sample Description: clear + odorless

Observations: DJA 8/2/18

Stabilization Test

Time	pH (Units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1508	7.4	540	14.0	5.4	NA	111	2.4
1516	7.3	530	13.5	5.8	NA	126	4.8
1524	7.3	530	13.5	5.8	NA	132	7.2
<u>DJA 8/2/18</u>							

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 8/2/18

Well Description and Presampling Information

Client Xcel Energy Project Sherco BAP / Pond 3 CCR, Summer 2018 Project No. 18-00929

Monitoring Point ID P-165 Labeled 822159

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 40.32 Feet

Static water level measurement before purging (Start Depth) 31.84 Feet

Static water level measurement at time of sampling (Final Depth) 31.84 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 8-2-18 Water Column 8.48 Feet

Time Purged 1555-1625 One Casing Volume 1.4 Gallons

Pump Rate 0.15 GPM / LPM Volume Purged 4.5 Gallons

Field Sampling Data

Date Sampled 8-2-18

Time Sampled 1640

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.0 (units) D.O. 8.0 (mg/l)

Spec. Cond. 510 (µmhos/cm) Turbidity 4.0 (NTU)

Temp. 11.5 (°C) Eh 160 (mV)

Other NA

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

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

Weather Conditions During Sampling: 72° + partly cloudy, wind 5-10

Sample Description: clear + odorless

Observations: DTA 8/2/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1605	6.9	510	11.5	8.0	NA	202	1.5
1615	6.9	510	11.5	8.0	NA	172	3.0
1625	7.0	510	11.5	8.0	NA	160	4.5
<u>DTA 8/2/18</u>							

Samples chilled immediately after collection:

☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 8/2/18



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

29 August 2018
Charles A Donkers
Environmental Services-Water Minneapolis
250 Marquette Plaza
Minneapolis, MN 55401
RE: Sherco Pond 3 CCR

cc:

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

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

Sincerely,

Steve Davis
Project Manager

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
P-131		MDH0010-01	Water	07/31/2018 10:45	08/01/2018 6:40
Rinse		MDH0071-01	Water	08/01/2018 11:10	08/03/2018 9:43
P-151		MDH0071-02	Water	08/01/2018 13:20	08/03/2018 9:43
P-150		MDH0071-03	Water	08/01/2018 14:25	08/03/2018 9:43
P-154A		MDH0071-04	Water	08/01/2018 15:35	08/03/2018 9:43
P-152A		MDH0071-05	Water	08/01/2018 16:40	08/03/2018 9:43
Duplicate		MDH0071-06	Water	08/01/2018 16:40	08/03/2018 9:43
P-130		MDH0071-07	Water	08/01/2018 17:30	08/03/2018 9:43
P-162		MDH0071-08	Water	08/02/2018 13:40	08/03/2018 9:43
P-163		MDH0071-09	Water	08/02/2018 14:40	08/03/2018 9:43
P-164		MDH0071-10	Water	08/02/2018 15:35	08/03/2018 9:43
P-165		MDH0071-11	Water	08/02/2018 16:40	08/03/2018 9:43
P-132		MDH0071-12	Water	08/02/2018 17:25	08/03/2018 9:43
P-153		MDH0071-13	Water	08/02/2018 18:15	08/03/2018 9:43

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-131

MDH0010-01 (Water) - Chain of Custody Number: 2202851/2202850

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	16.0	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 18:22	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 18:22	EPA 300.0	CRL
Sulfate	23.4	1.00	mg/L		1	BDH0056	8/2/18 7:57	8/2/18 18:22	EPA 300.0	CRL

Wet Chemistry

pH	7.92		pH Units	M_TTT	1	BDH0014	8/1/18 9:37	8/1/18 13:16	SM 4500-H+ B	CRL
Total Dissolved Solids	288	20.0	mg/L		1	BDH0081	8/3/18 8:15	8/3/18 8:15	SM 2540C	CRL

Total Metals by ICPMS

Arsenic	0.574	0.500	ug/L		1	BDH0029	8/1/18 12:26	8/2/18 10:03	EPA 200.8	CRL
Barium	72.6	0.500	ug/L		1	BDH0029	8/1/18 12:26	8/2/18 10:03	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0029	8/1/18 12:26	8/2/18 10:03	EPA 200.8	CRL
Chromium	1.11	0.500	ug/L		1	BDH0029	8/1/18 12:26	8/2/18 10:03	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0029	8/1/18 12:26	8/2/18 10:03	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0029	8/1/18 12:26	8/2/18 10:03	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0029	8/1/18 12:26	8/2/18 10:03	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0028	8/1/18 12:23	8/6/18 13:57	EPA 200.7	HRD
Calcium	74.7	1.25	mg/L		1	BDH0028	8/1/18 12:23	8/6/18 13:55	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Rinse

MDH0071-01 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:02	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:02	EPA 300.0	CRL
Sulfate	< 1.00	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:02	EPA 300.0	CRL

Wet Chemistry

pH	6.31		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 12:26	SM 4500-H+ B	HRD
Total Dissolved Solids	< 20.0	20.0	mg/L		1	BDH0172	8/7/18 9:11	8/7/18 9:11	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:30	EPA 200.8	CRL
Barium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:30	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:30	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:30	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:30	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:30	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:30	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 8:48	EPA 200.7	HSD
Calcium	< 1.25	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 8:46	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-151
MDH0071-02 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	11.7	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:23	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:23	EPA 300.0	CRL
Sulfate	15.0	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:23	EPA 300.0	CRL

Wet Chemistry

pH	7.91		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 12:29	SM 4500-H+ B	HRD
Total Dissolved Solids	198	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:41	EPA 200.8	CRL
Barium	38.0	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:41	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:41	EPA 200.8	CRL
Chromium	1.08	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:41	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:41	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:41	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:41	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:11	EPA 200.7	HSD
Calcium	52.4	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:09	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-150
MDH0071-03 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	42.0	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:43	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:43	EPA 300.0	CRL
Sulfate	5.44	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 17:43	EPA 300.0	CRL

Wet Chemistry

pH	7.90		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 12:33	SM 4500-H+ B	HRD
Total Dissolved Solids	244	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	0.558	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:45	EPA 200.8	CRL
Barium	46.3	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:45	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:45	EPA 200.8	CRL
Chromium	1.07	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:45	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:45	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:45	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:45	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:16	EPA 200.7	HSD
Calcium	53.5	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:14	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-154A

MDH0071-04 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	18.6	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:04	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:04	EPA 300.0	CRL
Sulfate	39.1	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:04	EPA 300.0	CRL

Wet Chemistry

pH	7.96		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 12:36	SM 4500-H+ B	HRD
Total Dissolved Solids	288	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	1.19	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:49	EPA 200.8	CRL
Barium	47.5	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:49	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:49	EPA 200.8	CRL
Chromium	0.763	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:49	EPA 200.8	CRL
Molybdenum	0.906	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:49	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:49	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:49	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:21	EPA 200.7	HSD
Calcium	69.9	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:19	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-152A
MDH0071-05 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	1.13	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:24	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:24	EPA 300.0	CRL
Sulfate	7.81	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:24	EPA 300.0	CRL

Wet Chemistry

pH	7.83		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 12:40	SM 4500-H+ B	HRD
Total Dissolved Solids	218	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:53	EPA 200.8	CRL
Barium	35.3	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:53	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:53	EPA 200.8	CRL
Chromium	1.00	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:53	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:53	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:53	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:53	EPA 200.8	CRL

Total Metals by ICP

Boron	0.0523	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:26	EPA 200.7	HSD
Calcium	57.8	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:24	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Duplicate

MDH0071-06 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	1.19	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:44	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:44	EPA 300.0	CRL
Sulfate	7.91	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 18:44	EPA 300.0	CRL

Wet Chemistry

pH	7.83		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 12:44	SM 4500-H+ B	HRD
Total Dissolved Solids	216	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	0.520	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:57	EPA 200.8	CRL
Barium	37.2	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:57	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:57	EPA 200.8	CRL
Chromium	0.982	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:57	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:57	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:57	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 11:57	EPA 200.8	CRL

Total Metals by ICP

Boron	0.0551	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:31	EPA 200.7	HSD
Calcium	58.5	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:29	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-130
MDH0071-07 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	1.04	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:05	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:05	EPA 300.0	CRL
Sulfate	10.6	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:05	EPA 300.0	CRL

Wet Chemistry

pH	7.46		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 12:59	SM 4500-H+ B	HRD
Total Dissolved Solids	418	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:01	EPA 200.8	CRL
Barium	83.7	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:01	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:01	EPA 200.8	CRL
Chromium	1.21	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:01	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:01	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:01	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:01	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:36	EPA 200.7	HSD
Calcium	117	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:34	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-162
MDH0071-08 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	24.7	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:25	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:25	EPA 300.0	CRL
Sulfate	79.8	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:25	EPA 300.0	CRL

Wet Chemistry

pH	7.79		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 13:03	SM 4500-H+ B	HRD
Total Dissolved Solids	510	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	0.613	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:05	EPA 200.8	CRL
Barium	52.2	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:05	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:05	EPA 200.8	CRL
Chromium	7.00	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:05	EPA 200.8	CRL
Molybdenum	3.48	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:05	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:05	EPA 200.8	CRL
Selenium	3.52	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:05	EPA 200.8	CRL

Total Metals by ICP

Boron	0.169	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:41	EPA 200.7	HSD
Calcium	94.5	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:39	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		08/29/2018 08:04
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

P-163

MDH0071-09 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	12.7	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:46	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:46	EPA 300.0	CRL
Sulfate	184	1.00	mg/L		1	BDH0353	8/13/18 9:33	8/14/18 19:46	EPA 300.0	CRL

Wet Chemistry

pH	7.75		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 13:06	SM 4500-H+ B	HRD
Total Dissolved Solids	678	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	0.775	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:09	EPA 200.8	CRL
Barium	87.0	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:09	EPA 200.8	CRL
Cobalt	0.588	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:09	EPA 200.8	CRL
Chromium	14.8	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:09	EPA 200.8	CRL
Molybdenum	0.885	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:09	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:09	EPA 200.8	CRL
Selenium	33.7	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:09	EPA 200.8	CRL

Total Metals by ICP

Boron	0.483	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:46	EPA 200.7	HSD
Calcium	146	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:44	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-164
MDH0071-10 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	9.86	1.00	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:08	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:08	EPA 300.0	CRL
Sulfate	29.9	1.00	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:08	EPA 300.0	CRL

Wet Chemistry

pH	8.00		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 13:20	SM 4500-H+ B	HRD
Total Dissolved Solids	302	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:13	EPA 200.8	CRL
Barium	39.0	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:13	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:13	EPA 200.8	CRL
Chromium	14.5	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:13	EPA 200.8	CRL
Molybdenum	0.839	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:13	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:13	EPA 200.8	CRL
Selenium	0.798	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:13	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:51	EPA 200.7	HSD
Calcium	74.3	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:50	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-165
MDH0071-11 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	4.88	1.00	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:28	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:28	EPA 300.0	CRL
Sulfate	26.6	1.00	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:28	EPA 300.0	CRL

Wet Chemistry

pH	7.83		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 13:24	SM 4500-H+ B	HRD
Total Dissolved Solids	296	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:17	EPA 200.8	CRL
Barium	32.9	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:17	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:17	EPA 200.8	CRL
Chromium	1.81	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:17	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:17	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:17	EPA 200.8	CRL
Selenium	0.845	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:17	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:56	EPA 200.7	HSD
Calcium	78.9	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 9:55	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

P-132
MDH0071-12 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	2.58	1.00	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:48	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:48	EPA 300.0	CRL
Sulfate	59.8	1.00	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 12:48	EPA 300.0	CRL

Wet Chemistry

pH	7.71		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 13:27	SM 4500-H+ B	HRD
Total Dissolved Solids	422	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:28	EPA 200.8	CRL
Barium	38.8	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:28	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:28	EPA 200.8	CRL
Chromium	1.94	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:28	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:28	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:28	EPA 200.8	CRL
Selenium	1.03	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:28	EPA 200.8	CRL

Total Metals by ICP

Boron	0.0790	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 10:13	EPA 200.7	HSD
Calcium	95.9	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 10:12	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

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MDH0071-13 (Water) - Chain of Custody Number: 2202848/2202849

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 13:09	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 13:09	EPA 300.0	CRL
Sulfate	3.59	1.00	mg/L		1	BDH0427	8/15/18 8:52	8/15/18 13:09	EPA 300.0	CRL

Wet Chemistry

pH	8.11		pH Units	M_TTT	1	BDH0105	8/3/18 10:36	8/3/18 13:30	SM 4500-H+ B	HRD
Total Dissolved Solids	110	20.0	mg/L		1	BDH0206	8/8/18 9:09	8/8/18 9:09	SM 2540C	HSD

Total Metals by ICPMS

Arsenic	0.949	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:32	EPA 200.8	CRL
Barium	15.2	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:32	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:32	EPA 200.8	CRL
Chromium	0.988	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:32	EPA 200.8	CRL
Molybdenum	0.680	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:32	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:32	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDH0229	8/8/18 12:10	8/13/18 12:32	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 10:18	EPA 200.7	HSD
Calcium	26.9	1.25	mg/L		1	BDH0228	8/8/18 12:05	8/9/18 10:17	EPA 200.7	HSD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0056 - Wet Prep

Blank (BDH0056-BLK1)				Prepared & Analyzed: 08/02/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

Blank (BDH0056-BLK2)				Prepared & Analyzed: 08/02/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

LCS (BDH0056-BS1)				Prepared & Analyzed: 08/02/2018						
Chloride	24.2	1.00	mg/L	25.076		96.5	90-110			
Fluoride	2.50	0.750	mg/L	2.5076		99.5	90-110			
Sulfate	47.4	1.00	mg/L	48.144		98.4	90-110			

LCS (BDH0056-BS2)				Prepared & Analyzed: 08/02/2018						
Chloride	24.5	1.00	mg/L	25.076		97.7	90-110			
Fluoride	2.62	0.750	mg/L	2.5076		104	90-110			
Sulfate	47.7	1.00	mg/L	48.144		99.2	90-110			

LCS (BDH0056-BS3)				Prepared & Analyzed: 08/02/2018						
Chloride	24.5	1.00	mg/L	25.076		97.7	90-110			
Fluoride	2.51	0.750	mg/L	2.5076		100	90-110			
Sulfate	47.7	1.00	mg/L	48.144		99.1	90-110			

Duplicate (BDH0056-DUP1)				Source: MDH0008-11		Prepared & Analyzed: 08/02/2018				
Chloride	28.8	1.00	mg/L		28.9			0.194	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	13.5	1.00	mg/L		13.5			0.119	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0056 - Wet Prep

Duplicate (BDH0056-DUP2)		Source: MDH0008-16		Prepared & Analyzed: 08/02/2018						
Chloride	30.0	1.00	mg/L		30.0			0.150	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	26.7	1.00	mg/L		26.8			0.213	20	

Matrix Spike (BDH0056-MS1)		Source: MDH0008-11		Prepared & Analyzed: 08/02/2018						
Chloride	58.6	1.25	mg/L	31.345	28.9	95.0	80-120			
Fluoride	3.11	0.938	mg/L	3.1345	<0.938	99.2	80-120			
Sulfate	71.4	1.25	mg/L	60.180	13.5	96.2	80-120			

Matrix Spike (BDH0056-MS2)		Source: MDH0008-16		Prepared & Analyzed: 08/02/2018						
Chloride	60.1	1.25	mg/L	31.345	30.0	95.9	80-120			
Fluoride	3.20	0.938	mg/L	3.1345	<0.938	102	80-120			
Sulfate	85.7	1.25	mg/L	60.180	26.8	97.8	80-120			

Matrix Spike Dup (BDH0056-MSD1)		Source: MDH0008-11		Prepared & Analyzed: 08/02/2018						
Chloride	58.8	1.25	mg/L	31.345	28.9	95.5	80-120	0.294	20	
Fluoride	3.20	0.938	mg/L	3.1345	<0.938	102	80-120	2.81	20	
Sulfate	71.8	1.25	mg/L	60.180	13.5	97.0	80-120	0.670	20	

Matrix Spike Dup (BDH0056-MSD2)		Source: MDH0008-16		Prepared & Analyzed: 08/02/2018						
Chloride	60.3	1.25	mg/L	31.345	30.0	96.5	80-120	0.289	20	
Fluoride	3.28	0.938	mg/L	3.1345	<0.938	105	80-120	2.43	20	
Sulfate	86.0	1.25	mg/L	60.180	26.8	98.3	80-120	0.355	20	

Batch BDH0353 - Wet Prep

Blank (BDH0353-BLK1)		Prepared: 08/13/2018 Analyzed: 08/14/2018								
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0353 - Wet Prep

Blank (BDH0353-BLK2)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

LCS (BDH0353-BS1)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	23.9	1.00	mg/L	25.076		95.1	90-110			
Fluoride	2.55	0.750	mg/L	2.5076		102	90-110			
Sulfate	46.3	1.00	mg/L	48.144		96.2	90-110			

LCS (BDH0353-BS2)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	23.9	1.00	mg/L	25.076		95.2	90-110			
Fluoride	2.56	0.750	mg/L	2.5076		102	90-110			
Sulfate	46.3	1.00	mg/L	48.144		96.1	90-110			

LCS (BDH0353-BS3)				Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	24.0	1.00	mg/L	25.076		95.9	90-110			
Fluoride	2.57	0.750	mg/L	2.5076		102	90-110			
Sulfate	46.6	1.00	mg/L	48.144		96.8	90-110			

Duplicate (BDH0353-DUP1)				Source: MDH0068-07		Prepared: 08/13/2018 Analyzed: 08/14/2018				
Chloride	1.88	1.00	mg/L		1.89			0.636	20	
Fluoride	0.121	0.750	mg/L		0.121			0.00	20	
Sulfate	13.4	1.00	mg/L		13.4			0.523	20	

Duplicate (BDH0353-DUP2)				Source: MDH0071-05		Prepared: 08/13/2018 Analyzed: 08/14/2018				
Chloride	1.16	1.00	mg/L		1.13			2.27	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	7.84	1.00	mg/L		7.81			0.332	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
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Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0353 - Wet Prep

Matrix Spike (BDH0353-MS1)	Source: MDH0068-07			Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	31.2	1.25	mg/L	31.345	1.89	93.4	80-120			
Fluoride	3.18	0.938	mg/L	3.1345	<0.938	101	80-120			
Sulfate	70.9	1.25	mg/L	60.180	13.4	95.5	80-120			

Matrix Spike (BDH0353-MS2)	Source: MDH0071-05			Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	30.1	1.25	mg/L	31.345	1.13	92.4	80-120			
Fluoride	3.13	0.938	mg/L	3.1345	<0.938	100	80-120			
Sulfate	64.8	1.25	mg/L	60.180	7.81	94.7	80-120			

Matrix Spike Dup (BDH0353-MSD1)	Source: MDH0068-07			Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	31.1	1.25	mg/L	31.345	1.89	93.1	80-120	0.265	20	
Fluoride	3.23	0.938	mg/L	3.1345	<0.938	103	80-120	1.83	20	
Sulfate	70.7	1.25	mg/L	60.180	13.4	95.3	80-120	0.212	20	

Matrix Spike Dup (BDH0353-MSD2)	Source: MDH0071-05			Prepared: 08/13/2018 Analyzed: 08/14/2018						
Chloride	30.9	1.25	mg/L	31.345	1.13	95.0	80-120	2.70	20	
Fluoride	3.28	0.938	mg/L	3.1345	<0.938	105	80-120	4.52	20	
Sulfate	66.4	1.25	mg/L	60.180	7.81	97.3	80-120	2.38	20	

Batch BDH0427 - Wet Prep

Blank (BDH0427-BLK1)	Prepared & Analyzed: 08/15/2018									
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

Blank (BDH0427-BLK2)	Prepared & Analyzed: 08/15/2018									
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0427 - Wet Prep

LCS (BDH0427-BS1)			Prepared & Analyzed: 08/15/2018							
Chloride	24.1	1.00	mg/L	25.076		96.1	90-110			
Fluoride	2.45	0.750	mg/L	2.5076		97.5	90-110			
Sulfate	46.6	1.00	mg/L	48.144		96.8	90-110			

LCS (BDH0427-BS2)			Prepared & Analyzed: 08/15/2018							
Chloride	24.4	1.00	mg/L	25.076		97.5	90-110			
Fluoride	2.49	0.750	mg/L	2.5076		99.5	90-110			
Sulfate	47.2	1.00	mg/L	48.144		98.0	90-110			

LCS (BDH0427-BS3)			Prepared & Analyzed: 08/15/2018							
Chloride	24.5	1.00	mg/L	25.076		97.6	90-110			
Fluoride	2.49	0.750	mg/L	2.5076		99.3	90-110			
Sulfate	47.2	1.00	mg/L	48.144		98.1	90-110			

Duplicate (BDH0427-DUP1)			Source: MDH0071-11		Prepared & Analyzed: 08/15/2018					
Chloride	4.88	1.00	mg/L		4.88			0.0205	20	
Fluoride	0.179	0.750	mg/L		0.179			0.00	20	
Sulfate	26.6	1.00	mg/L		26.6			0.218	20	

Duplicate (BDH0427-DUP2)			Source: MDH0071-13		Prepared & Analyzed: 08/15/2018					
Chloride	0.490	1.00	mg/L		0.484			1.23	20	
Fluoride	0.160	0.750	mg/L		0.160			0.00	20	
Sulfate	3.63	1.00	mg/L		3.59			1.22	20	

Matrix Spike (BDH0427-MS1)			Source: MDH0071-11		Prepared & Analyzed: 08/15/2018					
Chloride	34.5	1.25	mg/L	31.345	4.88	94.4	80-120			
Fluoride	3.30	0.938	mg/L	3.1345	0.179	99.4	80-120			
Sulfate	84.6	1.25	mg/L	60.180	26.6	96.4	80-120			

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
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Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0427 - Wet Prep

Matrix Spike (BDH0427-MS2)	Source: MDH0071-13			Prepared & Analyzed: 08/15/2018						
Chloride	30.5	1.25	mg/L	31.345	0.484	95.9	80-120			
Fluoride	3.39	0.938	mg/L	3.1345	0.160	103	80-120			
Sulfate	62.6	1.25	mg/L	60.180	3.59	98.1	80-120			

Matrix Spike Dup (BDH0427-MSD1)	Source: MDH0071-11			Prepared & Analyzed: 08/15/2018						
Chloride	34.7	1.25	mg/L	31.345	4.88	95.1	80-120	0.582	20	
Fluoride	3.19	0.938	mg/L	3.1345	0.179	96.1	80-120	3.16	20	
Sulfate	84.5	1.25	mg/L	60.180	26.6	96.3	80-120	0.117	20	

Matrix Spike Dup (BDH0427-MSD2)	Source: MDH0071-13			Prepared & Analyzed: 08/15/2018						
Chloride	30.4	1.25	mg/L	31.345	0.484	95.4	80-120	0.451	20	
Fluoride	3.26	0.938	mg/L	3.1345	0.160	98.9	80-120	3.84	20	
Sulfate	62.2	1.25	mg/L	60.180	3.59	97.3	80-120	0.729	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0014 - Wet Prep

LCS (BDH0014-BS1)		Prepared & Analyzed: 08/01/2018								
pH	7.06		pH Units	7.0000		101	90-110			
LCS (BDH0014-BS2)		Prepared & Analyzed: 08/01/2018								
pH	7.11		pH Units	7.0000		102	90-110			
Duplicate (BDH0014-DUP1)		Source: MDH0008-02		Prepared & Analyzed: 08/01/2018						
pH	7.47		pH Units		7.50			0.401	20	
Duplicate (BDH0014-DUP2)		Source: MDH0008-11		Prepared & Analyzed: 08/01/2018						
pH	7.90		pH Units		7.90			0.00	20	
Duplicate (BDH0014-DUP3)		Source: MDH0009-01		Prepared & Analyzed: 08/01/2018						
pH	7.94		pH Units		7.94			0.00	20	

Batch BDH0081 - Wet Prep

Blank (BDH0081-BLK1)		Prepared & Analyzed: 08/03/2018								
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDH0081-DUP1)		Source: MDH0008-11		Prepared & Analyzed: 08/03/2018						
Total Dissolved Solids	262	20.0	mg/L		272			3.75	20	
Duplicate (BDH0081-DUP2)		Source: MDH0010-01		Prepared & Analyzed: 08/03/2018						
Total Dissolved Solids	272	20.0	mg/L		288			5.71	20	

Batch BDH0105 - Wet Prep

LCS (BDH0105-BS1)		Prepared & Analyzed: 08/03/2018								
pH	7.09		pH Units	7.0000		101	90-110			

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0105 - Wet Prep

LCS (BDH0105-BS2)			Prepared & Analyzed: 08/03/2018							
pH	7.08		pH Units	7.0000		101	90-110			
Duplicate (BDH0105-DUP1)			Source: MDH0064-01		Prepared & Analyzed: 08/03/2018					
pH	7.66		pH Units	7.70		0.521	20			
Duplicate (BDH0105-DUP2)			Source: MDH0071-07		Prepared & Analyzed: 08/03/2018					
pH	7.46		pH Units	7.46		0.00	20			
Duplicate (BDH0105-DUP3)			Source: MDH0071-10		Prepared & Analyzed: 08/03/2018					
pH	8.01		pH Units	8.00		0.125	20			

Batch BDH0172 - Wet Prep

Blank (BDH0172-BLK1)			Prepared & Analyzed: 08/07/2018							
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDH0172-DUP1)			Source: MDH0064-01		Prepared & Analyzed: 08/07/2018					
Total Dissolved Solids	360	20.0	mg/L	302		17.5	20			
Duplicate (BDH0172-DUP2)			Source: MDH0064-02		Prepared & Analyzed: 08/07/2018					
Total Dissolved Solids	322	20.0	mg/L	322		0.00	20			

Batch BDH0206 - Wet Prep

Blank (BDH0206-BLK1)			Prepared & Analyzed: 08/08/2018							
Total Dissolved Solids	<20.0	20.0	mg/L							

Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0206 - Wet Prep

Duplicate (BDH0206-DUP1)	Source: MDH0071-02		Prepared & Analyzed: 08/08/2018							
Total Dissolved Solids	204	20.0	mg/L		198			2.99	20	
Duplicate (BDH0206-DUP2)	Source: MDH0071-03		Prepared & Analyzed: 08/08/2018							
Total Dissolved Solids	236	20.0	mg/L		244			3.33	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0029 - EPA 200.2, EPA 3005

Blank (BDH0029-BLK1)

Prepared: 08/01/2018 Analyzed: 08/02/2018

Molybdenum	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							

LCS (BDH0029-BS1)

Prepared: 08/01/2018 Analyzed: 08/02/2018

Selenium	100	0.500	ug/L	100.00		100	85-115			
Molybdenum	102	0.500	ug/L	100.00		102	85-115			
Chromium	98.9	0.500	ug/L	100.00		98.9	85-115			
Barium	98.2	0.500	ug/L	100.00		98.2	85-115			
Cobalt	95.6	0.500	ug/L	100.00		95.6	85-115			
Arsenic	97.4	0.500	ug/L	100.00		97.4	85-115			
Lead	96.9	0.500	ug/L	100.00		96.9	85-115			

Duplicate (BDH0029-DUP1)

Source: MDG0361-02

Prepared: 08/01/2018 Analyzed: 08/02/2018

Molybdenum	0.605	0.500	ug/L		0.562			7.25	20	
Cobalt	0.231	0.500	ug/L		0.207			10.7	20	
Lead	0.235	0.500	ug/L		0.220			6.79	20	
Arsenic	1.92	0.500	ug/L		2.07			7.50	20	
Barium	44.2	0.500	ug/L		44.7			1.19	20	
Selenium	0.188	0.500	ug/L		0.229			19.8	20	
Chromium	0.701	0.500	ug/L		0.692			1.24	20	

Duplicate (BDH0029-DUP2)

Source: MDG0361-03

Prepared: 08/01/2018 Analyzed: 08/02/2018

Cobalt	0.193	0.500	ug/L		0.199			3.27	20	
Arsenic	2.04	0.500	ug/L		2.02			0.819	20	
Barium	44.7	0.500	ug/L		45.6			1.97	20	
Lead	0.203	0.500	ug/L		0.208			2.28	20	
Chromium	0.623	0.500	ug/L		0.677			8.30	20	
Molybdenum	0.574	0.500	ug/L		0.558			2.81	20	
Selenium	0.201	0.500	ug/L		0.182			9.86	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0029 - EPA 200.2, EPA 3005

Matrix Spike (BDH0029-MS1)		Source: MDG0361-02		Prepared: 08/01/2018 Analyzed: 08/02/2018						
Arsenic	101	0.500	ug/L	100.00	2.07	98.6	70-130			
Barium	146	0.500	ug/L	100.00	44.7	101	70-130			
Cobalt	101	0.500	ug/L	100.00	0.207	101	70-130			
Chromium	105	0.500	ug/L	100.00	0.692	105	70-130			
Molybdenum	100	0.500	ug/L	100.00	0.562	99.8	70-130			
Lead	93.7	0.500	ug/L	100.00	0.220	93.5	70-130			
Selenium	101	0.500	ug/L	100.00	0.229	100	70-130			

Matrix Spike (BDH0029-MS2)		Source: MDG0361-03		Prepared: 08/01/2018 Analyzed: 08/02/2018						
Arsenic	102	0.500	ug/L	100.00	2.02	100	70-130			
Lead	91.6	0.500	ug/L	100.00	0.208	91.4	70-130			
Molybdenum	103	0.500	ug/L	100.00	0.558	102	70-130			
Barium	148	0.500	ug/L	100.00	45.6	102	70-130			
Selenium	102	0.500	ug/L	100.00	0.182	101	70-130			
Chromium	102	0.500	ug/L	100.00	0.677	101	70-130			
Cobalt	100	0.500	ug/L	100.00	0.199	99.8	70-130			

Matrix Spike Dup (BDH0029-MSD1)		Source: MDG0361-02		Prepared: 08/01/2018 Analyzed: 08/02/2018						
Barium	149	0.500	ug/L	100.00	44.7	104	70-130	1.87	20	
Lead	92.5	0.500	ug/L	100.00	0.220	92.3	70-130	1.25	20	
Arsenic	103	0.500	ug/L	100.00	2.07	101	70-130	2.32	20	
Molybdenum	101	0.500	ug/L	100.00	0.562	101	70-130	0.883	20	
Cobalt	101	0.500	ug/L	100.00	0.207	101	70-130	0.110	20	
Chromium	103	0.500	ug/L	100.00	0.692	102	70-130	2.02	20	
Selenium	101	0.500	ug/L	100.00	0.229	101	70-130	0.744	20	

Matrix Spike Dup (BDH0029-MSD2)		Source: MDG0361-03		Prepared: 08/01/2018 Analyzed: 08/02/2018						
Cobalt	102	0.500	ug/L	100.00	0.199	102	70-130	1.83	20	
Selenium	103	0.500	ug/L	100.00	0.182	103	70-130	1.55	20	
Chromium	104	0.500	ug/L	100.00	0.677	103	70-130	1.71	20	
Molybdenum	102	0.500	ug/L	100.00	0.558	102	70-130	0.335	20	
Barium	149	0.500	ug/L	100.00	45.6	103	70-130	0.452	20	
Lead	93.4	0.500	ug/L	100.00	0.208	93.2	70-130	1.98	20	
Arsenic	105	0.500	ug/L	100.00	2.02	103	70-130	3.23	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0229 - EPA 200.2, EPA 3005

Blank (BDH0229-BLK1)

Prepared: 08/08/2018 Analyzed: 08/13/2018

Arsenic	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Molybdenum	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							

LCS (BDH0229-BS1)

Prepared: 08/08/2018 Analyzed: 08/13/2018

Chromium	100	0.500	ug/L	100.00		100	85-115			
Cobalt	99.7	0.500	ug/L	100.00		99.7	85-115			
Lead	94.9	0.500	ug/L	100.00		94.9	85-115			
Barium	95.4	0.500	ug/L	100.00		95.4	85-115			
Selenium	92.1	0.500	ug/L	100.00		92.1	85-115			
Arsenic	98.6	0.500	ug/L	100.00		98.6	85-115			
Molybdenum	101	0.500	ug/L	100.00		101	85-115			

Duplicate (BDH0229-DUP1)

Source: MDH0071-04

Prepared: 08/08/2018 Analyzed: 08/13/2018

Arsenic	1.21	0.500	ug/L	1.19		2.15	20			
Barium	47.3	0.500	ug/L	47.5		0.534	20			
Cobalt	0.0785	0.500	ug/L	0.0763		2.80	20			
Chromium	0.817	0.500	ug/L	0.763		6.91	20			
Molybdenum	0.978	0.500	ug/L	0.906		7.64	20			
Lead	0.0234	0.500	ug/L	<0.500			20			
Selenium	0.314	0.500	ug/L	0.334		6.12	20			

Duplicate (BDH0229-DUP2)

Source: MDH0071-05

Prepared: 08/08/2018 Analyzed: 08/13/2018

Selenium	0.369	0.500	ug/L	0.423		13.6	20			
Lead	0.0227	0.500	ug/L	0.0239		5.07	20			
Arsenic	0.463	0.500	ug/L	0.418		10.2	20			
Molybdenum	0.0868	0.500	ug/L	0.0910		4.67	20			
Barium	36.4	0.500	ug/L	35.3		2.99	20			
Cobalt	0.0818	0.500	ug/L	0.0796		2.73	20			
Chromium	0.994	0.500	ug/L	1.00		0.635	20			

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0229 - EPA 200.2, EPA 3005

Matrix Spike (BDH0229-MS1)		Source: MDH0071-04		Prepared: 08/08/2018 Analyzed: 08/13/2018						
Molybdenum	102	0.500	ug/L	100.00	0.906	101	70-130			
Lead	87.7	0.500	ug/L	100.00	<0.500	87.7	70-130			
Cobalt	98.2	0.500	ug/L	100.00	0.0763	98.2	70-130			
Barium	143	0.500	ug/L	100.00	47.5	95.5	70-130			
Selenium	92.2	0.500	ug/L	100.00	0.334	91.9	70-130			
Chromium	101	0.500	ug/L	100.00	0.763	101	70-130			
Arsenic	101	0.500	ug/L	100.00	1.19	99.8	70-130			

Matrix Spike (BDH0229-MS2)		Source: MDH0071-05		Prepared: 08/08/2018 Analyzed: 08/13/2018						
Chromium	103	0.500	ug/L	100.00	1.00	102	70-130			
Cobalt	99.7	0.500	ug/L	100.00	0.0796	99.6	70-130			
Selenium	96.5	0.500	ug/L	100.00	0.423	96.1	70-130			
Molybdenum	95.8	0.500	ug/L	100.00	0.0910	95.7	70-130			
Lead	89.1	0.500	ug/L	100.00	0.0239	89.1	70-130			
Arsenic	104	0.500	ug/L	100.00	0.418	103	70-130			
Barium	130	0.500	ug/L	100.00	35.3	94.8	70-130			

Matrix Spike Dup (BDH0229-MSD1)		Source: MDH0071-04		Prepared: 08/08/2018 Analyzed: 08/13/2018						
Molybdenum	98.5	0.500	ug/L	100.00	0.906	97.5	70-130	3.07	20	
Arsenic	103	0.500	ug/L	100.00	1.19	102	70-130	2.10	20	
Barium	144	0.500	ug/L	100.00	47.5	96.3	70-130	0.542	20	
Selenium	98.9	0.500	ug/L	100.00	0.334	98.6	70-130	7.02	20	
Chromium	102	0.500	ug/L	100.00	0.763	102	70-130	0.905	20	
Cobalt	99.1	0.500	ug/L	100.00	0.0763	99.0	70-130	0.901	20	
Lead	87.0	0.500	ug/L	100.00	<0.500	87.0	70-130	0.739	20	

Matrix Spike Dup (BDH0229-MSD2)		Source: MDH0071-05		Prepared: 08/08/2018 Analyzed: 08/13/2018						
Lead	87.4	0.500	ug/L	100.00	0.0239	87.4	70-130	1.98	20	
Selenium	95.7	0.500	ug/L	100.00	0.423	95.2	70-130	0.922	20	
Barium	130	0.500	ug/L	100.00	35.3	94.7	70-130	0.116	20	
Chromium	101	0.500	ug/L	100.00	1.00	100	70-130	2.17	20	
Cobalt	97.5	0.500	ug/L	100.00	0.0796	97.4	70-130	2.26	20	
Arsenic	103	0.500	ug/L	100.00	0.418	103	70-130	0.368	20	
Molybdenum	97.7	0.500	ug/L	100.00	0.0910	97.6	70-130	1.96	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0028 - EPA 200.2, EPA 3005

Blank (BDH0028-BLK1)				Prepared: 08/01/2018 Analyzed: 08/06/2018						
Calcium	<1.25	1.25	mg/L							
Boron	<0.0500	0.0500	mg/L							
LCS (BDH0028-BS1)				Prepared: 08/01/2018 Analyzed: 08/06/2018						
Boron	1.00	0.0500	mg/L	1.0000		100	85-115			
Calcium	105	1.25	mg/L	100.00		105	85-115			
Duplicate (BDH0028-DUP1)				Source: MDG0361-01		Prepared: 08/01/2018 Analyzed: 08/06/2018				
Boron	0.0206	0.0500	mg/L		0.0233			12.4	20	
Calcium	41.4	1.25	mg/L		42.1			1.66	20	
Duplicate (BDH0028-DUP2)				Source: MDG0362-01		Prepared: 08/01/2018 Analyzed: 08/06/2018				
Calcium	120	1.25	mg/L		119			0.869	20	
Boron	0.0932	0.0500	mg/L		0.0958			2.82	20	
Matrix Spike (BDH0028-MS1)				Source: MDG0361-01		Prepared: 08/01/2018 Analyzed: 08/06/2018				
Calcium	150	1.25	mg/L	100.00	42.1	108	70-130			
Boron	1.08	0.0500	mg/L	1.0000	0.0233	105	70-130			
Matrix Spike (BDH0028-MS2)				Source: MDG0362-01		Prepared: 08/01/2018 Analyzed: 08/06/2018				
Boron	1.13	0.0500	mg/L	1.0000	0.0958	103	70-130			
Calcium	227	1.25	mg/L	100.00	119	108	70-130			
Matrix Spike Dup (BDH0028-MSD1)				Source: MDG0361-01		Prepared: 08/01/2018 Analyzed: 08/06/2018				
Boron	1.06	0.0500	mg/L	1.0000	0.0233	104	70-130	1.52	20	
Calcium	149	1.25	mg/L	100.00	42.1	107	70-130	0.734	20	
Matrix Spike Dup (BDH0028-MSD2)				Source: MDG0362-01		Prepared: 08/01/2018 Analyzed: 08/06/2018				
Boron	1.15	0.0500	mg/L	1.0000	0.0958	105	70-130	1.91	20	
Calcium	231	1.25	mg/L	100.00	119	112	70-130	1.75	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	08/29/2018 08:04

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDH0228 - EPA 200.2, EPA 3005

Blank (BDH0228-BLK1)				Prepared: 08/08/2018 Analyzed: 08/09/2018						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							
LCS (BDH0228-BS1)				Prepared: 08/08/2018 Analyzed: 08/09/2018						
Boron	0.994	0.0500	mg/L	1.0000		99.4	85-115			
Calcium	106	1.25	mg/L	100.00		106	85-115			
Duplicate (BDH0228-DUP1)				Source: MDH0071-02		Prepared: 08/08/2018 Analyzed: 08/09/2018				
Boron	0.0302	0.0500	mg/L		0.0323			6.71	20	
Calcium	52.1	1.25	mg/L		52.4			0.496	20	
Duplicate (BDH0228-DUP2)				Source: MDH0071-03		Prepared: 08/08/2018 Analyzed: 08/09/2018				
Calcium	54.8	1.25	mg/L		53.5			2.51	20	
Boron	0.0175	0.0500	mg/L		0.0178			2.13	20	
Matrix Spike (BDH0228-MS1)				Source: MDH0071-02		Prepared: 08/08/2018 Analyzed: 08/09/2018				
Calcium	155	1.25	mg/L	100.00	52.4	103	70-130			
Boron	1.02	0.0500	mg/L	1.0000	0.0323	99.2	70-130			
Matrix Spike (BDH0228-MS2)				Source: MDH0071-03		Prepared: 08/08/2018 Analyzed: 08/09/2018				
Calcium	157	1.25	mg/L	100.00	53.5	103	70-130			
Boron	1.03	0.0500	mg/L	1.0000	0.0178	101	70-130			
Matrix Spike Dup (BDH0228-MSD1)				Source: MDH0071-02		Prepared: 08/08/2018 Analyzed: 08/09/2018				
Boron	1.04	0.0500	mg/L	1.0000	0.0323	100	70-130	1.24	20	
Calcium	157	1.25	mg/L	100.00	52.4	104	70-130	1.18	20	
Matrix Spike Dup (BDH0228-MSD2)				Source: MDH0071-03		Prepared: 08/08/2018 Analyzed: 08/09/2018				
Boron	1.04	0.0500	mg/L	1.0000	0.0178	102	70-130	1.14	20	
Calcium	159	1.25	mg/L	100.00	53.5	106	70-130	1.56	20	

Environmental Services-Water Minneapolis
250 Marquette Plaza
Minneapolis MN, 55401

Project Name/Location: Sherco Pond 3 CCR

Project Manager: Charles A Donkers

Reported:

08/29/2018 08:04

Qualifiers and Definitions

M_TTT	Sample received at the lab outside of required hold time.
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

CHAIN-OF-CUSTODY / Analytical Request Document

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



Section A Required Client Information: Company: <u>Xcel Energy</u> Address: <u>Environmental Services</u> Email To: _____ Phone: _____ Fax: _____ Requested Due Date/TAT: _____		Section B Required Project Information: Report To: <u>Chuck Denters</u> Copy To: _____ Purchase Order No.: _____ Project Name: <u>Shoreline BAP / Pond 3 NPDES</u> Project Number: <u>+ CCR, Summer 2018</u>		Section C Invoice Information: Attention: <u>Steve Davis</u> Company Name: _____ Address: _____ Pace Quote Reference: _____ Pace Project Manager: _____ Pace Profile #: _____		Page: <u>1</u> of <u>1</u> 2202852 REGULATORY AGENCY ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____ Site Location STATE: _____		
Section D Required Client Information Matrix Codes MATRIX / CODE Drinking Water DW Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE		COLLECTED COMPOSITE START COMPOSITE END/GRAB DATE TIME DATE TIME 7/21/18 0840 7/21/18 1045 SAMPLE TEMP AT COLLECTION 21 21		PRESERVATIVES Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other Analysis Test 6W-CCR-BAP 6W-CCR-P3		Requested Analysis Filtered (Y/N) Residual Chlorine (Y/N) Pace Project No./ Lab I.D.		
ITEM #	ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
1	(1) H ₂ O3 bottles are unfiltetered.	David Anderson	8-1-18	0640	David Anderson	8/1/18	0640	Received on Ice (Y/N) Custody Sealed Cooler (Y/N) Samples Intact (Y/N)
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

ORIGINAL

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: David Anderson
 SIGNATURE of SAMPLER: David Anderson
 DATE Signed (MM/DD/YY): 7-31-18

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

CHAIN-OF-CUSTODY / Analytical Request Document

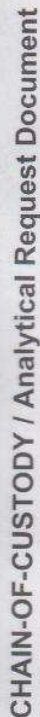
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information: Company: <u>Xcel Energy</u> Address: <u>Environmental Services</u> Email To: _____ Phone: _____ Fax: _____ Requested Due Date/TAT: _____		Section B Required Project Information: Report To: <u>Chuck Donkers</u> Copy To: _____ Purchase Order No.: _____ Project Name: <u>Shetco BAP / Pond 3 NPDES</u> Project Number: <u>4 CCR, Summer 2018</u>		Section C Invoice Information: Attention: <u>Steve Davis</u> Company Name: _____ Address: _____ Pace Quote Reference: _____ Pace Project Manager: _____ Pace Profile #: _____	
Page: <u>1</u> of <u>2</u> 2202849		REGULATORY AGENCY ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____ Site Location _____ STATE: _____			

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Codes DW WT WW P SL OL WP AR TS OT	Matrix Codes Drinking Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	SAMPLE ID (A-Z, 0-9 / -)	Sample IDs MUST BE UNIQUE	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS	Temp in °C	Received on	Sealed Cooler	Custody	Samples Intact
1	Rinse																	
2	P-151																	
3	P-150																	
4	P-1544																	
5	P-1524																	
6	Duplicate																	
7	P-130																	
8	P-158																	
9	P-157																	
10	P-23																	
11	P-22																	
12	P-155																	
ADDITIONAL COMMENTS: <u>① HNO3 bottles are unfiltered.</u>																		
RELINQUISHED BY / AFFILIATION: <u>David Anderson / Pace</u> DATE: <u>5/3/18</u> TIME: <u>0930</u>																		
ACCEPTED BY / AFFILIATION: <u>[Signature]</u> DATE: <u>5/3/18</u> TIME: <u>0943</u>																		
SAMPLE CONDITIONS: <u>Temp: 3.0°C</u> <u>M400841</u> <u>pH strips: MB00508</u>																		

SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: <u>David Anderson</u> SIGNATURE of SAMPLER: <u>[Signature]</u>		DATE Signed (MM/DD/YY): <u>8-2-18</u>	
---	--	---------------------------------------	--

*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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www.pacelabs.com

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

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

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Xcel Energy Environmental Services		Company: Chuck Dankers		Attention: Steve Davis	
Address: Environmental Services		Copy To:		Company Name:	
Email To:		Purchase Order No.:		Address:	
Phone:		Project Name: Sherco BAP/ Pond 3 NPDES		Pace Quote Reference:	
Requested Due Date/TAT:		Project Number: 4-CCR, summer 2018		Pace Project Manager:	
				Pace Profile #:	
Section D Required Client Information		Section E Matrix Codes		Section F Requested Analysis	
SAMPLE ID (A-Z, 0-9, /, -) Sample IDs MUST BE UNIQUE		Matrix Codes MATRIX / CODE		Requested Analysis Filtered (Y/N)	
Drinking Water DW		COMPOSITE START		Preservatives	
Water WT		COMPOSITE END/GRAB		Unpreserved	
Waste Water WW		DATE		H ₂ SO ₄	
Product P		TIME		HCl	
Solid/Solid SL		DATE		HNO ₃	
Oil OL		TIME		NaOH	
Wipe WP		DATE		Na ₂ S ₂ O ₃	
Air AR		TIME		Methanol	
Tissue TS		DATE		Other	
Other OT		TIME		Analysis Test ↑	
SAMPLE TYPE (G=GRAB C=COMP)		SAMPLE TEMP AT COLLECTION		# OF CONTAINERS	
MATRIX CODE (see valid codes to left)		DATE		Y/N	
WT		TIME		GW-CCR-BAP	
P-014-1		DATE		GW-CCR-P3	
P-156		TIME		Residual Chlorine (Y/N)	
P-162		DATE		Pace Project No./ Lab I.D.	
P-163		TIME			
P-164		DATE			
P-165		TIME			
P-132		DATE			
P-153		TIME			
P-154		DATE			
P-155		TIME			
P-156		DATE			
P-157		TIME			
P-158		DATE			
P-159		TIME			
P-160		DATE			
P-161		TIME			
P-162		DATE			
P-163		TIME			
P-164		DATE			
P-165		TIME			
P-166		DATE			
P-167		TIME			
P-168		DATE			
P-169		TIME			
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P-231		TIME			
P-232		DATE			
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P-234		DATE			
P-235		TIME			
P-236		DATE			
P-237		TIME			
P-238		DATE			
P-239		TIME			

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

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

August 20, 2018

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

RE: Project: 18-00929, Xcel Energy-ShercoBA
Pace Project No.: 30261472

Dear Dave Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on August 07, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30261472001	P-17	Water	07/31/18 08:40	08/07/18 09:45
30261472002	P-131	Water	07/31/18 10:45	08/07/18 09:45
30261472003	Rinse	Water	08/01/18 11:10	08/07/18 09:45
30261472004	P-151	Water	08/01/18 13:20	08/07/18 09:45
30261472005	P-150	Water	08/01/18 14:25	08/07/18 09:45
30261472006	P-154a	Water	08/01/18 15:35	08/07/18 09:45
30261472007	P-152a	Water	08/01/18 16:40	08/07/18 09:45
30261472008	Duplicate	Water	08/01/18 16:40	08/07/18 09:45
30261472009	P-130	Water	08/01/18 17:30	08/07/18 09:45
30261472010	P-158	Water	08/01/18 18:20	08/07/18 09:45
30261472011	P-157	Water	08/02/18 07:40	08/07/18 09:45
30261472012	P-23	Water	08/02/18 09:00	08/07/18 09:45
30261472013	P-22	Water	08/02/18 10:10	08/07/18 09:45
30261472014	P-155	Water	08/02/18 11:10	08/07/18 09:45
30261472015	P-01a-1	Water	08/02/18 11:50	08/07/18 09:45
30261472016	P-156	Water	08/02/18 12:40	08/07/18 09:45
30261472017	P-162	Water	08/02/18 13:40	08/07/18 09:45
30261472018	P-163	Water	08/02/18 14:40	08/07/18 09:45
30261472019	P-164	Water	08/02/18 15:35	08/07/18 09:45
30261472020	P-165	Water	08/02/18 16:40	08/07/18 09:45
30261472021	P-132	Water	08/02/18 17:25	08/07/18 09:45
30261472022	P-153	Water	08/02/18 18:15	08/07/18 09:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30261472001	P-17	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472002	P-131	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472003	Rinse	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472004	P-151	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472005	P-150	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472006	P-154a	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472007	P-152a	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472008	Duplicate	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472009	P-130	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472010	P-158	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472011	P-157	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472012	P-23	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472013	P-22	EPA 903.1	MK1	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30261472014	P-155	EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
30261472015	P-01a-1	Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472016	P-156	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
30261472017	P-162	EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
30261472018	P-163	Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472019	P-164	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
30261472020	P-165	EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
30261472021	P-132	Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30261472022	P-153	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	KAC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Method: EPA 903.1

Description: 903.1 Radium 226

Client: Pace-MN Field Services Division

Date: August 20, 2018

General Information:

22 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:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Method: EPA 904.0

Description: 904.0 Radium 228

Client: Pace-MN Field Services Division

Date: August 20, 2018

General Information:

22 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:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Method: Total Radium Calculation

Description: Total Radium 228+226

Client: Pace-MN Field Services Division

Date: August 20, 2018

General Information:

22 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.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Sample: P-17		Lab ID: 30261472001	Collected: 07/31/18 08:40	Received: 08/07/18 09:45	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.085 ± 0.552	(1.20)	pCi/L	08/15/18 20:59	13982-63-3	
		C:NA T:74%					
Radium-228	EPA 904.0	0.397 ± 0.420	(0.877)	pCi/L	08/15/18 13:22	15262-20-1	
		C:72% T:85%					
Total Radium	Total Radium Calculation	0.397 ± 0.972	(2.08)	pCi/L	08/16/18 13:22	7440-14-4	

Sample: P-131		Lab ID: 30261472002	Collected: 07/31/18 10:45	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.072 ± 0.374 (0.866) C:NA T:84%	pCi/L	08/15/18 20:59	13982-63-3	
Radium-228	EPA 904.0	0.699 ± 0.415 (0.772) C:75% T:87%	pCi/L	08/15/18 13:22	15262-20-1	
Total Radium	Total Radium Calculation	0.699 ± 0.789 (1.64)	pCi/L	08/16/18 13:22	7440-14-4	

Sample: Rinse		Lab ID: 30261472003	Collected: 08/01/18 11:10	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.452 (0.980) C:NA T:77%	pCi/L	08/15/18 20:59	13982-63-3	
Radium-228	EPA 904.0	0.581 ± 0.495 (1.00) C:71% T:77%	pCi/L	08/15/18 13:22	15262-20-1	
Total Radium	Total Radium Calculation	0.581 ± 0.947 (1.98)	pCi/L	08/16/18 13:22	7440-14-4	

Sample: P-151		Lab ID: 30261472004	Collected: 08/01/18 13:20	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.211 ± 0.498 (0.923) C:NA T:87%	pCi/L	08/15/18 20:59	13982-63-3	
Radium-228	EPA 904.0	0.685 ± 0.453 (0.873) C:76% T:80%	pCi/L	08/15/18 13:22	15262-20-1	
Total Radium	Total Radium Calculation	0.896 ± 0.951 (1.80)	pCi/L	08/16/18 13:22	7440-14-4	

Sample: P-150		Lab ID: 30261472005	Collected: 08/01/18 14:25	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.91 ± 0.852 (0.852) C:NA T:83%	pCi/L	08/15/18 21:15	13982-63-3	
Radium-228	EPA 904.0	0.261 ± 0.571 (1.26) C:73% T:77%	pCi/L	08/15/18 18:25	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Sample: P-150		Lab ID: 30261472005	Collected: 08/01/18 14:25	Received: 08/07/18 09:45	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	2.17 ± 1.42 (2.11)		pCi/L	08/16/18 13:22	7440-14-4	

Sample: P-154a		Lab ID: 30261472006	Collected: 08/01/18 15:35	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.706 ± 0.517 (0.577) C:NA T:79%	pCi/L	08/15/18 21:15	13982-63-3	
Radium-228	EPA 904.0	-0.609 ± 0.400 (1.06) C:69% T:87%	pCi/L	08/15/18 18:25	15262-20-1	
Total Radium	Total Radium Calculation	0.706 ± 0.917 (1.64)	pCi/L	08/16/18 13:22	7440-14-4	

Sample: P-152a		Lab ID: 30261472007	Collected: 08/01/18 16:40	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.252 ± 0.495 (0.904) C:NA T:75%	pCi/L	08/15/18 21:15	13982-63-3	
Radium-228	EPA 904.0	0.261 ± 0.534 (1.18) C:73% T:78%	pCi/L	08/15/18 18:25	15262-20-1	
Total Radium	Total Radium Calculation	0.513 ± 1.03 (2.08)	pCi/L	08/16/18 13:22	7440-14-4	

Sample: Duplicate		Lab ID: 30261472008	Collected: 08/01/18 16:40	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.149 ± 0.357 (0.691) C:NA T:81%	pCi/L	08/15/18 21:15	13982-63-3	
Radium-228	EPA 904.0	0.406 ± 0.560 (1.20) C:66% T:74%	pCi/L	08/15/18 18:25	15262-20-1	
Total Radium	Total Radium Calculation	0.555 ± 0.917 (1.89)	pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-130		Lab ID: 30261472009	Collected: 08/01/18 17:30	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.308 ± 0.428 (0.715) C:NA T:80%	pCi/L	08/15/18 21:25	13982-63-3	
Radium-228	EPA 904.0	-0.113 ± 0.380 (0.912) C:78% T:87%	pCi/L	08/15/18 18:25	15262-20-1	
Total Radium	Total Radium Calculation	0.308 ± 0.808 (1.63)	pCi/L	08/16/18 14:15	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Sample: P-158		Lab ID: 30261472010	Collected: 08/01/18 18:20	Received: 08/07/18 09:45	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.526 ± 0.535	(0.809)	pCi/L	08/15/18 21:15	13982-63-3	
		C:NA T:79%					
Radium-228	EPA 904.0	0.0583 ± 0.516	(1.19)	pCi/L	08/15/18 18:25	15262-20-1	
		C:70% T:78%					
Total Radium	Total Radium Calculation	0.584 ± 1.05	(2.00)	pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-157		Lab ID: 30261472011	Collected: 08/02/18 07:40	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.646 ± 0.596 (0.869) C:NA T:77%	pCi/L	08/15/18 21:15	13982-63-3	
Radium-228	EPA 904.0	0.449 ± 0.529 (1.11) C:70% T:74%	pCi/L	08/15/18 18:26	15262-20-1	
Total Radium	Total Radium Calculation	1.10 ± 1.13 (1.98)	pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-23		Lab ID: 30261472012	Collected: 08/02/18 09:00	Received: 08/07/18 09:45	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0834 ± 0.432 (0.897)		pCi/L	08/15/18 21:30	13982-63-3	
		C:NA T:79%					
Radium-228	EPA 904.0	0.109 ± 0.470 (1.07)		pCi/L	08/15/18 18:26	15262-20-1	
		C:73% T:78%					
Total Radium	Total Radium Calculation	0.192 ± 0.902 (1.97)		pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-22		Lab ID: 30261472013	Collected: 08/02/18 10:10	Received: 08/07/18 09:45	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0815 ± 0.372 (0.600)		pCi/L	08/15/18 21:41	13982-63-3	
		C:NA T:81%					
Radium-228	EPA 904.0	-0.397 ± 0.436 (1.11)		pCi/L	08/15/18 18:26	15262-20-1	
		C:72% T:76%					
Total Radium	Total Radium Calculation	0.0815 ± 0.808 (1.71)		pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-155		Lab ID: 30261472014	Collected: 08/02/18 11:10	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.160 ± 0.444 (0.861) C:NA T:84%	pCi/L	08/15/18 21:30	13982-63-3	
Radium-228	EPA 904.0	0.0667 ± 0.530 (1.22) C:74% T:74%	pCi/L	08/15/18 18:26	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Sample: P-155		Lab ID: 30261472014	Collected: 08/02/18 11:10	Received: 08/07/18 09:45	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	0.227 ± 0.974 (2.08)		pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-01a-1		Lab ID: 30261472015	Collected: 08/02/18 11:50	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.243 ± 0.422 (0.754) C:NA T:79%	pCi/L	08/15/18 21:30	13982-63-3	
Radium-228	EPA 904.0	0.288 ± 0.574 (1.27) C:71% T:73%	pCi/L	08/15/18 18:26	15262-20-1	
Total Radium	Total Radium Calculation	0.531 ± 0.996 (2.02)	pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-156		Lab ID: 30261472016	Collected: 08/02/18 12:40	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.073 ± 0.332 (0.783) C:NA T:90%	pCi/L	08/15/18 21:36	13982-63-3	
Radium-228	EPA 904.0	0.298 ± 0.537 (1.17) C:73% T:75%	pCi/L	08/15/18 18:26	15262-20-1	
Total Radium	Total Radium Calculation	0.298 ± 0.869 (1.95)	pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-162		Lab ID: 30261472017	Collected: 08/02/18 13:40	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.352 ± 0.424 (0.647) C:NA T:73%	pCi/L	08/15/18 21:30	13982-63-3	
Radium-228	EPA 904.0	0.0610 ± 0.421 (0.973) C:74% T:81%	pCi/L	08/15/18 18:26	15262-20-1	
Total Radium	Total Radium Calculation	0.413 ± 0.845 (1.62)	pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-163		Lab ID: 30261472018	Collected: 08/02/18 14:40	Received: 08/07/18 09:45	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0774 ± 0.402 (0.834) C:NA T:79%		pCi/L	08/15/18 21:47	13982-63-3	
Radium-228	EPA 904.0	-0.0332 ± 0.390 (0.922) C:75% T:88%		pCi/L	08/15/18 18:26	15262-20-1	
Total Radium	Total Radium Calculation	0.0774 ± 0.792 (1.76)		pCi/L	08/16/18 14:15	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

Sample: P-164		Lab ID: 30261472019	Collected: 08/02/18 15:35	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0824 ± 0.428 (0.887) C:NA T:76%	pCi/L	08/15/18 21:43	13982-63-3	
Radium-228	EPA 904.0	0.629 ± 0.467 (0.923) C:75% T:83%	pCi/L	08/15/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	0.711 ± 0.895 (1.81)	pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-165		Lab ID: 30261472020	Collected: 08/02/18 16:40	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.341 (0.766) C:NA T:91%	pCi/L	08/15/18 21:43	13982-63-3	
Radium-228	EPA 904.0	0.237 ± 0.364 (0.787) C:77% T:86%	pCi/L	08/15/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	0.237 ± 0.705 (1.55)	pCi/L	08/16/18 14:15	7440-14-4	

Sample: P-132		Lab ID: 30261472021	Collected: 08/02/18 17:25	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.331 (0.717) C:NA T:94%	pCi/L	08/16/18 19:41	13982-63-3	
Radium-228	EPA 904.0	0.211 ± 0.368 (0.803) C:80% T:83%	pCi/L	08/15/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	0.211 ± 0.699 (1.52)	pCi/L	08/20/18 15:27	7440-14-4	

Sample: P-153		Lab ID: 30261472022	Collected: 08/02/18 18:15	Received: 08/07/18 09:45	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.127 ± 0.289 (0.466) C:NA T:92%	pCi/L	08/16/18 19:41	13982-63-3	
Radium-228	EPA 904.0	0.337 ± 0.442 (0.945) C:79% T:78%	pCi/L	08/15/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	0.464 ± 0.731 (1.41)	pCi/L	08/20/18 15:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

QC Batch:	308839	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30261472021, 30261472022		

METHOD BLANK:	1509091	Matrix:	Water
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Associated Lab Samples: 30261472021, 30261472022

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.127 ± 0.290 (0.468) C:NA T:92%	pCi/L	08/16/18 19:41	

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

QC Batch:	308837	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30261472001, 30261472002, 30261472003, 30261472004, 30261472005, 30261472006, 30261472007, 30261472008, 30261472009, 30261472010, 30261472011, 30261472012, 30261472013, 30261472014, 30261472015, 30261472016, 30261472017, 30261472018, 30261472019, 30261472020		

METHOD BLANK:	1509088	Matrix:	Water
Associated Lab Samples:	30261472001, 30261472002, 30261472003, 30261472004, 30261472005, 30261472006, 30261472007, 30261472008, 30261472009, 30261472010, 30261472011, 30261472012, 30261472013, 30261472014, 30261472015, 30261472016, 30261472017, 30261472018, 30261472019, 30261472020		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.156 ± 0.374 (0.724) C:NA T:83%	pCi/L	08/15/18 21:00	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

QC Batch:	308838	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30261472001, 30261472002, 30261472003, 30261472004, 30261472005, 30261472006, 30261472007, 30261472008, 30261472009, 30261472010, 30261472011, 30261472012, 30261472013, 30261472014, 30261472015, 30261472016, 30261472017, 30261472018, 30261472019, 30261472020		

METHOD BLANK:	1509089	Matrix:	Water
Associated Lab Samples:	30261472001, 30261472002, 30261472003, 30261472004, 30261472005, 30261472006, 30261472007, 30261472008, 30261472009, 30261472010, 30261472011, 30261472012, 30261472013, 30261472014, 30261472015, 30261472016, 30261472017, 30261472018, 30261472019, 30261472020		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.126 ± 0.397 (0.896) C:75% T:67%	pCi/L	08/15/18 13:22	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

QC Batch:	308840	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30261472021, 30261472022		

METHOD BLANK:	1509095	Matrix:	Water
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Associated Lab Samples: 30261472021, 30261472022

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.173 ± 0.301 (0.748) C:76% T:84%	pCi/L	08/15/18 16:41	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00929, Xcel Energy-ShercoBA

Pace Project No.: 30261472

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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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.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Xcel Energy	Report To: David Anderson	Attention: Cara Ruikie	Page: 1 of 2		
Address: c/o Pacemw Field	Copy To:	Company Name: Pacemw Field Services	Invoice Number: 2202807		
Phone:	Purchase Order No.:	Address:	REGULATORY AGENCY		
Requested Due Date/TAT:	Project Name: 18-00929, Xcel Energy -	Pace Quote Reference: Tom Halverson	☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER		
	Project Number: ShereobAP/pand3 ccr	Pace Project Manager: Carin Ferris	Site Location		
	Summer 2018	Pace Profile #:	STATE:		

ITEM #	Section D Required Client Information		Matrix Codes MATRIX / CODE		COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)		MATRIX CODE (see valid codes to left)		SAMPLE TEMP AT COLLECTION		PRESERVATIVES		Analysis Test ↑		Y/N ↓	Residual C	Pace Project No./ Lab I.D.
	Section D Required Client Information	Matrix Codes MATRIX / CODE	Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	DW WT WW P SL OL WP AR TS OT	COMPOSITE START	COMPOSITE END/GRAB	DATE	TIME	DATE	TIME	# OF CONTAINERS	Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Analysis Test ↑	Y/N ↓					
1	P-17	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	001
2	P-131	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	002
3	Rinse	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	003
4	P-151	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	004
5	P-150	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	005
6	P-1544	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	006
7	P-1520	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	007
8	Duplicate	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	008
9	P-130	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	009
10	P-158	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	010
11	P-157	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	011
12	P-23	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	WT	012

Section I Additional Comments		Section J Relinquished By / Affiliation		Section K Date		Section L Time		Section M Accepted By / Affiliation		Section N Date		Section O Time		Section P Sample Conditions	
① client needs to analyze for:		David Anderson		8/13/18		11:15		Carmy		8-78		9:45		NA N N Y	
Radium 226+238pCi/L															
Combined.															
PA-226EPA9031															
PA-228EPA9040															

CHAIN-OF-CUSTODY / Analytical Request Document

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



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Page: 2 of 2

2202806

Section C

Invoice Information:

Company:	Xcel Energy	Report To:	David Anderson	Attention:	Ciara Ruithe
Address:	50 Pace Mall Field	Copy To:		Company Name:	Pace MW Field Services
				Address:	
Email To:		Purchase Order No.:		Pace Quote Reference:	Tam Halverson
Phone:				Pace Project Manager:	Catin Ferris
Requested Due Date/TAT:				Pace Profile #:	

Section B

Required Project Information:

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

Section D

Required Client Information

Sample ID	(A-Z, 0-9 / -)	Sample IDs MUST BE UNIQUE
Requested Analysis Filtered (Y/N)		
Requested Analysis Filtered (Y/N)		

ITEM #	Section D Required Client Information		Section B Required Project Information		Section C Invoice Information		Section A Required Client Information		Section D Required Client Information		Section B Required Project Information		Section C Invoice Information		Section A Required Client Information	
	Matrix Codes	MATRIX / CODE	Drinking Water	DW	WT	WW	P	SL	OL	WP	AR	TS	OT	Sample ID	(A-Z, 0-9 / -)	Sample IDs MUST BE UNIQUE
1	P-22															
2	P-155															
3	P-014-1															
4	P-156															
5	P-162															
6	P-163															
7	P-164															
8	P-165															
9	P-132															
10	P-153															
11																
12																

ITEM #	Section D Required Client Information		Section B Required Project Information		Section C Invoice Information		Section A Required Client Information		Section D Required Client Information		Section B Required Project Information		Section C Invoice Information		Section A Required Client Information	
	Matrix Codes	MATRIX / CODE	Drinking Water	DW	WT	WW	P	SL	OL	WP	AR	TS	OT	Sample ID	(A-Z, 0-9 / -)	Sample IDs MUST BE UNIQUE
1	P-22															
2	P-155															
3	P-014-1															
4	P-156															
5	P-162															
6	P-163															
7	P-164															
8	P-165															
9	P-132															
10	P-153															
11																
12																

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: XCEL

Project # 30261472

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

Tracking #: 4486 7787 0983

Label <u>ET</u>
LIMS Login <u>BZH</u>

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

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
Chain of Custody Present:	☒	☐	☐	<u>1053671</u>	<u>ET 8-7-18</u>
Chain of Custody Filled Out:	☒	☐	☐		
Chain of Custody Relinquished:	☒	☐	☐		
Sampler Name & Signature on COC:	☒	☐	☐		
Sample Labels match COC:	☒	☐	☐		
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	☒	☐	☐		
Short Hold Time Analysis (<72hr remaining):	☒	☐	☐		
Rush Turn Around Time Requested:	☒	☐	☐		
Sufficient Volume:	☒	☐	☐		
Correct Containers Used:	☒	☐	☐		
-Pace Containers Used:	☒	☐	☐		
Containers Intact:	☒	☐	☐		
Orthophosphate field filtered	☒	☐	☐		
Hex Cr Aqueous Compliance/NPDES sample field filtered	☒	☐	☐		
Organic Samples checked for dechlorination:	☒	☐	☐		
Filtered volume received for Dissolved tests	☒	☐	☐		
All containers have been checked for preservation.	☒	☐	☐		
All containers needing preservation are found to be in compliance with EPA recommendation.	☒	☐	☐	<u>PH12</u>	
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>ET</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	☒	☐	☐		
Trip Blank Present:	☒	☐	☐		
Trip Blank Custody Seals Present	☒	☐	☐		
Rad Aqueous Samples Screened > 0.5 mrem/hr	☒	☐	☐	Initial when completed: <u>ET</u>	Date: <u>8-7-18</u>

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

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

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

Appendix C

November 2018 Assessment Monitoring Semiannual Sampling Event Field Datasheets and Laboratory Reports

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds NPDES + ECR Fall 2018 Project No. 18-01330

Monitoring Point ID P-130 Labeled P130

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 46.84 Feet

Static water level measurement before purging (Start Depth) 38.00 Feet

Static water level measurement at time of sampling (Final Depth) 38.00 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method 6" inline red line 2 dedicated bladder pump Pump ID SP-1 PC-6

Date Purged 10-31-18 Water Column 8.84 Feet

Time Purged 0825-0846 One Casing Volume 1.4 Gallons

Pump Rate 0.2 **GPM** LPM Volume Purged 4.2 Gallons

Field Sampling Data

Date Sampled 10-31-18

Time Sampled 0900

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.7 (units) D.O. 6.9 (mg/l)

Spec. Cond. 810 (umhos/cm) Turbidity 4.1 (NTU)

Temp. 10.5 (°C) Eh 273 (mV)

Other NA

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

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

Weather Conditions During Sampling: 37° + partly cloudy, wind NW 10

Sample Description: clear + odorless

Observations: DJA 10-31-18

Stabilization Test

Time	pH (units)	Specific Conductance (umhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0832	7.8	810	10.5	6.7	NA	272	1.4
0839	7.7	810	10.5	6.8	NA	273	2.8
0846	7.7	810	10.5	6.9	NA	273	4.2
<u>DJA 10/31/18</u>							

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: 10/31/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds NPDES + ECR Fall 2018 Project No. 18-01330

Monitoring Point ID P-131 Labeled P131

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 48.55 Feet

Static water level measurement before purging (Start Depth) 35.61 Feet

Static water level measurement at time of sampling (Final Depth) 35.61 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method 6" Grundfos Rediflo 2 dedicated bladder pump Pump ID SP-1 PC-6

Date Purged 10-31-18 Water Column 12.94 Feet

Time Purged 0920-0953 One Casing Volume 2.1 Gallons

Pump Rate 0.2 **GPM** LPM Volume Purged 6.6 Gallons

Field Sampling Data

Date Sampled 10-31-18

Time Sampled 1005

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.9 (units) D.O. 7.7 (mg/l)

Spec. Cond. 530 (µmhos/cm) Turbidity 3.0 (NTU)

Temp. 10.0 (°C) Eh 261 (mV)

Other NA

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

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

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

Sample Description: clear + odorless

Observations: DJA 10/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0931	8.0	530	10.0	7.5	NA	268	2.2
0942	7.9	530	10.0	7.6	NA	265	4.4
0953	7.9	530	10.0	7.7	NA	261	6.6
<u>DJA 10/31/18</u>							

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: 10/31/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds NPDES + ECR Fall 2018 Project No. 18-01330

Monitoring Point ID P-132 Labeled P132

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 36.51 Feet

Static water level measurement before purging (Start Depth) 30.37 Feet

Static water level measurement at time of sampling (Final Depth) 30.37 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method Gruntfos rediflo 2 Pump ID sp-1

Date Purged 10-31-18 Water Column 6.14 Feet

Time Purged 1025-1040 One Casing Volume 1.0 Gallons

Pump Rate 0.2 (GPM) LPM Volume Purged 3.0 Gallons

Field Sampling Data

Date Sampled 10-31-18 Time Sampled 1050

Sampling Equip. above pump Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.6 (units) D.O. 8.6 (mg/l)

Spec. Cond. 590 (µmhos/cm) Turbidity 3.0 (NTU)

Temp. 10.0 (°C) Eh 271 (mV)

Other NA

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

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

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

Sample Description: clear + odorless

Observations: DJA 10/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1030	7.6	600	10.0	9.1	NA	273	1.0
1035	7.6	590	10.0	8.8	NA	271	2.0
1040	7.6	590	10.0	8.6	NA	271	3.0
<u>DJA 10/31/18</u>							

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: 10/31/18

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco Ponds CCR, Fall 2018 **Project No.** 18-01328

Monitoring Point ID P-150 **Labeled** 806320

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 36.66 **Feet**

Static water level measurement before purging (Start Depth) 32.87 **Feet**

Static water level measurement at time of sampling (Final Depth) 32.87 **Feet**

Static Water Level Elevation Before Purging NA **Feet**

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

Date Purged 11-1-18 **Water Column** 3.79 **Feet**

Time Purged 0805-0817 **One Casing Volume** 0.6 **Gallons**

Pump Rate 0.15 **GPM** **LPM** **Volume Purged** 1.8 **Gallons**

Date Sampled 11-1-18 **Time Sampled** 0830

Sampling Equip. above pump **Meter ID** MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

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

Spec. Cond. 510 (µmhos/cm) **Turbidity** 3.8 (NTU)

Temp. 10.0 (°C) **Eh** 247 (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 NW 5

Sample Description: clear + odorless

Observations: DJA 11-1-18

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0809	7.7	500	10.0	7.3	NA	244	0.6
0813	7.7	500	10.0	7.3	NA	245	1.2
0817	7.6	510	10.0	7.3	NA	247	1.8
<u>DJA 11-1-18</u>							

Samples chilled immediately after collection: ☒ **Yes** ☐ **Other**

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson **Date:** 11-1-18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds CCR, Fall 2018 Project No. 18-01328

Monitoring Point ID P-151 Labeled 806315

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 20.16 Feet

Static water level measurement before purging (Start Depth) 12.52 Feet

Static water level measurement at time of sampling (Final Depth) 12.52 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-1-18 Water Column 7.64 Feet

Time Purged 0855-0919 One Casing Volume 1.2 Gallons

Pump Rate 0.15 GPM LPM Volume Purged 3.6 Gallons

Field Sampling Data

Date Sampled 11-1-18

Time Sampled 0930

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.8 (units) D.O. 7.3 (mg/l)

Spec. Cond. 430 (µmhos/cm) Turbidity 4.9 (NTU)

Temp. 12.0 (°C) Eh 244 (mV)

Other NA

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

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

Weather Conditions During Sampling: 31° + sunny, wind 15-10

Sample Description: clear + odorless

Observations: DJA 11-1-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
0903	7.9	430	12.0	7.3	NA	253	1.2
0911	7.8	430	12.0	7.3	NA	249	2.4
0919	7.8	430	12.0	7.3	NA	244	3.6
<u>DJA 11-1-18</u>							

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 11-1-18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds CCR, Fall 2018 Project No. 18-01328

Monitoring Point ID P-1524 Labeled 806318

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 42.18 Feet

Static water level measurement before purging (Start Depth) 38.08 Feet

Static water level measurement at time of sampling (Final Depth) 38.08 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10-31-18 Water Column 4.10 Feet

Time Purged 1505-1520 One Casing Volume 0.7 Gallons

Pump Rate 0.15 **GPM** / LPM Volume Purged 2.25 Gallons

Field Sampling Data

Date Sampled 10-31-18

Time Sampled 1540

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DTA

Field Parameter Measurements of Sample

pH 7.9 (units) D.O. 8.5 (mg/l)

Spec. Cond. 380 (µmhos/cm) Turbidity 2.2 (NTU)

Temp. 10.5 (°C) Eh 257 (mV)

Other NA

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

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

Weather Conditions During Sampling: 50°+ sunny, wind W15

Sample Description: clear + odorless

Observations: collected Rinse Blank at this well.
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)
1510	8.0	380	10.5	8.5	NA	255	0.75
1515	7.9	380	10.5	8.5	NA	257	1.50
1520	7.9	380	10.5	8.5	NA	257	2.25
DTA 10/31/18							

Samples chilled immediately after collection: ☒ Yes ☐ Other

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

Lead Technician Signature: David Anderson Date: 10/31/18

Well Sampling Field Data Log Sheet

Client Xcel Energy **Project** Sherco Ponds CCR, Fall 2018 **Project No.** 18-01328

Monitoring Point ID P-153 **Labeled** 806314

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 23.63 **Feet**

Static water level measurement before purging (Start Depth) 17.07 **Feet**

Static water level measurement at time of sampling (Final Depth) 17.07 **Feet**

Static Water Level Elevation Before Purging NA **Feet**

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

Date Purged 11-1-18 **Water Column** 6.56 **Feet**

Time Purged 0955-1019 **One Casing Volume** 1.1 **Gallons**

Pump Rate 0.15 **GPM** **LPM** **Volume Purged** 3.6 **Gallons**

Date Sampled 11-1-18 **Time Sampled** 1030

Sampling Equip. above pump **Meter ID** MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.9 (units) **D.O.** 8.3 (mg/l)

Spec. Cond. 220 (µmhos/cm) **Turbidity** 4.3 (NTU)

Temp. 11.0 (°C) **Eh** 255 (mV)

Other NA

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

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

Weather Conditions During Sampling: 31° + sunny, wind N 5-10.

Sample Description: clear + odorless

Observations: DJA 11-1-18

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1003	8.0	220	10.5	8.5	NA	262	1.2
1011	7.9	220	11.0	8.4	NA	258	2.4
1019	7.9	220	11.0	8.3	NA	255	3.6
<u>DJA 11-1-18</u>							

Samples chilled immediately after collection: ☒ **Yes** ☐ **Other**

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson **Date:** 11-1-18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds CCR, Fall 2018 Project No. 18-01328

Monitoring Point ID P-154a Labeled 806316

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 49.53 Feet

Static water level measurement before purging (Start Depth) 33.61 Feet

Static water level measurement at time of sampling (Final Depth) 33.61 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-1-18 Water Column 15.92 Feet

Time Purged 1045-1124 One Casing Volume 2.6 Gallons

Pump Rate 0.2 GPM LPM Volume Purged 7.8 Gallons

Field Sampling Data

Date Sampled 11-1-18

Time Sampled 1135

Sampling Equip. above pump

Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.8 (units) D.O. 3.2 (mg/l)

Spec. Cond. 470 (µmhos/cm) Turbidity 4.3 (NTU)

Temp. 10.0 (°C) Eh 256 (mV)

Other NA

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

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

Weather Conditions During Sampling: 33° + sunny, wind N 5-10

Sample Description: clear + odorless

Observations: DJA 11-1-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1058	7.9	470	10.0	2.7	NA	254	2.6
1111	7.9	470	10.0	3.0	NA	255	5.2
1124	7.8	470	10.0	3.2	NA	256	7.8
<u>DJA 11-1-18</u>							

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 11-1-18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds CCR, Fall 2018 Project No. 18-01328

Monitoring Point ID P-162 Labeled 822156

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 166 Feet (estimate)

Static water level measurement before purging (Start Depth) 148.78 Feet (estimate)

Static water level measurement at time of sampling (Final Depth) 148.78 Feet (estimate)

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10-31-18 Water Column 17.22 Feet

Time Purged 1150-1220 One Casing Volume 2.8 Gallons

Pump Rate 0.3 (GPM) LPM Volume Purged 9.0 Gallons

Field Sampling Data

Date Sampled 10-31-18 Time Sampled 1230

Sampling Equip. above pump Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.9 (units) D.O. 6.0 (mg/l)

Spec. Cond. 840 (µmhos/cm) Turbidity 24.8 (NTU)

Temp. 11.0 (°C) Eh 246 (mV)

Other NA

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

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

Weather Conditions During Sampling: 45°+ sunny, wind W15

Sample Description: clear + odorless

Observations: DJA 10/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1200	8.0	830	11.0	6.2	NA	248	3.0
1210	7.9	840	11.0	6.1	NA	247	6.0
1220	7.9	840	11.0	6.0	NA	246	9.0
<u>DJA 10/31/18</u>							

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: 10/31/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds CCR Project No. 18-01328
 Monitoring Point ID P-163 Labeled 822157
 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 176 Feet (estimate)
 Static water level measurement before purging (Start Depth) 158.15 Feet (estimate)
 Static water level measurement at time of sampling (Final Depth) 158.15 Feet (estimate)
 Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PG-6
 Date Purged 10/31/18 Water Column 17.85 Feet
 Time Purged 1250-1320 One Casing Volume 2.9 Gallons
 Pump Rate 0.3 (GPM) LPM Volume Purged 9.0 Gallons

Field Sampling Data

Date Sampled 10/31/18 Time Sampled 1330
 Sampling Equip. above pump Meter ID MPS-5
 Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.8 (units) D.O. 6.2 (mg/l)
 Spec. Cond. 960 (µmhos/cm) Turbidity 87.4 (NTU)
 Temp. 12.0 (°C) Eh 269 (mV)
 Other NA

Field Measurements Temp. Corrected: ☒ Yes ☐ No ☐ NA
 Sample for Soluble Metals Filtered in Field: ☐ Yes ☒ No ☐ NA

Weather Conditions During Sampling: 46° + sunny, wind W20
 Sample Description: clear + odorless
 Observations: DJA 10/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1300	7.7	960	12.0	6.3	NA	265	3.0
1310	7.8	960	12.0	6.2	NA	268	6.0
1320	7.8	960	12.0	6.2	NA	269	9.0
<u>DJA 10/31/18</u>							

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: 10/31/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds CCR, Fall 2018 Project No. 18-01328

Monitoring Point ID P-164 Labeled 822/58

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 166 Feet (estimate)

Static water level measurement before purging (Start Depth) 151.93 Feet (estimate)

Static water level measurement at time of sampling (Final Depth) 151.93 Feet (estimate)

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 10-31-18 Water Column 14.07 Feet

Time Purged 1350-1414 One Casing Volume 2.3 Gallons

Pump Rate 0.3 GPM LPM Volume Purged 7.2 Gallons

Field Sampling Data

Date Sampled 10-31-18 Time Sampled 1425

Sampling Equip. above pump Meter ID MPS-5

Analyzed by DJA

Field Parameter Measurements of Sample

pH 7.9 (units) D.O. 5.6 (mg/l)

Spec. Cond. 540 (µmhos/cm) Turbidity 18.0 (NTU)

Temp. 12.0 (°C) Eh 267 (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° + sunny, wind W 20

Sample Description: clear + odorless

Observations: DJA 10/31/18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1358	8.0	540	12.0	5.4	NA	260	2.4
1406	7.9	540	12.0	5.5	NA	265	4.8
1414	7.9	540	12.0	5.6	NA	267	7.2

DJA 10/31/18

Samples chilled immediately after collection: ☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 10/31/18

Well Sampling Field Data Log Sheet

Well Description and Presampling Information

Client Xcel Energy Project Sherco Ponds CCR, Fall 2018 Project No. 18-01328

Monitoring Point ID P-165 Labeled 822159

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 40.32 Feet

Static water level measurement before purging (Start Depth) 32.27 Feet

Static water level measurement at time of sampling (Final Depth) 32.27 Feet

Static Water Level Elevation Before Purging NA Feet

Purge Method dedicated bladder pump Pump ID PC-6

Date Purged 11-1-18 Water Column 8.05 Feet

Time Purged 1150 - 1217 One Casing Volume 1.3 Gallons

Pump Rate 0.15 GPM LPM Volume Purged 4.05 Gallons

Field Sampling Data

Date Sampled 11-1-18

Time Sampled 1230

Sampling Equip. above pump

Meter ID MP5-5

Analyzed by DJA

Field Parameter Measurements of Sample

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

Spec. Cond. 440 (µmhos/cm) Turbidity 3.8 (NTU)

Temp. 10.5 (°C) Eh 255 (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 N 5-10

Sample Description: clear + odorless

Observations: DJA 11-1-18

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
1159	7.8	430	10.5	7.7	NA	253	1.35
1208	7.7	440	10.5	7.6	NA	255	2.70
1217	7.7	440	10.5	7.6	NA	255	4.05
<u>DJA 11-1-18</u>							

Samples chilled immediately after collection ☒ Yes ☐ Other

Form Revised: 01/25/2018

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

Lead Technician Signature: David Anderson Date: 11-1-18



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

20 November 2018
Charles A Donkers
Environmental Services-Water Minneapolis
250 Marquette Plaza
Minneapolis, MN 55401
RE: Sherco Pond 3 CCR

cc:

Enclosed are the results of analyses for samples received by the laboratory on 10/31/2018 06:35-11/05/2018 05:45. 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

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Rinse		MDJ0374-01	Water	10/29/2018 16:50	10/31/2018 6:35
Duplicate		MDJ0374-10	Water	10/29/2018 18:20	10/31/2018 6:35
P-130		MDK0025-04	Water	10/31/2018 9:00	11/05/2018 5:45
P-131		MDK0025-05	Water	10/31/2018 10:05	11/05/2018 5:45
P-132		MDK0025-06	Water	10/31/2018 10:50	11/05/2018 5:45
P-162		MDK0026-01	Water	10/31/2018 12:30	11/05/2018 5:45
P-163		MDK0026-02	Water	10/31/2018 13:30	11/05/2018 5:45
P-164		MDK0026-03	Water	10/31/2018 14:25	11/05/2018 5:45
Rinse		MDK0026-04	Water	10/31/2018 15:00	11/05/2018 5:45
P-152A		MDK0026-05	Water	10/31/2018 15:40	11/05/2018 5:45
Duplicate		MDK0026-06	Water	10/31/2018 15:40	11/05/2018 5:45
P-150		MDK0026-07	Water	11/01/2018 8:30	11/05/2018 5:45
P-151		MDK0026-08	Water	11/01/2018 9:30	11/05/2018 5:45
P-153		MDK0026-09	Water	11/01/2018 10:30	11/05/2018 5:45
P-154A		MDK0026-10	Water	11/01/2018 11:35	11/05/2018 5:45
P-165		MDK0026-11	Water	11/01/2018 12:30	11/05/2018 5:45

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

Rinse

MDJ0374-01 (Water) - Chain of Custody Number: 1845943/1845965

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDK0067	11/5/18 8:50	11/5/18 12:47	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0067	11/5/18 8:50	11/5/18 12:47	EPA 300.0	CRL
Sulfate	< 1.00	1.00	mg/L		1	BDK0067	11/5/18 8:50	11/5/18 12:47	EPA 300.0	CRL

Wet Chemistry

pH	6.20		pH Units	M_TTT	1	BDJ0802	10/31/18 11:47	10/31/18 13:05	SM 4500-H+ B	CRL
Total Dissolved Solids	< 20.0	20.0	mg/L		1	BDJ0786	10/31/18 13:00	10/31/18 13:00	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDJ0785	10/31/18 8:58	10/31/18 8:58	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:26	EPA 200.8	CRL
Barium	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:26	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:26	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:26	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:26	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:26	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:26	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDJ0798	10/31/18 10:50	11/6/18 12:19	EPA 200.7	HRD
Calcium	< 1.25	1.25	mg/L		1	BDJ0798	10/31/18 10:50	11/6/18 12:17	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

Duplicate

MDJ0374-10 (Water) - Chain of Custody Number: 1845943/1845965

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	23.5	1.00	mg/L		1	BDK0067	11/5/18 8:50	11/5/18 17:33	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0067	11/5/18 8:50	11/5/18 17:33	EPA 300.0	CRL
Sulfate	118	1.00	mg/L		1	BDK0067	11/5/18 8:50	11/5/18 17:33	EPA 300.0	CRL

Wet Chemistry

pH	7.79		pH Units	M_TTT	1	BDJ0802	10/31/18 11:47	10/31/18 14:13	SM 4500-H+ B	CRL
Total Dissolved Solids	434	20.0	mg/L		1	BDJ0809	11/1/18 9:08	11/1/18 9:08	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDJ0808	11/1/18 7:03	11/1/18 7:03	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.544	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:34	EPA 200.8	CRL
Barium	65.2	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:34	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:34	EPA 200.8	CRL
Chromium	1.08	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:34	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:34	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:34	EPA 200.8	CRL
Selenium	1.53	0.500	ug/L		1	BDJ0800	10/31/18 10:54	11/1/18 8:34	EPA 200.8	CRL

Total Metals by ICP

Boron	0.234	0.0500	mg/L		1	BDJ0798	10/31/18 10:50	11/6/18 12:29	EPA 200.7	HRD
Calcium	101	1.25	mg/L		1	BDJ0798	10/31/18 10:50	11/6/18 12:27	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0025-04 (Water) - Chain of Custody Number: 1845966

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	1.06	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 16:19	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 16:19	EPA 300.0	CRL
Sulfate	13.2	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 16:19	EPA 300.0	CRL

Wet Chemistry

pH	7.41		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 9:30	SM 4500-H+ B	CRL
Total Dissolved Solids	472	20.0	mg/L		1	BDK0062	11/5/18 9:35	11/5/18 9:35	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0061	11/5/18 7:52	11/5/18 7:52	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.532	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:51	EPA 200.8	CRL
Barium	92.0	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:51	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:51	EPA 200.8	CRL
Chromium	1.22	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:51	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:51	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:51	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:51	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:28	EPA 200.7	HRD
Calcium	127	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:26	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0025-05 (Water) - Chain of Custody Number: 1845966

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	13.3	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 16:40	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 16:40	EPA 300.0	CRL
Sulfate	19.6	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 16:40	EPA 300.0	CRL

Wet Chemistry

pH	7.80		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 9:37	SM 4500-H+ B	CRL
Total Dissolved Solids	298	20.0	mg/L		1	BDK0062	11/5/18 9:35	11/5/18 9:35	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0061	11/5/18 7:52	11/5/18 7:52	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.673	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:55	EPA 200.8	CRL
Barium	70.1	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:55	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:55	EPA 200.8	CRL
Chromium	0.867	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:55	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:55	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:55	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:55	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:32	EPA 200.7	HRD
Calcium	75.3	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:31	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

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MDK0025-06 (Water) - Chain of Custody Number: 1845966

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	2.42	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:00	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:00	EPA 300.0	CRL
Sulfate	44.1	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:00	EPA 300.0	CRL

Wet Chemistry

pH	7.66		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 9:43	SM 4500-H+ B	CRL
Total Dissolved Solids	358	20.0	mg/L		1	BDK0062	11/5/18 9:35	11/5/18 9:35	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0061	11/5/18 7:52	11/5/18 7:52	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:59	EPA 200.8	CRL
Barium	36.7	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:59	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:59	EPA 200.8	CRL
Chromium	1.53	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:59	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:59	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:59	EPA 200.8	CRL
Selenium	1.10	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 8:59	EPA 200.8	CRL

Total Metals by ICP

Boron	0.0745	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:37	EPA 200.7	HRD
Calcium	90.7	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:36	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-01 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	24.4	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:20	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:20	EPA 300.0	CRL
Sulfate	86.7	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:20	EPA 300.0	CRL

Wet Chemistry

pH	8.02		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 9:58	SM 4500-H+ B	CRL
Total Dissolved Solids	514	20.0	mg/L		1	BDK0062	11/5/18 9:35	11/5/18 9:35	SM 2540C	HSD
Total Suspended Solids	8.00	4.00	mg/L		1	BDK0061	11/5/18 7:52	11/5/18 7:52	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.632	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:03	EPA 200.8	CRL
Barium	51.2	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:03	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:03	EPA 200.8	CRL
Chromium	8.35	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:03	EPA 200.8	CRL
Molybdenum	3.29	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:03	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:03	EPA 200.8	CRL
Selenium	3.09	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:03	EPA 200.8	CRL

Total Metals by ICP

Boron	0.212	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:42	EPA 200.7	HRD
Calcium	96.9	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:41	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-02 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	13.9	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:41	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:41	EPA 300.0	CRL
Sulfate	166	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 17:41	EPA 300.0	CRL

Wet Chemistry

pH	7.91		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:02	SM 4500-H+ B	CRL
Total Dissolved Solids	628	20.0	mg/L		1	BDK0062	11/5/18 9:35	11/5/18 9:35	SM 2540C	HSD
Total Suspended Solids	94.0	5.00	mg/L		1	BDK0061	11/5/18 7:52	11/5/18 7:52	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	1.31	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:07	EPA 200.8	CRL
Barium	86.4	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:07	EPA 200.8	CRL
Cobalt	1.42	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:07	EPA 200.8	CRL
Chromium	36.7	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:07	EPA 200.8	CRL
Molybdenum	1.93	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:07	EPA 200.8	CRL
Lead	0.746	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:07	EPA 200.8	CRL
Selenium	34.5	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:07	EPA 200.8	CRL

Total Metals by ICP

Boron	0.506	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:47	EPA 200.7	HRD
Calcium	142	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:46	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-03 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	9.33	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:01	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:01	EPA 300.0	CRL
Sulfate	29.5	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:01	EPA 300.0	CRL

Wet Chemistry

pH	8.04		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:05	SM 4500-H+ B	CRL
Total Dissolved Solids	308	20.0	mg/L		1	BDK0062	11/5/18 9:35	11/5/18 9:35	SM 2540C	HSD
Total Suspended Solids	4.40	4.00	mg/L		1	BDK0061	11/5/18 7:52	11/5/18 7:52	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.566	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:11	EPA 200.8	CRL
Barium	39.3	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:11	EPA 200.8	CRL
Cobalt	1.15	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:11	EPA 200.8	CRL
Chromium	56.3	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:11	EPA 200.8	CRL
Molybdenum	3.67	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:11	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:11	EPA 200.8	CRL
Selenium	1.16	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:11	EPA 200.8	CRL

Total Metals by ICP

Boron	0.0532	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:53	EPA 200.7	HRD
Calcium	80.2	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 13:51	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

Rinse

MDK0026-04 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:22	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:22	EPA 300.0	CRL
Sulfate	< 1.00	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:22	EPA 300.0	CRL

Wet Chemistry

pH	6.26		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:08	SM 4500-H+ B	CRL
Total Dissolved Solids	< 20.0	20.0	mg/L		1	BDK0062	11/5/18 9:35	11/5/18 9:35	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0061	11/5/18 7:52	11/5/18 7:52	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:22	EPA 200.8	CRL
Barium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:22	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:22	EPA 200.8	CRL
Chromium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:22	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:22	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:22	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:22	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:08	EPA 200.7	HRD
Calcium	< 1.25	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:07	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-05 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:42	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:42	EPA 300.0	CRL
Sulfate	10.5	1.00	mg/L		1	BDK0098	11/6/18 6:10	11/6/18 18:42	EPA 300.0	CRL

Wet Chemistry

pH	7.81		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:12	SM 4500-H+ B	CRL
Total Dissolved Solids	218	20.0	mg/L		1	BDK0094	11/6/18 8:56	11/6/18 8:56	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0093	11/6/18 6:55	11/6/18 6:55	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:26	EPA 200.8	CRL
Barium	36.8	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:26	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:26	EPA 200.8	CRL
Chromium	0.794	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:26	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:26	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:26	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:26	EPA 200.8	CRL

Total Metals by ICP

Boron	0.0566	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:13	EPA 200.7	HRD
Calcium	59.3	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:12	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Duplicate

MDK0026-06 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 10:38	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 10:38	EPA 300.0	CRL
Sulfate	10.7	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 10:38	EPA 300.0	CRL

Wet Chemistry

pH	7.84		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:15	SM 4500-H+ B	CRL
Total Dissolved Solids	204	20.0	mg/L		1	BDK0094	11/6/18 8:56	11/6/18 8:56	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0093	11/6/18 6:55	11/6/18 6:55	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.512	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:30	EPA 200.8	CRL
Barium	37.7	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:30	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:30	EPA 200.8	CRL
Chromium	0.777	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:30	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:30	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:30	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:30	EPA 200.8	CRL

Total Metals by ICP

Boron	0.0570	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:18	EPA 200.7	HRD
Calcium	60.4	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:17	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-07 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	44.8	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 10:59	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 10:59	EPA 300.0	CRL
Sulfate	6.30	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 10:59	EPA 300.0	CRL

Wet Chemistry

pH	7.84		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:19	SM 4500-H+ B	CRL
Total Dissolved Solids	250	20.0	mg/L		1	BDK0094	11/6/18 8:56	11/6/18 8:56	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0093	11/6/18 6:55	11/6/18 6:55	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	0.628	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:34	EPA 200.8	CRL
Barium	50.8	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:34	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:34	EPA 200.8	CRL
Chromium	0.732	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:34	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:34	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:34	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:34	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:23	EPA 200.7	HRD
Calcium	58.3	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:22	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-08 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	18.1	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 11:19	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 11:19	EPA 300.0	CRL
Sulfate	18.0	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 11:19	EPA 300.0	CRL

Wet Chemistry

pH	7.90		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:23	SM 4500-H+ B	CRL
Total Dissolved Solids	222	20.0	mg/L		1	BDK0094	11/6/18 8:56	11/6/18 8:56	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0093	11/6/18 6:55	11/6/18 6:55	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:38	EPA 200.8	CRL
Barium	47.2	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:38	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:38	EPA 200.8	CRL
Chromium	0.851	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:38	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:38	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:38	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:38	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:28	EPA 200.7	HRD
Calcium	60.2	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:27	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-09 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	< 1.00	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 11:40	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 11:40	EPA 300.0	CRL
Sulfate	3.14	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 11:40	EPA 300.0	CRL

Wet Chemistry

pH	8.08		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:26	SM 4500-H+ B	CRL
Total Dissolved Solids	94.0	20.0	mg/L		1	BDK0094	11/6/18 8:56	11/6/18 8:56	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0093	11/6/18 6:55	11/6/18 6:55	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	1.14	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:42	EPA 200.8	CRL
Barium	16.7	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:42	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:42	EPA 200.8	CRL
Chromium	0.798	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:42	EPA 200.8	CRL
Molybdenum	0.697	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:42	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:42	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:42	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:33	EPA 200.7	HRD
Calcium	28.0	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:31	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-10 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	10.6	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 12:00	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 12:00	EPA 300.0	CRL
Sulfate	24.7	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 12:00	EPA 300.0	CRL

Wet Chemistry

pH	7.95		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:29	SM 4500-H+ B	CRL
Total Dissolved Solids	250	20.0	mg/L		1	BDK0094	11/6/18 8:56	11/6/18 8:56	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0093	11/6/18 6:55	11/6/18 6:55	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	1.27	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:46	EPA 200.8	CRL
Barium	41.9	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:46	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:46	EPA 200.8	CRL
Chromium	0.657	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:46	EPA 200.8	CRL
Molybdenum	0.822	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:46	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:46	EPA 200.8	CRL
Selenium	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:46	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:38	EPA 200.7	HRD
Calcium	61.7	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:36	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	Reported:
250 Marquette Plaza		11/20/2018 08:57
Minneapolis MN, 55401	Project Manager: Charles A Donkers	

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MDK0026-11 (Water) - Chain of Custody Number: 1845962/1845961

Analyte	Result	Reporting Limit	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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Anions by Ion Chromatography

Chloride	3.75	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 12:21	EPA 300.0	CRL
Fluoride	< 0.750	0.750	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 12:21	EPA 300.0	CRL
Sulfate	18.0	1.00	mg/L		1	BDK0154	11/7/18 7:29	11/7/18 12:21	EPA 300.0	CRL

Wet Chemistry

pH	7.84		pH Units	M_TTT	1	BDK0064	11/5/18 7:58	11/5/18 10:42	SM 4500-H+ B	CRL
Total Dissolved Solids	230	20.0	mg/L		1	BDK0094	11/6/18 8:56	11/6/18 8:56	SM 2540C	HSD
Total Suspended Solids	< 4.00	4.00	mg/L		1	BDK0093	11/6/18 6:55	11/6/18 6:55	SM 2540D	HSD

Total Metals by ICPMS

Arsenic	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:50	EPA 200.8	CRL
Barium	29.8	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:50	EPA 200.8	CRL
Cobalt	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:50	EPA 200.8	CRL
Chromium	1.41	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:50	EPA 200.8	CRL
Molybdenum	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:50	EPA 200.8	CRL
Lead	< 0.500	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:50	EPA 200.8	CRL
Selenium	0.991	0.500	ug/L		1	BDK0069	11/5/18 9:17	11/8/18 9:50	EPA 200.8	CRL

Total Metals by ICP

Boron	< 0.0500	0.0500	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:43	EPA 200.7	HRD
Calcium	65.9	1.25	mg/L		1	BDK0068	11/5/18 9:11	11/7/18 14:41	EPA 200.7	HRD

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
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Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0067 - Wet Prep

Blank (BDK0067-BLK1)				Prepared & Analyzed: 11/05/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

Blank (BDK0067-BLK2)				Prepared & Analyzed: 11/05/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

LCS (BDK0067-BS1)				Prepared & Analyzed: 11/05/2018						
Chloride	23.6	1.00	mg/L	25.000		94.6	90-110			
Fluoride	2.63	0.750	mg/L	2.5000		105	90-110			
Sulfate	45.8	1.00	mg/L	48.000		95.4	90-110			

LCS (BDK0067-BS2)				Prepared & Analyzed: 11/05/2018						
Chloride	23.7	1.00	mg/L	25.000		95.0	90-110			
Fluoride	2.61	0.750	mg/L	2.5000		104	90-110			
Sulfate	45.7	1.00	mg/L	48.000		95.2	90-110			

LCS (BDK0067-BS3)				Prepared & Analyzed: 11/05/2018						
Chloride	23.7	1.00	mg/L	25.000		94.9	90-110			
Fluoride	2.60	0.750	mg/L	2.5000		104	90-110			
Sulfate	45.7	1.00	mg/L	48.000		95.1	90-110			

Duplicate (BDK0067-DUP1)				Source: MDJ0374-11		Prepared & Analyzed: 11/05/2018				
Chloride	12.1	1.00	mg/L		12.3			1.54	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	45.1	1.00	mg/L		45.5			0.847	20	

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Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0067 - Wet Prep

Duplicate (BDK0067-DUP2)		Source: MDJ0374-12		Prepared & Analyzed: 11/05/2018						
Chloride	9.77	1.00	mg/L		9.88			1.07	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	55.5	1.00	mg/L		56.2			1.21	20	

Matrix Spike (BDK0067-MS1)		Source: MDJ0374-11		Prepared & Analyzed: 11/05/2018						
Chloride	41.7	1.25	mg/L	31.250	12.3	94.0	80-120			
Fluoride	3.01	0.938	mg/L	3.1250	<0.938	96.4	80-120			
Sulfate	102	1.25	mg/L	60.000	45.5	93.6	80-120			

Matrix Spike (BDK0067-MS2)		Source: MDJ0374-12		Prepared & Analyzed: 11/05/2018						
Chloride	40.7	1.25	mg/L	31.250	9.88	98.7	80-120			
Fluoride	3.35	0.938	mg/L	3.1250	<0.938	107	80-120			
Sulfate	115	1.25	mg/L	60.000	56.2	97.8	80-120			

Matrix Spike Dup (BDK0067-MSD1)		Source: MDJ0374-11		Prepared & Analyzed: 11/05/2018						
Chloride	42.8	1.25	mg/L	31.250	12.3	97.6	80-120	2.64	20	
Fluoride	3.40	0.938	mg/L	3.1250	<0.938	109	80-120	12.0	20	
Sulfate	104	1.25	mg/L	60.000	45.5	97.3	80-120	2.17	20	

Matrix Spike Dup (BDK0067-MSD2)		Source: MDJ0374-12		Prepared & Analyzed: 11/05/2018						
Chloride	40.8	1.25	mg/L	31.250	9.88	99.0	80-120	0.230	20	
Fluoride	3.45	0.938	mg/L	3.1250	<0.938	110	80-120	2.98	20	
Sulfate	115	1.25	mg/L	60.000	56.2	97.9	80-120	0.0696	20	

Batch BDK0098 - Wet Prep

Blank (BDK0098-BLK1)		Prepared & Analyzed: 11/06/2018								
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

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250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0098 - Wet Prep

Blank (BDK0098-BLK2)				Prepared & Analyzed: 11/06/2018						
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

LCS (BDK0098-BS1)				Prepared & Analyzed: 11/06/2018						
Chloride	24.9	1.00	mg/L	25.000		99.4	90-110			
Fluoride	2.65	0.750	mg/L	2.5000		106	90-110			
Sulfate	47.9	1.00	mg/L	48.000		99.7	90-110			

LCS (BDK0098-BS2)				Prepared & Analyzed: 11/06/2018						
Chloride	23.9	1.00	mg/L	25.000		95.5	90-110			
Fluoride	2.51	0.750	mg/L	2.5000		101	90-110			
Sulfate	45.8	1.00	mg/L	48.000		95.4	90-110			

LCS (BDK0098-BS3)				Prepared & Analyzed: 11/06/2018						
Chloride	23.9	1.00	mg/L	25.000		95.7	90-110			
Fluoride	2.51	0.750	mg/L	2.5000		100	90-110			
Sulfate	45.9	1.00	mg/L	48.000		95.6	90-110			

Duplicate (BDK0098-DUP1)				Source: MDJ0374-19		Prepared & Analyzed: 11/06/2018				
Chloride	0.759	1.00	mg/L		0.762			0.394	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	3.88	1.00	mg/L		3.85			0.906	20	

Duplicate (BDK0098-DUP2)				Source: MDJ0374-21		Prepared & Analyzed: 11/06/2018				
Chloride	0.974	1.00	mg/L		0.961			1.34	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	12.9	1.00	mg/L		12.6			2.82	20	

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Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0098 - Wet Prep

Matrix Spike (BDK0098-MS1)		Source: MDJ0374-19		Prepared & Analyzed: 11/06/2018						
Chloride	30.5	1.25	mg/L	31.250	0.762	95.1	80-120			
Fluoride	3.25	0.938	mg/L	3.1250	<0.938	104	80-120			
Sulfate	61.4	1.25	mg/L	60.000	3.85	95.9	80-120			
Matrix Spike (BDK0098-MS2)		Source: MDJ0374-21		Prepared & Analyzed: 11/06/2018						
Chloride	31.5	1.25	mg/L	31.250	0.961	97.9	80-120			
Fluoride	3.41	0.938	mg/L	3.1250	<0.938	109	80-120			
Sulfate	72.1	1.25	mg/L	60.000	12.6	99.3	80-120			
Matrix Spike Dup (BDK0098-MSD1)		Source: MDJ0374-19		Prepared & Analyzed: 11/06/2018						
Chloride	31.7	1.25	mg/L	31.250	0.762	99.1	80-120	4.03	20	
Fluoride	3.34	0.938	mg/L	3.1250	<0.938	107	80-120	2.69	20	
Sulfate	63.7	1.25	mg/L	60.000	3.85	99.8	80-120	3.67	20	
Matrix Spike Dup (BDK0098-MSD2)		Source: MDJ0374-21		Prepared & Analyzed: 11/06/2018						
Chloride	31.8	1.25	mg/L	31.250	0.961	98.6	80-120	0.711	20	
Fluoride	3.34	0.938	mg/L	3.1250	<0.938	107	80-120	2.00	20	
Sulfate	72.5	1.25	mg/L	60.000	12.6	99.8	80-120	0.448	20	

Batch BDK0154 - Wet Prep

Blank (BDK0154-BLK1)		Prepared & Analyzed: 11/07/2018								
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							
Blank (BDK0154-BLK2)		Prepared & Analyzed: 11/07/2018								
Chloride	<1.00	1.00	mg/L							
Fluoride	<0.750	0.750	mg/L							
Sulfate	<1.00	1.00	mg/L							

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250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0154 - Wet Prep

LCS (BDK0154-BS1)			Prepared & Analyzed: 11/07/2018							
Chloride	24.4	1.00	mg/L	25.000		97.4	90-110			
Fluoride	2.50	0.750	mg/L	2.5000		100	90-110			
Sulfate	47.0	1.00	mg/L	48.000		97.9	90-110			

LCS (BDK0154-BS2)			Prepared & Analyzed: 11/07/2018							
Chloride	23.7	1.00	mg/L	25.000		94.8	90-110			
Fluoride	2.50	0.750	mg/L	2.5000		100	90-110			
Sulfate	45.6	1.00	mg/L	48.000		94.9	90-110			

LCS (BDK0154-BS3)			Prepared & Analyzed: 11/07/2018							
Chloride	23.6	1.00	mg/L	25.000		94.5	90-110			
Fluoride	2.48	0.750	mg/L	2.5000		99.2	90-110			
Sulfate	45.4	1.00	mg/L	48.000		94.6	90-110			

Duplicate (BDK0154-DUP1)			Source: MDK0026-08		Prepared & Analyzed: 11/07/2018					
Chloride	18.1	1.00	mg/L		18.1			0.0938	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	18.2	1.00	mg/L		18.0			0.900	20	

Duplicate (BDK0154-DUP2)			Source: MDK0026-09		Prepared & Analyzed: 11/07/2018					
Chloride	0.405	1.00	mg/L		0.404			0.247	20	
Fluoride	<0.750	0.750	mg/L		<0.750				20	
Sulfate	3.17	1.00	mg/L		3.14			0.887	20	

Matrix Spike (BDK0154-MS1)			Source: MDK0026-08		Prepared & Analyzed: 11/07/2018					
Chloride	47.4	1.25	mg/L	31.250	18.1	93.6	80-120			
Fluoride	2.98	0.938	mg/L	3.1250	<0.938	95.5	80-120			
Sulfate	74.4	1.25	mg/L	60.000	18.0	93.9	80-120			

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Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0154 - Wet Prep

Matrix Spike (BDK0154-MS2)		Source: MDK0026-09		Prepared & Analyzed: 11/07/2018						
Chloride	30.8	1.25	mg/L	31.250	0.404	97.4	80-120			
Fluoride	3.28	0.938	mg/L	3.1250	<0.938	105	80-120			
Sulfate	62.0	1.25	mg/L	60.000	3.14	98.0	80-120			
Matrix Spike Dup (BDK0154-MSD1)		Source: MDK0026-08		Prepared & Analyzed: 11/07/2018						
Chloride	48.8	1.25	mg/L	31.250	18.1	98.3	80-120	3.06	20	
Fluoride	3.28	0.938	mg/L	3.1250	<0.938	105	80-120	9.35	20	
Sulfate	76.9	1.25	mg/L	60.000	18.0	98.2	80-120	3.40	20	
Matrix Spike Dup (BDK0154-MSD2)		Source: MDK0026-09		Prepared & Analyzed: 11/07/2018						
Chloride	30.9	1.25	mg/L	31.250	0.404	97.5	80-120	0.0770	20	
Fluoride	3.40	0.938	mg/L	3.1250	<0.938	109	80-120	3.52	20	
Sulfate	62.1	1.25	mg/L	60.000	3.14	98.3	80-120	0.244	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
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Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDJ0785 - Wet Prep

Blank (BDJ0785-BLK1)	Prepared & Analyzed: 10/31/2018									
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDJ0785-DUP1)	Source: MDJ0364-01 Prepared & Analyzed: 10/31/2018									
Total Suspended Solids	7.20	4.00	mg/L		6.00			18.2	20	

Batch BDJ0786 - Wet Prep

Blank (BDJ0786-BLK1)	Prepared & Analyzed: 10/31/2018									
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDJ0786-DUP1)	Source: MDJ0364-01 Prepared & Analyzed: 10/31/2018									
Total Dissolved Solids	548	20.0	mg/L		554			1.09	20	

Batch BDJ0802 - Wet Prep

LCS (BDJ0802-BS1)	Prepared & Analyzed: 10/31/2018									
pH	7.08		pH Units	7.0000		101	90-110			
LCS (BDJ0802-BS2)	Prepared & Analyzed: 10/31/2018									
pH	7.09		pH Units	7.0000		101	90-110			
Duplicate (BDJ0802-DUP1)	Source: MDJ0374-02 Prepared & Analyzed: 10/31/2018									
pH	7.64		pH Units	7.66				0.261	20	
Duplicate (BDJ0802-DUP2)	Source: MDJ0374-11 Prepared & Analyzed: 10/31/2018									
pH	7.78		pH Units	7.77				0.129	20	

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Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDJ0802 - Wet Prep

Duplicate (BDJ0802-DUP3)	Source: MDJ0374-21		Prepared & Analyzed: 10/31/2018							
pH	7.79		pH Units		7.78			0.128	20	

Batch BDJ0808 - Wet Prep

Blank (BDJ0808-BLK1)	Prepared & Analyzed: 11/01/2018									
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDJ0808-DUP1)	Source: MDJ0374-10		Prepared & Analyzed: 11/01/2018							
Total Suspended Solids	<4.00	4.00	mg/L		<4.00				20	

Batch BDJ0809 - Wet Prep

Blank (BDJ0809-BLK1)	Prepared & Analyzed: 11/01/2018									
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDJ0809-DUP1)	Source: MDJ0374-10		Prepared & Analyzed: 11/01/2018							
Total Dissolved Solids	426	20.0	mg/L		434			1.86	20	

Batch BDK0033 - Wet Prep

Blank (BDK0033-BLK1)	Prepared & Analyzed: 11/02/2018									
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDK0033-DUP1)	Source: MDJ0374-20		Prepared & Analyzed: 11/02/2018							
Total Suspended Solids	0.400	4.00	mg/L		0.400			0.00	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
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Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0034 - Wet Prep

Blank (BDK0034-BLK1)				Prepared & Analyzed: 11/02/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDK0034-DUP1)				Source: MDJ0374-20		Prepared & Analyzed: 11/02/2018				
Total Dissolved Solids	1390	20.0	mg/L		1400			0.715	20	

Batch BDK0061 - Wet Prep

Blank (BDK0061-BLK1)				Prepared & Analyzed: 11/05/2018						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDK0061-DUP1)				Source: MDK0025-01		Prepared & Analyzed: 11/05/2018				
Total Suspended Solids	75.6	4.00	mg/L		65.2			14.8	20	

Batch BDK0062 - Wet Prep

Blank (BDK0062-BLK1)				Prepared & Analyzed: 11/05/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							
Duplicate (BDK0062-DUP1)				Source: MDK0025-01		Prepared & Analyzed: 11/05/2018				
Total Dissolved Solids	352	20.0	mg/L		358			1.69	20	

Batch BDK0064 - Wet Prep

LCS (BDK0064-BS1)				Prepared & Analyzed: 11/05/2018						
pH	7.06		pH Units	7.0000		101	90-110			

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
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Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0064 - Wet Prep

LCS (BDK0064-BS2)				Prepared & Analyzed: 11/05/2018						
pH	7.06		pH Units	7.0000		101	90-110			
Duplicate (BDK0064-DUP1)				Source: MDK0025-01 Prepared & Analyzed: 11/05/2018						
pH	7.70		pH Units	7.76		0.776	20			
Duplicate (BDK0064-DUP2)				Source: MDK0026-01 Prepared & Analyzed: 11/05/2018						
pH	8.01		pH Units	8.02		0.125	20			
Duplicate (BDK0064-DUP3)				Source: MDK0026-11 Prepared & Analyzed: 11/05/2018						
pH	7.84		pH Units	7.84		0.00	20			
Duplicate (BDK0064-DUP4)				Source: MDK0029-02 Prepared & Analyzed: 11/05/2018						
pH	7.62		pH Units	7.66		0.524	20			

Batch BDK0093 - Wet Prep

Blank (BDK0093-BLK1)				Prepared & Analyzed: 11/06/2018						
Total Suspended Solids	<4.00	4.00	mg/L							
Duplicate (BDK0093-DUP1)				Source: MDK0026-05 Prepared & Analyzed: 11/06/2018						
Total Suspended Solids	<4.00	4.00	mg/L	<4.00			20			

Batch BDK0094 - Wet Prep

Blank (BDK0094-BLK1)				Prepared & Analyzed: 11/06/2018						
Total Dissolved Solids	<20.0	20.0	mg/L							

Christine Keefe, Supervisor (612) 630-4506

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Wet Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0094 - Wet Prep

Duplicate (BDK0094-DUP1)	Source: MDK0026-05		Prepared & Analyzed: 11/06/2018							
Total Dissolved Solids	206	20.0	mg/L		218			5.66	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDJ0800 - EPA 200.2, EPA 3005

Blank (BDJ0800-BLK1)

Prepared: 10/31/2018 Analyzed: 11/01/2018

Selenium	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Molybdenum	<0.500	0.500	ug/L							

LCS (BDJ0800-BS1)

Prepared: 10/31/2018 Analyzed: 11/01/2018

Arsenic	96.8	0.500	ug/L	100.00		96.8	85-115			
Cobalt	103	0.500	ug/L	100.00		103	85-115			
Chromium	103	0.500	ug/L	100.00		103	85-115			
Barium	98.2	0.500	ug/L	100.00		98.2	85-115			
Molybdenum	99.1	0.500	ug/L	100.00		99.1	85-115			
Selenium	98.9	0.500	ug/L	100.00		98.9	85-115			
Lead	97.3	0.500	ug/L	100.00		97.3	85-115			

Duplicate (BDJ0800-DUP1)

Source: MDJ0364-01

Prepared: 10/31/2018 Analyzed: 11/01/2018

Cobalt	8.13	0.500	ug/L		8.11			0.318	20	
Barium	64.6	0.500	ug/L		63.2			2.09	20	
Molybdenum	3.21	0.500	ug/L		3.28			2.11	20	
Selenium	0.766	0.500	ug/L		0.806			5.11	20	
Lead	0.0672	0.500	ug/L		0.0959			35.2	20	M_D-RL
Arsenic	1.08	0.500	ug/L		1.04			4.13	20	
Chromium	1.31	0.500	ug/L		1.36			3.75	20	

Matrix Spike (BDJ0800-MS1)

Source: MDJ0364-01

Prepared: 10/31/2018 Analyzed: 11/01/2018

Selenium	98.3	0.500	ug/L	100.00	0.806	97.5	70-130			
Lead	90.4	0.500	ug/L	100.00	0.0959	90.3	70-130			
Cobalt	112	0.500	ug/L	100.00	8.11	104	70-130			
Molybdenum	104	0.500	ug/L	100.00	3.28	101	70-130			
Arsenic	106	0.500	ug/L	100.00	1.04	105	70-130			
Chromium	106	0.500	ug/L	100.00	1.36	104	70-130			
Barium	168	0.500	ug/L	100.00	63.2	105	70-130			

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDJ0800 - EPA 200.2, EPA 3005

Matrix Spike Dup (BDJ0800-MSD1)	Source: MDJ0364-01			Prepared: 10/31/2018 Analyzed: 11/01/2018						
Barium	168	0.500	ug/L	100.00	63.2	105	70-130	0.282	20	
Molybdenum	107	0.500	ug/L	100.00	3.28	103	70-130	2.47	20	
Selenium	103	0.500	ug/L	100.00	0.806	102	70-130	4.68	20	
Arsenic	106	0.500	ug/L	100.00	1.04	105	70-130	0.210	20	
Cobalt	112	0.500	ug/L	100.00	8.11	104	70-130	0.195	20	
Chromium	109	0.500	ug/L	100.00	1.36	107	70-130	2.89	20	
Lead	93.8	0.500	ug/L	100.00	0.0959	93.7	70-130	3.69	20	

Batch BDK0069 - EPA 200.2, EPA 3005

Blank (BDK0069-BLK1)	Prepared: 11/05/2018 Analyzed: 11/08/2018									
Chromium	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Molybdenum	<0.500	0.500	ug/L							
Barium	<0.500	0.500	ug/L							

Blank (BDK0069-BLK2)	Prepared: 11/05/2018 Analyzed: 11/08/2018									
Barium	<0.500	0.500	ug/L							
Molybdenum	<0.500	0.500	ug/L							
Lead	<0.500	0.500	ug/L							
Cobalt	<0.500	0.500	ug/L							
Arsenic	<0.500	0.500	ug/L							
Selenium	<0.500	0.500	ug/L							
Chromium	<0.500	0.500	ug/L							

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0069 - EPA 200.2, EPA 3005

LCS (BDK0069-BS1)

Prepared: 11/05/2018 Analyzed: 11/08/2018

Chromium	99.4	0.500	ug/L	100.00		99.4	85-115			
Molybdenum	99.5	0.500	ug/L	100.00		99.5	85-115			
Arsenic	96.2	0.500	ug/L	100.00		96.2	85-115			
Barium	93.8	0.500	ug/L	100.00		93.8	85-115			
Selenium	95.2	0.500	ug/L	100.00		95.2	85-115			
Lead	93.7	0.500	ug/L	100.00		93.7	85-115			
Cobalt	100	0.500	ug/L	100.00		100	85-115			

LCS (BDK0069-BS2)

Prepared: 11/05/2018 Analyzed: 11/08/2018

Molybdenum	101	0.500	ug/L	100.00		101	85-115			
Barium	98.7	0.500	ug/L	100.00		98.7	85-115			
Chromium	101	0.500	ug/L	100.00		101	85-115			
Lead	96.4	0.500	ug/L	100.00		96.4	85-115			
Selenium	99.2	0.500	ug/L	100.00		99.2	85-115			
Cobalt	100	0.500	ug/L	100.00		100	85-115			
Arsenic	98.6	0.500	ug/L	100.00		98.6	85-115			

Duplicate (BDK0069-DUP1)

Source: MDK0026-07

Prepared: 11/05/2018 Analyzed: 11/08/2018

Arsenic	0.568	0.500	ug/L		0.628			10.2	20	
Barium	51.6	0.500	ug/L		50.8			1.56	20	
Cobalt	0.0325	0.500	ug/L		<0.500				20	
Chromium	0.735	0.500	ug/L		0.732			0.375	20	
Molybdenum	0.234	0.500	ug/L		0.146			46.4	20	M_D-RL
Selenium	0.295	0.500	ug/L		0.381			25.5	20	M_D-RL
Lead	0.0627	0.500	ug/L		0.0158			119	20	M_D-RL

Duplicate (BDK0069-DUP2)

Source: MDK0026-08

Prepared: 11/05/2018 Analyzed: 11/08/2018

Molybdenum	0.306	0.500	ug/L		0.314			2.50	20	
Barium	46.8	0.500	ug/L		47.2			0.862	20	
Cobalt	0.193	0.500	ug/L		0.183			4.95	20	
Chromium	0.841	0.500	ug/L		0.851			1.22	20	
Lead	0.0878	0.500	ug/L		0.0866			1.41	20	
Arsenic	0.250	0.500	ug/L		0.315			22.8	20	M_D-RL
Selenium	0.371	0.500	ug/L		0.468			23.1	20	M_D-RL

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0069 - EPA 200.2, EPA 3005

Duplicate (BDK0069-DUP3)	Source: MDK0026-09			Prepared: 11/05/2018 Analyzed: 11/08/2018						
Molybdenum	0.692	0.500	ug/L		0.697			0.654	20	
Arsenic	1.07	0.500	ug/L		1.14			6.67	20	
Chromium	0.817	0.500	ug/L		0.798			2.28	20	
Lead	0.0256	0.500	ug/L		0.0242			5.70	20	
Cobalt	0.0251	0.500	ug/L		<0.500				20	
Barium	16.5	0.500	ug/L		16.7			1.17	20	
Selenium	0.340	0.500	ug/L		0.387			13.0	20	

Matrix Spike (BDK0069-MS1)	Source: MDK0026-07			Prepared: 11/05/2018 Analyzed: 11/08/2018						
Molybdenum	103	0.500	ug/L	100.00	0.146	103	70-130			
Lead	89.4	0.500	ug/L	100.00	0.0158	89.4	70-130			
Arsenic	102	0.500	ug/L	100.00	0.628	102	70-130			
Selenium	103	0.500	ug/L	100.00	0.381	103	70-130			
Barium	144	0.500	ug/L	100.00	50.8	92.9	70-130			
Cobalt	106	0.500	ug/L	100.00	<0.500	106	70-130			
Chromium	103	0.500	ug/L	100.00	0.732	102	70-130			

Matrix Spike (BDK0069-MS2)	Source: MDK0026-08			Prepared: 11/05/2018 Analyzed: 11/08/2018						
Arsenic	98.2	0.500	ug/L	100.00	0.315	97.8	70-130			
Chromium	103	0.500	ug/L	100.00	0.851	102	70-130			
Cobalt	102	0.500	ug/L	100.00	0.183	102	70-130			
Barium	145	0.500	ug/L	100.00	47.2	98.2	70-130			
Molybdenum	103	0.500	ug/L	100.00	0.314	103	70-130			
Lead	94.9	0.500	ug/L	100.00	0.0866	94.8	70-130			
Selenium	98.3	0.500	ug/L	100.00	0.468	97.9	70-130			

Matrix Spike (BDK0069-MS3)	Source: MDK0026-09			Prepared: 11/05/2018 Analyzed: 11/08/2018						
Molybdenum	104	0.500	ug/L	100.00	0.697	104	70-130			
Chromium	102	0.500	ug/L	100.00	0.798	101	70-130			
Cobalt	102	0.500	ug/L	100.00	<0.500	102	70-130			
Selenium	102	0.500	ug/L	100.00	0.387	102	70-130			
Lead	94.7	0.500	ug/L	100.00	0.0242	94.7	70-130			
Arsenic	102	0.500	ug/L	100.00	1.14	101	70-130			
Barium	116	0.500	ug/L	100.00	16.7	98.9	70-130			

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Total Metals by ICPMS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0069 - EPA 200.2, EPA 3005

Matrix Spike Dup (BDK0069-MSD1)		Source: MDK0026-07		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Chromium	102	0.500	ug/L	100.00	0.732	101	70-130	0.941	20	
Lead	87.2	0.500	ug/L	100.00	0.0158	87.1	70-130	2.56	20	
Arsenic	97.2	0.500	ug/L	100.00	0.628	96.5	70-130	5.03	20	
Molybdenum	98.2	0.500	ug/L	100.00	0.146	98.1	70-130	4.94	20	
Barium	143	0.500	ug/L	100.00	50.8	92.2	70-130	0.424	20	
Selenium	98.7	0.500	ug/L	100.00	0.381	98.3	70-130	4.29	20	
Cobalt	103	0.500	ug/L	100.00	<0.500	103	70-130	3.24	20	

Matrix Spike Dup (BDK0069-MSD2)		Source: MDK0026-08		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Molybdenum	106	0.500	ug/L	100.00	0.314	106	70-130	3.03	20	
Chromium	103	0.500	ug/L	100.00	0.851	102	70-130	0.0966	20	
Selenium	102	0.500	ug/L	100.00	0.468	101	70-130	3.46	20	
Lead	92.7	0.500	ug/L	100.00	0.0866	92.6	70-130	2.36	20	
Cobalt	101	0.500	ug/L	100.00	0.183	100	70-130	1.76	20	
Arsenic	101	0.500	ug/L	100.00	0.315	101	70-130	2.77	20	
Barium	144	0.500	ug/L	100.00	47.2	97.1	70-130	0.729	20	

Matrix Spike Dup (BDK0069-MSD3)		Source: MDK0026-09		Prepared: 11/05/2018 Analyzed: 11/08/2018						
Chromium	100	0.500	ug/L	100.00	0.798	99.5	70-130	1.97	20	
Molybdenum	104	0.500	ug/L	100.00	0.697	104	70-130	0.144	20	
Selenium	101	0.500	ug/L	100.00	0.387	101	70-130	0.613	20	
Cobalt	98.4	0.500	ug/L	100.00	<0.500	98.4	70-130	3.32	20	
Arsenic	102	0.500	ug/L	100.00	1.14	101	70-130	0.555	20	
Barium	114	0.500	ug/L	100.00	16.7	96.8	70-130	1.78	20	
Lead	97.7	0.500	ug/L	100.00	0.0242	97.7	70-130	3.14	20	

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDJ0798 - EPA 200.2, EPA 3005

Blank (BDJ0798-BLK1)				Prepared: 10/31/2018 Analyzed: 11/06/2018						
Calcium	<1.25	1.25	mg/L							
Boron	<0.0500	0.0500	mg/L							
LCS (BDJ0798-BS1)				Prepared: 10/31/2018 Analyzed: 11/06/2018						
Calcium	109	1.25	mg/L	100.00		109	85-115			
Boron	1.04	0.0500	mg/L	1.0000		104	85-115			
Duplicate (BDJ0798-DUP1)				Source: MDJ0369-01		Prepared: 10/31/2018 Analyzed: 11/06/2018				
Calcium	137	1.25	mg/L		134			2.55	20	
Boron	0.0879	0.0500	mg/L		0.0876			0.335	20	
Matrix Spike (BDJ0798-MS1)				Source: MDJ0369-01		Prepared: 10/31/2018 Analyzed: 11/06/2018				
Calcium	247	1.25	mg/L	100.00	134	113	70-130			
Boron	1.15	0.0500	mg/L	1.0000	0.0876	107	70-130			
Matrix Spike Dup (BDJ0798-MSD1)				Source: MDJ0369-01		Prepared: 10/31/2018 Analyzed: 11/06/2018				
Boron	1.15	0.0500	mg/L	1.0000	0.0876	106	70-130	0.353	20	
Calcium	251	1.25	mg/L	100.00	134	117	70-130	1.73	20	

Batch BDK0068 - EPA 200.2, EPA 3005

Blank (BDK0068-BLK1)				Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							
Blank (BDK0068-BLK2)				Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	<0.0500	0.0500	mg/L							
Calcium	<1.25	1.25	mg/L							

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0068 - EPA 200.2, EPA 3005

LCS (BDK0068-BS1)				Prepared: 11/05/2018 Analyzed: 11/07/2018						
Calcium	103	1.25	mg/L	100.00		103	85-115			
Boron	0.983	0.0500	mg/L	1.0000		98.3	85-115			
LCS (BDK0068-BS2)				Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.01	0.0500	mg/L	1.0000		101	85-115			
Calcium	106	1.25	mg/L	100.00		106	85-115			
Duplicate (BDK0068-DUP1)				Source: MDK0026-01		Prepared: 11/05/2018 Analyzed: 11/07/2018				
Boron	0.205	0.0500	mg/L		0.212			3.59	20	
Calcium	95.4	1.25	mg/L		96.9			1.61	20	
Duplicate (BDK0068-DUP2)				Source: MDK0026-02		Prepared: 11/05/2018 Analyzed: 11/07/2018				
Boron	0.500	0.0500	mg/L		0.506			1.15	20	
Calcium	142	1.25	mg/L		142			0.284	20	
Duplicate (BDK0068-DUP3)				Source: MDK0026-03		Prepared: 11/05/2018 Analyzed: 11/07/2018				
Calcium	76.1	1.25	mg/L		80.2			5.32	20	
Boron	0.0533	0.0500	mg/L		0.0532			0.0853	20	
Matrix Spike (BDK0068-MS1)				Source: MDK0026-01		Prepared: 11/05/2018 Analyzed: 11/07/2018				
Calcium	207	1.25	mg/L	100.00	96.9	111	70-130			
Boron	1.24	0.0500	mg/L	1.0000	0.212	103	70-130			
Matrix Spike (BDK0068-MS2)				Source: MDK0026-02		Prepared: 11/05/2018 Analyzed: 11/07/2018				
Boron	1.53	0.0500	mg/L	1.0000	0.506	103	70-130			
Calcium	253	1.25	mg/L	100.00	142	111	70-130			
Matrix Spike (BDK0068-MS3)				Source: MDK0026-03		Prepared: 11/05/2018 Analyzed: 11/07/2018				
Calcium	188	1.25	mg/L	100.00	80.2	108	70-130			
Boron	1.09	0.0500	mg/L	1.0000	0.0532	103	70-130			

Environmental Services-Water Minneapolis	Project Name/Location: Sherco Pond 3 CCR	
250 Marquette Plaza		Reported:
Minneapolis MN, 55401	Project Manager: Charles A Donkers	11/20/2018 08:57

Total Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BDK0068 - EPA 200.2, EPA 3005

Matrix Spike Dup (BDK0068-MSD1)		Source: MDK0026-01		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.25	0.0500	mg/L	1.0000	0.212	104	70-130	0.415	20	
Calcium	204	1.25	mg/L	100.00	96.9	107	70-130	1.90	20	
Matrix Spike Dup (BDK0068-MSD2)		Source: MDK0026-02		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Boron	1.53	0.0500	mg/L	1.0000	0.506	102	70-130	0.0701	20	
Calcium	254	1.25	mg/L	100.00	142	112	70-130	0.227	20	
Matrix Spike Dup (BDK0068-MSD3)		Source: MDK0026-03		Prepared: 11/05/2018 Analyzed: 11/07/2018						
Calcium	188	1.25	mg/L	100.00	80.2	108	70-130	0.159	20	
Boron	1.09	0.0500	mg/L	1.0000	0.0532	104	70-130	0.474	20	

Environmental Services-Water Minneapolis
250 Marquette Plaza
Minneapolis MN, 55401

Project Name/Location: Sherco Pond 3 CCR
Project Manager: Charles A Donkers

Reported:
11/20/2018 08:57

Qualifiers and Definitions

M_TTT	Sample received at the lab outside of required hold time.
M_D-RL	The RPD for the sample duplicate was outside of QC acceptance limits due to <RL.
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

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



CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: <u>Xcel Energy</u>	Report To: <u>Chuck Dankers</u>	Attention: <u>Steve Davis</u>	Company Name:	Address:	REGULATORY AGENCY
Address: <u>Environmental Services</u>	Copy To:			Pace Quote Reference:	☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
Email To: <u>MP-7</u>	Purchase Order No.:			Pace Project Manager:	☐ UST ☐ RCRA ☐ OTHER
Phone: <u></u>	Project Name: <u>SARCO Ponds NPDES + CCR</u>			Pace Profile #:	Site Location
Requested Due Date/TAT:	Project Number: <u>Wells Fall 2018</u>				STATE:

[illegible]

SAMPLER NAME AND SIGNATURE	PRINT Name of SAMPLER:	DATE Signed (MM/DD/YYYY)	SIGNATURE of SAMPLER:	Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
In Cooper photo by M.D. 06-12						X	X
David Anderson Data	David Anderson	11-2-18	1345 W / Xcel	11/5/18 - 0545	M40841, 1.82		

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

CHAIN-OF-CUSTODY / Analytical Request Document

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Section A Required Client Information: Company: <u>Xcel Energy</u> Address: <u>Environmental Services</u> Email To: <u>mp-7</u> Phone: _____ Fax: _____ Requested Due Date/TAT: _____		Section B Required Project Information: Report To: <u>Chuck Dauters</u> Copy To: _____ Purchase Order No.: _____ Project Name: <u>Shetco Ponds ccr only wells</u> Project Number: _____		Section C Invoice Information: Attention: <u>Steve Davis</u> Company Name: _____ Address: _____ Pace Quote Reference: _____ Pace Project Manager: _____ Pace Profile #: _____	
Regulatory Agency: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____		Site Location: STATE: _____		Page: <u>1</u> of <u>2</u> 1845962	

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	COLLECTED				SAMPLE TYPE (G=GRAB C=COMP) (see valid codes to left)	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB	DATE	TIME									
	SAMPLE ID (A-Z, 0-9 / -)	Sample IDs MUST BE UNIQUE													
1	P-162				10/31/18	1230	WT								
2	P-163					1330									
3	P-164					1425									
4	Rinse					1500									
5	P-152.4					1540									
6	Duplicate					1540									
7	P-17					1650									
8	P-158					1730									
9	P-157					1810									
10	P-150					11-1-18	0830								
11	P-151					0930									
12	P-153					1030									

ADDITIONAL COMMENTS In cooler 45 strip mmo402	RELINQUISHED BY / AFFILIATION David Andersen & Co 11-2-18 1345	DATE 11-2-18	TIME 1345	ACCEPTED BY / AFFILIATION D / Xcl	DATE 11/5/2018	TIME 1500	SAMPLE CONDITIONS Received on Ice (Y/N) ☒ Custody Sealed Cooler (Y/N) ☒ Samples Intact (Y/N) ☒

ORIGINAL

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: David Andersen
 SIGNATURE of SAMPLER: David Andersen
 DATE Signed (MM/DD/YYYY): 11-1-18

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

CHAIN-OF-CUSTODY / Analytical Request Document

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Section A Required Client Information: Company: <u>Xcel Energy</u> Address: <u>Environmental Services</u> Email To: <u>mp-7</u> Phone: _____ Fax: _____ Requested Due Date/TAT: _____		Section B Required Project Information: Report To: <u>Chuck Donkers</u> Copy To: _____ Purchase Order No.: _____ Project Name: <u>Stetco Ponds NPDES + CCR</u> Project Number: <u>Wells, Fall 2018</u>		Section C Invoice Information: Attention: <u>Steve Davis</u> Company Name: _____ Address: _____ Pace Quote Reference: _____ Pace Project Manager: _____ Pace Profile #: _____	
Regulatory Agency: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____		Site Location: STATE: _____		Page: <u>2</u> of <u>3</u> <u>1845965</u>	

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE TYPE (G=GRAB C=COMP) (see valid codes to left)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analysis Test Y/N	Requested Analysis Filtered (Y/N)	Pace Project No. / Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB			Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	
1	P-42	DW	WT	DATE	TIME	DATE	TIME									
2	P-101A	Water	WT	10/30/18	0955			3	111							
3	P-56	Waste Water	WW		1035			3	111							
4	P-94A	Product	P		1110			3	111							
5	P-89-1	Soil/Solid	SL		1150			3	111							
6	P-50	Oil	OL		1220			3	111							
7	P-03A	Wipe	WP		1300			3	111							
8	P-05A	Air	AR		1330			3	111							
9	P-04A	Tissue	TS		1350			3	111							
10	P-22	Other	OT		1420			3	111							
11	P-88				1540			4	112							
12					1605			3	111							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
David Anderson Pace Quality Assurance	David Anderson Pace Quality Assurance	10/30/18	1620	David Anderson Pace	10/30/18	1620	Received on _____ Custody (Y/N) _____ Sealed Cooler (Y/N) _____ Samples Intact (Y/N) _____
		10/30/18	0635	David Anderson Pace	10/30/18	0635	
		10/30/18	0635	David Anderson Pace	10/30/18	0635	

Step 5: MD00402

ORIGINAL

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: David Anderson
 SIGNATURE of SAMPLER: David Anderson
 DATE Signed (MM/DD/YY): 10/30/18

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

CHAIN-OF-CUSTODY / Analytical Request Document
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Section A Requested Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: <u>Xcel Energy</u>	Report To: <u>Chuck Danks</u>	Attention: <u>Steve Davis</u>	Company Name:	REGULATORY AGENCY	
Address: <u>Environmental Services</u>	Copy To:		Address:	☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER	
<u>mp-7</u>	Purchase Order No.:		Pace Quote Reference:	☐ UST ☐ RCRA ☐ OTHER	
Email To:	Project Name: <u>Shelco Ponds CCR only wells</u>	Pace Project Manager:	Site Location		
Phone: <u> </u>	Project Number:		STATE:		
Fax: <u> </u>					
Requested Due Date/TAT: <u> </u>					

[illegible]

ORIGINAL		SAMPLER NAME AND SIGNATURE		Temp in °C		Received on		Custody		Sealed Cooler		Samples Intact	
		PRINT Name of SAMPLER:		DATE Signed (MM/DD/YY):									
In cooler pH Strip: 7.0-7.2		David Anderson		11-1-18		11/5/18 2545		11/5/18 2545		11/5/18 2545		11/5/18 2545	
David Anderson, Dec 11-2-18 1345		David Anderson		11-1-18		11/5/18 2545		11/5/18 2545		11/5/18 2545		11/5/18 2545	

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

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

November 29, 2018

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

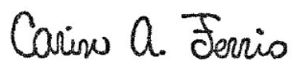
RE: Project: 18-01330, Xcel Energy
Pace Project No.: 30270907

Dear Dave Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 08, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30270907001	Rinse	Water	10/29/18 16:50	11/08/18 10:15
30270907002	P-23	Water	10/29/18 18:20	11/08/18 10:15
30270907003	Duplicate	Water	10/29/18 18:20	11/08/18 10:15
30270907004	P-22	Water	10/30/18 15:40	11/08/18 10:15
30270907005	P-01A-1	Water	10/31/18 08:00	11/08/18 10:15
30270907006	P-130	Water	10/31/18 09:00	11/08/18 10:15
30270907007	P-131	Water	10/31/18 10:05	11/08/18 10:15
30270907008	P-132	Water	10/31/18 10:50	11/08/18 10:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30270907001	Rinse	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270907002	P-23	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270907003	Duplicate	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270907004	P-22	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270907005	P-01A-1	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270907006	P-130	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270907007	P-131	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270907008	P-132	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

Method: EPA 903.1

Description: 903.1 Radium 226

Client: Pace-MN Field Services Division

Date: November 29, 2018

General Information:

8 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:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

Method: EPA 904.0

Description: 904.0 Radium 228

Client: Pace-MN Field Services Division

Date: November 29, 2018

General Information:

8 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:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

Method: Total Radium Calculation

Description: Total Radium 228+226

Client: Pace-MN Field Services Division

Date: November 29, 2018

General Information:

8 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.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

Sample: Rinse		Lab ID: 30270907001	Collected: 10/29/18 16:50	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.396 ± 0.366 (0.533) C:NA T:90%	pCi/L	11/27/18 21:16	13982-63-3	
Radium-228	EPA 904.0	0.761 ± 0.639 (1.29) C:70% T:83%	pCi/L	11/26/18 16:54	15262-20-1	
Total Radium	Total Radium Calculation	1.16 ± 1.01 (1.82)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-23		Lab ID: 30270907002	Collected: 10/29/18 18:20	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.160 ± 0.278 (0.496) C:NA T:83%	pCi/L	11/27/18 21:16	13982-63-3	
Radium-228	EPA 904.0	1.10 ± 0.511 (0.884) C:71% T:86%	pCi/L	11/26/18 13:31	15262-20-1	
Total Radium	Total Radium Calculation	1.26 ± 0.789 (1.38)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: Duplicate		Lab ID: 30270907003	Collected: 10/29/18 18:20	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.251 ± 0.328 (0.541) C:NA T:92%	pCi/L	11/27/18 21:16	13982-63-3	
Radium-228	EPA 904.0	0.668 ± 0.517 (1.05) C:70% T:91%	pCi/L	11/26/18 13:26	15262-20-1	
Total Radium	Total Radium Calculation	0.919 ± 0.845 (1.59)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-22		Lab ID: 30270907004	Collected: 10/30/18 15:40	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.490 ± 0.417 (0.586) C:NA T:81%	pCi/L	11/27/18 21:16	13982-63-3	
Radium-228	EPA 904.0	1.04 ± 0.504 (0.894) C:66% T:95%	pCi/L	11/26/18 13:26	15262-20-1	
Total Radium	Total Radium Calculation	1.53 ± 0.921 (1.48)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-01A-1		Lab ID: 30270907005	Collected: 10/31/18 08:00	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.628 ± 0.410 (0.420) C:NA T:80%	pCi/L	11/27/18 21:30	13982-63-3	
Radium-228	EPA 904.0	0.652 ± 0.481 (0.952) C:69% T:82%	pCi/L	11/26/18 13:26	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

Sample: P-01A-1		Lab ID: 30270907005	Collected: 10/31/18 08:00	Received: 11/08/18 10:15	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	1.28 ± 0.891 (1.37)		pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-130		Lab ID: 30270907006	Collected: 10/31/18 09:00	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.650 ± 0.481 (0.651) C:NA T:88%	pCi/L	11/27/18 21:30	13982-63-3	
Radium-228	EPA 904.0	0.230 ± 0.468 (1.03) C:69% T:86%	pCi/L	11/26/18 13:26	15262-20-1	
Total Radium	Total Radium Calculation	0.880 ± 0.949 (1.68)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-131		Lab ID: 30270907007	Collected: 10/31/18 10:05	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.302 ± 0.283 (0.401) C:NA T:97%	pCi/L	11/27/18 21:30	13982-63-3	
Radium-228	EPA 904.0	-0.00344 ± 0.491 (1.12) C:69% T:85%	pCi/L	11/26/18 13:26	15262-20-1	
Total Radium	Total Radium Calculation	0.302 ± 0.774 (1.52)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-132		Lab ID: 30270907008	Collected: 10/31/18 10:50	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.745 ± 0.433 (0.461) C:NA T:87%	pCi/L	11/27/18 21:30	13982-63-3	
Radium-228	EPA 904.0	0.314 ± 0.521 (1.13) C:70% T:86%	pCi/L	11/26/18 16:53	15262-20-1	
Total Radium	Total Radium Calculation	1.06 ± 0.954 (1.59)	pCi/L	11/28/18 13:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

QC Batch:	320182	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30270907001, 30270907002, 30270907003, 30270907004, 30270907005, 30270907006, 30270907007, 30270907008		

METHOD BLANK:	1562010	Matrix:	Water
Associated Lab Samples:	30270907001, 30270907002, 30270907003, 30270907004, 30270907005, 30270907006, 30270907007, 30270907008		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0918 ± 0.221 (0.426) C:NA T:96%	pCi/L	11/27/18 20:47	

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

QC Batch:	320188	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30270907001, 30270907002, 30270907003, 30270907004, 30270907005, 30270907006, 30270907007, 30270907008		

METHOD BLANK:	1562041	Matrix:	Water
Associated Lab Samples:	30270907001, 30270907002, 30270907003, 30270907004, 30270907005, 30270907006, 30270907007, 30270907008		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.561 ± 0.388 (0.731) C:70% T:74%	pCi/L	11/26/18 13:30	

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.

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QUALIFIERS

Project: 18-01330, Xcel Energy

Pace Project No.: 30270907

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

REPORT OF LABORATORY ANALYSIS

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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.



Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Xcel Energy	Report To:	David Anderson	Attention:	Clara Ruikie
Address:	210 Pace Mill Field	Copy To:		Company Name:	Pace Mill Field Services
Email To:		Purchase Order No.:		Address:	
Phone:		Project Name:	18-01330; Xcel Energy -	Pace Quote Reference:	Tom Halverson
Requested Due Date/TAT:		Project Number:	Shelco Ponds NPDES + CCR	Pace Project Manager:	Carin Ferris

Section D Required Client Information		Section E Requested Analysis Filtered (Y/N)	
SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE		WO# : 30270907	
Matrix Codes MATRIX / CODE Drinking Water DW Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT		Preservatives Unpreserved H₂SO₄ HNO₃ HCl NaOH Na₂O₃ Methanol Other	
COLLECTED COMPOSITE START COMPOSITE END/GRAB		# OF CONTAINERS	
MATRIX CODE (see valid codes to left) SAMPLE TYPE (G=GRAB C=COMP)		Analysis Test RA-226 EPA 903.1 RA-228 EPA 904.0	
DATE TIME		DATE TIME	
RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION	
DATE TIME		DATE TIME	

Section F Additional Comments		Section G Sample Conditions	
① client needs to analyze for: Radium 226+228pCi/L combined. ② RA-226 EPA 903.1 RA-228 EPA 904.0		11/8/18 10:50 - N N Y	
SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: David Anderson SIGNATURE OF SAMPLER: David Anderson		Temp in °C Received on Custody Sealed Cooler Samples Intact	
DATE SIGNED (MM/DD/YYYY): 10/31/18		DATE SIGNED (MM/DD/YYYY): 10/31/18	

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

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name:

Xcel energy

Project # 30270907

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

Tracking #: 4486 7790 0718

Label

LIMS Login

Custody Seal on Cooler/Box Present: ☐ yes ☒ no

Seals intact:

☐ yes☐ no

Thermometer Used

N/A

Type of Ice: Wet Blue NoneCooler Temperature Observed Temp °C Correction Factor: °C Final Temp: °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>BTH 11/8/18</u>
	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:	☒	☐	☐	5.
-Includes date/time/ID Matrix: <u>WT</u>				
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:	☒	☐	☐	10.
-Pace Containers Used:	☒	☐	☐	
Containers Intact:	☒	☐	☐	11.
Orthophosphate field filtered	☒	☐	☐	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	☒	☐	☐	13.
Organic Samples checked for dechlorination:	☒	☐	☐	14.
Filtered volume received for Dissolved tests	☒	☐	☐	15.
All containers have been checked for preservation.	☒	☐	☐	16.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒	☐	☐	<u>pH 2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>BTH</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	☒	☐	☐	17.
Trip Blank Present:	☒	☐	☐	18.
Trip Blank Custody Seals Present	☒	☐	☐	
Rad Aqueous Samples Screened > 0.5 mrem/hr	☒	☐	☐	Initial when completed <u>BTH</u> Date: <u>11/8/18</u>

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.

December 03, 2018

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

RE: Project: 18-01328, Xcel Energy
Pace Project No.: 30270899

Dear Dave Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 08, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30270899001	P-162	Water	10/31/18 12:30	11/08/18 10:15
30270899002	P-163	Water	10/31/18 13:30	11/08/18 10:15
30270899003	P-164	Water	10/31/18 14:25	11/08/18 10:15
30270899004	Rinse	Water	10/31/18 15:00	11/08/18 10:15
30270899005	P-152a	Water	10/31/18 15:40	11/08/18 10:15
30270899006	Duplicate	Water	10/31/18 15:40	11/08/18 10:15
30270899007	P-17	Water	10/31/18 16:50	11/08/18 10:15
30270899008	P-158	Water	10/31/18 17:30	11/08/18 10:15
30270899009	P-157	Water	10/31/18 18:10	11/08/18 10:15
30270899010	P-150	Water	11/01/18 08:30	11/08/18 10:15
30270899011	P-151	Water	11/01/18 09:30	11/08/18 10:15
30270899012	P-153	Water	11/01/18 10:30	11/08/18 10:15
30270899013	P-154a	Water	11/01/18 11:35	11/08/18 10:15
30270899014	P-165	Water	11/01/18 12:30	11/08/18 10:15
30270899015	P-156	Water	11/01/18 13:25	11/08/18 10:15
30270899016	P-155	Water	11/01/18 14:20	11/08/18 10:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30270899001	P-162	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899002	P-163	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899003	P-164	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899004	Rinse	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899005	P-152a	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899006	Duplicate	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899007	P-17	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899008	P-158	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899009	P-157	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899010	P-150	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899011	P-151	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899012	P-153	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899013	P-154a	EPA 903.1	MK1	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30270899014	P-165	EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
30270899015	P-156	Total Radium Calculation	CMC	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30270899016	P-155	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Method: EPA 903.1

Description: 903.1 Radium 226

Client: Pace-MN Field Services Division

Date: December 03, 2018

General Information:

16 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:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Method: EPA 904.0

Description: 904.0 Radium 228

Client: Pace-MN Field Services Division

Date: December 03, 2018

General Information:

16 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:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Method: Total Radium Calculation

Description: Total Radium 228+226

Client: Pace-MN Field Services Division

Date: December 03, 2018

General Information:

16 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.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01328, Xcel Energy
Pace Project No.: 30270899

Sample: P-162		Lab ID: 30270899001	Collected: 10/31/18 12:30	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.202 ± 0.343 (0.606) C:NA T:89%	pCi/L	11/27/18 20:34	13982-63-3	
Radium-228	EPA 904.0	-0.0473 ± 0.508 (1.21) C:60% T:83%	pCi/L	11/26/18 19:14	15262-20-1	
Total Radium	Total Radium Calculation	0.202 ± 0.851 (1.82)	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-163		Lab ID: 30270899002	Collected: 10/31/18 13:30	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.439 ± 0.462 (0.733) C:NA T:89%	pCi/L	11/27/18 20:34	13982-63-3	
Radium-228	EPA 904.0	0.766 ± 0.712 (1.46) C:66% T:80%	pCi/L	11/26/18 19:14	15262-20-1	
Total Radium	Total Radium Calculation	1.21 ± 1.17 (2.19)	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-164		Lab ID: 30270899003	Collected: 10/31/18 14:25	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.349 ± 0.380 (0.598) C:NA T:84%	pCi/L	11/27/18 20:34	13982-63-3	
Radium-228	EPA 904.0	-0.0102 ± 0.603 (1.41) C:63% T:74%	pCi/L	11/26/18 19:14	15262-20-1	
Total Radium	Total Radium Calculation	0.349 ± 0.983 (2.01)	pCi/L	11/28/18 13:36	7440-14-4	

Sample: Rinse		Lab ID: 30270899004	Collected: 10/31/18 15:00	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.235 ± 0.216 (0.127) C:NA T:96%	pCi/L	11/27/18 20:34	13982-63-3	
Radium-228	EPA 904.0	0.661 ± 0.638 (1.31) C:63% T:81%	pCi/L	11/26/18 19:14	15262-20-1	
Total Radium	Total Radium Calculation	0.896 ± 0.854 (1.44)	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-152a		Lab ID: 30270899005	Collected: 10/31/18 15:40	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.302 ± 0.227 (0.117) C:NA T:98%	pCi/L	11/27/18 20:34	13982-63-3	
Radium-228	EPA 904.0	0.488 ± 0.371 (0.719) C:73% T:75%	pCi/L	11/29/18 15:14	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Sample: P-152a		Lab ID: 30270899005	Collected: 10/31/18 15:40	Received: 11/08/18 10:15	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	0.790 ± 0.598 (0.836)		pCi/L	11/30/18 13:15	7440-14-4	

Sample: Duplicate		Lab ID: 30270899006	Collected: 10/31/18 15:40	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.622 ± 0.334 (0.120) C:NA T:95%	pCi/L	11/27/18 20:47	13982-63-3	
Radium-228	EPA 904.0	0.211 ± 0.531 (1.19) C:65% T:89%	pCi/L	11/26/18 19:27	15262-20-1	
Total Radium	Total Radium Calculation	0.833 ± 0.865 (1.31)	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-17		Lab ID: 30270899007	Collected: 10/31/18 16:50	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.218 ± 0.428 (0.769) C:NA T:79%	pCi/L	11/27/18 20:47	13982-63-3	
Radium-228	EPA 904.0	0.986 ± 0.650 (1.22) C:62% T:80%	pCi/L	11/26/18 19:27	15262-20-1	
Total Radium	Total Radium Calculation	1.20 ± 1.08 (1.99)	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-158		Lab ID: 30270899008	Collected: 10/31/18 17:30	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.142 ± 0.307 (0.567) C:NA T:89%	pCi/L	11/27/18 20:47	13982-63-3	
Radium-228	EPA 904.0	0.971 ± 0.610 (1.13) C:67% T:83%	pCi/L	11/26/18 19:27	15262-20-1	
Total Radium	Total Radium Calculation	1.11 ± 0.917 (1.70)	pCi/L	11/28/18 13:36	7440-14-4	

Sample: P-157		Lab ID: 30270899009	Collected: 10/31/18 18:10	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.639 ± 0.398 (0.392) C:NA T:86%	pCi/L	11/27/18 21:02	13982-63-3	
Radium-228	EPA 904.0	0.251 ± 0.397 (0.860) C:76% T:83%	pCi/L	11/26/18 13:57	15262-20-1	
Total Radium	Total Radium Calculation	0.890 ± 0.795 (1.25)	pCi/L	11/28/18 13:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Sample: P-150		Lab ID: 30270899010	Collected: 11/01/18 08:30	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.281 ± 0.319 (0.504) C:NA T:91%	pCi/L	11/27/18 21:02	13982-63-3	
Radium-228	EPA 904.0	0.893 ± 0.474 (0.848) C:78% T:80%	pCi/L	11/26/18 14:36	15262-20-1	
Total Radium	Total Radium Calculation	1.17 ± 0.793 (1.35)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-151		Lab ID: 30270899011	Collected: 11/01/18 09:30	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.564 ± 0.419 (0.552) C:NA T:86%	pCi/L	11/27/18 21:02	13982-63-3	
Radium-228	EPA 904.0	0.459 ± 0.327 (0.636) C:83% T:88%	pCi/L	11/26/18 13:31	15262-20-1	
Total Radium	Total Radium Calculation	1.02 ± 0.746 (1.19)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-153		Lab ID: 30270899012	Collected: 11/01/18 10:30	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.293 ± 0.298 (0.451) C:NA T:99%	pCi/L	11/27/18 21:02	13982-63-3	
Radium-228	EPA 904.0	0.990 ± 0.486 (0.859) C:77% T:79%	pCi/L	11/26/18 13:31	15262-20-1	
Total Radium	Total Radium Calculation	1.28 ± 0.784 (1.31)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-154a		Lab ID: 30270899013	Collected: 11/01/18 11:35	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0501 ± 0.229 (0.466) C:NA T:90%	pCi/L	11/27/18 21:02	13982-63-3	
Radium-228	EPA 904.0	0.779 ± 0.405 (0.720) C:74% T:89%	pCi/L	11/26/18 13:31	15262-20-1	
Total Radium	Total Radium Calculation	0.829 ± 0.634 (1.19)	pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-165		Lab ID: 30270899014	Collected: 11/01/18 12:30	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0477 ± 0.337 (0.673) C:NA T:90%	pCi/L	11/27/18 21:02	13982-63-3	
Radium-228	EPA 904.0	0.215 ± 0.400 (0.877) C:74% T:79%	pCi/L	11/26/18 13:31	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

Sample: P-165		Lab ID: 30270899014	Collected: 11/01/18 12:30	Received: 11/08/18 10:15	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	0.263 ± 0.737 (1.55)		pCi/L	11/28/18 13:42	7440-14-4	

Sample: P-156		Lab ID: 30270899015	Collected: 11/01/18 13:25	Received: 11/08/18 10:15	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.385 (0.833) C:NA T:90%	pCi/L	12/03/18 09:53	13982-63-3	
Radium-228	EPA 904.0	0.786 ± 0.410 (0.732) C:75% T:88%	pCi/L	11/26/18 13:31	15262-20-1	
Total Radium	Total Radium Calculation	0.786 ± 0.795 (1.57)	pCi/L	12/03/18 14:53	7440-14-4	

Sample: P-155		Lab ID: 30270899016	Collected: 11/01/18 14:20	Received: 11/08/18 10:15	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.291 ± 0.357 (0.583) C:NA T:87%		pCi/L	11/27/18 21:16	13982-63-3	
Radium-228	EPA 904.0	0.512 ± 0.391 (0.766) C:70% T:83%		pCi/L	11/26/18 13:31	15262-20-1	
Total Radium	Total Radium Calculation	0.803 ± 0.748 (1.35)		pCi/L	11/28/18 13:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

QC Batch:	320186	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30270899001, 30270899002, 30270899003, 30270899004, 30270899005, 30270899006, 30270899007, 30270899008		

METHOD BLANK:	1562014	Matrix:	Water
Associated Lab Samples:	30270899001, 30270899002, 30270899003, 30270899004, 30270899005, 30270899006, 30270899007, 30270899008		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.405 ± 0.316 (0.616) C:80% T:79%	pCi/L	11/26/18 13:41	

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

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

QC Batch:	320182	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30270899009, 30270899010, 30270899011, 30270899012, 30270899013, 30270899014, 30270899015, 30270899016		

METHOD BLANK:	1562010	Matrix:	Water
Associated Lab Samples:	30270899009, 30270899010, 30270899011, 30270899012, 30270899013, 30270899014, 30270899015, 30270899016		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0918 ± 0.221 (0.426) C:NA T:96%	pCi/L	11/27/18 20:47	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

QC Batch:	320188	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30270899009, 30270899010, 30270899011, 30270899012, 30270899013, 30270899014, 30270899015, 30270899016		

METHOD BLANK:	1562041	Matrix:	Water
Associated Lab Samples:	30270899009, 30270899010, 30270899011, 30270899012, 30270899013, 30270899014, 30270899015, 30270899016		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.561 ± 0.388 (0.731) C:70% T:74%	pCi/L	11/26/18 13:30	

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.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

QC Batch:	320181	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30270899001, 30270899002, 30270899003, 30270899004, 30270899005, 30270899006, 30270899007, 30270899008		

METHOD BLANK:	1562009	Matrix:	Water
Associated Lab Samples:	30270899001, 30270899002, 30270899003, 30270899004, 30270899005, 30270899006, 30270899007, 30270899008		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0996 ± 0.227 (0.366) C:NA T:88%	pCi/L	11/27/18 20:07	

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

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QUALIFIERS

Project: 18-01328, Xcel Energy

Pace Project No.: 30270899

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

REPORT OF LABORATORY ANALYSIS

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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.

Section A Required Client Information: Company: <u>Xcel Energy</u> Address: <u>510 Pace MN Field</u> Email To: _____ Phone: _____ Fax: _____ Requested Due Date/TAT: _____		Section B Required Project Information: Report To: <u>David Anderson</u> Copy To: _____ Purchase Order No.: _____ Project Name: <u>18-01328, Xcel Energy -</u> Project Number: <u>Shoreo Parks CCR only wells</u>		Section C Invoice Information: Attention: <u>Clara Ruitk</u> Company Name: <u>Pace MN Field Services</u> Address: _____ Pace Quote Reference: <u>Tom Halverson</u> Pace Project Manager: <u>Carin Feltis</u> Pace Profile #: _____	
Regulatory Agency: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____		Site Location: STATE: _____			

Section D Required Client Information		Section E Matrix Codes		Section F Sample ID		Section G Requested Analysis Filtered (Y/N)		Section H Requested Analysis		Section I Requested Analysis		Section J Requested Analysis	
Item #	Sample ID (A-Z, 0-9 / -)	Matrix Code	Matrix Code	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	
1	P-162	Drinking Water	DW	WT	WT	WT	WT	WT	WT	WT	WT	WT	
2	P-163	Water	WW	WT	WT	WT	WT	WT	WT	WT	WT	WT	
3	P-164	Waste Water	WW	WT	WT	WT	WT	WT	WT	WT	WT	WT	
4	Rinse	Product	P	WT	WT	WT	WT	WT	WT	WT	WT	WT	
5	P-152a	Soil/Solid	SL	WT	WT	WT	WT	WT	WT	WT	WT	WT	
6	Duplicate	Oil	OL	WT	WT	WT	WT	WT	WT	WT	WT	WT	
7	P-17	Wipe	WP	WT	WT	WT	WT	WT	WT	WT	WT	WT	
8	P-158	Air	AR	WT	WT	WT	WT	WT	WT	WT	WT	WT	
9	P-157	Tissue	TS	WT	WT	WT	WT	WT	WT	WT	WT	WT	
10	P-150	Other	OT	WT	WT	WT	WT	WT	WT	WT	WT	WT	
11	P-151			WT	WT	WT	WT	WT	WT	WT	WT	WT	
12	P-153			WT	WT	WT	WT	WT	WT	WT	WT	WT	

ADDITIONAL COMMENTS: ① client needs to analyze for: Radium 226 & 228 pCi/L Combined,		RELINQUISHED BY / AFFILIATION: David Anderson Pace 11-6-18 1230		ACCEPTED BY / AFFILIATION: David Anderson Pace 11-6-18 1230		DATE: 11/8/18 1015		TIME: 1015		SAMPLE CONDITIONS: N N N Y	
SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: <u>David Anderson</u> SIGNATURE of SAMPLER: <u>David Anderson</u>		DATE Signed (MM/DD/YYYY): <u>11-1-18</u>		Received on (Y/N): _____		Custody Sealed (Y/N): _____		Samples Intact (Y/N): _____			

CHAIN-OF-CUSTODY / Analytical Request Document

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



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Section A Required Client Information: Company: <u>Xcel Energy</u> Address: <u>c/o Pace MN Field</u> Email To: _____ Phone: _____ Requested Due Date/TAT: _____		Section B Required Project Information: Report To: <u>David Anderson</u> Copy To: _____ Purchase Order No.: _____ Project Name: <u>18-01328, Xcel Energy -</u> Project Number: <u>Shorelands CCR only wells</u>		Section C Invoice Information: Attention: <u>Ciara Ruikkie</u> Company Name: <u>Pace MN Field Services</u> Address: _____ Pace Quote Reference: <u>Tom Halverson</u> Pace Project Manager: <u>Carin Fertis</u> Pace Profile #: _____	
Regulatory Agency: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RORA ☐ OTHER _____		Site Location: STATE: _____		Page: <u>2</u> of <u>3</u> 1845964	

ITEM #	Section D Required Client Information	Matrix Codes MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB							
1	P-1544	Drinking Water	WT	DATE	TIME	DATE	TIME					
2	P-1654	Waste Water	WT	DATE	TIME	DATE	TIME					
3	P-156	Product	WT	DATE	TIME	DATE	TIME					
4	P-155	Soil/Solid	WT	DATE	TIME	DATE	TIME					
5		Oil	WT	DATE	TIME	DATE	TIME					
6		Wipe	WT	DATE	TIME	DATE	TIME					
7		Air	WT	DATE	TIME	DATE	TIME					
8		Tissue	WT	DATE	TIME	DATE	TIME					
9		Other	WT	DATE	TIME	DATE	TIME					
10												
11												
12												

ADDITIONAL COMMENTS ① Client needs to analyze for: Radium 226+228 pCi/L combined. RA-226 EPA 903.1 RA-228 EPA 904.0	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	David Anderson 11-6-18 1350	11-1-18 1135 1230 1325 1420	11-1-18 1135 1230 1325 1420	11-1-18 1135 1230 1325 1420	David Anderson 11-1-18 1135	11-1-18 1135 1230 1325 1420	11-1-18 1135 1230 1325 1420

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Xcel energy

Project # 30270899

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

Tracking #: 4486 7790 0713

Label	<u>BTH</u>
LIMS Login	<u>BTH</u>

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

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
Chain of Custody Present:	☒	☐	☐	<u>10D4671</u>	<u>BTH 11/8/18</u>
Chain of Custody Filled Out:	☒	☐	☐		
Chain of Custody Relinquished:	☒	☐	☐		
Sampler Name & Signature on COC:	☒	☐	☐		
Sample Labels match COC:	☒	☐	☐		
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	☒	☐	☐		
Short Hold Time Analysis (<72hr remaining):	☒	☐	☐		
Rush Turn Around Time Requested:	☒	☐	☐		
Sufficient Volume:	☒	☐	☐		
Correct Containers Used:	☒	☐	☐		
-Pace Containers Used:	☒	☐	☐		
Containers Intact:	☒	☐	☐		
Orthophosphate field filtered	☒	☐	☐		
Hex Cr Aqueous Compliance/NPDES sample field filtered	☒	☐	☐		
Organic Samples checked for dechlorination:	☒	☐	☐		
Filtered volume received for Dissolved tests	☒	☐	☐		
All containers have been checked for preservation.	☒	☐	☐		
All containers needing preservation are found to be in compliance with EPA recommendation.	☒	☐	☐	<u>PH12</u>	
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>BTH</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	☒	☐	☐		
Trip Blank Present:	☒	☐	☐		
Trip Blank Custody Seals Present	☒	☐	☐		
Rad Aqueous Samples Screened > 0.5 mrem/hr	☒	☐	☐	Initial when completed <u>BTH</u>	Date:

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.