2018 Annual Groundwater Monitoring and Corrective Action Report

for Compliance with the Coal Combustion Residuals (CCR) Rule

Hayden Station

Public Service Company of Colorado

January 30, 2019

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Table of Abbreviations and Acronyms

Abbreviation	Definition
BTV	background threshold value
CCR	Coal Combustion Residuals
COI	constituent of interest
EPA	Environmental Protection Agency
LCS	Laboratory Control Samples
MS/MSD	Matrix Spike/Duplicate
QC	quality control
RPD	relative percent difference
SOP	Standard Operating Procedure
SSI	statistically significant increase
TDS	Total Dissolved Solids
TSS	Total Suspended Solids

Certification

2018 Groundwater Monitoring and Corrective Action Annual Report for Hayden Station

I hereby certify to the best of my knowledge that this groundwater monitoring and corrective action annual report is designed to meet the performance standard in 40 CFR Part 257 of the Federal Coal Combustion Residuals (CCR) Rule.

I am duly licensed Professional Engineer under the laws of the State of Colorado.

Matthew Rohr, PE
Colorado PE License 0053467
License renewal date October 31, 2019

1.0 Introduction

The U.S. Environmental Protection Agency's (EPA's) final Coal Combustion Residuals (CCR) Rule establishes a comprehensive set of requirements for the management and disposal of CCR (or coal ash) in landfills and surface impoundments by electric utilities. Hayden Station, located in Routt County, Colorado (**Figure 1**), has an ash disposal facility subject to the CCR Rule (**Figure 2**). Hayden Station is operated by Public Service Company of Colorado (PSCo), an Xcel Energy Company.

The original certified CCR monitoring well network for the Hayden CCR landfill consisted of four wells completed in the colluvium that underlies the landfill; one upgradient of the landfill and three at the downgradient waste boundary. In 2018, detection monitoring continued in these four wells. Upgradient colluvial monitoring well MW-5 has continued to be dry since program implementation and comparison of upgradient and downgradient groundwater chemistry in the colluvial wells has not been possible. The colluvium under the landfill discharges to the adjacent alluvial aquifer of Sage Creek. Therefore, existing monitoring wells in the adjacent alluvial aquifer were sampled for CCR constituents of interest (COIs) in 2018. These wells are located both upgradient and downgradient of the CCR landfill, and can be used to supplement the colluvial landfill monitoring wells. It is not appropriate to compare alluvial water quality to colluvial water quality. However, collecting CCR background samples from the alluvial well system will provide background groundwater that has not been impacted by the CCR unit and groundwater downgradient of the waste boundary of the CCR unit in compliance with the CCR Rule. In 2018, eight rounds of background sampling were completed in the alluvial wells to establish background water quality for CCR constituents.

This Annual Groundwater Monitoring Report presents the sampling and analysis completed in 2018:

- The status of the groundwater monitoring program for the CCR Landfill at the end of 2018 is detection monitoring for the colluvial well network
- The status of the groundwater monitoring program for the CCR Landfill at the end of 2018 is background monitoring for the alluvial well network.

2.0 Facility Description

Hayden Station is a coal-fired, steam turbine electric generating station; the fuel source for the existing coal-fired units is sub-bituminous, low-sulfur coal supplied by several mines in western Colorado. Hayden Station uses water from the Yampa River and discharges no water offsite. Hayden Station began operating in 1965 (Unit 1), with the addition of Unit 2 in 1976. CCR generated at the Station is permanently disposed in the landfill (**Figure 2**). Wastes disposed at the landfill consist of coal ash, air emission control byproducts, water intake silt, excavation soils, and coal impurities.

2.1 Hydrogeology

The landfill is located on a west-facing hillslope that drains to Sage Creek and the alluvial aquifer (**Figure 2**). Sage Creek flows to the north. The soil underlying the landfill is colluvium consisting of silty clay or clay to a depth of 9 to 24 feet, which is underlain by shale bedrock of the Lewis Shale Formation (Walsh, 2001). The Lewis Shale Formation surface slopes down to the west/northwest toward Sage Creek (Walsh, 2001). The Lewis Shale Formation is several hundred feet thick in the area and is recognized as an aquiclude that inhibits vertical movement of water (Xcel, 2001). Eight monitoring wells were installed in 1984 in the vicinity of the landfill, prior to landfill construction. All wells were dry (and remained dry throughout the multi-year period in which they were monitored) with the exception of one (HD-1) in the northwest near County Road 27. This well was observed to be wet at the top of bedrock. These observations indicate that the background hydrologic condition associated with the landfill was predominantly dry colluvium. Limited perched groundwater may be present beneath the landfill from infiltrated precipitation above the bedrock contact, which would then flow along the bedrock surface and ultimately discharge to the Sage Creek alluvial aquifer.

Within approximately 100 feet west of the landfill, the uppermost aquifer is within the alluvium of the Sage Creek valley. Monitoring wells W-1, W-2, and W-3 were drilled to a depth of 15 to 20 feet in 2001 and encountered layers of sand and gravel alternating with finer-grained layers of sand, silt and clay. These wells are monitored as part of the State groundwater program. Three additional wells (W-4, W-5, and W-6) were installed in the Sage Creek alluvium for the State monitoring program in March 2017. A seventh well (W-7) was installed in the Sage Creek alluvium in September, 2017. Groundwater in the alluvial aquifer is 5 to 10 feet below grade (Xcel, 2001). Groundwater present in the Sage Creek valley bottom alluvium flows to the north.

2.2 Monitoring Well Network

Four monitoring wells (MW-5, MW-6, MW-7, and MW-8) were drilled and installed in 2015 around the perimeter of the landfill and are monitored for compliance with the CCR Rule. All four wells were completed in the colluvium. The well locations are shown on **Figure 2**. The upgradient well (MW-5) is located to the southeast of the ash landfill. The three downgradient wells (MW-6, MW-7, and MW-8) are located immediately west of the landfill. The three downgradient wells are spaced along the length of the landfill. Each downgradient well is located at the waste boundary of the CCR unit. Upgradient well MW-5 has been consistently dry over the three year monitoring period and therefore background water quality could not be established in the colluvial system of wells.

In 2018 PSCo began sampling four existing monitoring wells in the adjacent alluvial aquifer for CCR constituents of interest (COIs). These four wells are screened in the alluvial aquifer west of the waste boundary (**Figure 2**). Based on the site hydrogeology and westerly sloping bedrock surface, impacts to groundwater in colluvium under the landfill should be observable in the alluvial aquifer downgradient of the landfill waste boundary. One upgradient well (W-3) is located southwest of the landfill to represent background water quality conditions and three downgradient wells (W-1, W-2, and W-4) are located west and northwest of the landfill (**Figure 2**).

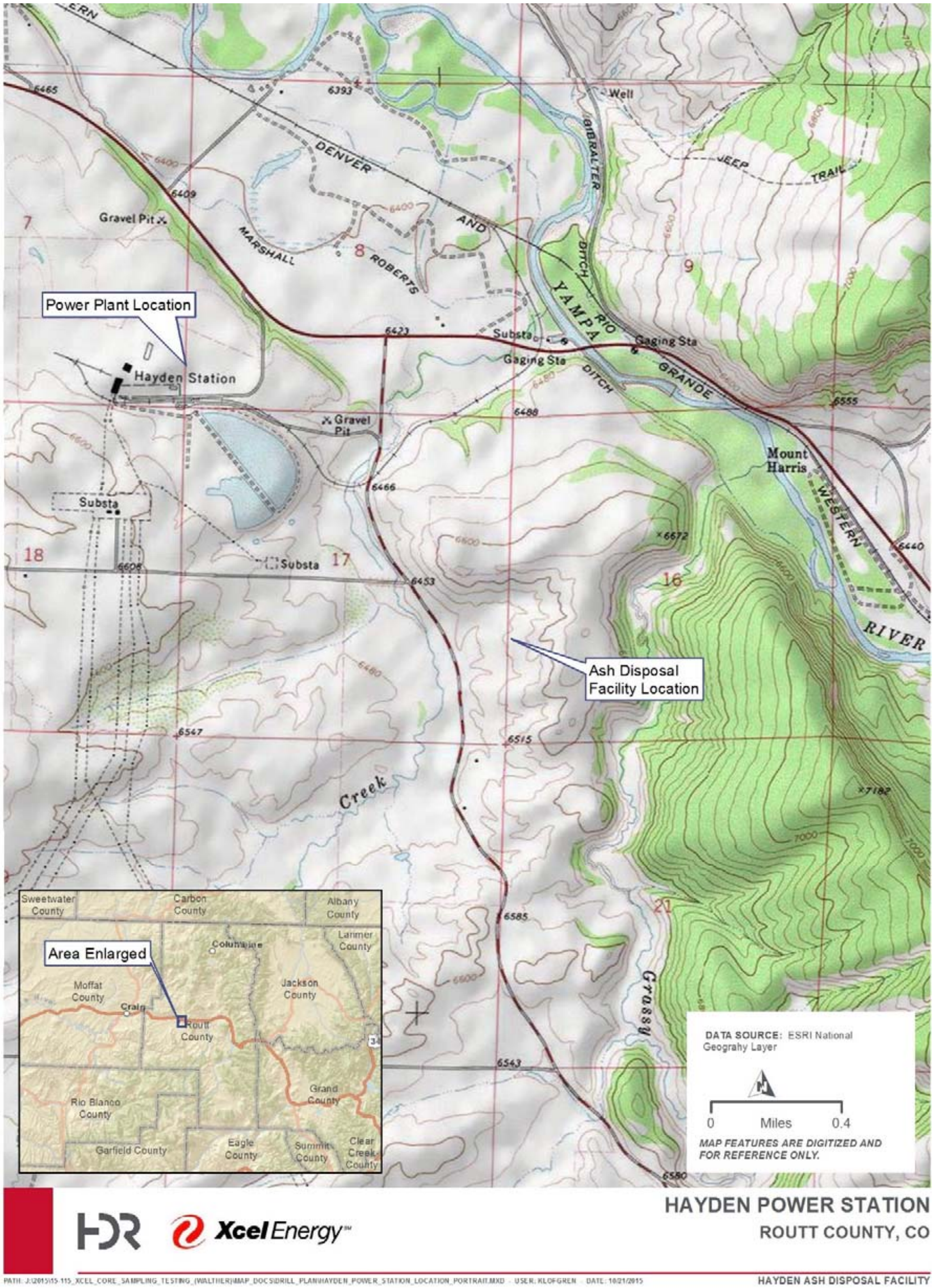


Figure 1. Vicinity map for Hayden Station.

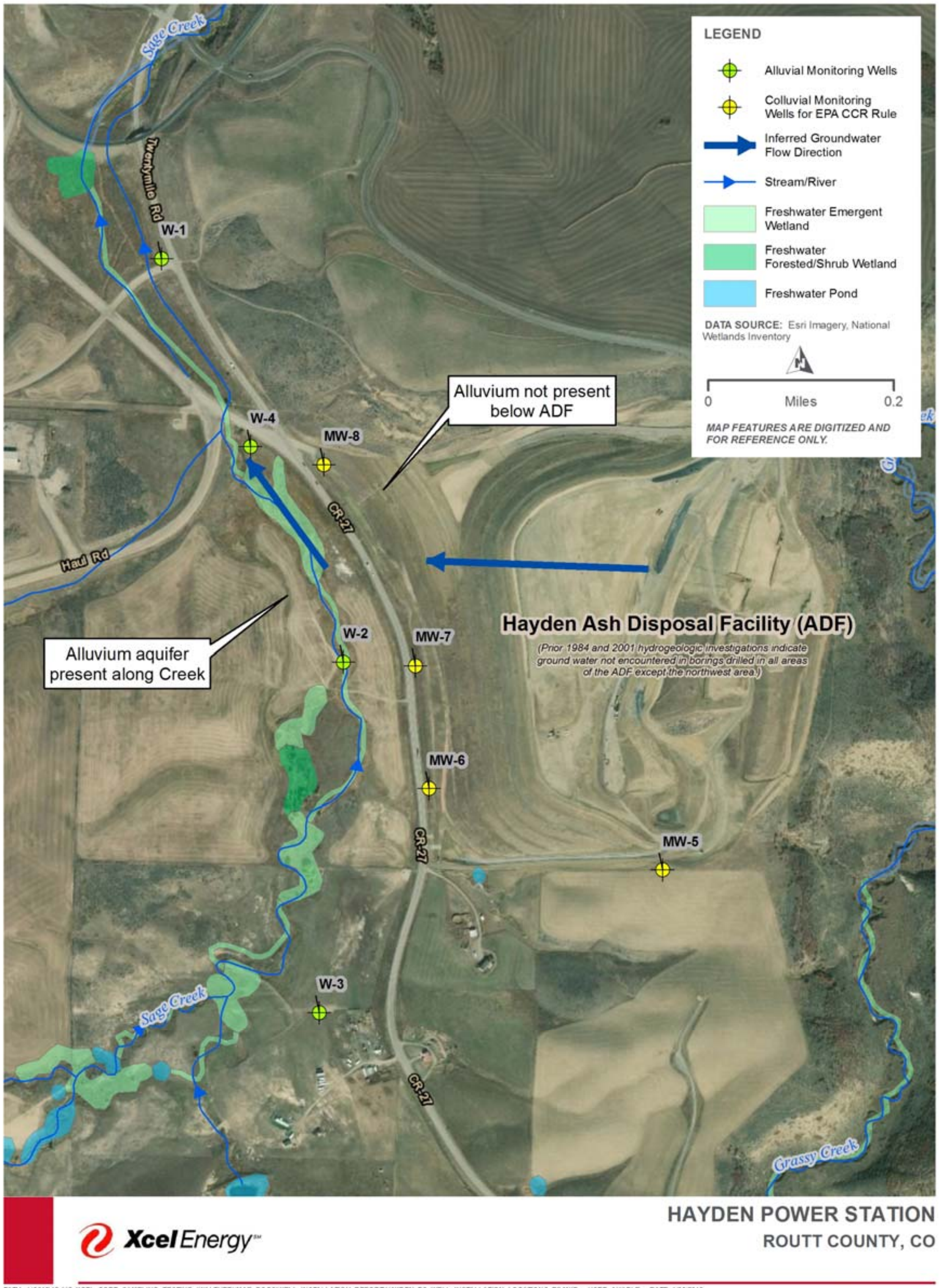


Figure 2. Hayden Station – CCR unit and monitoring well location map.

3.0 Monitoring

3.1 Frequency

In accordance with CCR Rule 257.94 PSCo continued semi-annual detection monitoring in 2018 in the colluvial wells. Samples were analyzed for Appendix III COIs (Table 1). Monitoring was conducted at the original colluvial landfill monitoring network of wells (MW-5, MW-6, MW-7, and MW-8); however MW-5 was dry.

As stipulated in the CCR Rule, eight rounds of background groundwater sampling were completed in 2018 in the alluvial monitoring wells west of the landfill. Sampling was conducted on a monthly frequency, between April and November 2018. Samples were collected from the alluvial monitoring wells (W-1, W-2, W-3, and W-4). Samples were analyzed for Appendix III and IV COIs plus total suspended solids (TSS) (**Table 1**).

Table 2 provides the well identification, number of samples collected, dates samples were collected in 2018, and whether the sample was required by the detection monitoring or background monitoring programs (per (257.90(e)(3))).

Table 1. Groundwater quality parameters

Appendix III Constituents for Detection Monitoring	**Appendix IV Constituents for Assessment Monitoring**
Boron	Antimony
Calcium	Arsenic
Chloride	Barium
Fluoride	Beryllium
pH	Cadmium
Sulfate	Chromium
Total Dissolved Solids (TDS)	Cobalt
Additional Parameters	Fluoride
Total Suspended Solids (TSS)	Lead
	Lithium
	Mercury
	Molybdenum
	Selenium
	Thallium
	Radium 226 and 228 combined

Table 2. Number and dates of groundwater samples collected for each well and the required monitoring programs (257.90(e)(3))

Monitoring Well I.D.	Well Location	Dates Monitored	CCR Rule Monitoring Purpose
MW-5 (Colluvial)	Upgradient	April 10, 2108* October 11, 2018*	Detection Monitoring
MW-6 (Colluvial)	Downgradient	April 10, 2108 October 11, 2018	Detection Monitoring
MW-7 (Colluvial)	Downgradient	April 10, 2108 October 11, 2018	Detection Monitoring
MW-8 (Colluvial)	Downgradient	April 10, 2108 October 11, 2018	Detection Monitoring
W-1 (Alluvial)	Downgradient	April 11, 2018 May 14, 2018 June 11, 2018 July 10, 2018 August 13, 2018 September 10, 2018 October 10, 2018 November 13, 2018	Background Monitoring
W-2 (Alluvial)	Downgradient	April 11, 2018 May 14, 2018 June 11, 2018 July 10, 2018 August 13, 2018 September 10, 2018 October 10, 2018 November 13, 2018	Background Monitoring
W-3 (Alluvial)	Upgradient	April 11, 2018 May 14, 2018 June 11, 2018 July 10, 2018 August 13, 2018 September 10, 2018 October 10, 2018 November 13, 2018	Background Monitoring
W-4 (Alluvial)	Downgradient	April 11, 2018 May 14, 2018 June 11, 2018 July 10, 2018 August 13, 2018 September 10, 2018 October 10, 2018 November 13, 2018	Background Monitoring

*Well was monitored and found to be dry, no sample could be collected

3.2 Water Levels and Sample Collection

Water levels were collected in each well prior to sample collection. Groundwater quality samples were collected in all monitoring wells listed in **Table 2** unless wells were dry. Groundwater sample collection protocols follow the Groundwater Sample Collection Standard Operating Procedure (SOP) (HDR, 2016). The water samples were collected using a peristaltic pump, and the hose was decontaminated between wells following protocols outlined in the Sampling SOP. Each well was purged until field parameters stabilized in accordance with the sampling SOP. In accordance with the CCR Rule, groundwater samples were not field filtered. The field parameters of turbidity, pH, and temperature were measured using a YSI Professional Plus (or an equivalent) portable water quality instrument that was calibrated prior to use each day of sampling. The results of field measurements were recorded on a field data form, which is maintained as part of the field sampling records. For quality control (QC), one field duplicate sample and one field equipment blank sample was collected during each sample event. Water samples were delivered under Chain of Custody to TestAmerica in Denver, Colorado.

3.3 Analytical Testing

Groundwater samples from colluvial wells for detection monitoring were analyzed for the CCR Rule Appendix III constituents shown in **Table 1.** The laboratory analyzed matrix spike/matrix spike duplicates at a rate of 5 percent, per laboratory QC procedures.

Groundwater samples from alluvial wells for background sampling were analyzed for Appendices III and IV COIs of CCR Rule Part 257, plus TSS (**Table 1**). The laboratory analyzed matrix spike/matrix spike duplicates at a rate of 5 percent, per laboratory QC procedures.

4.0 Data Validation and Data Management

Data validation was conducted to eliminate data that did not meet validation criteria, and designate a data qualifier for any data quality limitation discovered. All data validation and data management tasks were performed per the Data Management and Statistical Procedures Plan for Compliance with the Coal Combustion Residuals Rule (HDR, 2018).

All samples and quality control (QC) were reviewed and evaluated, and no samples were rejected. Most QC analyses were within reportable limits; however, when QC was outside limit controls, samples were reported as estimated. Relative percent difference (RPD) failures for field duplicate analyses were slightly greater than the 20 percent limit criteria, in a few instances. Laboratory Control Sample (LCS)/LCS duplicates and Matrix Spike/Duplicate (MS/MSD) duplicates %RPD recoveries all were generally within control limits. Data analyses required minimal qualifications, and all data were usable, even when qualified.

5.0 Monitoring Results

5.1 Water Levels and Groundwater Flow Direction

The water levels at monitoring wells were recorded during monitoring events. Upgradient well MW-5 is consistently dry over the three year monitoring period, reflecting the normally dry background conditions in the colluvium under the landfill and above the Lewis Shale aquitard. However, groundwater is observed in the colluvium downgradient wells MW-6, MW-7 and MW8 at the waste boundary. Because the colluvium is otherwise dry, the water in these wells is likely seepage from within the footprint of the landfill which is collecting as perched groundwater, flowing along the top of bedrock and discharging to the northwest into the alluvial aquifer of Sage Creek. The groundwater flow direction appears to be consistent with previous conceptual models in that groundwater flow direction between the three colluvial downgradient wells is to the north.

HDR has reviewed site conditions on multiple occasions to evaluate potential locations for a new upgradient monitoring well. Based upon the documented dry colluvium conditions, locations east of the landfill are expected to also be dry. Locations along the south end of the landfill are inappropriate due to possible stormwater runoff from the landfill and potential contributions from the adjacent property owner. Therefore, the most appropriate location for an upgradient well is along the south edge of the landfill and west of CR-27. However, a well installed west of CR-27 would likely intercept the alluvial aquifer, and would not be representative of the colluvium that is monitored in downgradient CCR wells at the waste boundary. No options for an upgradient well in the colluvium exist, and since the colluvium discharges to the alluvial aquifer, existing monitoring wells in the alluvial aquifer can be used to supplement the monitoring network. Groundwater elevations in these wells are displayed on the potentiometric contour map in **Appendix A.** Groundwater flow in the alluvial aquifer is north, consistent with the flow of Sage Creek. The potentiometric contour map confirms well W-3 as being upgradient of the influence of the landfill and is appropriate to represent background water quality for the landfill in the alluvial aquifer.

5.2 Water Quality

In April and October the colluvial CCR wells MW-5, MW-6, MW-7, and MW-8 were sampled for detection monitoring. All four wells were monitored but MW-5 was dry. Groundwater was analyzed for CCR Rule Appendix III COIs. Laboratory reports are provided in **Appendix B**.

The 8 groundwater sampling events of both upgradient and downgradient alluvial wells occurred between April and November 2018 for background monitoring. All four wells (W-1, W-2, W-3, and W-4) were sampled during the 8 events. Groundwater was analyzed for CCR Rule Appendix III and IV COIs plus TSS. Laboratory reports are provided in **Appendix B** (except the report for the November sampling event which was not received by year end). The data from the alluvial well sampling events will be evaluated and detection monitoring will begin in the alluvial wells in 2019.

6.0 Summary

In 2018 PSCo continued detection monitoring (CCR Rule Appendix III COI analysis) in the colluvial CCR monitoring well network. Upgradient, colluvial monitoring well MW-5 has been consistently dry over the three year monitoring period, reflecting the normally dry background conditions in the colluvium under the landfill and above the Lewis Shale aquitard. Therefore, no background water quality is available to develop BTVs. However, groundwater is observed in the colluvium downgradient wells MW-6, MW-7 and MW8 at the waste boundary, which likely represents seepage from within the footprint of the landfill collecting as perched groundwater in these wells, flowing along the top of bedrock and discharging to the northwest into the alluvial aquifer of Sage Creek. Therefore, existing monitoring wells in the Sage Creek aquifer were sampled for CCR constituents of interest (COIs) in 2018. Eight rounds of background sampling were completed in one upgradient and three downgradient alluvial wells to establish background water quality for the CCR Constituents in Appendix III and Appendix IV. The data from these sampling events will be evaluated and detection monitoring will begin in the alluvial wells in 2019.

Under the separate State groundwater monitoring system of wells in the alluvial aquifer, State SSIs over background were identified in downgradient well W-2. PSCo initiated assessment monitoring under the State program in 2017 and initiated a dewatering corrective action program in 2018. Although no SSIs have been demonstrated in the CCR monitoring program, assessment monitoring and corrective action are being implemented at the site under the state program, which is functionally equivalent to that which is outlined in the CCR Rule.

The following observations are based on CCR Rule compliance data collected in 2018:

- Groundwater flow direction under the CCR landfill is generally to the northwest and discharges to the Sage Creek alluvial aquifer. Groundwater flow direction in the Sage Creek alluvial aquifer is to the north.
- All four of the colluvial CCR monitoring wells were sampled in April and in October for Appendix III COIs for detection monitoring, except MW-5 located upgradient of the landfill which was consistently dry.
- No background water quality is available to develop BTVs for the colluvial system.
- No wells were installed or abandoned in 2018.
- Four existing alluvial wells (W-1 – W-4) were sampled 8 times between April and November 2018 and analyzed for background water quality (CCR Appendix III and IV COIs). This data will be evaluated and detection monitoring will begin in the alluvial wells in 2019.
- Under the State groundwater monitoring program, Hayden Station is implementing assessment monitoring and corrective action that is functionally equivalent to that which would be required if there were a documented SSI in the CCR monitoring well network.
- The status of the groundwater monitoring program for the CCR Landfill at the end of 2018 is detection monitoring for the colluvial wells.
  The status of the groundwater monitoring program for the CCR Landfill at the end of 2018 is background monitoring for the alluvial wells.

7.0 References

AECOM, 2016. Hayden Station Ash Disposal Facility Semi-Annual Groundwater Monitoring Report December 28, 2016.

HDR, 2016. Groundwater Monitoring System Certification - Compliance with the Coal Combustion Residuals Rule Hayden Station. August 1, 2016.

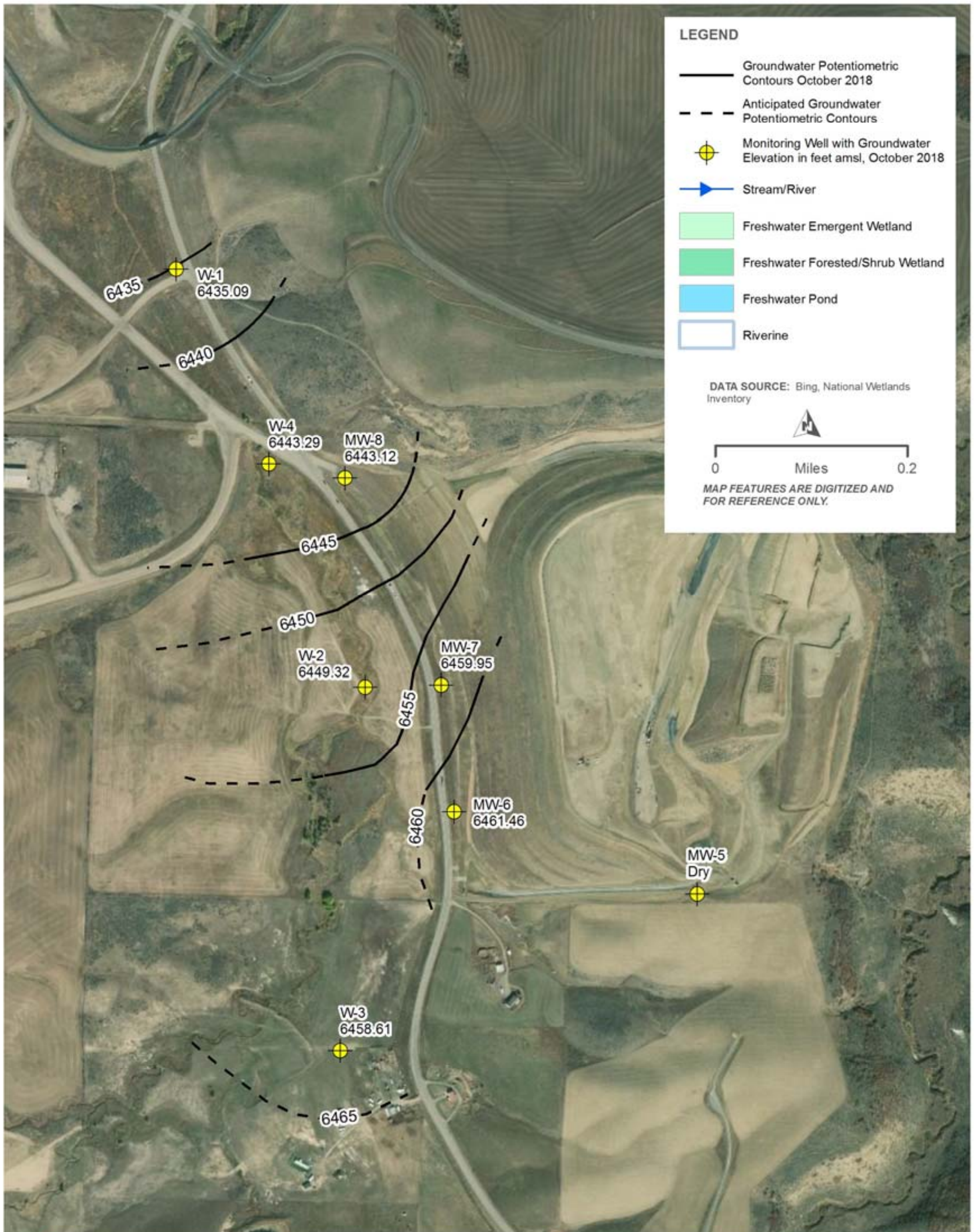
HDR, 2018. Data Management and Statistical Procedures Plan for Compliance with the Coal Combustion Residuals Rule. Updated January 15, 2018.

Walsh (Walsh Environmental Scientists and Engineers), 2013. Hayden Station Coal Ash Disposal Facility Engineering and Design and Operation Plan. Xcel Energy, Hayden, Colorado. November 2013.

Xcel Energy, 2001. Hayden Ash Disposal Facility Environmental Monitoring System (EMS) Work Plan, August 23, 2001.

Appendix A

Potentiometric Surface Map



HAYDEN POWER STATION

ROUTT COUNTY, CO

PATH: J:\2015\15-115_XCEL_CORE_SAMPLING_TESTING_(WALTHER)\MAP_DOCS\GROUNDWATER_CONTROURS\HAYDEN_POWER_STATION_PORTAIT_GW_WELL_CERT_GWELEV201810.MXD - USER: GMILLERF - DATE: 1/29/2019

Appendix B

Laboratory Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-108402-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Stephanie Rothmeyer

Authorized for release by:
5/8/2018 10:08:50 AM

Stephanie Rothmeyer, Project Manager I
(303)736-0182
stephanie.rothmeyer@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-108402-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-108402-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 4/12/2018 at 12:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6º C.

TOTAL RECOVERABLE METALS

Samples MW 6 (280-108402-1), MW 7 (280-108402-2), MW 8 (280-108402-3), MW-7D (280-108402-4) and MW-8EB (280-108402-5) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/16/2018 and analyzed on 04/17/2018 and 04/18/2018.

Samples MW 6 (280-108402-1)[5X], MW 7 (280-108402-2)[5X] and MW-7D (280-108402-4)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)

Samples MW 6 (280-108402-1), MW 7 (280-108402-2), MW 8 (280-108402-3), MW-7D (280-108402-4) and MW-8EB (280-108402-5) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 04/16/2018 and analyzed on 04/18/2018.

Calcium failed the recovery criteria high for the MS and MSD of sample 240-94032-1 in batch 240-323147. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS

Samples MW 6 (280-108402-1), MW 7 (280-108402-2), MW 8 (280-108402-3), MW-7D (280-108402-4) and MW-8EB (280-108402-5) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 04/17/2018.

Total Dissolved Solids (TDS) was detected in method blank MB 280-411621/1 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 280-108402-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

TOTAL SUSPENDED SOLIDS
Samples MW 6 (280-108402-1), MW 7 (280-108402-2), MW 8 (280-108402-3), MW-7D (280-108402-4) and MW-8EB (280-108402-5) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 04/17/2018.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample MW 6 (280-108402-1). Sample non-homogeneity is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)
Samples MW 6 (280-108402-1), MW 7 (280-108402-2), MW 8 (280-108402-3), MW-7D (280-108402-4) and MW-8EB (280-108402-5) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 04/13/2018 and 04/20/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)
Samples MW 6 (280-108402-1), MW 7 (280-108402-2), MW 8 (280-108402-3), MW-7D (280-108402-4) and MW-8EB (280-108402-5) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 05/06/2018.

Chloride was detected in method blank MB 280-413885/6 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Fluoride exceeded the RPD limit for the duplicate of sample 280-108784-10. Refer to the QC report for details.

Samples MW 6 (280-108402-1)[50X], MW 7 (280-108402-2)[2X], MW 7 (280-108402-2)[50X], MW 8 (280-108402-3)[2X], MW 8 (280-108402-3)[50X], MW-7D (280-108402-4)[2X] and MW-7D (280-108402-4)[20X] required dilution prior to analysis to bring the concentration of target analytes within the calibration range. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: HDR Inc
TestAmerica Job ID: 280-108402-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: MW 6
Lab Sample ID: 280-108402-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	37		0.50	0.12	mg/L	5		6010C	Total Recoverable
Calcium	450		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.3	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	18.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	50	B	3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	0.29	J	0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	2800		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4800	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	5.6		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW 7
Lab Sample ID: 280-108402-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	48		0.50	0.12	mg/L	5		6010C	Total Recoverable
Calcium	450		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	18.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	130	B	6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.23	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2800		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4800	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.8	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW 8
Lab Sample ID: 280-108402-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.1		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	490		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	230	B	6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.20	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	4800		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7500	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.4		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-7D
Lab Sample ID: 280-108402-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	47		0.50	0.12	mg/L	5		6010C	Total Recoverable
Calcium	460		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	130	B	6.0	0.51	mg/L	2		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-7D (Continued) Lab Sample ID: 280-108402-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.23	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	3100		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4700	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-8EB Lab Sample ID: 280-108402-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.088	J	0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	5.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	1.4	J B	3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	0.064	J	0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	0.87	J	5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	12	B	10	4.7	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108402-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-108402-1	MW 6	Water	04/10/18 15:00	04/12/18 12:30
280-108402-2	MW 7	Water	04/10/18 13:35	04/12/18 12:30
280-108402-3	MW 8	Water	04/10/18 16:15	04/12/18 12:30
280-108402-4	MW-7D	Water	04/10/18 13:35	04/12/18 12:30
280-108402-5	MW-8EB	Water	04/10/18 16:30	04/12/18 12:30

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW 6
Lab Sample ID: 280-108402-1
Date Collected: 04/10/18 15:00
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	37		0.50	0.12	mg/L		04/16/18 15:00	04/18/18 04:38	5

Client Sample ID: MW 7
Lab Sample ID: 280-108402-2
Date Collected: 04/10/18 13:35
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	48		0.50	0.12	mg/L		04/16/18 15:00	04/18/18 04:42	5

Client Sample ID: MW 8
Lab Sample ID: 280-108402-3
Date Collected: 04/10/18 16:15
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.1		0.10	0.023	mg/L		04/16/18 15:00	04/17/18 13:26	1

Client Sample ID: MW-7D
Lab Sample ID: 280-108402-4
Date Collected: 04/10/18 13:35
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	47		0.50	0.12	mg/L		04/16/18 15:00	04/18/18 04:47	5

Client Sample ID: MW-8EB
Lab Sample ID: 280-108402-5
Date Collected: 04/10/18 16:30
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.088	J	0.10	0.023	mg/L		04/16/18 15:00	04/17/18 13:36	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW 6
Lab Sample ID: 280-108402-1
Date Collected: 04/10/18 15:00
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	450		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 19:39	1

Client Sample ID: MW 7
Lab Sample ID: 280-108402-2
Date Collected: 04/10/18 13:35
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	450		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 19:52	1

Client Sample ID: MW 8
Lab Sample ID: 280-108402-3
Date Collected: 04/10/18 16:15
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	490		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 19:56	1

Client Sample ID: MW-7D
Lab Sample ID: 280-108402-4
Date Collected: 04/10/18 13:35
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	460		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 20:01	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-8EB — **Lab Sample ID: 280-108402-5**
Date Collected: 04/10/18 16:30 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 20:05	1

General Chemistry

Client Sample ID: MW 6 — **Lab Sample ID: 280-108402-1**
Date Collected: 04/10/18 15:00 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.3	HF	0.1	0.1	SU			04/13/18 21:45	1
Temperature	18.8	HF	1.0	1.0	Degrees C			04/13/18 21:45	1
Chloride	50	B	3.0	0.25	mg/L			05/06/18 11:09	1
Fluoride	0.29	J	0.50	0.060	mg/L			05/06/18 11:09	1
Sulfate	2800		250	12	mg/L			05/06/18 22:44	50
Total Dissolved Solids (TDS)	4800	B	40	19	mg/L			04/17/18 12:41	1
Total Suspended Solids	5.6		4.0	1.1	mg/L			04/17/18 09:04	1

Client Sample ID: MW 7 — **Lab Sample ID: 280-108402-2**
Date Collected: 04/10/18 13:35 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.8	HF	0.1	0.1	SU			04/13/18 21:49	1
Temperature	18.8	HF	1.0	1.0	Degrees C			04/13/18 21:49	1
Chloride	130	B	6.0	0.51	mg/L			05/06/18 11:32	2
Fluoride	0.23	J	1.0	0.12	mg/L			05/06/18 11:32	2
Sulfate	2800		250	12	mg/L			05/06/18 23:06	50
Total Dissolved Solids (TDS)	4800	B	40	19	mg/L			04/17/18 12:41	1
Total Suspended Solids	2.8	J	4.0	1.1	mg/L			04/17/18 09:04	1

Client Sample ID: MW 8 — **Lab Sample ID: 280-108402-3**
Date Collected: 04/10/18 16:15 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			04/13/18 21:54	1
Temperature	19.1	HF	1.0	1.0	Degrees C			04/13/18 21:54	1
Chloride	230	B	6.0	0.51	mg/L			05/06/18 11:54	2
Fluoride	0.20	J	1.0	0.12	mg/L			05/06/18 11:54	2
Sulfate	4800		250	12	mg/L			05/06/18 23:29	50
Total Dissolved Solids (TDS)	7500	B	40	19	mg/L			04/17/18 12:41	1
Total Suspended Solids	4.4		4.0	1.1	mg/L			04/17/18 09:04	1

Client Sample ID: MW-7D — **Lab Sample ID: 280-108402-4**
Date Collected: 04/10/18 13:35 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.8	HF	0.1	0.1	SU			04/13/18 21:58	1
Temperature	19.1	HF	1.0	1.0	Degrees C			04/13/18 21:58	1
Chloride	130	B	6.0	0.51	mg/L			05/06/18 12:17	2
Fluoride	0.23	J	1.0	0.12	mg/L			05/06/18 12:17	2
Sulfate	3100		100	4.6	mg/L			05/06/18 12:39	20
Total Dissolved Solids (TDS)	4700	B	40	19	mg/L			04/17/18 12:41	1

General Chemistry (Continued)

Client Sample ID: MW-7D
Lab Sample ID: 280-108402-4
Date Collected: 04/10/18 13:35
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	3.6	J	4.0	1.1	mg/L			04/17/18 09:04	1

Client Sample ID: MW-8EB
Lab Sample ID: 280-108402-5
Date Collected: 04/10/18 16:30
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	5.8	HF	0.1	0.1	SU			04/20/18 14:32	1
Temperature	19.2	HF	1.0	1.0	Degrees C			04/20/18 14:32	1
Chloride	1.4	J B	3.0	0.25	mg/L			05/06/18 13:02	1
Fluoride	0.064	J	0.50	0.060	mg/L			05/06/18 13:02	1
Sulfate	0.87	J	5.0	0.23	mg/L			05/06/18 13:02	1
Total Dissolved Solids (TDS)	12	B	10	4.7	mg/L			04/17/18 12:41	1
Total Suspended Solids	ND		4.0	1.1	mg/L			04/17/18 09:04	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-322686/1-A
Matrix: Water
Analysis Batch: 322823

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 322686

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		04/16/18 15:00	04/17/18 12:34	1

Lab Sample ID: LCS 240-322686/2-A
Matrix: Water
Analysis Batch: 322823

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 322686

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.02		mg/L		102	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-322686/1-A
Matrix: Water
Analysis Batch: 323147

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 322686

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 19:03	1

Lab Sample ID: LCS 240-322686/3-A
Matrix: Water
Analysis Batch: 323147

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 322686

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	10.0	10.5		mg/L		105	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-411327/4
Matrix: Water
Analysis Batch: 411327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 280-412143/4
Matrix: Water
Analysis Batch: 412143

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Client: HDR Inc
TestAmerica Job ID: 280-108402-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-413885/6
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 413885

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.16	J	3.0	0.25	mg/L			05/06/18 10:47	1
Fluoride	ND		0.50	0.060	mg/L			05/06/18 10:47	1
Sulfate	ND		5.0	0.23	mg/L			05/06/18 10:47	1

Lab Sample ID: LCS 280-413885/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 413885

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	95.7		mg/L		96	90 - 110
Fluoride	5.00	4.84		mg/L		97	90 - 110
Sulfate	100	95.6		mg/L		96	90 - 110

Lab Sample ID: LCSD 280-413885/5
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 413885

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	95.9		mg/L		96	90 - 110	0	10
Fluoride	5.00	4.88		mg/L		98	90 - 110	1	10
Sulfate	100	95.4		mg/L		95	90 - 110	0	10

Lab Sample ID: MRL 280-413885/3
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 413885

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.88	J	mg/L		115	50 - 150
Fluoride	0.200	0.243	J	mg/L		121	50 - 150
Sulfate	2.50	2.87	J	mg/L		115	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-411621/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 411621

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	8.00	J	10	4.7	mg/L			04/17/18 12:41	1

Lab Sample ID: LCS 280-411621/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 411621

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	484		mg/L		97	86 - 110

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCSD 280-411621/3
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 411621

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)			500	492		mg/L		98	86 - 110	2	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-411548/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 411548

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			04/17/18 09:04	1

Lab Sample ID: LCS 280-411548/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 411548

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids			100	88.0		mg/L		88	86 - 114

Lab Sample ID: LCSD 280-411548/3
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 411548

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids			100	93.2		mg/L		93	86 - 114	6	20

Lab Sample ID: 280-108402-1 DU
Client Sample ID: MW 6
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 411548

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	5.6			4.80	F5	mg/L				15	10

Metals

Prep Batch: 322686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108402-1	MW 6	Total Recoverable	Water	3005A	
280-108402-2	MW 7	Total Recoverable	Water	3005A	
280-108402-3	MW 8	Total Recoverable	Water	3005A	
280-108402-4	MW-7D	Total Recoverable	Water	3005A	
280-108402-5	MW-8EB	Total Recoverable	Water	3005A	
MB 240-322686/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-322686/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-322686/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 322823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108402-1	MW 6	Total Recoverable	Water	6010C	322686
280-108402-2	MW 7	Total Recoverable	Water	6010C	322686
280-108402-3	MW 8	Total Recoverable	Water	6010C	322686
280-108402-4	MW-7D	Total Recoverable	Water	6010C	322686
280-108402-5	MW-8EB	Total Recoverable	Water	6010C	322686
MB 240-322686/1-A	Method Blank	Total Recoverable	Water	6010C	322686
LCS 240-322686/2-A	Lab Control Sample	Total Recoverable	Water	6010C	322686

Analysis Batch: 323147

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108402-1	MW 6	Total Recoverable	Water	6020A	322686
280-108402-2	MW 7	Total Recoverable	Water	6020A	322686
280-108402-3	MW 8	Total Recoverable	Water	6020A	322686
280-108402-4	MW-7D	Total Recoverable	Water	6020A	322686
280-108402-5	MW-8EB	Total Recoverable	Water	6020A	322686
MB 240-322686/1-A	Method Blank	Total Recoverable	Water	6020A	322686
LCS 240-322686/3-A	Lab Control Sample	Total Recoverable	Water	6020A	322686

General Chemistry

Analysis Batch: 411327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108402-1	MW 6	Total/NA	Water	9040B	
280-108402-2	MW 7	Total/NA	Water	9040B	
280-108402-3	MW 8	Total/NA	Water	9040B	
280-108402-4	MW-7D	Total/NA	Water	9040B	
LCS 280-411327/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 411548

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108402-1	MW 6	Total/NA	Water	SM 2540D	
280-108402-2	MW 7	Total/NA	Water	SM 2540D	
280-108402-3	MW 8	Total/NA	Water	SM 2540D	
280-108402-4	MW-7D	Total/NA	Water	SM 2540D	
280-108402-5	MW-8EB	Total/NA	Water	SM 2540D	
MB 280-411548/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-411548/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-411548/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	
280-108402-1 DU	MW 6	Total/NA	Water	SM 2540D	

1 2 3 4 5 6 7 8 9 10 11 12 13 14

General Chemistry (Continued)

Analysis Batch: 411621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108402-1	MW 6	Total/NA	Water	SM 2540C	
280-108402-2	MW 7	Total/NA	Water	SM 2540C	
280-108402-3	MW 8	Total/NA	Water	SM 2540C	
280-108402-4	MW-7D	Total/NA	Water	SM 2540C	
280-108402-5	MW-8EB	Total/NA	Water	SM 2540C	
MB 280-411621/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-411621/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-411621/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

Analysis Batch: 412143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108402-5	MW-8EB	Total/NA	Water	9040B	
LCS 280-412143/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 413885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108402-1	MW 6	Total/NA	Water	9056A	
280-108402-1	MW 6	Total/NA	Water	9056A	
280-108402-2	MW 7	Total/NA	Water	9056A	
280-108402-2	MW 7	Total/NA	Water	9056A	
280-108402-3	MW 8	Total/NA	Water	9056A	
280-108402-3	MW 8	Total/NA	Water	9056A	
280-108402-4	MW-7D	Total/NA	Water	9056A	
280-108402-4	MW-7D	Total/NA	Water	9056A	
280-108402-5	MW-8EB	Total/NA	Water	9056A	
MB 280-413885/6	Method Blank	Total/NA	Water	9056A	
LCS 280-413885/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-413885/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-413885/3	Lab Control Sample	Total/NA	Water	9056A	

Client Sample ID: MW 6 **Lab Sample ID: 280-108402-1**
Date Collected: 04/10/18 15:00 **Matrix: Water**
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		5			322823	04/18/18 04:38	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 19:39	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 21:45	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	413885	05/06/18 11:09	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	413885	05/06/18 22:44	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	411621	04/17/18 12:41	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	411548	04/17/18 09:04	JAP	TAL DEN

Client Sample ID: MW 7 **Lab Sample ID: 280-108402-2**
Date Collected: 04/10/18 13:35 **Matrix: Water**
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		5			322823	04/18/18 04:42	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 19:52	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 21:49	LPL	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	413885	05/06/18 11:32	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	413885	05/06/18 23:06	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	411621	04/17/18 12:41	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	411548	04/17/18 09:04	JAP	TAL DEN

Client Sample ID: MW 8 **Lab Sample ID: 280-108402-3**
Date Collected: 04/10/18 16:15 **Matrix: Water**
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			322823	04/17/18 13:26	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 19:56	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 21:54	LPL	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	413885	05/06/18 11:54	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	413885	05/06/18 23:29	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	411621	04/17/18 12:41	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	411548	04/17/18 09:04	JAP	TAL DEN

Lab Chronicle

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108402-1

Client Sample ID: MW-7D

Date Collected: 04/10/18 13:35
Date Received: 04/12/18 12:30

Lab Sample ID: 280-108402-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		5			322823	04/18/18 04:47	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 20:01	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 21:58	LPL	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	413885	05/06/18 12:17	CCJ	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	413885	05/06/18 12:39	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	411621	04/17/18 12:41	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	411548	04/17/18 09:04	JAP	TAL DEN

Client Sample ID: MW-8EB

Date Collected: 04/10/18 16:30
Date Received: 04/12/18 12:30

Lab Sample ID: 280-108402-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			322823	04/17/18 13:36	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 20:05	DSH	TAL CAN
Total/NA	Analysis	9040B		1			412143	04/20/18 14:32	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	413885	05/06/18 13:02	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	411621	04/17/18 12:41	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	411548	04/17/18 09:04	JAP	TAL DEN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-18 *
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18 *
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-18
Texas	NELAP	6	T104704517-17-9	08-31-18
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tara Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No:
Client Contact: Anna Lundin	Phone: 720933 7496	E-Mail: stephanie.rothmeyer@testamericainc.com		Page: Page ___ of ___
Company: HDR Inc				Job #:
Address: 9781 S. Meridian Blve Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days): Standard			
State, Zip: CO, 80112				
Phone: 720-633-2380(Tel)	PO #: DEN-001			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Colorado	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6010C	pH - 9040B, Anions - 9056A_28D	2540D - TSS	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N		
~~MW 5~~ TK				~~Water~~		N						
MW 6	4.10.18	1500	G	Water		N	✓	✓	✓	✓		
MW 7	4.10.18	1335	G	Water		N	✓	✓	✓	✓		
MW 8	4.10.18	1615	G	Water		N	✓	✓	✓	✓		
~~Field Duplicate~~ TK MW-7D	4.10.18	1335	G	Water		N	✓	✓	✓	✓		
~~Equipment Blank~~ TK MW-8EB	4-10.18	1630	G	Water		N	✓	✓	✓	✓		

280-108402 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ________ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tara Kent	Date: 4-12-18	Time: 1230	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			[illegible signature]	4-12-18 1230	TA-DEN

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.7-0.1 IR#8 Transferred by NCB 4/13/18

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

124/C12.5

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-433734.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-108402-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 5/7/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

520

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C/3005A (MOD) Boron	6020A/3005A (MOD) 13 Total Metals (w/collision cell)	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW 6 (280-108402-1)	4/10/18	15:00 Mountain		Water			X	X	1	, Use Collision Cell
MW 7 (280-108402-2)	4/10/18	13:35 Mountain		Water			X	X	1	, Use Collision Cell
MW 8 (280-108402-3)	4/10/18	16:15 Mountain		Water			X	X	1	, Use Collision Cell
MW-7D (280-108402-4)	4/10/18	13:35 Mountain		Water			X	X	1	, Use Collision Cell
MW-8EB (280-108402-5)	4/10/18	16:30 Mountain		Water			X	X	1	, Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:		Method of Shipment:	
Relinquished by: [signature]	Date/Time: 4/13/18 1645	Company	Received by: [signature]	Date/Time: 4/14/18 1145	Company TAC
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative Login # :
Canton Facility

Client TA Denver Site Name — Cooler unpacked by: DSO

Cooler Received on 4/14/18 Opened on 4/16/18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   - IR GUN# IR-8 (CF +0.1 °C) Observed Cooler Temp. 12.4 °C Corrected Cooler Temp. 12.5 °C
   - IR GUN #36 (CF +0.3°C) Observed Cooler Temp.____ °C Corrected Cooler Temp.____ °C
   - ~~IR GUN # 627 (CF -1.3°C) Observed Cooler Temp.____ °C Corrected Cooler Temp.____ °C~~
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   - -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   - -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   - -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# HC732776
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____ — Yes No
16. Was a LL Hg or Me Hg trip blank present? — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-108402-1

Login Number: 108402
List Number: 1
Creator: Blogin, Nick C

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

1 2 3 4 5 6 7 8 9 10 11 12 13 14

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-108405-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Stephanie Rothmeyer

Authorized for release by:
5/9/2018 11:14:24 AM

Stephanie Rothmeyer, Project Manager I
(303)736-0182
stephanie.rothmeyer@testamericainc.com

LINKS

Review your project results through TotalAccess

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Table of Contents

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-108405-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-108405-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 4/12/2018 at 12:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7º C.

TOTAL RECOVERABLE METALS
Samples W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5) and W-1EB (280-108405-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/16/2018 and analyzed on 04/17/2018.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)
Samples W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5) and W-1EB (280-108405-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 04/16/2018 and analyzed on 04/18/2018.

Calcium failed the recovery criteria high for the MS and MSD of sample 240-94032-1 in batch 240-323147. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS
Samples W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5) and W-1EB (280-108405-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 04/18/2018.

Constant weight was not achieved after 4 drying cycles for the following sample: W-3 (280-108405-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)
Samples W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5) and W-1EB (280-108405-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 04/13/2018 and 04/20/2018.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Job ID: 280-108405-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)
Samples W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5) and W-1EB (280-108405-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 05/07/2018 and 05/08/2018.

Samples W-1 (280-108405-1)[20X], W-2 (280-108405-2)[5X], W-2 (280-108405-2)[50X], W-3 (280-108405-3)[5X], W-3 (280-108405-3)[50X], W-4 (280-108405-4)[10X], W-4 (280-108405-4)[100X], W-2D (280-108405-5)[5X] and W-2D (280-108405-5)[50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108405-1

Client Sample ID: W-1 — Lab Sample ID: 280-108405-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.66		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	380		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	45		3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	0.29	J	0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	2600		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4100		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-2 — Lab Sample ID: 280-108405-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	8.0		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	410		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	85		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.45	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	4500		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	6500		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-3 — Lab Sample ID: 280-108405-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.86		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	410		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.45	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	7900		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	12000		100	47	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-4 — Lab Sample ID: 280-108405-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.1		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	430		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	380		30	2.5	mg/L	10		9056A	Total/NA
Sulfate	13000		500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	19000		100	47	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client: HDR Inc
TestAmerica Job ID: 280-108405-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-2D
Lab Sample ID: 280-108405-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	8.0		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	410		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	84		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.43	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	4500		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	6500		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-1EB
Lab Sample ID: 280-108405-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.028	J	0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	5.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	0.39	J	3.0	0.25	mg/L	1		9056A	Total/NA
Sulfate	0.71	J	5.0	0.23	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-108405-1	W-1	Water	04/11/18 12:50	04/12/18 12:30
280-108405-2	W-2	Water	04/11/18 11:10	04/12/18 12:30
280-108405-3	W-3	Water	04/11/18 16:25	04/12/18 12:30
280-108405-4	W-4	Water	04/11/18 14:15	04/12/18 12:30
280-108405-5	W-2D	Water	04/11/18 11:10	04/12/18 12:30
280-108405-6	W-1EB	Water	04/11/18 13:00	04/12/18 12:30

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: W-1 — **Lab Sample ID: 280-108405-1**
Date Collected: 04/11/18 12:50 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.66		0.10	0.023	mg/L		04/16/18 15:00	04/17/18 13:41	1

Client Sample ID: W-2 — **Lab Sample ID: 280-108405-2**
Date Collected: 04/11/18 11:10 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	8.0		0.10	0.023	mg/L		04/16/18 15:00	04/17/18 13:45	1

Client Sample ID: W-3 — **Lab Sample ID: 280-108405-3**
Date Collected: 04/11/18 16:25 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.86		0.10	0.023	mg/L		04/16/18 15:00	04/17/18 13:50	1

Client Sample ID: W-4 — **Lab Sample ID: 280-108405-4**
Date Collected: 04/11/18 14:15 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.1		0.10	0.023	mg/L		04/16/18 15:00	04/17/18 13:55	1

Client Sample ID: W-2D — **Lab Sample ID: 280-108405-5**
Date Collected: 04/11/18 11:10 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	8.0		0.10	0.023	mg/L		04/16/18 15:00	04/17/18 14:00	1

Client Sample ID: W-1EB — **Lab Sample ID: 280-108405-6**
Date Collected: 04/11/18 13:00 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.028	J	0.10	0.023	mg/L		04/16/18 15:00	04/17/18 14:05	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1 — **Lab Sample ID: 280-108405-1**
Date Collected: 04/11/18 12:50 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	380		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 20:10	1

Client Sample ID: W-2 — **Lab Sample ID: 280-108405-2**
Date Collected: 04/11/18 11:10 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	410		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 20:14	1

Client Sample ID: W-3 — **Lab Sample ID: 280-108405-3**
Date Collected: 04/11/18 16:25 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	410		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 20:19	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-4
Lab Sample ID: 280-108405-4
Date Collected: 04/11/18 14:15
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	430		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 20:23	1

Client Sample ID: W-2D
Lab Sample ID: 280-108405-5
Date Collected: 04/11/18 11:10
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	410		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 20:28	1

Client Sample ID: W-1EB
Lab Sample ID: 280-108405-6
Date Collected: 04/11/18 13:00
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 20:32	1

General Chemistry

Client Sample ID: W-1
Lab Sample ID: 280-108405-1
Date Collected: 04/11/18 12:50
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			04/13/18 22:09	1
Temperature	19.1	HF	1.0	1.0	Degrees C			04/13/18 22:09	1
Chloride	45		3.0	0.25	mg/L			05/07/18 18:01	1
Fluoride	0.29	J	0.50	0.060	mg/L			05/07/18 18:01	1
Sulfate	2600		100	4.6	mg/L			05/08/18 02:37	20
Total Dissolved Solids (TDS)	4100		40	19	mg/L			04/18/18 08:31	1

Client Sample ID: W-2
Lab Sample ID: 280-108405-2
Date Collected: 04/11/18 11:10
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			04/13/18 22:13	1
Temperature	19.0	HF	1.0	1.0	Degrees C			04/13/18 22:13	1
Chloride	85		15	1.3	mg/L			05/07/18 19:12	5
Fluoride	0.45	J	2.5	0.30	mg/L			05/07/18 19:12	5
Sulfate	4500		250	12	mg/L			05/08/18 02:55	50
Total Dissolved Solids (TDS)	6500		40	19	mg/L			04/18/18 08:31	1

Client Sample ID: W-3
Lab Sample ID: 280-108405-3
Date Collected: 04/11/18 16:25
Matrix: Water
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			04/13/18 22:19	1
Temperature	19.0	HF	1.0	1.0	Degrees C			04/13/18 22:19	1
Chloride	190		15	1.3	mg/L			05/07/18 19:48	5
Fluoride	0.45	J	2.5	0.30	mg/L			05/07/18 19:48	5
Sulfate	7900		250	12	mg/L			05/08/18 03:13	50
Total Dissolved Solids (TDS)	12000		100	47	mg/L			04/18/18 08:31	1

Client Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108405-1

General Chemistry

Client Sample ID: W-4
Date Collected: 04/11/18 14:15
Date Received: 04/12/18 12:30

Lab Sample ID: 280-108405-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			04/13/18 22:34	1
Temperature	19.3	HF	1.0	1.0	Degrees C			04/13/18 22:34	1
Chloride	380		30	2.5	mg/L			05/07/18 20:23	10
Fluoride	ND		5.0	0.60	mg/L			05/07/18 20:23	10
Sulfate	13000		500	23	mg/L			05/08/18 03:30	100
Total Dissolved Solids (TDS)	19000		100	47	mg/L			04/18/18 08:31	1

Client Sample ID: W-2D
Date Collected: 04/11/18 11:10
Date Received: 04/12/18 12:30

Lab Sample ID: 280-108405-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			04/13/18 22:39	1
Temperature	19.1	HF	1.0	1.0	Degrees C			04/13/18 22:39	1
Chloride	84		15	1.3	mg/L			05/07/18 20:59	5
Fluoride	0.43	J	2.5	0.30	mg/L			05/07/18 20:59	5
Sulfate	4500		250	12	mg/L			05/08/18 03:48	50
Total Dissolved Solids (TDS)	6500		40	19	mg/L			04/18/18 08:31	1

Client Sample ID: W-1EB
Date Collected: 04/11/18 13:00
Date Received: 04/12/18 12:30

Lab Sample ID: 280-108405-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	5.8	HF	0.1	0.1	SU			04/20/18 14:35	1
Temperature	19.1	HF	1.0	1.0	Degrees C			04/20/18 14:35	1
Chloride	0.39	J	3.0	0.25	mg/L			05/07/18 21:34	1
Fluoride	ND		0.50	0.060	mg/L			05/07/18 21:34	1
Sulfate	0.71	J	5.0	0.23	mg/L			05/07/18 21:34	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			04/18/18 08:31	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-322686/1-A
Matrix: Water
Analysis Batch: 322823

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 322686

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		04/16/18 15:00	04/17/18 12:34	1

Lab Sample ID: LCS 240-322686/2-A
Matrix: Water
Analysis Batch: 322823

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 322686

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.02		mg/L		102	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-322686/1-A
Matrix: Water
Analysis Batch: 323147

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 322686

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.0	0.58	mg/L		04/16/18 15:00	04/18/18 19:03	1

Lab Sample ID: LCS 240-322686/3-A
Matrix: Water
Analysis Batch: 323147

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 322686

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	10.0	10.5		mg/L		105	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-411327/4
Matrix: Water
Analysis Batch: 411327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 280-412143/4
Matrix: Water
Analysis Batch: 412143

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108405-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-413962/6
Matrix: Water
Analysis Batch: 413962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			05/07/18 12:50	1
Fluoride	ND		0.50	0.060	mg/L			05/07/18 12:50	1
Sulfate	ND		5.0	0.23	mg/L			05/07/18 12:50	1

Lab Sample ID: LCS 280-413962/4
Matrix: Water
Analysis Batch: 413962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	103		mg/L		103	90 - 110
Fluoride	5.00	5.17		mg/L		103	90 - 110
Sulfate	100	102		mg/L		102	90 - 110

Lab Sample ID: LCSD 280-413962/5
Matrix: Water
Analysis Batch: 413962

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	103		mg/L		103	90 - 110	0	10
Fluoride	5.00	5.22		mg/L		104	90 - 110	1	10
Sulfate	100	102		mg/L		102	90 - 110	0	10

Lab Sample ID: MRL 280-413962/3
Matrix: Water
Analysis Batch: 413962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.64	J	mg/L		105	50 - 150
Fluoride	0.200	0.132	J	mg/L		66	50 - 150
Sulfate	2.50	2.67	J	mg/L		107	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-411718/1
Matrix: Water
Analysis Batch: 411718

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			04/18/18 08:31	1

Lab Sample ID: LCS 280-411718/2
Matrix: Water
Analysis Batch: 411718

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	492		mg/L		98	86 - 110

QC Association Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108405-1

Metals

Prep Batch: 322686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-1	W-1	Total Recoverable	Water	3005A	
280-108405-2	W-2	Total Recoverable	Water	3005A	
280-108405-3	W-3	Total Recoverable	Water	3005A	
280-108405-4	W-4	Total Recoverable	Water	3005A	
280-108405-5	W-2D	Total Recoverable	Water	3005A	
280-108405-6	W-1EB	Total Recoverable	Water	3005A	
MB 240-322686/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-322686/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-322686/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 322823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-1	W-1	Total Recoverable	Water	6010C	322686
280-108405-2	W-2	Total Recoverable	Water	6010C	322686
280-108405-3	W-3	Total Recoverable	Water	6010C	322686
280-108405-4	W-4	Total Recoverable	Water	6010C	322686
280-108405-5	W-2D	Total Recoverable	Water	6010C	322686
280-108405-6	W-1EB	Total Recoverable	Water	6010C	322686
MB 240-322686/1-A	Method Blank	Total Recoverable	Water	6010C	322686
LCS 240-322686/2-A	Lab Control Sample	Total Recoverable	Water	6010C	322686

Analysis Batch: 323147

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-1	W-1	Total Recoverable	Water	6020A	322686
280-108405-2	W-2	Total Recoverable	Water	6020A	322686
280-108405-3	W-3	Total Recoverable	Water	6020A	322686
280-108405-4	W-4	Total Recoverable	Water	6020A	322686
280-108405-5	W-2D	Total Recoverable	Water	6020A	322686
280-108405-6	W-1EB	Total Recoverable	Water	6020A	322686
MB 240-322686/1-A	Method Blank	Total Recoverable	Water	6020A	322686
LCS 240-322686/3-A	Lab Control Sample	Total Recoverable	Water	6020A	322686

General Chemistry

Analysis Batch: 411327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-1	W-1	Total/NA	Water	9040B	
280-108405-2	W-2	Total/NA	Water	9040B	
280-108405-3	W-3	Total/NA	Water	9040B	
280-108405-4	W-4	Total/NA	Water	9040B	
280-108405-5	W-2D	Total/NA	Water	9040B	
LCS 280-411327/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 411718

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-1	W-1	Total/NA	Water	SM 2540C	
280-108405-2	W-2	Total/NA	Water	SM 2540C	
280-108405-3	W-3	Total/NA	Water	SM 2540C	
280-108405-4	W-4	Total/NA	Water	SM 2540C	
280-108405-5	W-2D	Total/NA	Water	SM 2540C	

1 2 3 4 5 6 7 8 9 10 11 12 13 14

General Chemistry (Continued)

Analysis Batch: 411718 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-6	W-1EB	Total/NA	Water	SM 2540C	
MB 280-411718/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-411718/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 412143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-6	W-1EB	Total/NA	Water	9040B	
LCS 280-412143/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 413962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-1	W-1	Total/NA	Water	9056A	
280-108405-1	W-1	Total/NA	Water	9056A	
280-108405-2	W-2	Total/NA	Water	9056A	
280-108405-2	W-2	Total/NA	Water	9056A	
280-108405-3	W-3	Total/NA	Water	9056A	
280-108405-3	W-3	Total/NA	Water	9056A	
280-108405-4	W-4	Total/NA	Water	9056A	
280-108405-4	W-4	Total/NA	Water	9056A	
280-108405-5	W-2D	Total/NA	Water	9056A	
280-108405-5	W-2D	Total/NA	Water	9056A	
280-108405-6	W-1EB	Total/NA	Water	9056A	
MB 280-413962/6	Method Blank	Total/NA	Water	9056A	
LCS 280-413962/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-413962/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-413962/3	Lab Control Sample	Total/NA	Water	9056A	

Client Sample ID: W-1
Lab Sample ID: 280-108405-1

Date Collected: 04/11/18 12:50
Matrix: Water
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			322823	04/17/18 13:41	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 20:10	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 22:09	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	413962	05/07/18 18:01	CCJ	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	413962	05/08/18 02:37	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	411718	04/18/18 08:31	JAP	TAL DEN

Client Sample ID: W-2
Lab Sample ID: 280-108405-2

Date Collected: 04/11/18 11:10
Matrix: Water
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			322823	04/17/18 13:45	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 20:14	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 22:13	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	413962	05/07/18 19:12	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	413962	05/08/18 02:55	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	411718	04/18/18 08:31	JAP	TAL DEN

Client Sample ID: W-3
Lab Sample ID: 280-108405-3

Date Collected: 04/11/18 16:25
Matrix: Water
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			322823	04/17/18 13:50	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 20:19	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 22:19	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	413962	05/07/18 19:48	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	413962	05/08/18 03:13	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	411718	04/18/18 08:31	JAP	TAL DEN

Lab Chronicle

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108405-1

Client Sample ID: W-4

Lab Sample ID: 280-108405-4
Date Collected: 04/11/18 14:15
Matrix: Water
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			322823	04/17/18 13:55	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 20:23	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 22:34	LPL	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	413962	05/07/18 20:23	CCJ	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	413962	05/08/18 03:30	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	411718	04/18/18 08:31	JAP	TAL DEN

Client Sample ID: W-2D

Lab Sample ID: 280-108405-5
Date Collected: 04/11/18 11:10
Matrix: Water
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			322823	04/17/18 14:00	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 20:28	DSH	TAL CAN
Total/NA	Analysis	9040B		1			411327	04/13/18 22:39	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	413962	05/07/18 20:59	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	413962	05/08/18 03:48	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	411718	04/18/18 08:31	JAP	TAL DEN

Client Sample ID: W-1EB

Lab Sample ID: 280-108405-6
Date Collected: 04/11/18 13:00
Matrix: Water
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			322823	04/17/18 14:05	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	322686	04/16/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			323147	04/18/18 20:32	DSH	TAL CAN
Total/NA	Analysis	9040B		1			412143	04/20/18 14:35	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	413962	05/07/18 21:34	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	411718	04/18/18 08:31	JAP	TAL DEN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: HDR Inc
TestAmerica Job ID: 280-108405-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-18 *
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18 *
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-18
Texas	NELAP	6	T104704517-17-9	08-31-18
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tara Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No:
Client Contact: Anna Lundin	Phone: 720 933 7496	E-Mail: stephanie.rothmeyer@testamericainc.com		Page: Page ___ of ___
Company: HDR Inc		Analysis Requested		Job #:
Address: 9781 S. Meridian Blve Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days): Standard			
State, Zip: CO, 80112				
Phone: 720-633-2380(Tel)	PO #: DEN-001			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Colorado	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

280-108405 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6010C	pH - 9040B, Anions - 9056A_28D	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	D	N		
W-1	4-11-18	1250	G	Water		N	✓	✓	✓		
W-2	4-11.18	1110	G	Water		N	✓	✓	✓		
W-3	4-11-18	1625	G	Water		N	✓	✓	✓		
W-4	4-11.18	1415	G	Water		N	✓	✓	✓		
~~Field Duplicate~~ TK W-2D	4-11.18	1110	G	Water		N	✓	✓	✓		
~~Equipment Blank~~ TK W-1EB	4.11.18	1300	G	Water		N	✓	✓	✓		

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ________ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tara Kent	Date: 4-12.18	Time: 1230	Method of Shipment:	
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 4-12-18 1230	Company TA Den
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 2.8°c -0.1 JR #8 Transfered BB 4/12/18

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

12.4 / C12.5

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-433735.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-108405-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 5/7/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

520

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C/3005A (MOD) Boron	6020A/3005A (MOD) 13 Total Metals (w/collision cell)	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
W-1 (280-108405-1)	4/11/18	12:50 Mountain		Water			X	X	1	Use Collision Cell
W-2 (280-108405-2)	4/11/18	11:10 Mountain		Water			X	X	1	Use Collision Cell
W-3 (280-108405-3)	4/11/18	16:25 Mountain		Water			X	X	1	Use Collision Cell
W-4 (280-108405-4)	4/11/18	14:15 Mountain		Water			X	X	1	Use Collision Cell
W-2D (280-108405-5)	4/11/18	11:10 Mountain		Water			X	X	1	Use Collision Cell
W-1EB (280-108405-6)	4/11/18	13:00 Mountain		Water			X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification Unconfirmed	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:		Method of Shipment:	
Relinquished by: [signature]	Date/Time: 4/13/18 1645	Company	Received by: [signature]	Date/Time: 4/14/18 1145	Company TAL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** ____________

Canton Facility

Cooler unpacked by: DSD

Client TA Denver Site Name —

Cooler Received on 4/14/18 Opened on 4/16/18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ____

Receipt After-hours: Drop-off Date/Time ____ Storage Location ____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ____

Packing material used: Bubble Wrap Foam Plastic Bag None Other ____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

☐ See Multiple Cooler Form

1. Cooler temperature upon receipt
   - IR GUN# IR-8 (CF +0.1 °C) Observed Cooler Temp. 12.4 °C Corrected Cooler Temp. 12.5 °C
   - IR GUN #36 (CF +0.3°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
   - ~~IR GUN # 627 (CF -1.3°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C~~

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   - -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   - -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   - -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA — pH Strip Lot# **HC732776**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ____ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

____

18. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____.

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-108405-1

Login Number: 108405
List Number: 1
Creator: Blogin, Nick C

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-108405-2
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Stephanie Rothmeyer

Authorized for release by:
7/2/2018 11:53:00 AM

Stephanie Rothmeyer, Project Manager I
(303)736-0182
stephanie.rothmeyer@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108405-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-108405-2

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-108405-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 4/12/2018 at 12:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7° C.

RADIUM-226 (GFPC)
Samples W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5) and W-1EB (280-108405-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 06/05/2018 and analyzed on 06/30/2018.

Sample aliquots were reduced due to limited sample volume: W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5), W-1EB (280-108405-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228
Samples W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5) and W-1EB (280-108405-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 06/05/2018 and analyzed on 06/14/2018.

Radium-228 exceeded the RPD limit for the duplicate of sample 400-154450-1. Refer to the QC report for details.

Sample aliquots were reduced due to limited sample volume: W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5), W-1EB (280-108405-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226/RADIUM-228 (GFPC)
Samples W-1 (280-108405-1), W-2 (280-108405-2), W-3 (280-108405-3), W-4 (280-108405-4), W-2D (280-108405-5) and W-1EB (280-108405-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 07/02/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: HDR Inc TestAmerica Job ID: 280-108405-2
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108405-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-108405-1	W-1	Water	04/11/18 12:50	04/12/18 12:30
280-108405-2	W-2	Water	04/11/18 11:10	04/12/18 12:30
280-108405-3	W-3	Water	04/11/18 16:25	04/12/18 12:30
280-108405-4	W-4	Water	04/11/18 14:15	04/12/18 12:30
280-108405-5	W-2D	Water	04/11/18 11:10	04/12/18 12:30
280-108405-6	W-1EB	Water	04/11/18 13:00	04/12/18 12:30

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1
Date Collected: 04/11/18 12:50
Date Received: 04/12/18 12:30
Lab Sample ID: 280-108405-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0807	U	0.0659	0.0663	1.00	0.0935	pCi/L	06/05/18 09:17	06/30/18 09:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.6*		*40 - 110*	*06/05/18 09:17*	*06/30/18 09:43*	*1*

Client Sample ID: W-2
Date Collected: 04/11/18 11:10
Date Received: 04/12/18 12:30
Lab Sample ID: 280-108405-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.237**		0.0962	0.0985	1.00	0.0921	pCi/L	06/05/18 09:17	06/30/18 09:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*06/05/18 09:17*	*06/30/18 09:43*	*1*

Client Sample ID: W-3
Date Collected: 04/11/18 16:25
Date Received: 04/12/18 12:30
Lab Sample ID: 280-108405-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0349	U	0.0542	0.0543	1.00	0.0942	pCi/L	06/05/18 09:17	06/30/18 09:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*06/05/18 09:17*	*06/30/18 09:43*	*1*

Client Sample ID: W-4
Date Collected: 04/11/18 14:15
Date Received: 04/12/18 12:30
Lab Sample ID: 280-108405-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0861	U	0.0671	0.0676	1.00	0.0945	pCi/L	06/05/18 09:17	06/30/18 09:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*06/05/18 09:17*	*06/30/18 09:43*	*1*

Client Sample ID: W-2D
Date Collected: 04/11/18 11:10
Date Received: 04/12/18 12:30
Lab Sample ID: 280-108405-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.190**		0.0863	0.0880	1.00	0.0835	pCi/L	06/05/18 09:17	06/30/18 09:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.7*		*40 - 110*	*06/05/18 09:17*	*06/30/18 09:43*	*1*

Client: HDR Inc TestAmerica Job ID: 280-108405-2
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1EB **Lab Sample ID: 280-108405-6**
Date Collected: 04/11/18 13:00 **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0274	U	0.0308	0.0309	1.00	0.0946	pCi/L	06/05/18 09:17	06/30/18 09:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*06/05/18 09:17*	*06/30/18 09:44*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1 **Lab Sample ID: 280-108405-1**
Date Collected: 04/11/18 12:50 **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.746**		0.349	0.356	1.00	0.510	pCi/L	06/05/18 10:41	06/14/18 15:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.6*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:27*	*1*
Y Carrier	*94.2*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:27*	*1*

Client Sample ID: W-2 **Lab Sample ID: 280-108405-2**
Date Collected: 04/11/18 11:10 **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.00**		0.407	0.417	1.00	0.591	pCi/L	06/05/18 10:41	06/14/18 15:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:15*	*1*
Y Carrier	*92.3*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:15*	*1*

Client Sample ID: W-3 **Lab Sample ID: 280-108405-3**
Date Collected: 04/11/18 16:25 **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.428	U	0.349	0.351	1.00	0.558	pCi/L	06/05/18 10:41	06/14/18 15:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:16*	*1*
Y Carrier	*94.2*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:16*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-4 — **Lab Sample ID: 280-108405-4**
Date Collected: 04/11/18 14:15 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.568**		0.301	0.305	1.00	0.449	pCi/L	06/05/18 10:41	06/14/18 15:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:16*	*1*
Y Carrier	*95.0*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:16*	*1*

Client Sample ID: W-2D — **Lab Sample ID: 280-108405-5**
Date Collected: 04/11/18 11:10 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.10**		0.387	0.400	1.00	0.537	pCi/L	06/05/18 10:41	06/14/18 15:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.7*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:16*	*1*
Y Carrier	*93.1*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:16*	*1*

Client Sample ID: W-1EB — **Lab Sample ID: 280-108405-6**
Date Collected: 04/11/18 13:00 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.198	U	0.289	0.290	1.00	0.484	pCi/L	06/05/18 10:41	06/14/18 15:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:16*	*1*
Y Carrier	*96.4*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:16*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-1 — **Lab Sample ID: 280-108405-1**
Date Collected: 04/11/18 12:50 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.827**		0.355	0.362	5.00	0.510	pCi/L		07/02/18 11:33	1

Client Sample ID: W-2 — **Lab Sample ID: 280-108405-2**
Date Collected: 04/11/18 11:10 — **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.24**		0.418	0.428	5.00	0.591	pCi/L		07/02/18 11:33	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-3 **Lab Sample ID: 280-108405-3**
Date Collected: 04/11/18 16:25 **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.463	U	0.353	0.355	5.00	0.558	pCi/L		07/02/18 11:33	1

Client Sample ID: W-4 **Lab Sample ID: 280-108405-4**
Date Collected: 04/11/18 14:15 **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.654**		0.308	0.312	5.00	0.449	pCi/L		07/02/18 11:33	1

Client Sample ID: W-2D **Lab Sample ID: 280-108405-5**
Date Collected: 04/11/18 11:10 **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.29**		0.397	0.410	5.00	0.537	pCi/L		07/02/18 11:44	1

Client Sample ID: W-1EB **Lab Sample ID: 280-108405-6**
Date Collected: 04/11/18 13:00 **Matrix: Water**
Date Received: 04/12/18 12:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.170	U	0.291	0.292	5.00	0.484	pCi/L		07/02/18 11:44	1

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-368814/23-A
Matrix: Water
Analysis Batch: 373286

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 368814

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.008760	U	0.0412	0.0412	1.00	0.0821	pCi/L	06/05/18 09:17	06/30/18 09:39	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.5*		*40 - 110*	*06/05/18 09:17*	*06/30/18 09:39*	*1*

Lab Sample ID: LCS 160-368814/1-A
Matrix: Water
Analysis Batch: 373288

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 368814

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.8	11.44		1.16	1.00	0.0909	pCi/L	97	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*92.9*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-368837/23-A
Matrix: Water
Analysis Batch: 370595

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 368837

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.005722	U	0.185	0.185	1.00	0.333	pCi/L	06/05/18 10:41	06/14/18 15:17	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.5*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:17*	*1*
Y Carrier	*96.4*		*40 - 110*	*06/05/18 10:41*	*06/14/18 15:17*	*1*

Lab Sample ID: LCS 160-368837/1-A
Matrix: Water
Analysis Batch: 370597

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 368837

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	8.23	9.977		1.14	1.00	0.410	pCi/L	121	56 - 140

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*92.9*		*40 - 110*
Y Carrier	*97.2*		*40 - 110*

Rad

Prep Batch: 368814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-1	W-1	Total/NA	Water	PrecSep-21	
280-108405-2	W-2	Total/NA	Water	PrecSep-21	
280-108405-3	W-3	Total/NA	Water	PrecSep-21	
280-108405-4	W-4	Total/NA	Water	PrecSep-21	
280-108405-5	W-2D	Total/NA	Water	PrecSep-21	
280-108405-6	W-1EB	Total/NA	Water	PrecSep-21	
MB 160-368814/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-368814/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 368837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-108405-1	W-1	Total/NA	Water	PrecSep_0	
280-108405-2	W-2	Total/NA	Water	PrecSep_0	
280-108405-3	W-3	Total/NA	Water	PrecSep_0	
280-108405-4	W-4	Total/NA	Water	PrecSep_0	
280-108405-5	W-2D	Total/NA	Water	PrecSep_0	
280-108405-6	W-1EB	Total/NA	Water	PrecSep_0	
MB 160-368837/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-368837/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Client Sample ID: W-1

Lab Sample ID: 280-108405-1

Date Collected: 04/11/18 12:50

Date Received: 04/12/18 12:30

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			750.67 mL	1.0 g	368814	06/05/18 09:17	JLC	TAL SL
Total/NA	Analysis	9315		1			373288	06/30/18 09:43	ALS	TAL SL
Total/NA	Prep	PrecSep_0			750.67 mL	1.0 g	368837	06/05/18 10:41	JLC	TAL SL
Total/NA	Analysis	9320		1			370595	06/14/18 15:27	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			373524	07/02/18 11:33	ALS	TAL SL

Client Sample ID: W-2

Lab Sample ID: 280-108405-2

Date Collected: 04/11/18 11:10

Date Received: 04/12/18 12:30

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			750.06 mL	1.0 g	368814	06/05/18 09:17	JLC	TAL SL
Total/NA	Analysis	9315		1			373288	06/30/18 09:43	ALS	TAL SL
Total/NA	Prep	PrecSep_0			750.06 mL	1.0 g	368837	06/05/18 10:41	JLC	TAL SL
Total/NA	Analysis	9320		1			370595	06/14/18 15:15	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			373524	07/02/18 11:33	ALS	TAL SL

Client Sample ID: W-3

Lab Sample ID: 280-108405-3

Date Collected: 04/11/18 16:25

Date Received: 04/12/18 12:30

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			749.57 mL	1.0 g	368814	06/05/18 09:17	JLC	TAL SL
Total/NA	Analysis	9315		1			373288	06/30/18 09:43	ALS	TAL SL
Total/NA	Prep	PrecSep_0			749.57 mL	1.0 g	368837	06/05/18 10:41	JLC	TAL SL
Total/NA	Analysis	9320		1			370595	06/14/18 15:16	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			373524	07/02/18 11:33	ALS	TAL SL

Client Sample ID: W-4

Lab Sample ID: 280-108405-4

Date Collected: 04/11/18 14:15

Date Received: 04/12/18 12:30

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			750.25 mL	1.0 g	368814	06/05/18 09:17	JLC	TAL SL
Total/NA	Analysis	9315		1			373288	06/30/18 09:43	ALS	TAL SL
Total/NA	Prep	PrecSep_0			750.25 mL	1.0 g	368837	06/05/18 10:41	JLC	TAL SL
Total/NA	Analysis	9320		1			370595	06/14/18 15:16	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			373524	07/02/18 11:33	ALS	TAL SL

Client Sample ID: W-2D
Lab Sample ID: 280-108405-5

Date Collected: 04/11/18 11:10
Matrix: Water
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			750.20 mL	1.0 g	368814	06/05/18 09:17	JLC	TAL SL
Total/NA	Analysis	9315		1			373288	06/30/18 09:43	ALS	TAL SL
Total/NA	Prep	PrecSep_0			750.20 mL	1.0 g	368837	06/05/18 10:41	JLC	TAL SL
Total/NA	Analysis	9320		1			370595	06/14/18 15:16	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			373524	07/02/18 11:44	ALS	TAL SL

Client Sample ID: W-1EB
Lab Sample ID: 280-108405-6

Date Collected: 04/11/18 13:00
Matrix: Water
Date Received: 04/12/18 12:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			750.45 mL	1.0 g	368814	06/05/18 09:17	JLC	TAL SL
Total/NA	Analysis	9315		1			373287	06/30/18 09:44	ALS	TAL SL
Total/NA	Prep	PrecSep_0			750.45 mL	1.0 g	368837	06/05/18 10:41	JLC	TAL SL
Total/NA	Analysis	9320		1			370595	06/14/18 15:16	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			373524	07/02/18 11:44	ALS	TAL SL

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: HDR Inc
TestAmerica Job ID: 280-108405-2
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-18 *
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-18 *
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-18 *
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-18 *
New Jersey	NELAP	2	MO002	06-30-18 *
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-18 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *
Texas	NELAP	6	T104704193-17-11	07-31-18
US Fish & Wildlife	Federal		058448	07-31-18
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18
West Virginia DEP	State Program	3	381	08-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-439787.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-108405-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/27/2018	Analysis Requested		Preservation Codes:
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
W-1 (280-108405-1)	4/11/18	12:50 Mountain		Water			X	X	X	1	
W-2 (280-108405-2)	4/11/18	11:10 Mountain		Water			X	X	X	1	
W-3 (280-108405-3)	4/11/18	16:25 Mountain		Water			X	X	X	1	
W-4 (280-108405-4)	4/11/18	14:15 Mountain		Water			X	X	X	1	
W-2D (280-108405-5)	4/11/18	11:10 Mountain		Water			X	X	X	1	
W-1EB (280-108405-6)	4/11/18	13:00 Mountain		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4
Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:	
Relinquished by:	Date/Time:	Company	Received by: Nicholas Preuss	Date/Time: 05-26-18/0915	Company: TASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-108405-2

Login Number: 108405
List Number: 1
Creator: Blogin, Nick C

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-108405-2

Login Number: 108405
List Number: 3
Creator: Press, Nicholas B

List Source: TestAmerica St. Louis
List Creation: 05/26/18 01:49 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.7
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-108405-2

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-108405-1	W-1	97.6
280-108405-2	W-2	100
280-108405-3	W-3	101
280-108405-4	W-4	106
280-108405-5	W-2D	99.7
280-108405-6	W-1EB	98.8
LCS 160-368814/1-A	Lab Control Sample	92.9
MB 160-368814/23-A	Method Blank	98.5

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-108405-1	W-1	97.6	94.2
280-108405-2	W-2	100	92.3
280-108405-3	W-3	101	94.2
280-108405-4	W-4	106	95.0
280-108405-5	W-2D	99.7	93.1
280-108405-6	W-1EB	98.8	96.4
LCS 160-368837/1-A	Lab Control Sample	92.9	97.2
MB 160-368837/23-A	Method Blank	98.5	96.4

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-109755-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Stephanie Rothmeyer

Authorized for release by:
6/20/2018 11:52:22 AM

Stephanie Rothmeyer, Project Manager I
(303)736-0182
stephanie.rothmeyer@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-109755-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
H	Sample was prepped or analyzed beyond the specified holding time

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-109755-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-109755-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 5/15/2018 at 12:55 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.1º C and 4.6º C.

TOTAL RECOVERABLE METALS

Samples W-1 (280-109755-1), W-2 (280-109755-2), W-3 (280-109755-3), W-4 (280-109755-4), W-1D (280-109755-5) and W-3EB (280-109755-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/18/2018 and analyzed on 05/21/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS

Samples W-1 (280-109755-1), W-2 (280-109755-2), W-3 (280-109755-3), W-4 (280-109755-4), W-1D (280-109755-5) and W-3EB (280-109755-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 05/19/2018 and 06/01/2018.

Reanalysis of the following sample was performed outside of the analytical holding time due to residue in excess of 200mg in original analysis: W-4 (280-109755-4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS

Samples W-1 (280-109755-1), W-2 (280-109755-2), W-3 (280-109755-3), W-4 (280-109755-4), W-1D (280-109755-5) and W-3EB (280-109755-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 05/17/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)

Samples W-1 (280-109755-1), W-2 (280-109755-2), W-3 (280-109755-3), W-4 (280-109755-4), W-1D (280-109755-5) and W-3EB (280-109755-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 05/30/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 280-109755-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

ANIONS (28 DAYS)
Samples W-1 (280-109755-1), W-2 (280-109755-2), W-3 (280-109755-3), W-4 (280-109755-4), W-1D (280-109755-5) and W-3EB (280-109755-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 06/04/2018 and 06/05/2018.

Sulfate failed the recovery criteria low for the MSD of sample 280-109687-5 in batch 280-417399. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

Samples W-1 (280-109755-1)[20X], W-1 (280-109755-1)[5X], W-2 (280-109755-2)[10X], W-2 (280-109755-2)[50X], W-3 (280-109755-3)[10X], W-3 (280-109755-3)[50X], W-4 (280-109755-4)[100X], W-4 (280-109755-4)[20X], W-1D (280-109755-5)[20X] and W-1D (280-109755-5)[5X] required dilution prior to analysis due to the Matrix Conductivity Threshold (MCT) of the instrument. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 (GFPC)
Samples W-1 (280-109755-1), W-2 (280-109755-2), W-3 (280-109755-3), W-4 (280-109755-4), W-1D (280-109755-5) and W-3EB (280-109755-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 05/21/2018 and analyzed on 06/18/2018 and 06/19/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228
Samples W-1 (280-109755-1), W-2 (280-109755-2), W-3 (280-109755-3), W-4 (280-109755-4), W-1D (280-109755-5) and W-3EB (280-109755-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 05/21/2018 and analyzed on 05/31/2018.

Radium-228 was detected in method blank MB 160-366811/23-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226/RADIUM-228 (GFPC)
Samples W-1 (280-109755-1), W-2 (280-109755-2), W-3 (280-109755-3), W-4 (280-109755-4), W-1D (280-109755-5) and W-3EB (280-109755-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 06/19/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-109755-1

Client Sample ID: W-1

Lab Sample ID: 280-109755-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.62		0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	44		15	1.3	mg/L	5		9056A	Total/NA
Sulfate	2700		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4600		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-2

Lab Sample ID: 280-109755-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	8.5		0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	84		30	2.5	mg/L	10		9056A	Total/NA
Sulfate	4600		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7300		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-3

Lab Sample ID: 280-109755-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.94		0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190		30	2.5	mg/L	10		9056A	Total/NA
Sulfate	8100		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	13000		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4

Lab Sample ID: 280-109755-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.1		0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	390		60	5.1	mg/L	20		9056A	Total/NA
Sulfate	14000		500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	21000	H	200	94	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.0	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-1D

Lab Sample ID: 280-109755-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.62		0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	43		15	1.3	mg/L	5		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-1D (Continued) — Lab Sample ID: 280-109755-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	2800		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4600		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-3EB — Lab Sample ID: 280-109755-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH adj. to 25 deg C	6.3	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA

This Detection Summary does not include radiochemical test results.

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-109755-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-109755-1	W-1	Water	05/14/18 15:05	05/15/18 12:55
280-109755-2	W-2	Water	05/14/18 18:35	05/15/18 12:55
280-109755-3	W-3	Water	05/14/18 16:20	05/15/18 12:55
280-109755-4	W-4	Water	05/14/18 17:35	05/15/18 12:55
280-109755-5	W-1D	Water	05/14/18 15:05	05/15/18 12:55
280-109755-6	W-3EB	Water	05/14/18 16:30	05/15/18 12:55

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: W-1 — **Lab Sample ID: 280-109755-1**
Date Collected: 05/14/18 15:05 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.62**		0.10	0.023	mg/L		05/18/18 14:00	05/21/18 15:17	1

Client Sample ID: W-2 — **Lab Sample ID: 280-109755-2**
Date Collected: 05/14/18 18:35 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**8.5**		0.10	0.023	mg/L		05/18/18 14:00	05/21/18 16:02	1

Client Sample ID: W-3 — **Lab Sample ID: 280-109755-3**
Date Collected: 05/14/18 16:20 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.94**		0.10	0.023	mg/L		05/18/18 14:00	05/21/18 16:07	1

Client Sample ID: W-4 — **Lab Sample ID: 280-109755-4**
Date Collected: 05/14/18 17:35 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.1**		0.10	0.023	mg/L		05/18/18 14:00	05/21/18 16:12	1

Client Sample ID: W-1D — **Lab Sample ID: 280-109755-5**
Date Collected: 05/14/18 15:05 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.62**		0.10	0.023	mg/L		05/18/18 14:00	05/21/18 16:18	1

Client Sample ID: W-3EB — **Lab Sample ID: 280-109755-6**
Date Collected: 05/14/18 16:30 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		05/18/18 14:00	05/21/18 16:23	1

General Chemistry

Client Sample ID: W-1 — **Lab Sample ID: 280-109755-1**
Date Collected: 05/14/18 15:05 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.7**	**HF**	0.1	0.1	SU			05/30/18 21:54	1
Temperature	**20.0**	**HF**	1.0	1.0	Degrees C			05/30/18 21:54	1
Chloride	**44**		15	1.3	mg/L			06/04/18 23:09	5
Fluoride	ND		2.5	0.30	mg/L			06/04/18 23:09	5
Fluoride	ND		2.5	0.30	mg/L			06/04/18 23:09	5
Sulfate	**2700**		100	4.6	mg/L			06/04/18 23:31	20
Total Dissolved Solids (TDS)	**4600**		40	19	mg/L			05/19/18 11:34	1
Total Suspended Solids	ND		4.0	1.1	mg/L			05/17/18 12:58	1

General Chemistry

Client Sample ID: W-2
Lab Sample ID: 280-109755-2
Date Collected: 05/14/18 18:35
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			05/30/18 21:58	1
Temperature	20.0	HF	1.0	1.0	Degrees C			05/30/18 21:58	1
Chloride	84		30	2.5	mg/L			06/05/18 17:28	10
Fluoride	ND		5.0	0.60	mg/L			06/05/18 17:28	10
Fluoride	ND		5.0	0.60	mg/L			06/05/18 17:28	10
Sulfate	4600		250	12	mg/L			06/05/18 17:51	50
Total Dissolved Solids (TDS)	7300		40	19	mg/L			05/19/18 11:34	1
Total Suspended Solids	1.2	J	4.0	1.1	mg/L			05/17/18 12:58	1

Client Sample ID: W-3
Lab Sample ID: 280-109755-3
Date Collected: 05/14/18 16:20
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			05/30/18 22:03	1
Temperature	20.2	HF	1.0	1.0	Degrees C			05/30/18 22:03	1
Chloride	190		30	2.5	mg/L			06/05/18 18:13	10
Fluoride	ND		5.0	0.60	mg/L			06/05/18 18:13	10
Fluoride	ND		5.0	0.60	mg/L			06/05/18 18:13	10
Sulfate	8100		250	12	mg/L			06/05/18 18:35	50
Total Dissolved Solids (TDS)	13000		100	47	mg/L			05/19/18 11:34	1
Total Suspended Solids	1.2	J	4.0	1.1	mg/L			05/17/18 12:58	1

Client Sample ID: W-4
Lab Sample ID: 280-109755-4
Date Collected: 05/14/18 17:35
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			05/30/18 21:45	1
Temperature	20.4	HF	1.0	1.0	Degrees C			05/30/18 21:45	1
Chloride	390		60	5.1	mg/L			06/05/18 18:57	20
Fluoride	ND		10	1.2	mg/L			06/05/18 18:57	20
Fluoride	ND		10	1.2	mg/L			06/05/18 18:57	20
Sulfate	14000		500	23	mg/L			06/05/18 19:19	100
Total Dissolved Solids (TDS)	21000	H	200	94	mg/L			06/01/18 11:06	1
Total Suspended Solids	2.0	J	4.0	1.1	mg/L			05/17/18 12:58	1

Client Sample ID: W-1D
Lab Sample ID: 280-109755-5
Date Collected: 05/14/18 15:05
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			05/30/18 22:07	1
Temperature	20.4	HF	1.0	1.0	Degrees C			05/30/18 22:07	1
Chloride	43		15	1.3	mg/L			06/05/18 20:26	5
Fluoride	ND		2.5	0.30	mg/L			06/05/18 20:26	5
Fluoride	ND		2.5	0.30	mg/L			06/05/18 20:26	5
Sulfate	2800		100	4.6	mg/L			06/05/18 20:48	20
Total Dissolved Solids (TDS)	4600		40	19	mg/L			05/19/18 11:34	1
Total Suspended Solids	ND		4.0	1.1	mg/L			05/17/18 12:58	1

General Chemistry

Client Sample ID: W-3EB **Lab Sample ID: 280-109755-6**
Date Collected: 05/14/18 16:30 **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**6.3**	**HF**	0.1	0.1	SU			05/30/18 22:11	1
Temperature	**19.7**	**HF**	1.0	1.0	Degrees C			05/30/18 22:11	1
Chloride	ND		3.0	0.25	mg/L			06/05/18 21:10	1
Fluoride	ND		0.50	0.060	mg/L			06/05/18 21:10	1
Fluoride	ND		0.50	0.060	mg/L			06/05/18 21:10	1
Sulfate	ND		5.0	0.23	mg/L			06/05/18 21:10	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			05/19/18 11:34	1
Total Suspended Solids	ND		4.0	1.1	mg/L			05/17/18 12:58	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1 **Lab Sample ID: 280-109755-1**
Date Collected: 05/14/18 15:05 **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.0884**		0.0603	0.0608	1.00	0.0806	pCi/L	05/21/18 14:42	06/19/18 05:30	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.2*		*40 - 110*	*05/21/18 14:42*	*06/19/18 05:30*	*1*

Client Sample ID: W-2 **Lab Sample ID: 280-109755-2**
Date Collected: 05/14/18 18:35 **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.214**		0.0852	0.0874	1.00	0.0884	pCi/L	05/21/18 14:42	06/18/18 17:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*05/21/18 14:42*	*06/18/18 17:15*	*1*

Client Sample ID: W-3 **Lab Sample ID: 280-109755-3**
Date Collected: 05/14/18 16:20 **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0946	U	0.0721	0.0726	1.00	0.104	pCi/L	05/21/18 14:42	06/18/18 17:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.5*		*40 - 110*	*05/21/18 14:42*	*06/18/18 17:16*	*1*

Client Sample ID: W-4 **Lab Sample ID: 280-109755-4**
Date Collected: 05/14/18 17:35 **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.173**		0.0832	0.0846	1.00	0.0990	pCi/L	05/21/18 14:42	06/18/18 17:16	1

Method: 9315 - Radium-226 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*101*		*40 - 110*	*05/21/18 14:42*	*06/18/18 17:16*	*1*

Client Sample ID: W-1D — **Lab Sample ID: 280-109755-5**
Date Collected: 05/14/18 15:05 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.133**		0.0721	0.0731	1.00	0.0904	pCi/L	05/21/18 14:42	06/18/18 17:20	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*95.0*		*40 - 110*	*05/21/18 14:42*	*06/18/18 17:20*	*1*

Client Sample ID: W-3EB — **Lab Sample ID: 280-109755-6**
Date Collected: 05/14/18 16:30 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0428	U	0.0426	0.0427	1.00	0.0645	pCi/L	05/21/18 14:42	06/18/18 17:20	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*101*		*40 - 110*	*05/21/18 14:42*	*06/18/18 17:20*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1 — **Lab Sample ID: 280-109755-1**
Date Collected: 05/14/18 15:05 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.279	U	0.250	0.251	1.00	0.402	pCi/L	05/21/18 15:44	05/31/18 14:50	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*93.2*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*
Y Carrier	*93.8*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*

Client Sample ID: W-2 — **Lab Sample ID: 280-109755-2**
Date Collected: 05/14/18 18:35 — **Matrix: Water**
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.588**		0.225	0.232	1.00	0.305	pCi/L	05/21/18 15:44	05/31/18 14:50	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*101*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*
Y Carrier	*94.6*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-3
Date Collected: 05/14/18 16:20
Date Received: 05/15/18 12:55
Lab Sample ID: 280-109755-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.558**		0.253	0.258	1.00	0.361	pCi/L	05/21/18 15:44	05/31/18 14:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.5*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*
Y Carrier	*89.0*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*

Client Sample ID: W-4
Date Collected: 05/14/18 17:35
Date Received: 05/15/18 12:55
Lab Sample ID: 280-109755-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.912**		0.299	0.311	1.00	0.412	pCi/L	05/21/18 15:44	05/31/18 14:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*
Y Carrier	*93.5*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*

Client Sample ID: W-1D
Date Collected: 05/14/18 15:05
Date Received: 05/15/18 12:55
Lab Sample ID: 280-109755-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.259	U	0.247	0.248	1.00	0.400	pCi/L	05/21/18 15:44	05/31/18 14:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.0*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*
Y Carrier	*90.8*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*

Client Sample ID: W-3EB
Date Collected: 05/14/18 16:30
Date Received: 05/15/18 12:55
Lab Sample ID: 280-109755-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.126	U	0.195	0.196	1.00	0.371	pCi/L	05/21/18 15:44	05/31/18 14:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*
Y Carrier	*90.8*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:50*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-1
Lab Sample ID: 280-109755-1
Date Collected: 05/14/18 15:05
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.368	U	0.257	0.258	5.00	0.402	pCi/L		06/19/18 18:29	1

Client Sample ID: W-2
Lab Sample ID: 280-109755-2
Date Collected: 05/14/18 18:35
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.802**		0.241	0.248	5.00	0.305	pCi/L		06/19/18 18:29	1

Client Sample ID: W-3
Lab Sample ID: 280-109755-3
Date Collected: 05/14/18 16:20
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.652**		0.263	0.268	5.00	0.361	pCi/L		06/19/18 18:29	1

Client Sample ID: W-4
Lab Sample ID: 280-109755-4
Date Collected: 05/14/18 17:35
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.09**		0.310	0.322	5.00	0.412	pCi/L		06/19/18 18:29	1

Client Sample ID: W-1D
Lab Sample ID: 280-109755-5
Date Collected: 05/14/18 15:05
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.392	U	0.257	0.259	5.00	0.400	pCi/L		06/19/18 18:29	1

Client Sample ID: W-3EB
Lab Sample ID: 280-109755-6
Date Collected: 05/14/18 16:30
Matrix: Water
Date Received: 05/15/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.0832	U	0.200	0.201	5.00	0.371	pCi/L		06/19/18 18:29	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-327510/1-A
Matrix: Water
Analysis Batch: 327969
Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 327510

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		05/18/18 14:00	05/21/18 15:08	1

Lab Sample ID: LCS 240-327510/2-A
Matrix: Water
Analysis Batch: 327969
Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 327510

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.10		mg/L		110	80 - 120

Lab Sample ID: 280-109755-1 MS
Matrix: Water
Analysis Batch: 327969
Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 327510

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.62		1.00	1.74		mg/L		113	75 - 125

Lab Sample ID: 280-109755-1 MSD
Matrix: Water
Analysis Batch: 327969
Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 327510

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.62		1.00	1.76		mg/L		115	75 - 125	1	20

Method: 9040B - pH

Lab Sample ID: LCS 280-416969/4
Matrix: Water
Analysis Batch: 416969
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.1		SU		101	99 - 101

Lab Sample ID: 280-109755-4 DU
Matrix: Water
Analysis Batch: 416969
Client Sample ID: W-4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH adj. to 25 deg C	7.6	HF	7.6		SU		0	5
Temperature	20.4	HF	20.1		Degrees C		2	10

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-417251/6
Matrix: Water
Analysis Batch: 417251
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			06/04/18 12:33	1
Fluoride	ND		0.50	0.060	mg/L			06/04/18 12:33	1

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-109755-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 280-417251/6
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 417251

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.0	0.23	mg/L			06/04/18 12:33	1

Lab Sample ID: LCS 280-417251/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 417251

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	100		mg/L		100	90 - 110
Fluoride	5.00	4.96		mg/L		99	90 - 110
Sulfate	100	99.0		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-417251/5
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 417251

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	100		mg/L		100	90 - 110	0	10
Fluoride	5.00	4.99		mg/L		100	90 - 110	0	10
Sulfate	100	99.0		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-417251/3
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 417251

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.50	J	mg/L		100	50 - 150
Fluoride	0.200	0.185	J	mg/L		93	50 - 150
Sulfate	2.50	2.43	J	mg/L		97	50 - 150

Lab Sample ID: MB 280-417399/6
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 417399

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			06/05/18 12:05	1
Fluoride	ND		0.50	0.060	mg/L			06/05/18 12:05	1
Sulfate	ND		5.0	0.23	mg/L			06/05/18 12:05	1

Lab Sample ID: LCS 280-417399/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 417399

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	101		mg/L		101	90 - 110
Fluoride	5.00	4.94		mg/L		99	90 - 110
Sulfate	100	99.3		mg/L		99	90 - 110

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 280-417399/5 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 417399

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	101		mg/L		101	90 - 110	0	10
Fluoride	5.00	4.99		mg/L		100	90 - 110	1	10
Sulfate	100	99.2		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-417399/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 417399

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.56	J	mg/L		102	50 - 150
Fluoride	0.200	0.162	J	mg/L		81	50 - 150
Sulfate	2.50	2.36	J	mg/L		94	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-415513/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 415513

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			05/19/18 11:34	1

Lab Sample ID: LCS 280-415513/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 415513

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	502		mg/L		100	86 - 110

Lab Sample ID: LCSD 280-415513/3 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 415513

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	501	502		mg/L		100	86 - 110	0	20

Lab Sample ID: MB 280-417084/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 417084

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			06/01/18 11:06	1

Lab Sample ID: LCS 280-417084/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 417084

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	499	493		mg/L		99	86 - 110

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCSD 280-417084/25
Matrix: Water
Analysis Batch: 417084

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	499	479		mg/L		96	86 - 110	3	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-415253/1
Matrix: Water
Analysis Batch: 415253

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			05/17/18 12:58	1

Lab Sample ID: LCS 280-415253/2
Matrix: Water
Analysis Batch: 415253

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	98.0		mg/L		98	86 - 114

Lab Sample ID: 280-109755-6 DU
Matrix: Water
Analysis Batch: 415253

Client Sample ID: W-3EB
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	ND		ND		mg/L		NC	10

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-366803/23-A
Matrix: Water
Analysis Batch: 370841

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 366803

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03636	U	0.0475	0.0476	1.00	0.0792	pCi/L	05/21/18 14:42	06/18/18 19:08	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*05/21/18 14:42*	*06/18/18 19:08*	*1*

Lab Sample ID: LCS 160-366803/1-A
Matrix: Water
Analysis Batch: 371107

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 366803

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.8	10.86		1.10	1.00	0.0819	pCi/L	92	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.3*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-366811/23-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 368174
Prep Batch: 366811

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.5847		0.239	0.245	1.00	0.335	pCi/L	05/21/18 15:44	05/31/18 14:47	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:47*	*1*
Y Carrier	*93.1*		*40 - 110*	*05/21/18 15:44*	*05/31/18 14:47*	*1*

Lab Sample ID: LCS 160-366811/1-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 368163
Prep Batch: 366811

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	8.27	9.362		1.07	1.00	0.347	pCi/L	113	56 - 140

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.3*		*40 - 110*
Y Carrier	*96.1*		*40 - 110*

Metals

Prep Batch: 327510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-1	W-1	Total Recoverable	Water	3005A	
280-109755-2	W-2	Total Recoverable	Water	3005A	
280-109755-3	W-3	Total Recoverable	Water	3005A	
280-109755-4	W-4	Total Recoverable	Water	3005A	
280-109755-5	W-1D	Total Recoverable	Water	3005A	
280-109755-6	W-3EB	Total Recoverable	Water	3005A	
MB 240-327510/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-327510/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-109755-1 MS	W-1	Total Recoverable	Water	3005A	
280-109755-1 MSD	W-1	Total Recoverable	Water	3005A	

Analysis Batch: 327969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-1	W-1	Total Recoverable	Water	6010C	327510
280-109755-2	W-2	Total Recoverable	Water	6010C	327510
280-109755-3	W-3	Total Recoverable	Water	6010C	327510
280-109755-4	W-4	Total Recoverable	Water	6010C	327510
280-109755-5	W-1D	Total Recoverable	Water	6010C	327510
280-109755-6	W-3EB	Total Recoverable	Water	6010C	327510
MB 240-327510/1-A	Method Blank	Total Recoverable	Water	6010C	327510
LCS 240-327510/2-A	Lab Control Sample	Total Recoverable	Water	6010C	327510
280-109755-1 MS	W-1	Total Recoverable	Water	6010C	327510
280-109755-1 MSD	W-1	Total Recoverable	Water	6010C	327510

General Chemistry

Analysis Batch: 415253

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-1	W-1	Total/NA	Water	SM 2540D	
280-109755-2	W-2	Total/NA	Water	SM 2540D	
280-109755-3	W-3	Total/NA	Water	SM 2540D	
280-109755-4	W-4	Total/NA	Water	SM 2540D	
280-109755-5	W-1D	Total/NA	Water	SM 2540D	
280-109755-6	W-3EB	Total/NA	Water	SM 2540D	
MB 280-415253/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-415253/2	Lab Control Sample	Total/NA	Water	SM 2540D	
280-109755-6 DU	W-3EB	Total/NA	Water	SM 2540D	

Analysis Batch: 415513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-1	W-1	Total/NA	Water	SM 2540C	
280-109755-2	W-2	Total/NA	Water	SM 2540C	
280-109755-3	W-3	Total/NA	Water	SM 2540C	
280-109755-5	W-1D	Total/NA	Water	SM 2540C	
280-109755-6	W-3EB	Total/NA	Water	SM 2540C	
MB 280-415513/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-415513/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-415513/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 416969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-1	W-1	Total/NA	Water	9040B	
280-109755-2	W-2	Total/NA	Water	9040B	
280-109755-3	W-3	Total/NA	Water	9040B	
280-109755-4	W-4	Total/NA	Water	9040B	
280-109755-5	W-1D	Total/NA	Water	9040B	
280-109755-6	W-3EB	Total/NA	Water	9040B	
LCS 280-416969/4	Lab Control Sample	Total/NA	Water	9040B	
280-109755-4 DU	W-4	Total/NA	Water	9040B	

Analysis Batch: 417084

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-4	W-4	Total/NA	Water	SM 2540C	
MB 280-417084/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-417084/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-417084/25	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

Analysis Batch: 417251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-1	W-1	Total/NA	Water	9056A	
280-109755-1	W-1	Total/NA	Water	9056A	
MB 280-417251/6	Method Blank	Total/NA	Water	9056A	
LCS 280-417251/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-417251/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-417251/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 417399

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-2	W-2	Total/NA	Water	9056A	
280-109755-2	W-2	Total/NA	Water	9056A	
280-109755-3	W-3	Total/NA	Water	9056A	
280-109755-3	W-3	Total/NA	Water	9056A	
280-109755-4	W-4	Total/NA	Water	9056A	
280-109755-4	W-4	Total/NA	Water	9056A	
280-109755-5	W-1D	Total/NA	Water	9056A	
280-109755-5	W-1D	Total/NA	Water	9056A	
280-109755-6	W-3EB	Total/NA	Water	9056A	
MB 280-417399/6	Method Blank	Total/NA	Water	9056A	
LCS 280-417399/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-417399/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-417399/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 366803

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-1	W-1	Total/NA	Water	PrecSep-21	
280-109755-2	W-2	Total/NA	Water	PrecSep-21	
280-109755-3	W-3	Total/NA	Water	PrecSep-21	
280-109755-4	W-4	Total/NA	Water	PrecSep-21	
280-109755-5	W-1D	Total/NA	Water	PrecSep-21	

Rad (Continued)

Prep Batch: 366803 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-6	W-3EB	Total/NA	Water	PrecSep-21	
MB 160-366803/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-366803/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 366811

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-109755-1	W-1	Total/NA	Water	PrecSep_0	
280-109755-2	W-2	Total/NA	Water	PrecSep_0	
280-109755-3	W-3	Total/NA	Water	PrecSep_0	
280-109755-4	W-4	Total/NA	Water	PrecSep_0	
280-109755-5	W-1D	Total/NA	Water	PrecSep_0	
280-109755-6	W-3EB	Total/NA	Water	PrecSep_0	
MB 160-366811/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-366811/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Client Sample ID: W-1 Lab Sample ID: 280-109755-1

Date Collected: 05/14/18 15:05 **Matrix: Water**

Date Received: 05/15/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	327510	05/18/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			327969	05/21/18 15:17	KLC	TAL CAN
Total/NA	Analysis	9040B		1			416969	05/30/18 21:54	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	417251	06/04/18 23:09	CCJ	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	417251	06/04/18 23:31	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	415513	05/19/18 11:34	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	415253	05/17/18 12:58	AWW	TAL DEN
Total/NA	Prep	PrecSep-21			999.38 mL	1.0 g	366803	05/21/18 14:42	TJT	TAL SL
Total/NA	Analysis	9315		1			371107	06/19/18 05:30	ALS	TAL SL
Total/NA	Prep	PrecSep_0			999.38 mL	1.0 g	366811	05/21/18 15:44	TJT	TAL SL
Total/NA	Analysis	9320		1			368163	05/31/18 14:50	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			371289	06/19/18 18:29	ALS	TAL SL

Client Sample ID: W-2 Lab Sample ID: 280-109755-2

Date Collected: 05/14/18 18:35 **Matrix: Water**

Date Received: 05/15/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	327510	05/18/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			327969	05/21/18 16:02	KLC	TAL CAN
Total/NA	Analysis	9040B		1			416969	05/30/18 21:58	LPL	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	417399	06/05/18 17:28	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	417399	06/05/18 17:51	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	415513	05/19/18 11:34	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	415253	05/17/18 12:58	AWW	TAL DEN
Total/NA	Prep	PrecSep-21			1000.44 mL	1.0 g	366803	05/21/18 14:42	TJT	TAL SL
Total/NA	Analysis	9315		1			371080	06/18/18 17:15	ALS	TAL SL
Total/NA	Prep	PrecSep_0			1000.44 mL	1.0 g	366811	05/21/18 15:44	TJT	TAL SL
Total/NA	Analysis	9320		1			368163	05/31/18 14:50	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			371289	06/19/18 18:29	ALS	TAL SL

Client Sample ID: W-3 Lab Sample ID: 280-109755-3

Date Collected: 05/14/18 16:20 **Matrix: Water**

Date Received: 05/15/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	327510	05/18/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			327969	05/21/18 16:07	KLC	TAL CAN
Total/NA	Analysis	9040B		1			416969	05/30/18 22:03	LPL	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	417399	06/05/18 18:13	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	417399	06/05/18 18:35	TLP	TAL DEN

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client Sample ID: W-3
Lab Sample ID: 280-109755-3
Date Collected: 05/14/18 16:20
Matrix: Water
Date Received: 05/15/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	415513	05/19/18 11:34	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	415253	05/17/18 12:58	AWW	TAL DEN
Total/NA	Prep	PrecSep-21			999.60 mL	1.0 g	366803	05/21/18 14:42	TJT	TAL SL
Total/NA	Analysis	9315		1			371080	06/18/18 17:16	ALS	TAL SL
Total/NA	Prep	PrecSep_0			999.60 mL	1.0 g	366811	05/21/18 15:44	TJT	TAL SL
Total/NA	Analysis	9320		1			368163	05/31/18 14:50	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			371289	06/19/18 18:29	ALS	TAL SL

Client Sample ID: W-4
Lab Sample ID: 280-109755-4
Date Collected: 05/14/18 17:35
Matrix: Water
Date Received: 05/15/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	327510	05/18/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			327969	05/21/18 16:12	KLC	TAL CAN
Total/NA	Analysis	9040B		1			416969	05/30/18 21:45	LPL	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	417399	06/05/18 18:57	TLP	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	417399	06/05/18 19:19	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	5 mL	100 mL	417084	06/01/18 11:06	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	415253	05/17/18 12:58	AWW	TAL DEN
Total/NA	Prep	PrecSep-21			999.49 mL	1.0 g	366803	05/21/18 14:42	TJT	TAL SL
Total/NA	Analysis	9315		1			371080	06/18/18 17:16	ALS	TAL SL
Total/NA	Prep	PrecSep_0			999.49 mL	1.0 g	366811	05/21/18 15:44	TJT	TAL SL
Total/NA	Analysis	9320		1			368163	05/31/18 14:50	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			371289	06/19/18 18:29	ALS	TAL SL

Client Sample ID: W-1D
Lab Sample ID: 280-109755-5
Date Collected: 05/14/18 15:05
Matrix: Water
Date Received: 05/15/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	327510	05/18/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			327969	05/21/18 16:18	KLC	TAL CAN
Total/NA	Analysis	9040B		1			416969	05/30/18 22:07	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	417399	06/05/18 20:26	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	417399	06/05/18 20:48	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	415513	05/19/18 11:34	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	415253	05/17/18 12:58	AWW	TAL DEN
Total/NA	Prep	PrecSep-21			1000.73 mL	1.0 g	366803	05/21/18 14:42	TJT	TAL SL
Total/NA	Analysis	9315		1			370842	06/18/18 17:20	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.73 mL	1.0 g	366811	05/21/18 15:44	TJT	TAL SL
Total/NA	Analysis	9320		1			368163	05/31/18 14:50	ALS	TAL SL

Client Sample ID: W-1D **Lab Sample ID: 280-109755-5**
Date Collected: 05/14/18 15:05 **Matrix: Water**
Date Received: 05/15/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Ra226_Ra228		1			371289	06/19/18 18:29	ALS	TAL SL

Client Sample ID: W-3EB **Lab Sample ID: 280-109755-6**
Date Collected: 05/14/18 16:30 **Matrix: Water**
Date Received: 05/15/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	327510	05/18/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			327969	05/21/18 16:23	KLC	TAL CAN
Total/NA	Analysis	9040B		1			416969	05/30/18 22:11	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	417399	06/05/18 21:10	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	415513	05/19/18 11:34	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	415253	05/17/18 12:58	AWW	TAL DEN
Total/NA	Prep	PrecSep-21			999.33 mL	1.0 g	366803	05/21/18 14:42	TJT	TAL SL
Total/NA	Analysis	9315		1			370842	06/18/18 17:20	CDR	TAL SL
Total/NA	Prep	PrecSep_0			999.33 mL	1.0 g	366811	05/21/18 15:44	TJT	TAL SL
Total/NA	Analysis	9320		1			368163	05/31/18 14:50	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			371289	06/19/18 18:29	ALS	TAL SL

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Client: HDR Inc
TestAmerica Job ID: 280-109755-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-18 *
Illinois	NELAP	5	200004	07-31-18 *
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-18 *
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-18 *
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-18 *
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-18 *
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: HDR Inc
TestAmerica Job ID: 280-109755-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-18 *
New Jersey	NELAP	2	MO002	06-30-18 *
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-18 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *
Texas	NELAP	6	T104704193-17-11	07-31-18
US Fish & Wildlife	Federal		058448	08-31-18
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18
West Virginia DEP	State Program	3	381	08-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information

Client Contact: Anna Lundin	Sampler: Tava Kent Phone: 720.933.7496	Lab PM: Rothmeyer, Stephanie K E-Mail: stephanie.rothmeyer@testamericainc.com	Carrier Tracking No(s):
COC No:	Page: Page 1 of 1	Job #:	
Company: HDR Inc			
Address: 9781 S. Meridian Blve Suite 400	Due Date Requested:		
City: Englewood	TAT Requested (days): Standard		
State, Zip: CO, 80112			
Phone: 720-633-2380(Tel)	PO #: DEN-001		
Email: anna.lundin@hdrinc.com	WO #:		
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377		
Site: Colorado	SSOW#:		

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6010C	pH - 9040B, Anions - 9056A_28D	TSS	Ra226/Ra228	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	D	N	N	D	X	
W-1	5.14.18	1505	G	Water		N	✓	✓	✓	✓	✓		
W-2	5.14-18	1835	G	Water		N	✓	✓	✓	✓	✓		
W-3	5.14.18	1620	G	Water		N	✓	✓	✓	✓	✓		
W-4	5.14.18	1735	G	Water		N	✓	✓	✓	✓	✓		
~~Field Duplicate~~ tk W-1D	5.14.18	1505	G	Water		N	✓	✓	✓	✓	✓		
~~Equipment Blank~~ tk W-3EB	5.14-18	1630	G	Water		N	✓	✓	✓	✓	✓		

280-109755 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)
Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tava Kent	Date: 15MAY2018	Time: 1255	Method of Shipment:		
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 5-15-18 1255	Company TA-Den
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 3.1, 4.6 IRA 8.0.0 RR 5-15-18		

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information

Sampler:	Tava Kent
Phone:	720.933.7496
Lab PM:	Rothmeyer, Stephanie K
E-Mail:	stephanie.rothmeyer@testamericainc.com
Carrier Tracking No(s):	
COC No:	
Page:	Page 1 of 1
Job #:	
Client Contact:	Anna Lundin
Company:	HDR Inc
Address:	9781 S. Meridian Blve Suite 400
City:	Englewood
State, Zip	CO, 80112
Phone:	720-633-2380(Tel)
Email:	anna.lundin@hdrinc.com
Project Name:	Xcel Energy GW CCR Monitoring - Hayden
Site:	Colorado
Due Date Requested:	
TAT Requested (days):	Standard
PO #:	DEN-001
WO #:	
Project #:	28014377
SSOW#:	

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6010C	pH - 9040B, Anions - 9056A_28D	TSS	Ra226/Ra228	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D		
W-1	5.14.18	1505	G	Water		N	✓	✓	✓	✓	✓		
W-2	5.14.18	1835	G	Water		N	✓	✓	✓	✓	✓		
W-3	5.14.18	1620	G	Water		N	✓	✓	✓	✓	✓		
W-4	5.14.18	1735	G	Water		N	✓	✓	✓	✓	✓		
~~Field Duplicate~~ TK W-1D	5.14.18	1505	G	Water		N	✓	✓	✓	✓	✓		
~~Equipment Blank~~ TK W-3EB	5.14.18	1630	G	Water		N	✓	✓	✓	✓	✓		

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)
Other:

280-109755 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tava Kent	Date: 15MAY2018	Time: 1255	Method of Shipment:		
Relinquished by:	Date/Time:	Company	Received by: Lely	Date/Time: 5-15-18 1255	Company TA-Den
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 3.1, 4.6 IR# 80.0 RR 5-15-18		

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tava Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No:
Client Contact: Anna Lundin	Phone: 720.933.7496	E-Mail: stephanie.rothmeyer@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc				Job #:
Address: 9781 S. Meridian Blve Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days): Standard			
State, Zip: CO, 80112				
Phone: 720-633-2380(Tel)	PO #: DEN-001			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Colorado	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6010C	pH - 9040B, Anions - 9056A_28D	TSS	Ra226/Ra228	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D		
W-1	5.14.18	1505	G	Water		N	✓	✓	✓	✓	✓		
W-2	5.14-18	1835	G	Water		N	✓	✓	✓	✓	✓		
W-3	5.14.18	1620	G	Water		N	✓	✓	✓	✓	✓		
W-4	5.14.18	1735	G	Water		N	✓	✓	✓	✓	✓		
~~Field Duplicate~~ tk W-1D	5.14.18	1505	G	Water		N	✓	✓	✓	✓	✓		
~~Equipment Blank~~ tk W-3EB	5.14-18	1630	G	Water		N	✓	✓	✓	✓	✓		

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)

Other:

280-109755 Chain of Custody

Possible Hazard Identification
☒ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☒ *Disposal By Lab* ☐ *Archive For* ________ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tava Kent	Date: 15MAY2018	Time: 1255	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			Lelo	5-15-18 1255	TA-Den

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.1, 4.6 IR# 80.0 RR 5-15-18

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-438160.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-109755-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/11/2018			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
W-1 (280-109755-1)	5/14/18	15:05 Mountain		Water			X	X	X	~~2~~	1
W-2 (280-109755-2)	5/14/18	18:35 Mountain		Water			X	X	X	~~2~~	1
W-3 (280-109755-3)	5/14/18	16:20 Mountain		Water			X	X	X	~~2~~	1
W-4 (280-109755-4)	5/14/18	17:35 Mountain		Water			X	X	X	~~2~~	1
W-1D (280-109755-5)	5/14/18	15:05 Mountain		Water			X	X	X	~~2~~	1
W-3EB (280-109755-6)	5/14/18	16:30 Mountain		Water			X	X	X	~~2~~	1 AOJ 5/16/18

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:	Method of Shipment:	
Relinquished by: [signature]	Date/Time: 5/16/18 15:06	Company: TA	Received by: [signature]	Date/Time: 05-17-18	Company: TA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

16.2/16.3

171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

...tract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-438161.1
	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-109755-1
	Due Date Requested: 6/7/2018	Analysis Requested		Preservation Codes:
No.:	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			Other:

Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C/3005A (MOD) Boron	Total Number of containers	Special Instructions/Note: -59
			Preservation Code:						
W-1 (280-109755-1)	5/14/18	15:05 Mountain		Water			X	2	1
W-2 (280-109755-2)	5/14/18	18:35 Mountain		Water			X	2	1
W-3 (280-109755-3)	5/14/18	16:20 Mountain		Water			X	2	1
W-4 (280-109755-4)	5/14/18	17:35 Mountain		Water			X	2	1
W-1D (280-109755-5)	5/14/18	15:05 Mountain		Water			X	2	1
W-3EB (280-109755-6)	5/14/18	16:30 Mountain		Water			X	2	1 AM 5/16/18

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification		*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*	
Unconfirmed		☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*	
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 4	Special Instructions/QC Requirements:	
Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	5/16/18 15:00	TA	[signature]	5/17/18 945	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** ____________
Canton Facility

Client TA Dawes Site Name ____________ Cooler unpacked by: &C

Cooler Received on 5/17/18 Opened on 5/17/18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ____________

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ____________

Packing material used: Bubble Wrap Foam Plastic Bag None Other ____________

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **+0.1** °C) Observed Cooler Temp. 16.2 °C Corrected Cooler Temp. 16.3 °C
   IR GUN #36 (CF **+0.3**°C) Observed Cooler Temp.______ °C Corrected Cooler Temp.______ °C
   ~~IR GUN # 627 (CF -1.3°C) Observed Cooler Temp.______ °C Corrected Cooler Temp.______ °C~~

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC732776**
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____________ Yes No
16. Was a LL Hg or Me Hg trip blank present? ____________ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____________ Date ____________ by ____________ via Verbal Voice Mail Other

Concerning ____________

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ____________ were received after the recommended holding time had expired.
Sample(s) ____________ were received in a broken container.
Sample(s) ____________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____________ were further preserved in the laboratory.
Time preserved: ____________ Preservative(s) added/Lot number(s): ____________.

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc Job Number: 280-109755-1

Login Number: 109755 **List Source: TestAmerica Denver**
List Number: 1
Creator: Pottruff, Reed W

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-109755-1

Login Number: 109755
List Number: 2
Creator: Press, Nicholas B

List Source: TestAmerica St. Louis
List Creation: 05/17/18 12:54 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	19, 19
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-109755-1	W-1	93.2
280-109755-2	W-2	101
280-109755-3	W-3	96.5
280-109755-4	W-4	101
280-109755-5	W-1D	95.0
280-109755-6	W-3EB	101
LCS 160-366803/1-A	Lab Control Sample	95.3
MB 160-366803/23-A	Method Blank	101

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-109755-1	W-1	93.2	93.8
280-109755-2	W-2	101	94.6
280-109755-3	W-3	96.5	89.0
280-109755-4	W-4	101	93.5
280-109755-5	W-1D	95.0	90.8
280-109755-6	W-3EB	101	90.8
LCS 160-366811/1-A	Lab Control Sample	95.3	96.1
MB 160-366811/23-A	Method Blank	101	93.1

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-110845-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Stephanie Rothmeyer

Authorized for release by:
7/19/2018 1:14:53 PM

Stephanie Rothmeyer, Project Manager I
(303)736-0182
stephanie.rothmeyer@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-110845-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-110845-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 6/12/2018 at 1:57 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.3º C and 3.5º C.

TOTAL RECOVERABLE METALS (ICPMS)
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 06/15/2018 and analyzed on 06/18/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 07/03/2018 and analyzed on 07/05/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 06/18/2018.

Total Dissolved Solids (TDS) was detected in method blank MB 280-418963/1 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 06/15/2018.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample 280-110765-1. Sample non-homogeneity is suspected.

Job ID: 280-110845-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 06/30/2018 and 07/05/2018.

The following samples failed to reach constant pH after 3 replicates: 2-3EB (280-110845-6).

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 07/03/2018, 07/07/2018, 07/08/2018 and 07/09/2018.

Samples W-1 (280-110845-1)[20X], W-1 (280-110845-1)[5X], W-2 (280-110845-2)[5X], W-2 (280-110845-2)[50X], W-3 (280-110845-3)[100X], W-3 (280-110845-3)[5X], W-4 (280-110845-4)[10X], W-4 (280-110845-4)[100X], W-2D (280-110845-5)[2X] and W-2D (280-110845-5)[50X] required dilution prior to analysis due to the Matrix Conductivity Threshold (MCT) of the instrument. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 (GFPC)
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 06/19/2018 and analyzed on 07/13/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) associated with batch 160-371257.

Sample aliquots reduced due to limited sample volume: W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5), 2-3EB (280-110845-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 06/19/2018 and analyzed on 07/12/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) associated with batch 160-371263.

Sample aliquots reduced due to limited sample volume: W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5), 2-3EB (280-110845-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226/RADIUM-228 (GFPC)
Samples W-1 (280-110845-1), W-2 (280-110845-2), W-3 (280-110845-3), W-4 (280-110845-4), W-2D (280-110845-5) and 2-3EB (280-110845-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 07/19/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client Sample ID: W-1 — Lab Sample ID: 280-110845-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0096		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	340		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.00080	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0046	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.011		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.28		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	43		15	1.3	mg/L	5		9056A	Total/NA
Sulfate	2700		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4500	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.4	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-2 — Lab Sample ID: 280-110845-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0055		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	370		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.0011		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0040	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0038	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.72		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	18.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	81		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.53	J	2.5	0.30	mg/L	5		9056A	Total/NA
Fluoride	0.53	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	4300		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7200	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-3 — Lab Sample ID: 280-110845-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0066		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	390		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00041	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0018		0.0010	0.00019	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-3 (Continued) — Lab Sample ID: 280-110845-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	0.0033	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.018		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	1.8		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	18.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.51	J	2.5	0.30	mg/L	5		9056A	Total/NA
Fluoride	0.51	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	7900		500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	13000	B	100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	7.2		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4 — Lab Sample ID: 280-110845-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0093		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	370		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00033	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0061		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0034	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0027	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.93		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	380		30	2.5	mg/L	10		9056A	Total/NA
Sulfate	13000		500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	25000	B	200	94	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	8.8		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-2D — Lab Sample ID: 280-110845-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0053		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	360		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.0011		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0034	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0046	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.70		0.0080	0.0017	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-2D (Continued) Lab Sample ID: 280-110845-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	80		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.42	J	1.0	0.12	mg/L	2		9056A	Total/NA
Fluoride	0.42	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	4400		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7300	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.4		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: 2-3EB Lab Sample ID: 280-110845-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Selenium	0.0017	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	18.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA

This Detection Summary does not include radiochemical test results.

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-110845-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-110845-1	W-1	Water	06/11/18 18:45	06/12/18 13:57
280-110845-2	W-2	Water	06/11/18 16:30	06/12/18 13:57
280-110845-3	W-3	Water	06/11/18 15:10	06/12/18 13:57
280-110845-4	W-4	Water	06/11/18 17:45	06/12/18 13:57
280-110845-5	W-2D	Water	06/11/18 16:30	06/12/18 13:57
280-110845-6	2-3EB	Water	06/11/18 15:25	06/12/18 13:57

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1
Date Collected: 06/11/18 18:45
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/15/18 14:00	06/18/18 18:52	1
Arsenic	ND		0.0050	0.00075	mg/L		06/15/18 14:00	06/18/18 18:52	1
Barium	**0.0096**		0.0050	0.0022	mg/L		06/15/18 14:00	06/18/18 18:52	1
Beryllium	ND		0.0010	0.00031	mg/L		06/15/18 14:00	06/18/18 18:52	1
Calcium	**340**		1.0	0.58	mg/L		06/15/18 14:00	06/18/18 18:52	1
Cadmium	ND		0.0010	0.00021	mg/L		06/15/18 14:00	06/18/18 18:52	1
Cobalt	**0.00080**	**J**	0.0010	0.00019	mg/L		06/15/18 14:00	06/18/18 18:52	1
Chromium	ND		0.0020	0.00098	mg/L		06/15/18 14:00	06/18/18 18:52	1
Molybdenum	**0.0046**	**J**	0.010	0.0011	mg/L		06/15/18 14:00	06/18/18 18:52	1
Lead	ND		0.0010	0.00045	mg/L		06/15/18 14:00	06/18/18 18:52	1
Selenium	**0.011**		0.0050	0.00089	mg/L		06/15/18 14:00	06/18/18 18:52	1
Thallium	ND		0.0010	0.00020	mg/L		06/15/18 14:00	06/18/18 18:52	1
Lithium	**0.28**		0.0080	0.0017	mg/L		06/15/18 14:00	06/18/18 18:52	1

Client Sample ID: W-2
Date Collected: 06/11/18 16:30
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/15/18 14:00	06/18/18 18:56	1
Arsenic	ND		0.0050	0.00075	mg/L		06/15/18 14:00	06/18/18 18:56	1
Barium	**0.0055**		0.0050	0.0022	mg/L		06/15/18 14:00	06/18/18 18:56	1
Beryllium	ND		0.0010	0.00031	mg/L		06/15/18 14:00	06/18/18 18:56	1
Calcium	**370**		1.0	0.58	mg/L		06/15/18 14:00	06/18/18 18:56	1
Cadmium	ND		0.0010	0.00021	mg/L		06/15/18 14:00	06/18/18 18:56	1
Cobalt	**0.0011**		0.0010	0.00019	mg/L		06/15/18 14:00	06/18/18 18:56	1
Chromium	ND		0.0020	0.00098	mg/L		06/15/18 14:00	06/18/18 18:56	1
Molybdenum	**0.0040**	**J**	0.010	0.0011	mg/L		06/15/18 14:00	06/18/18 18:56	1
Lead	ND		0.0010	0.00045	mg/L		06/15/18 14:00	06/18/18 18:56	1
Selenium	**0.0038**	**J**	0.0050	0.00089	mg/L		06/15/18 14:00	06/18/18 18:56	1
Thallium	ND		0.0010	0.00020	mg/L		06/15/18 14:00	06/18/18 18:56	1
Lithium	**0.72**		0.0080	0.0017	mg/L		06/15/18 14:00	06/18/18 18:56	1

Client Sample ID: W-3
Date Collected: 06/11/18 15:10
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/15/18 14:00	06/18/18 19:00	1
Arsenic	ND		0.0050	0.00075	mg/L		06/15/18 14:00	06/18/18 19:00	1
Barium	**0.0066**		0.0050	0.0022	mg/L		06/15/18 14:00	06/18/18 19:00	1
Beryllium	ND		0.0010	0.00031	mg/L		06/15/18 14:00	06/18/18 19:00	1
Calcium	**390**		1.0	0.58	mg/L		06/15/18 14:00	06/18/18 19:00	1
Cadmium	**0.00041**	**J**	0.0010	0.00021	mg/L		06/15/18 14:00	06/18/18 19:00	1
Cobalt	**0.0018**		0.0010	0.00019	mg/L		06/15/18 14:00	06/18/18 19:00	1
Chromium	ND		0.0020	0.00098	mg/L		06/15/18 14:00	06/18/18 19:00	1
Molybdenum	**0.0033**	**J**	0.010	0.0011	mg/L		06/15/18 14:00	06/18/18 19:00	1
Lead	ND		0.0010	0.00045	mg/L		06/15/18 14:00	06/18/18 19:00	1
Selenium	**0.018**		0.0050	0.00089	mg/L		06/15/18 14:00	06/18/18 19:00	1
Thallium	ND		0.0010	0.00020	mg/L		06/15/18 14:00	06/18/18 19:00	1
Lithium	**1.8**		0.0080	0.0017	mg/L		06/15/18 14:00	06/18/18 19:00	1

Client: HDR Inc | TestAmerica Job ID: 280-110845-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-4 | **Lab Sample ID: 280-110845-4**
Date Collected: 06/11/18 17:45 | **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/15/18 14:00	06/18/18 19:05	1
Arsenic	ND		0.0050	0.00075	mg/L		06/15/18 14:00	06/18/18 19:05	1
Barium	**0.0093**		0.0050	0.0022	mg/L		06/15/18 14:00	06/18/18 19:05	1
Beryllium	ND		0.0010	0.00031	mg/L		06/15/18 14:00	06/18/18 19:05	1
Calcium	**370**		1.0	0.58	mg/L		06/15/18 14:00	06/18/18 19:05	1
Cadmium	**0.00033**	**J**	0.0010	0.00021	mg/L		06/15/18 14:00	06/18/18 19:05	1
Cobalt	**0.0061**		0.0010	0.00019	mg/L		06/15/18 14:00	06/18/18 19:05	1
Chromium	ND		0.0020	0.00098	mg/L		06/15/18 14:00	06/18/18 19:05	1
Molybdenum	**0.0034**	**J**	0.010	0.0011	mg/L		06/15/18 14:00	06/18/18 19:05	1
Lead	ND		0.0010	0.00045	mg/L		06/15/18 14:00	06/18/18 19:05	1
Selenium	**0.0027**	**J**	0.0050	0.00089	mg/L		06/15/18 14:00	06/18/18 19:05	1
Thallium	ND		0.0010	0.00020	mg/L		06/15/18 14:00	06/18/18 19:05	1
Lithium	**0.93**		0.0080	0.0017	mg/L		06/15/18 14:00	06/18/18 19:05	1

Client Sample ID: W-2D | **Lab Sample ID: 280-110845-5**
Date Collected: 06/11/18 16:30 | **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/15/18 14:00	06/18/18 19:09	1
Arsenic	ND		0.0050	0.00075	mg/L		06/15/18 14:00	06/18/18 19:09	1
Barium	**0.0053**		0.0050	0.0022	mg/L		06/15/18 14:00	06/18/18 19:09	1
Beryllium	ND		0.0010	0.00031	mg/L		06/15/18 14:00	06/18/18 19:09	1
Calcium	**360**		1.0	0.58	mg/L		06/15/18 14:00	06/18/18 19:09	1
Cadmium	ND		0.0010	0.00021	mg/L		06/15/18 14:00	06/18/18 19:09	1
Cobalt	**0.0011**		0.0010	0.00019	mg/L		06/15/18 14:00	06/18/18 19:09	1
Chromium	ND		0.0020	0.00098	mg/L		06/15/18 14:00	06/18/18 19:09	1
Molybdenum	**0.0034**	**J**	0.010	0.0011	mg/L		06/15/18 14:00	06/18/18 19:09	1
Lead	ND		0.0010	0.00045	mg/L		06/15/18 14:00	06/18/18 19:09	1
Selenium	**0.0046**	**J**	0.0050	0.00089	mg/L		06/15/18 14:00	06/18/18 19:09	1
Thallium	ND		0.0010	0.00020	mg/L		06/15/18 14:00	06/18/18 19:09	1
Lithium	**0.70**		0.0080	0.0017	mg/L		06/15/18 14:00	06/18/18 19:09	1

Client Sample ID: 2-3EB | **Lab Sample ID: 280-110845-6**
Date Collected: 06/11/18 15:25 | **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/15/18 14:00	06/18/18 19:23	1
Arsenic	ND		0.0050	0.00075	mg/L		06/15/18 14:00	06/18/18 19:23	1
Barium	ND		0.0050	0.0022	mg/L		06/15/18 14:00	06/18/18 19:23	1
Beryllium	ND		0.0010	0.00031	mg/L		06/15/18 14:00	06/18/18 19:23	1
Calcium	ND		1.0	0.58	mg/L		06/15/18 14:00	06/18/18 19:23	1
Cadmium	ND		0.0010	0.00021	mg/L		06/15/18 14:00	06/18/18 19:23	1
Cobalt	ND		0.0010	0.00019	mg/L		06/15/18 14:00	06/18/18 19:23	1
Chromium	ND		0.0020	0.00098	mg/L		06/15/18 14:00	06/18/18 19:23	1
Molybdenum	ND		0.010	0.0011	mg/L		06/15/18 14:00	06/18/18 19:23	1
Lead	ND		0.0010	0.00045	mg/L		06/15/18 14:00	06/18/18 19:23	1
Selenium	**0.0017**	**J**	0.0050	0.00089	mg/L		06/15/18 14:00	06/18/18 19:23	1
Thallium	ND		0.0010	0.00020	mg/L		06/15/18 14:00	06/18/18 19:23	1
Lithium	ND		0.0080	0.0017	mg/L		06/15/18 14:00	06/18/18 19:23	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-1
Date Collected: 06/11/18 18:45
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/03/18 14:00	07/05/18 11:28	1

Client Sample ID: W-2
Date Collected: 06/11/18 16:30
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/03/18 14:00	07/05/18 11:30	1

Client Sample ID: W-3
Date Collected: 06/11/18 15:10
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/03/18 14:00	07/05/18 11:32	1

Client Sample ID: W-4
Date Collected: 06/11/18 17:45
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/03/18 14:00	07/05/18 11:34	1

Client Sample ID: W-2D
Date Collected: 06/11/18 16:30
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/03/18 14:00	07/05/18 11:36	1

Client Sample ID: 2-3EB
Date Collected: 06/11/18 15:25
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/03/18 14:00	07/05/18 11:42	1

General Chemistry

Client Sample ID: W-1
Date Collected: 06/11/18 18:45
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.7**	**HF**	0.1	0.1	SU			06/30/18 10:26	1
Temperature	**19.2**	**HF**	1.0	1.0	Degrees C			06/30/18 10:26	1
Chloride	**43**		15	1.3	mg/L			07/03/18 15:34	5
Fluoride	ND		2.5	0.30	mg/L			07/03/18 15:34	5
Fluoride	ND		2.5	0.30	mg/L			07/03/18 15:34	5
Sulfate	**2700**		100	4.6	mg/L			07/09/18 23:13	20
Total Dissolved Solids (TDS)	**4500**	**B**	40	19	mg/L			06/18/18 11:51	1
Total Suspended Solids	**2.4**	**J**	4.0	1.1	mg/L			06/15/18 07:50	1

General Chemistry

Client Sample ID: W-2 **Lab Sample ID: 280-110845-2**
Date Collected: 06/11/18 16:30 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			06/30/18 10:34	1
Temperature	18.4	HF	1.0	1.0	Degrees C			06/30/18 10:34	1
Chloride	81		15	1.3	mg/L			07/03/18 15:52	5
Fluoride	0.53	J	2.5	0.30	mg/L			07/03/18 15:52	5
Fluoride	0.53	J	2.5	0.30	mg/L			07/03/18 15:52	5
Sulfate	4300		250	12	mg/L			07/09/18 23:35	50
Total Dissolved Solids (TDS)	7200	B	40	19	mg/L			06/18/18 11:51	1
Total Suspended Solids	3.2	J	4.0	1.1	mg/L			06/15/18 07:50	1

Client Sample ID: W-3 **Lab Sample ID: 280-110845-3**
Date Collected: 06/11/18 15:10 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			06/30/18 10:38	1
Temperature	18.7	HF	1.0	1.0	Degrees C			06/30/18 10:38	1
Chloride	190		15	1.3	mg/L			07/07/18 21:46	5
Fluoride	0.51	J	2.5	0.30	mg/L			07/07/18 21:46	5
Fluoride	0.51	J	2.5	0.30	mg/L			07/07/18 21:46	5
Sulfate	7900		500	23	mg/L			07/07/18 22:08	100
Total Dissolved Solids (TDS)	13000	B	100	47	mg/L			06/18/18 11:51	1
Total Suspended Solids	7.2		4.0	1.1	mg/L			06/15/18 07:50	1

Client Sample ID: W-4 **Lab Sample ID: 280-110845-4**
Date Collected: 06/11/18 17:45 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			06/30/18 10:42	1
Temperature	19.0	HF	1.0	1.0	Degrees C			06/30/18 10:42	1
Chloride	380		30	2.5	mg/L			07/07/18 22:30	10
Fluoride	ND		5.0	0.60	mg/L			07/07/18 22:30	10
Fluoride	ND		5.0	0.60	mg/L			07/07/18 22:30	10
Sulfate	13000		500	23	mg/L			07/07/18 22:52	100
Total Dissolved Solids (TDS)	25000	B	200	94	mg/L			06/18/18 11:51	1
Total Suspended Solids	8.8		4.0	1.1	mg/L			06/15/18 07:50	1

Client Sample ID: W-2D **Lab Sample ID: 280-110845-5**
Date Collected: 06/11/18 16:30 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			06/30/18 10:46	1
Temperature	19.0	HF	1.0	1.0	Degrees C			06/30/18 10:46	1
Chloride	80		6.0	0.51	mg/L			07/08/18 00:21	2
Fluoride	0.42	J	1.0	0.12	mg/L			07/08/18 00:21	2
Fluoride	0.42	J	1.0	0.12	mg/L			07/08/18 00:21	2
Sulfate	4400		250	12	mg/L			07/08/18 00:44	50
Total Dissolved Solids (TDS)	7300	B	40	19	mg/L			06/18/18 11:51	1
Total Suspended Solids	4.4		4.0	1.1	mg/L			06/15/18 07:50	1

General Chemistry

Client Sample ID: 2-3EB **Lab Sample ID: 280-110845-6**
Date Collected: 06/11/18 15:25 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**6.7**	**HF**	0.1	0.1	SU			07/05/18 11:48	1
Temperature	**18.9**	**HF**	1.0	1.0	Degrees C			07/05/18 11:48	1
Chloride	ND		3.0	0.25	mg/L			07/07/18 23:15	1
Fluoride	ND		0.50	0.060	mg/L			07/07/18 23:15	1
Fluoride	ND		0.50	0.060	mg/L			07/07/18 23:15	1
Sulfate	ND		5.0	0.23	mg/L			07/07/18 23:15	1
Total Dissolved Solids (TDS)	ND		20	9.4	mg/L			06/18/18 11:51	1
Total Suspended Solids	ND		4.0	1.1	mg/L			06/15/18 07:50	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1 **Lab Sample ID: 280-110845-1**
Date Collected: 06/11/18 18:45 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.149	U	0.166	0.166	1.00	0.264	pCi/L	06/19/18 14:42	07/13/18 05:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*06/19/18 14:42*	*07/13/18 05:37*	*1*

Client Sample ID: W-2 **Lab Sample ID: 280-110845-2**
Date Collected: 06/11/18 16:30 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.129	U	0.156	0.157	1.00	0.255	pCi/L	06/19/18 14:42	07/13/18 05:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*105*		*40 - 110*	*06/19/18 14:42*	*07/13/18 05:37*	*1*

Client Sample ID: W-3 **Lab Sample ID: 280-110845-3**
Date Collected: 06/11/18 15:10 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.193	U	0.170	0.170	1.00	0.248	pCi/L	06/19/18 14:42	07/13/18 05:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*108*		*40 - 110*	*06/19/18 14:42*	*07/13/18 05:38*	*1*

Client Sample ID: W-4 **Lab Sample ID: 280-110845-4**
Date Collected: 06/11/18 17:45 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0945	U	0.150	0.150	1.00	0.262	pCi/L	06/19/18 14:42	07/13/18 05:38	1

Method: 9315 - Radium-226 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110	06/19/18 14:42	07/13/18 05:38	1

Client Sample ID: W-2D
Lab Sample ID: 280-110845-5
Date Collected: 06/11/18 16:30
Matrix: Water
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0128	U	0.118	0.118	1.00	0.250	pCi/L	06/19/18 14:42	07/13/18 05:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110	06/19/18 14:42	07/13/18 05:38	1

Client Sample ID: 2-3EB
Lab Sample ID: 280-110845-6
Date Collected: 06/11/18 15:25
Matrix: Water
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0130	U	0.0918	0.0918	1.00	0.226	pCi/L	06/19/18 14:42	07/13/18 05:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110	06/19/18 14:42	07/13/18 05:38	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1
Lab Sample ID: 280-110845-1
Date Collected: 06/11/18 18:45
Matrix: Water
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.291	U	0.327	0.328	1.00	0.537	pCi/L	06/19/18 15:12	07/12/18 14:26	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110	06/19/18 15:12	07/12/18 14:26	1
Y Carrier	89.0		40 - 110	06/19/18 15:12	07/12/18 14:26	1

Client Sample ID: W-2
Lab Sample ID: 280-110845-2
Date Collected: 06/11/18 16:30
Matrix: Water
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.175	U	0.328	0.328	1.00	0.555	pCi/L	06/19/18 15:12	07/12/18 14:26	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	105		40 - 110	06/19/18 15:12	07/12/18 14:26	1
Y Carrier	89.3		40 - 110	06/19/18 15:12	07/12/18 14:26	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-3 **Lab Sample ID: 280-110845-3**
Date Collected: 06/11/18 15:10 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.500**		0.317	0.320	1.00	0.489	pCi/L	06/19/18 15:12	07/12/18 14:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*108*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:26*	*1*
Y Carrier	*89.0*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:26*	*1*

Client Sample ID: W-4 **Lab Sample ID: 280-110845-4**
Date Collected: 06/11/18 17:45 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.343	U	0.323	0.325	1.00	0.524	pCi/L	06/19/18 15:12	07/12/18 14:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*104*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:26*	*1*
Y Carrier	*89.0*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:26*	*1*

Client Sample ID: W-2D **Lab Sample ID: 280-110845-5**
Date Collected: 06/11/18 16:30 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.466	U	0.323	0.326	1.00	0.503	pCi/L	06/19/18 15:12	07/12/18 14:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:27*	*1*
Y Carrier	*85.2*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:27*	*1*

Client Sample ID: 2-3EB **Lab Sample ID: 280-110845-6**
Date Collected: 06/11/18 15:25 **Matrix: Water**
Date Received: 06/12/18 13:57

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0324	U	0.242	0.242	1.00	0.430	pCi/L	06/19/18 15:12	07/12/18 14:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:27*	*1*
Y Carrier	*92.7*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:27*	*1*

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-110845-1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-1
Date Collected: 06/11/18 18:45
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.440	U	0.367	0.368	5.00	0.537	pCi/L		07/19/18 11:31	1

Client Sample ID: W-2
Date Collected: 06/11/18 16:30
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.304	U	0.363	0.364	5.00	0.555	pCi/L		07/19/18 11:31	1

Client Sample ID: W-3
Date Collected: 06/11/18 15:10
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.693**		0.360	0.362	5.00	0.489	pCi/L		07/19/18 11:31	1

Client Sample ID: W-4
Date Collected: 06/11/18 17:45
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.437	U	0.356	0.358	5.00	0.524	pCi/L		07/19/18 11:31	1

Client Sample ID: W-2D
Date Collected: 06/11/18 16:30
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.479	U	0.344	0.347	5.00	0.503	pCi/L		07/19/18 11:31	1

Client Sample ID: 2-3EB
Date Collected: 06/11/18 15:25
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0194	U	0.259	0.259	5.00	0.430	pCi/L		07/19/18 11:31	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-110845-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-331855/1-A
Matrix: Water
Analysis Batch: 332270

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 331855

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/15/18 14:00	06/18/18 17:40	1
Arsenic	ND		0.0050	0.00075	mg/L		06/15/18 14:00	06/18/18 17:40	1
Barium	ND		0.0050	0.0022	mg/L		06/15/18 14:00	06/18/18 17:40	1
Beryllium	ND		0.0010	0.00031	mg/L		06/15/18 14:00	06/18/18 17:40	1
Calcium	ND		1.0	0.58	mg/L		06/15/18 14:00	06/18/18 17:40	1
Cadmium	ND		0.0010	0.00021	mg/L		06/15/18 14:00	06/18/18 17:40	1
Cobalt	ND		0.0010	0.00019	mg/L		06/15/18 14:00	06/18/18 17:40	1
Chromium	ND		0.0020	0.00098	mg/L		06/15/18 14:00	06/18/18 17:40	1
Molybdenum	ND		0.010	0.0011	mg/L		06/15/18 14:00	06/18/18 17:40	1
Lead	ND		0.0010	0.00045	mg/L		06/15/18 14:00	06/18/18 17:40	1
Selenium	ND		0.0050	0.00089	mg/L		06/15/18 14:00	06/18/18 17:40	1
Thallium	ND		0.0010	0.00020	mg/L		06/15/18 14:00	06/18/18 17:40	1
Lithium	ND		0.0080	0.0017	mg/L		06/15/18 14:00	06/18/18 17:40	1

Lab Sample ID: LCS 240-331855/2-A
Matrix: Water
Analysis Batch: 332270

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 331855

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0978		mg/L		98	80 - 120
Arsenic	1.00	0.967		mg/L		97	80 - 120
Barium	1.00	0.943		mg/L		94	80 - 120
Beryllium	1.00	0.938		mg/L		94	80 - 120
Calcium	10.0	9.80		mg/L		98	80 - 120
Cadmium	1.00	0.982		mg/L		98	80 - 120
Cobalt	1.00	0.975		mg/L		98	80 - 120
Chromium	1.00	0.951		mg/L		95	80 - 120
Molybdenum	0.100	0.0948		mg/L		95	80 - 120
Lead	1.00	1.03		mg/L		103	80 - 120
Selenium	1.00	0.980		mg/L		98	80 - 120
Thallium	0.250	0.252		mg/L		101	80 - 120
Lithium	0.100	0.0938		mg/L		94	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-334583/1-A
Matrix: Water
Analysis Batch: 334843

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 334583

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/03/18 14:00	07/05/18 11:17	1

Lab Sample ID: LCS 240-334583/2-A
Matrix: Water
Analysis Batch: 334843

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 334583

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.72		ug/L		94	80 - 120

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-110845-1

Method: 9040B - pH

Lab Sample ID: LCS 280-421036/4
Matrix: Water
Analysis Batch: 421036

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		101	99 - 101

Lab Sample ID: 280-110845-1 DU
Matrix: Water
Analysis Batch: 421036

Client Sample ID: W-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH adj. to 25 deg C	7.7	HF	7.7		SU		0.1	5
Temperature	19.2	HF	18.8		Degrees C		2	10

Lab Sample ID: LCS 280-421184/4
Matrix: Water
Analysis Batch: 421184

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-420939/15
Matrix: Water
Analysis Batch: 420939

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			07/03/18 12:54	1
Fluoride	ND		0.50	0.060	mg/L			07/03/18 12:54	1
Sulfate	ND		5.0	0.23	mg/L			07/03/18 12:54	1

Lab Sample ID: LCS 280-420939/13
Matrix: Water
Analysis Batch: 420939

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	98.8		mg/L		99	90 - 110
Fluoride	5.00	5.16		mg/L		103	90 - 110
Sulfate	100	100		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-420939/14
Matrix: Water
Analysis Batch: 420939

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	98.2		mg/L		98	90 - 110	1	10
Fluoride	5.00	5.14		mg/L		103	90 - 110	0	10
Sulfate	100	99.7		mg/L		100	90 - 110	1	10

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MRL 280-420939/3
Matrix: Water
Analysis Batch: 420939

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.49	J	mg/L		100	50 - 150
Fluoride	0.200	0.164	J	mg/L		82	50 - 150
Sulfate	2.50	2.38	J	mg/L		95	50 - 150

Lab Sample ID: MB 280-421388/6
Matrix: Water
Analysis Batch: 421388

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			07/07/18 12:09	1
Fluoride	ND		0.50	0.060	mg/L			07/07/18 12:09	1
Sulfate	ND		5.0	0.23	mg/L			07/07/18 12:09	1

Lab Sample ID: LCS 280-421388/4
Matrix: Water
Analysis Batch: 421388

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	95.8		mg/L		96	90 - 110
Fluoride	5.00	5.23		mg/L		105	90 - 110
Sulfate	100	95.7		mg/L		96	90 - 110

Lab Sample ID: LCSD 280-421388/5
Matrix: Water
Analysis Batch: 421388

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	95.9		mg/L		96	90 - 110	0	10
Fluoride	5.00	5.25		mg/L		105	90 - 110	0	10
Sulfate	100	95.7		mg/L		96	90 - 110	0	10

Lab Sample ID: MRL 280-421388/3
Matrix: Water
Analysis Batch: 421388

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.39	J	mg/L		96	50 - 150
Fluoride	0.200	0.174	J	mg/L		87	50 - 150
Sulfate	2.50	2.14	J	mg/L		86	50 - 150

Lab Sample ID: MB 280-421505/6
Matrix: Water
Analysis Batch: 421505

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.0	0.23	mg/L			07/09/18 17:38	1

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-110845-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 280-421505/4
Matrix: Water
Analysis Batch: 421505

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	100	103		mg/L		103	90 - 110

Lab Sample ID: LCSD 280-421505/5
Matrix: Water
Analysis Batch: 421505

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	100	103		mg/L		103	90 - 110	0	10

Lab Sample ID: MRL 280-421505/3
Matrix: Water
Analysis Batch: 421505

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	2.50	2.45	J	mg/L		98	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-418963/1
Matrix: Water
Analysis Batch: 418963

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	7.00	J	10	4.7	mg/L			06/18/18 11:51	1

Lab Sample ID: LCS 280-418963/2
Matrix: Water
Analysis Batch: 418963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	504		mg/L		101	86 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-418695/1
Matrix: Water
Analysis Batch: 418695

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			06/15/18 07:50	1

Lab Sample ID: LCS 280-418695/2
Matrix: Water
Analysis Batch: 418695

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	94.0		mg/L		94	86 - 114

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-371257/23-A
Matrix: Water
Analysis Batch: 375306

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 371257

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.2180	U	0.310	0.311	1.00	0.527	pCi/L	06/19/18 14:42	07/13/18 05:41	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*103*		*40 - 110*	*06/19/18 14:42*	*07/13/18 05:41*	*1*

Lab Sample ID: LCS 160-371257/1-A
Matrix: Water
Analysis Batch: 375307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 371257

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	23.6	21.85		2.63	1.00	0.330	pCi/L	93	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*107*		*40 - 110*

Lab Sample ID: LCSD 160-371257/2-A
Matrix: Water
Analysis Batch: 375307

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 371257

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	23.6	21.47		2.59	1.00	0.478	pCi/L	91	68 - 137	0.07	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*104*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-371263/23-A
Matrix: Water
Analysis Batch: 375103

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 371263

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1158	U	0.366	0.366	1.00	0.640	pCi/L	06/19/18 15:12	07/12/18 14:28	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*103*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:28*	*1*
Y Carrier	*91.2*		*40 - 110*	*06/19/18 15:12*	*07/12/18 14:28*	*1*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-371263/1-A
Matrix: Water
Analysis Batch: 375135

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 371263

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	16.3	17.59		2.05	1.00	0.760	pCi/L	108	56 - 140

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*107*		*40 - 110*
Y Carrier	*83.0*		*40 - 110*

Lab Sample ID: LCSD 160-371263/2-A
Matrix: Water
Analysis Batch: 375135

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 371263

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	16.3	16.80		1.97	1.00	0.677	pCi/L	103	56 - 140	0.20	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*104*		*40 - 110*
Y Carrier	*87.5*		*40 - 110*

Metals

Prep Batch: 331855

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total Recoverable	Water	3005A	
280-110845-2	W-2	Total Recoverable	Water	3005A	
280-110845-3	W-3	Total Recoverable	Water	3005A	
280-110845-4	W-4	Total Recoverable	Water	3005A	
280-110845-5	W-2D	Total Recoverable	Water	3005A	
280-110845-6	2-3EB	Total Recoverable	Water	3005A	
MB 240-331855/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-331855/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 332270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total Recoverable	Water	6020A	331855
280-110845-2	W-2	Total Recoverable	Water	6020A	331855
280-110845-3	W-3	Total Recoverable	Water	6020A	331855
280-110845-4	W-4	Total Recoverable	Water	6020A	331855
280-110845-5	W-2D	Total Recoverable	Water	6020A	331855
280-110845-6	2-3EB	Total Recoverable	Water	6020A	331855
MB 240-331855/1-A	Method Blank	Total Recoverable	Water	6020A	331855
LCS 240-331855/2-A	Lab Control Sample	Total Recoverable	Water	6020A	331855

Prep Batch: 334583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	7470A	
280-110845-2	W-2	Total/NA	Water	7470A	
280-110845-3	W-3	Total/NA	Water	7470A	
280-110845-4	W-4	Total/NA	Water	7470A	
280-110845-5	W-2D	Total/NA	Water	7470A	
280-110845-6	2-3EB	Total/NA	Water	7470A	
MB 240-334583/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-334583/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 334843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	7470A	334583
280-110845-2	W-2	Total/NA	Water	7470A	334583
280-110845-3	W-3	Total/NA	Water	7470A	334583
280-110845-4	W-4	Total/NA	Water	7470A	334583
280-110845-5	W-2D	Total/NA	Water	7470A	334583
280-110845-6	2-3EB	Total/NA	Water	7470A	334583
MB 240-334583/1-A	Method Blank	Total/NA	Water	7470A	334583
LCS 240-334583/2-A	Lab Control Sample	Total/NA	Water	7470A	334583

General Chemistry

Analysis Batch: 418695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	SM 2540D	
280-110845-2	W-2	Total/NA	Water	SM 2540D	
280-110845-3	W-3	Total/NA	Water	SM 2540D	
280-110845-4	W-4	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 418695 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-5	W-2D	Total/NA	Water	SM 2540D	
280-110845-6	2-3EB	Total/NA	Water	SM 2540D	
MB 280-418695/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-418695/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 418963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	SM 2540C	
280-110845-2	W-2	Total/NA	Water	SM 2540C	
280-110845-3	W-3	Total/NA	Water	SM 2540C	
280-110845-4	W-4	Total/NA	Water	SM 2540C	
280-110845-5	W-2D	Total/NA	Water	SM 2540C	
280-110845-6	2-3EB	Total/NA	Water	SM 2540C	
MB 280-418963/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-418963/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 420939

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	9056A	
280-110845-2	W-2	Total/NA	Water	9056A	
MB 280-420939/15	Method Blank	Total/NA	Water	9056A	
LCS 280-420939/13	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-420939/14	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-420939/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 421036

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	9040B	
280-110845-2	W-2	Total/NA	Water	9040B	
280-110845-3	W-3	Total/NA	Water	9040B	
280-110845-4	W-4	Total/NA	Water	9040B	
280-110845-5	W-2D	Total/NA	Water	9040B	
LCS 280-421036/4	Lab Control Sample	Total/NA	Water	9040B	
280-110845-1 DU	W-1	Total/NA	Water	9040B	

Analysis Batch: 421184

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-6	2-3EB	Total/NA	Water	9040B	
LCS 280-421184/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 421388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-3	W-3	Total/NA	Water	9056A	
280-110845-3	W-3	Total/NA	Water	9056A	
280-110845-4	W-4	Total/NA	Water	9056A	
280-110845-4	W-4	Total/NA	Water	9056A	
280-110845-5	W-2D	Total/NA	Water	9056A	
280-110845-5	W-2D	Total/NA	Water	9056A	
280-110845-6	2-3EB	Total/NA	Water	9056A	
MB 280-421388/6	Method Blank	Total/NA	Water	9056A	
LCS 280-421388/4	Lab Control Sample	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 421388 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 280-421388/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-421388/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 421505

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	9056A	
280-110845-2	W-2	Total/NA	Water	9056A	
MB 280-421505/6	Method Blank	Total/NA	Water	9056A	
LCS 280-421505/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-421505/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-421505/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 371257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	PrecSep-21	
280-110845-2	W-2	Total/NA	Water	PrecSep-21	
280-110845-3	W-3	Total/NA	Water	PrecSep-21	
280-110845-4	W-4	Total/NA	Water	PrecSep-21	
280-110845-5	W-2D	Total/NA	Water	PrecSep-21	
280-110845-6	2-3EB	Total/NA	Water	PrecSep-21	
MB 160-371257/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-371257/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-371257/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 371263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110845-1	W-1	Total/NA	Water	PrecSep_0	
280-110845-2	W-2	Total/NA	Water	PrecSep_0	
280-110845-3	W-3	Total/NA	Water	PrecSep_0	
280-110845-4	W-4	Total/NA	Water	PrecSep_0	
280-110845-5	W-2D	Total/NA	Water	PrecSep_0	
280-110845-6	2-3EB	Total/NA	Water	PrecSep_0	
MB 160-371263/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-371263/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-371263/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Client Sample ID: W-1 Lab Sample ID: 280-110845-1

Date Collected: 06/11/18 18:45 **Matrix: Water**
Date Received: 06/12/18 13:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	331855	06/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			332270	06/18/18 18:52	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	334583	07/03/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			334843	07/05/18 11:28	AJC	TAL CAN
Total/NA	Analysis	9040B		1			421036	06/30/18 10:26	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	420939	07/03/18 15:34	CCJ	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	421505	07/09/18 23:13	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	418963	06/18/18 11:51	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418695	06/15/18 07:50	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			750.14 mL	1.0 g	371257	06/19/18 14:42	JLC	TAL SL
Total/NA	Analysis	9315		1			375309	07/13/18 05:37	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.14 mL	1.0 g	371263	06/19/18 15:12	JLC	TAL SL
Total/NA	Analysis	9320		1			375135	07/12/18 14:26	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			376619	07/19/18 11:31	RTM	TAL SL

Client Sample ID: W-2 Lab Sample ID: 280-110845-2

Date Collected: 06/11/18 16:30 **Matrix: Water**
Date Received: 06/12/18 13:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	331855	06/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			332270	06/18/18 18:56	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	334583	07/03/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			334843	07/05/18 11:30	AJC	TAL CAN
Total/NA	Analysis	9040B		1			421036	06/30/18 10:34	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	420939	07/03/18 15:52	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	421505	07/09/18 23:35	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	418963	06/18/18 11:51	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418695	06/15/18 07:50	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			749.93 mL	1.0 g	371257	06/19/18 14:42	JLC	TAL SL
Total/NA	Analysis	9315		1			375309	07/13/18 05:37	RTM	TAL SL
Total/NA	Prep	PrecSep_0			749.93 mL	1.0 g	371263	06/19/18 15:12	JLC	TAL SL
Total/NA	Analysis	9320		1			375135	07/12/18 14:26	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			376619	07/19/18 11:31	RTM	TAL SL

Client Sample ID: W-3 Lab Sample ID: 280-110845-3

Date Collected: 06/11/18 15:10 **Matrix: Water**
Date Received: 06/12/18 13:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	331855	06/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			332270	06/18/18 19:00	RKT	TAL CAN

Lab Chronicle

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-110845-1

Client Sample ID: W-3

Lab Sample ID: 280-110845-3
Date Collected: 06/11/18 15:10
Matrix: Water
Date Received: 06/12/18 13:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	334583	07/03/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			334843	07/05/18 11:32	AJC	TAL CAN
Total/NA	Analysis	9040B		1			421036	06/30/18 10:38	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	421388	07/07/18 21:46	TLP	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	421388	07/07/18 22:08	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	418963	06/18/18 11:51	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418695	06/15/18 07:50	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			750.13 mL	1.0 g	371257	06/19/18 14:42	JLC	TAL SL
Total/NA	Analysis	9315		1			375308	07/13/18 05:38	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.13 mL	1.0 g	371263	06/19/18 15:12	JLC	TAL SL
Total/NA	Analysis	9320		1			375135	07/12/18 14:26	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			376619	07/19/18 11:31	RTM	TAL SL

Client Sample ID: W-4

Lab Sample ID: 280-110845-4
Date Collected: 06/11/18 17:45
Matrix: Water
Date Received: 06/12/18 13:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	331855	06/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			332270	06/18/18 19:05	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	334583	07/03/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			334843	07/05/18 11:34	AJC	TAL CAN
Total/NA	Analysis	9040B		1			421036	06/30/18 10:42	LPL	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	421388	07/07/18 22:30	TLP	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	421388	07/07/18 22:52	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	5 mL	100 mL	418963	06/18/18 11:51	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418695	06/15/18 07:50	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			750.44 mL	1.0 g	371257	06/19/18 14:42	JLC	TAL SL
Total/NA	Analysis	9315		1			375308	07/13/18 05:38	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.44 mL	1.0 g	371263	06/19/18 15:12	JLC	TAL SL
Total/NA	Analysis	9320		1			375135	07/12/18 14:26	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			376619	07/19/18 11:31	RTM	TAL SL

Client Sample ID: W-2D

Lab Sample ID: 280-110845-5
Date Collected: 06/11/18 16:30
Matrix: Water
Date Received: 06/12/18 13:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	331855	06/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			332270	06/18/18 19:09	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	334583	07/03/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			334843	07/05/18 11:36	AJC	TAL CAN

Lab Chronicle

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-110845-1

Client Sample ID: W-2D
Date Collected: 06/11/18 16:30
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9040B		1			421036	06/30/18 10:46	LPL	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	421388	07/08/18 00:21	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	421388	07/08/18 00:44	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	418963	06/18/18 11:51	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418695	06/15/18 07:50	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			749.97 mL	1.0 g	371257	06/19/18 14:42	JLC	TAL SL
Total/NA	Analysis	9315		1			375308	07/13/18 05:38	RTM	TAL SL
Total/NA	Prep	PrecSep_0			749.97 mL	1.0 g	371263	06/19/18 15:12	JLC	TAL SL
Total/NA	Analysis	9320		1			375135	07/12/18 14:27	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			376619	07/19/18 11:31	RTM	TAL SL

Client Sample ID: 2-3EB
Date Collected: 06/11/18 15:25
Date Received: 06/12/18 13:57

Lab Sample ID: 280-110845-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	331855	06/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			332270	06/18/18 19:23	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	334583	07/03/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			334843	07/05/18 11:42	AJC	TAL CAN
Total/NA	Analysis	9040B		1			421184	07/05/18 11:48	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	421388	07/07/18 23:15	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	418963	06/18/18 11:51	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418695	06/15/18 07:50	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			750.17 mL	1.0 g	371257	06/19/18 14:42	JLC	TAL SL
Total/NA	Analysis	9315		1			375308	07/13/18 05:38	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.17 mL	1.0 g	371263	06/19/18 15:12	JLC	TAL SL
Total/NA	Analysis	9320		1			375135	07/12/18 14:27	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			376619	07/19/18 11:31	RTM	TAL SL

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: HDR Inc
TestAmerica Job ID: 280-110845-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-18 *
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: HDR Inc TestAmerica Job ID: 280-110845-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-18 *
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-18 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *
Texas	NELAP	6	T104704193-17-11	07-31-18 *
US Fish & Wildlife	Federal		058448	07-31-18
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18
West Virginia DEP	State Program	3	381	08-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tara Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No:
Client Contact: Anna Lundin	Phone: 720 933 7496	E-Mail: stephanie.rothmeyer@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc		Analysis Requested		Job #:
Address: 9781 S. Meridian Blve Suite 400	Due Date Requested:			Preservation Codes:
City: Englewood	TAT Requested (days): Standard			
State, Zip: CO, 80112				
Phone: 720-633-2380(Tel)	PO #: DEN-001			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Colorado	SSOW#:			Other:

Preservation Codes: A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2SO3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - ph 4-5; Z - other (specify)

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6020A, 7470A	pH - 9040B, Anions - 9056A_28D	2540D - Total Suspended Solids	9315_Ra226, 9320_Ra228	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	D	N	N	D		
W-1	6-11-18	1845	G	Water		N	✓	✓	✓	✓	✓	5	Analyzing for Appendix III & IV plus TSS
W-2	6-11-18	1630	G	Water		N	✓	✓	✓	✓	✓	5	
W-3	6-11-18	1510	G	Water		N	✓	✓	✓	✓	✓	5	
W-4	6-11-18	1745	G	Water		N	✓	✓	✓	✓	✓	5	
~~Field Duplicate~~ TK W-2D	6-11-18	1630	G	Water		N	✓	✓	✓	✓	✓	5	
~~Equipment Blank~~ TK W-3EB	6-11-18	1525		Water		N	✓	✓	✓	✓	✓	5	

280-110845 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tara Kent	Date: 6-12-18	Time: 1357	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			[signature]	6-12-18 1357	TA-Den

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.3, 3.5 +0.0 XFERED BY KD 06-12-18

7/19/2018

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)

Client Contact: Shipping/Receiving
Company: TestAmerica Laboratories, Inc.
Address: 13715 Rider Trail North, ,
City: Earth City
State, Zip: MO, 63045
Phone: 314-298-8566(Tel) 314-298-8757(Fax)
Email:
Project Name: Xcel Energy GW CCR Monitoring - Hayden
Site: Xcel Energy CCR - Hayden Station

Sampler:
Phone:
Due Date Requested: 7/9/2018
TAT Requested (days):
PO #:
WO #:
Project #: 28014377
SSOW#:

Lab PM: Rothmeyer, Stephanie K
E-Mail: stephanie.rothmeyer@testamericainc.com
Accreditations Required (See note): DoD ELAP - A2LA

Carrier Tracking No(s):
State of Origin: Colorado

COC No: 280-442135.1
Page: Page 1 of 1
Job #: 280-110845-1

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
W-1 (280-110845-1)	6/11/18	18:45 Mountain		Water			X	X	X	1	
W-2 (280-110845-2)	6/11/18	16:30 Mountain		Water			X	X	X	1	
W-3 (280-110845-3)	6/11/18	15:10 Mountain		Water			X	X	X	1	
W-4 (280-110845-4)	6/11/18	17:45 Mountain		Water			X	X	X	1	
W-2D (280-110845-5)	6/11/18	16:30 Mountain		Water			X	X	X	1	
2-3EB (280-110845-6)	6/11/18	15:25 Mountain		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*
Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	6/13/18 1500		Nicholas Brown	6-14-18 0925	TASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

18.0/C18.0

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-442132.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-110845-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 7/5/2018	Analysis Requested		Preservation Codes:
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			Other:

Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 13 Total Metals (w/collision cell)	6020A/3005A (MOD) 12 Total Metals (w/collision cell)	Total Number of containers	S20 Special Instructions/Note:
			Preservation Code:							
W-1 (280-110845-1)	6/11/18	18:45 Mountain		Water			X	X	1	Use Collision Cell
W-2 (280-110845-2)	6/11/18	16:30 Mountain		Water			X	X	1	Use Collision Cell
W-3 (280-110845-3)	6/11/18	15:10 Mountain		Water			X	X	1	Use Collision Cell
W-4 (280-110845-4)	6/11/18	17:45 Mountain		Water			X	X	1	Use Collision Cell
W-2D (280-110845-5)	6/11/18	16:30 Mountain		Water			X	X	1	Use Collision Cell
2-3EB (280-110845-6)	6/11/18	15:25 Mountain		Water			X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification Unconfirmed	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 6/13/18 1500	Company	Received by:	Date/Time: 6-14-18 910	Company TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** ____________
Canton Facility

Client Denver Site Name ____________ Cooler unpacked by: [signature]

Cooler Received on 6.14.18 Opened on 6.14.18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ____________

Receipt After-hours: Drop-off Date/Time ____________ Storage Location ____________

TestAmerica Cooler # ____________ Foam Box Client Cooler Box Other ____________

Packing material used: Bubble Wrap Foam Plastic Bag None Other ____________

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   - IR GUN# IR-8 (CF +0 °C) Observed Cooler Temp. 18.0 °C Corrected Cooler Temp. 18.0 °C
   - IR GUN #36 (CF **-0.3**°C) Observed Cooler Temp. ______ °C Corrected Cooler Temp. ______ °C
   - ~~IR GUN # 627 (CF -1.3°C) Observed Cooler Temp. ______ °C Corrected Cooler Temp. ______ °C~~

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   - -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   - -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   - -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# **HC740840**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____________ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ____________ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____________ Date ____________ by ____________ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

____

18. SAMPLE CONDITION

Sample(s) ____________ were received after the recommended holding time had expired.

Sample(s) ____________ were received in a broken container.

Sample(s) ____________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____________ were further preserved in the laboratory.

Time preserved: ____________ Preservative(s) added/Lot number(s): ____________.

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-110845-1

Login Number: 110845 | **List Source: TestAmerica Denver**
List Number: 1
Creator: Dunlap, Krista M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-110845-1

Login Number: 110845
List Number: 2
Creator: Press, Nicholas B

List Source: TestAmerica St. Louis
List Creation: 06/14/18 10:50 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-110845-1

Login Number: 110845
List Number: 3
Creator: Press, Nicholas B

List Source: TestAmerica St. Louis
List Creation: 06/14/18 10:51 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 9315 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-110845-1	W-1	100
280-110845-2	W-2	105
280-110845-3	W-3	108
280-110845-4	W-4	104
280-110845-5	W-2D	106
280-110845-6	2-3EB	106
LCS 160-371257/1-A	Lab Control Sample	107
LCSD 160-371257/2-A	Lab Control Sample Dup	104
MB 160-371257/23-A	Method Blank	103

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-110845-1	W-1	100	89.0
280-110845-2	W-2	105	89.3
280-110845-3	W-3	108	89.0
280-110845-4	W-4	104	89.0
280-110845-5	W-2D	106	85.2
280-110845-6	2-3EB	106	92.7
LCS 160-371263/1-A	Lab Control Sample	107	83.0
LCSD 160-371263/2-A	Lab Control Sample Dup	104	87.5
MB 160-371263/23-A	Method Blank	103	91.2

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-111779-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Authorized for release by:
8/20/2018 12:23:19 PM

Stephanie Rothmeyer, Project Manager I
(303)736-0182
stephanie.rothmeyer@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Client: HDR Inc	TestAmerica Job ID: 280-111779-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
B	Compound was found in the blank and sample.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-111779-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-111779-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 7/11/2018 at 8:41 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.6º C and 9.6º C.

The following samples were received in 1 out of temp cooler at 9.6C: W-3 (280-111779-3): 1) One of One samples for 2540 C, pH, 2540 D, Metals and 9315; W-2D (280-111779-5): 1) One of One samples for 2540 C, pH, 2540 D, Metals and 9315; W-2 (280-111779-2): 1) One of One samples for 2540 C, pH, Metals and 9315; W-3EB (280-111779-6): 1) One of One samples for 2540 C, and pH.

TOTAL RECOVERABLE METALS
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 08/10/2018 and analyzed on 08/13/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 07/13/2018 and analyzed on 07/17/2018.

Beryllium and Cadmium were detected in method blank MB 240-336095/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The CCB was greater than or equal to the reporting limit for Antimony. Since the sample results were below the requested reporting limit, the results were accepted: W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5), W-3EB (280-111779-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 07/13/2018 and analyzed on 07/16/2018.

Job ID: 280-111779-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 07/11/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 07/12/2018.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample 280-111778-1. Sample non-homogeneity is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 07/14/2018 and 07/18/2018.

The following sample failed to reach constant pH after 3 replicates: W-3EB (280-111779-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 07/23/2018 and 07/24/2018.

Chloride and Sulfate were detected in method blank MB 280-423188/6 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Fluoride failed the recovery criteria high for the MSD of sample 280-111493-11 in batch 280-423188. Refer to the QC report for details.

Samples W-1 (280-111779-1)[2X], W-1 (280-111779-1)[20X], W-2 (280-111779-2)[2X], W-2 (280-111779-2)[50X], W-3 (280-111779-3)[100X], W-3 (280-111779-3)[5X], W-4 (280-111779-4)[200X], W-4 (280-111779-4)[5X], W-2D (280-111779-5)[2X] and W-2D (280-111779-5)[50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 (GFPC)
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 07/13/2018 and analyzed on 08/08/2018.

Radium-226 was detected in method blank MB 160-375564/15-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Insufficient sample volume was available to perform a sample duplicate (DUP) for batch 160-375564.

Sample aliquots were reduced due to limited sample volume: W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4

Job ID: 280-111779-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

(280-111779-4), W-2D (280-111779-5), W-3EB (280-111779-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 07/13/2018 and analyzed on 07/27/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) for batch 160-375578.

Sample aliquots were reduced due to limited sample volume: W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5), W-3EB (280-111779-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226/RADIUM-228 (GFPC)
Samples W-1 (280-111779-1), W-2 (280-111779-2), W-3 (280-111779-3), W-4 (280-111779-4), W-2D (280-111779-5) and W-3EB (280-111779-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 08/16/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client Sample ID: W-1 — Lab Sample ID: 280-111779-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.50		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0091		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.00082	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0029	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lead	0.0017		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Selenium	0.0078		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.25		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	42	B	6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.36	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2700	B	100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4500		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.0	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-2 — Lab Sample ID: 280-111779-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	7.8		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0049	J	0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.0011		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0028	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lead	0.0016		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Selenium	0.0029	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.61		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	310		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	83	B	6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.56	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	4400	B	250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	6900		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-3 — Lab Sample ID: 280-111779-3

This Detection Summary does not include radiochemical test results.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client Sample ID: W-3 (Continued) Lab Sample ID: 280-111779-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.89		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0064		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00032	J B	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0017		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0027	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lead	0.00083	J	0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Selenium	0.016		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	1.8		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	120		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190	B	15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.81	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	7800	B	500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	12000		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4 Lab Sample ID: 280-111779-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.92		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0087		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00024	J B	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0062		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0032	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0011	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.91		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	78		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	380	B	15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.88	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	13000	B	1000	46	mg/L	200		9056A	Total/NA
Total Dissolved Solids (TDS)	20000		200	94	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	5.6		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-2D Lab Sample ID: 280-111779-5

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-2D (Continued) Lab Sample ID: 280-111779-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	8.0		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0055		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.0012		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0033	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0030	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.77		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	190		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	82	B	6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.55	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	4500	B	250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7100		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.0	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-3EB Lab Sample ID: 280-111779-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0017	J	0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	0.46	J B	3.0	0.25	mg/L	1		9056A	Total/NA
Sulfate	0.56	J B	5.0	0.23	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-111779-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-111779-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-111779-1	W-1	Water	07/10/18 16:00	07/11/18 08:41
280-111779-2	W-2	Water	07/10/18 13:40	07/11/18 08:41
280-111779-3	W-3	Water	07/10/18 12:25	07/11/18 08:41
280-111779-4	W-4	Water	07/10/18 15:00	07/11/18 08:41
280-111779-5	W-2D	Water	07/10/18 13:40	07/11/18 08:41
280-111779-6	W-3EB	Water	07/10/18 12:45	07/11/18 08:41

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: W-1
Lab Sample ID: 280-111779-1
Date Collected: 07/10/18 16:00
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.50**		0.10	0.023	mg/L		08/10/18 14:00	08/13/18 11:44	1

Client Sample ID: W-2
Lab Sample ID: 280-111779-2
Date Collected: 07/10/18 13:40
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**7.8**		0.10	0.023	mg/L		08/10/18 14:00	08/13/18 11:49	1

Client Sample ID: W-3
Lab Sample ID: 280-111779-3
Date Collected: 07/10/18 12:25
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.89**		0.10	0.023	mg/L		08/10/18 14:00	08/13/18 11:12	1

Client Sample ID: W-4
Lab Sample ID: 280-111779-4
Date Collected: 07/10/18 15:00
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.92**		0.10	0.023	mg/L		08/10/18 14:00	08/13/18 11:54	1

Client Sample ID: W-2D
Lab Sample ID: 280-111779-5
Date Collected: 07/10/18 13:40
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**8.0**		0.10	0.023	mg/L		08/10/18 14:00	08/13/18 11:59	1

Client Sample ID: W-3EB
Lab Sample ID: 280-111779-6
Date Collected: 07/10/18 12:45
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		08/10/18 14:00	08/13/18 12:04	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1
Lab Sample ID: 280-111779-1
Date Collected: 07/10/18 16:00
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/13/18 14:00	07/17/18 14:49	1
Arsenic	ND		0.0050	0.00075	mg/L		07/13/18 14:00	07/17/18 14:49	1
Barium	**0.0091**		0.0050	0.0022	mg/L		07/13/18 14:00	07/17/18 14:49	1
Beryllium	ND		0.0010	0.00031	mg/L		07/13/18 14:00	07/17/18 14:49	1
Cadmium	ND		0.0010	0.00021	mg/L		07/13/18 14:00	07/17/18 14:49	1
Cobalt	**0.00082**	**J**	0.0010	0.00019	mg/L		07/13/18 14:00	07/17/18 14:49	1
Chromium	ND		0.0020	0.00098	mg/L		07/13/18 14:00	07/17/18 14:49	1
Molybdenum	**0.0029**	**J**	0.010	0.0011	mg/L		07/13/18 14:00	07/17/18 14:49	1
Lead	**0.0017**		0.0010	0.00045	mg/L		07/13/18 14:00	07/17/18 14:49	1
Selenium	**0.0078**		0.0050	0.00089	mg/L		07/13/18 14:00	07/17/18 14:49	1
Thallium	ND		0.0010	0.00020	mg/L		07/13/18 14:00	07/17/18 14:49	1
Lithium	**0.25**		0.0080	0.0017	mg/L		07/13/18 14:00	07/17/18 14:49	1
Calcium	**300**		1.0	0.58	mg/L		07/13/18 14:00	07/17/18 14:49	1

Client Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-111779-1

Client Sample ID: W-2
Date Collected: 07/10/18 13:40
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/13/18 14:00	07/17/18 14:54	1
Arsenic	ND		0.0050	0.00075	mg/L		07/13/18 14:00	07/17/18 14:54	1
Barium	**0.0049**	**J**	0.0050	0.0022	mg/L		07/13/18 14:00	07/17/18 14:54	1
Beryllium	ND		0.0010	0.00031	mg/L		07/13/18 14:00	07/17/18 14:54	1
Cadmium	ND		0.0010	0.00021	mg/L		07/13/18 14:00	07/17/18 14:54	1
Cobalt	**0.0011**		0.0010	0.00019	mg/L		07/13/18 14:00	07/17/18 14:54	1
Chromium	ND		0.0020	0.00098	mg/L		07/13/18 14:00	07/17/18 14:54	1
Molybdenum	**0.0028**	**J**	0.010	0.0011	mg/L		07/13/18 14:00	07/17/18 14:54	1
Lead	**0.0016**		0.0010	0.00045	mg/L		07/13/18 14:00	07/17/18 14:54	1
Selenium	**0.0029**	**J**	0.0050	0.00089	mg/L		07/13/18 14:00	07/17/18 14:54	1
Thallium	ND		0.0010	0.00020	mg/L		07/13/18 14:00	07/17/18 14:54	1
Lithium	**0.61**		0.0080	0.0017	mg/L		07/13/18 14:00	07/17/18 14:54	1
Calcium	**310**		1.0	0.58	mg/L		07/13/18 14:00	07/17/18 14:54	1

Client Sample ID: W-3
Date Collected: 07/10/18 12:25
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/13/18 14:00	07/17/18 14:58	1
Arsenic	ND		0.0050	0.00075	mg/L		07/13/18 14:00	07/17/18 14:58	1
Barium	**0.0064**		0.0050	0.0022	mg/L		07/13/18 14:00	07/17/18 14:58	1
Beryllium	ND		0.0010	0.00031	mg/L		07/13/18 14:00	07/17/18 14:58	1
Cadmium	**0.00032**	**J B**	0.0010	0.00021	mg/L		07/13/18 14:00	07/17/18 14:58	1
Cobalt	**0.0017**		0.0010	0.00019	mg/L		07/13/18 14:00	07/17/18 14:58	1
Chromium	ND		0.0020	0.00098	mg/L		07/13/18 14:00	07/17/18 14:58	1
Molybdenum	**0.0027**	**J**	0.010	0.0011	mg/L		07/13/18 14:00	07/17/18 14:58	1
Lead	**0.00083**	**J**	0.0010	0.00045	mg/L		07/13/18 14:00	07/17/18 14:58	1
Selenium	**0.016**		0.0050	0.00089	mg/L		07/13/18 14:00	07/17/18 14:58	1
Thallium	ND		0.0010	0.00020	mg/L		07/13/18 14:00	07/17/18 14:58	1
Lithium	**1.8**		0.0080	0.0017	mg/L		07/13/18 14:00	07/17/18 14:58	1
Calcium	**120**		1.0	0.58	mg/L		07/13/18 14:00	07/17/18 14:58	1

Client Sample ID: W-4
Date Collected: 07/10/18 15:00
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/13/18 14:00	07/17/18 15:03	1
Arsenic	ND		0.0050	0.00075	mg/L		07/13/18 14:00	07/17/18 15:03	1
Barium	**0.0087**		0.0050	0.0022	mg/L		07/13/18 14:00	07/17/18 15:03	1
Beryllium	ND		0.0010	0.00031	mg/L		07/13/18 14:00	07/17/18 15:03	1
Cadmium	**0.00024**	**J B**	0.0010	0.00021	mg/L		07/13/18 14:00	07/17/18 15:03	1
Cobalt	**0.0062**		0.0010	0.00019	mg/L		07/13/18 14:00	07/17/18 15:03	1
Chromium	ND		0.0020	0.00098	mg/L		07/13/18 14:00	07/17/18 15:03	1
Molybdenum	**0.0032**	**J**	0.010	0.0011	mg/L		07/13/18 14:00	07/17/18 15:03	1
Lead	ND		0.0010	0.00045	mg/L		07/13/18 14:00	07/17/18 15:03	1
Selenium	**0.0011**	**J**	0.0050	0.00089	mg/L		07/13/18 14:00	07/17/18 15:03	1
Thallium	ND		0.0010	0.00020	mg/L		07/13/18 14:00	07/17/18 15:03	1
Lithium	**0.91**		0.0080	0.0017	mg/L		07/13/18 14:00	07/17/18 15:03	1
Calcium	**78**		1.0	0.58	mg/L		07/13/18 14:00	07/17/18 15:03	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-2D **Lab Sample ID: 280-111779-5**
Date Collected: 07/10/18 13:40 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/13/18 14:00	07/17/18 15:07	1
Arsenic	ND		0.0050	0.00075	mg/L		07/13/18 14:00	07/17/18 15:07	1
Barium	**0.0055**		0.0050	0.0022	mg/L		07/13/18 14:00	07/17/18 15:07	1
Beryllium	ND		0.0010	0.00031	mg/L		07/13/18 14:00	07/17/18 15:07	1
Cadmium	ND		0.0010	0.00021	mg/L		07/13/18 14:00	07/17/18 15:07	1
Cobalt	**0.0012**		0.0010	0.00019	mg/L		07/13/18 14:00	07/17/18 15:07	1
Chromium	ND		0.0020	0.00098	mg/L		07/13/18 14:00	07/17/18 15:07	1
Molybdenum	**0.0033**	**J**	0.010	0.0011	mg/L		07/13/18 14:00	07/17/18 15:07	1
Lead	ND		0.0010	0.00045	mg/L		07/13/18 14:00	07/17/18 15:07	1
Selenium	**0.0030**	**J**	0.0050	0.00089	mg/L		07/13/18 14:00	07/17/18 15:07	1
Thallium	ND		0.0010	0.00020	mg/L		07/13/18 14:00	07/17/18 15:07	1
Lithium	**0.77**		0.0080	0.0017	mg/L		07/13/18 14:00	07/17/18 15:07	1
Calcium	**190**		1.0	0.58	mg/L		07/13/18 14:00	07/17/18 15:07	1

Client Sample ID: W-3EB **Lab Sample ID: 280-111779-6**
Date Collected: 07/10/18 12:45 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/13/18 14:00	07/17/18 15:12	1
Arsenic	ND		0.0050	0.00075	mg/L		07/13/18 14:00	07/17/18 15:12	1
Barium	ND		0.0050	0.0022	mg/L		07/13/18 14:00	07/17/18 15:12	1
Beryllium	ND		0.0010	0.00031	mg/L		07/13/18 14:00	07/17/18 15:12	1
Cadmium	ND		0.0010	0.00021	mg/L		07/13/18 14:00	07/17/18 15:12	1
Cobalt	ND		0.0010	0.00019	mg/L		07/13/18 14:00	07/17/18 15:12	1
Chromium	ND		0.0020	0.00098	mg/L		07/13/18 14:00	07/17/18 15:12	1
Molybdenum	ND		0.010	0.0011	mg/L		07/13/18 14:00	07/17/18 15:12	1
Lead	ND		0.0010	0.00045	mg/L		07/13/18 14:00	07/17/18 15:12	1
Selenium	ND		0.0050	0.00089	mg/L		07/13/18 14:00	07/17/18 15:12	1
Thallium	ND		0.0010	0.00020	mg/L		07/13/18 14:00	07/17/18 15:12	1
Lithium	**0.0017**	**J**	0.0080	0.0017	mg/L		07/13/18 14:00	07/17/18 15:12	1
Calcium	ND		1.0	0.58	mg/L		07/13/18 14:00	07/17/18 15:12	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-1 **Lab Sample ID: 280-111779-1**
Date Collected: 07/10/18 16:00 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/13/18 14:00	07/16/18 17:02	1

Client Sample ID: W-2 **Lab Sample ID: 280-111779-2**
Date Collected: 07/10/18 13:40 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/13/18 14:00	07/16/18 17:04	1

Client: HDR Inc TestAmerica Job ID: 280-111779-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-3 **Lab Sample ID: 280-111779-3**
Date Collected: 07/10/18 12:25 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/13/18 14:00	07/16/18 17:06	1

Client Sample ID: W-4 **Lab Sample ID: 280-111779-4**
Date Collected: 07/10/18 15:00 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/13/18 14:00	07/16/18 17:08	1

Client Sample ID: W-2D **Lab Sample ID: 280-111779-5**
Date Collected: 07/10/18 13:40 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/13/18 14:00	07/16/18 17:10	1

Client Sample ID: W-3EB **Lab Sample ID: 280-111779-6**
Date Collected: 07/10/18 12:45 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/13/18 14:00	07/16/18 17:12	1

General Chemistry

Client Sample ID: W-1 **Lab Sample ID: 280-111779-1**
Date Collected: 07/10/18 16:00 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.5**	**HF**	0.1	0.1	SU			07/14/18 10:20	1
Temperature	**19.2**	**HF**	1.0	1.0	Degrees C			07/14/18 10:20	1
Chloride	**42**	**B**	6.0	0.51	mg/L			07/23/18 23:23	2
Fluoride	**0.36**	**J**	1.0	0.12	mg/L			07/23/18 23:23	2
Sulfate	**2700**	**B**	100	4.6	mg/L			07/23/18 23:40	20
Total Dissolved Solids (TDS)	**4500**		40	19	mg/L			07/11/18 10:37	1
Total Suspended Solids	**2.0**	**J**	4.0	1.1	mg/L			07/12/18 14:06	1

Client Sample ID: W-2 **Lab Sample ID: 280-111779-2**
Date Collected: 07/10/18 13:40 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.6**	**HF**	0.1	0.1	SU			07/14/18 10:24	1
Temperature	**19.5**	**HF**	1.0	1.0	Degrees C			07/14/18 10:24	1
Chloride	**83**	**B**	6.0	0.51	mg/L			07/23/18 23:58	2
Fluoride	**0.56**	**J**	1.0	0.12	mg/L			07/23/18 23:58	2
Sulfate	**4400**	**B**	250	12	mg/L			07/24/18 00:15	50
Total Dissolved Solids (TDS)	**6900**		100	47	mg/L			07/11/18 10:52	1
Total Suspended Solids	**1.6**	**J**	4.0	1.1	mg/L			07/12/18 14:06	1

Client Sample ID: W-3 **Lab Sample ID: 280-111779-3**
Date Collected: 07/10/18 12:25 **Matrix: Water**
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.4**	**HF**	0.1	0.1	SU			07/14/18 10:28	1

General Chemistry (Continued)

Client Sample ID: W-3
Lab Sample ID: 280-111779-3
Date Collected: 07/10/18 12:25
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	19.4	HF	1.0	1.0	Degrees C			07/14/18 10:28	1
Chloride	190	B	15	1.3	mg/L			07/24/18 00:33	5
Fluoride	0.81	J	2.5	0.30	mg/L			07/24/18 00:33	5
Sulfate	7800	B	500	23	mg/L			07/24/18 00:50	100
Total Dissolved Solids (TDS)	12000		100	47	mg/L			07/11/18 10:52	1
Total Suspended Solids	3.2	J	4.0	1.1	mg/L			07/12/18 14:06	1

Client Sample ID: W-4
Lab Sample ID: 280-111779-4
Date Collected: 07/10/18 15:00
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU			07/14/18 10:32	1
Temperature	19.2	HF	1.0	1.0	Degrees C			07/14/18 10:32	1
Chloride	380	B	15	1.3	mg/L			07/24/18 01:08	5
Fluoride	0.88	J	2.5	0.30	mg/L			07/24/18 01:08	5
Sulfate	13000	B	1000	46	mg/L			07/24/18 01:25	200
Total Dissolved Solids (TDS)	20000		200	94	mg/L			07/11/18 10:52	1
Total Suspended Solids	5.6		4.0	1.1	mg/L			07/12/18 14:06	1

Client Sample ID: W-2D
Lab Sample ID: 280-111779-5
Date Collected: 07/10/18 13:40
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			07/14/18 10:36	1
Temperature	19.0	HF	1.0	1.0	Degrees C			07/14/18 10:36	1
Chloride	82	B	6.0	0.51	mg/L			07/24/18 02:35	2
Fluoride	0.55	J	1.0	0.12	mg/L			07/24/18 02:35	2
Sulfate	4500	B	250	12	mg/L			07/24/18 02:53	50
Total Dissolved Solids (TDS)	7100		100	47	mg/L			07/11/18 10:52	1
Total Suspended Solids	2.0	J	4.0	1.1	mg/L			07/12/18 14:06	1

Client Sample ID: W-3EB
Lab Sample ID: 280-111779-6
Date Collected: 07/10/18 12:45
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.4	HF	0.1	0.1	SU			07/18/18 14:01	1
Temperature	20.2	HF	1.0	1.0	Degrees C			07/18/18 14:01	1
Chloride	0.46	J B	3.0	0.25	mg/L			07/24/18 01:43	1
Fluoride	ND		0.50	0.060	mg/L			07/24/18 01:43	1
Sulfate	0.56	J B	5.0	0.23	mg/L			07/24/18 01:43	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			07/11/18 10:52	1
Total Suspended Solids	ND		4.0	1.1	mg/L			07/12/18 14:06	1

Client Sample Results

Client: HDR Inc
TestAmerica Job ID: 280-111779-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1
Lab Sample ID: 280-111779-1
Date Collected: 07/10/18 16:00
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.358		0.128	0.132	1.00	0.127	pCi/L	07/13/18 13:31	08/08/18 05:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.6*		*40 - 110*	*07/13/18 13:31*	*08/08/18 05:28*	*1*

Client Sample ID: W-2
Lab Sample ID: 280-111779-2
Date Collected: 07/10/18 13:40
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.468		0.135	0.141	1.00	0.106	pCi/L	07/13/18 13:31	08/08/18 05:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*07/13/18 13:31*	*08/08/18 05:28*	*1*

Client Sample ID: W-3
Lab Sample ID: 280-111779-3
Date Collected: 07/10/18 12:25
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.173		0.0984	0.0996	1.00	0.129	pCi/L	07/13/18 13:31	08/08/18 05:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*110*		*40 - 110*	*07/13/18 13:31*	*08/08/18 05:28*	*1*

Client Sample ID: W-4
Lab Sample ID: 280-111779-4
Date Collected: 07/10/18 15:00
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.285		0.111	0.114	1.00	0.108	pCi/L	07/13/18 13:31	08/08/18 05:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*07/13/18 13:31*	*08/08/18 05:28*	*1*

Client Sample ID: W-2D
Lab Sample ID: 280-111779-5
Date Collected: 07/10/18 13:40
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.256		0.109	0.112	1.00	0.120	pCi/L	07/13/18 13:31	08/08/18 05:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*104*		*40 - 110*	*07/13/18 13:31*	*08/08/18 05:28*	*1*

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-3EB
Lab Sample ID: 280-111779-6
Date Collected: 07/10/18 12:45
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.156		0.0883	0.0894	1.00	0.107	pCi/L	07/13/18 13:31	08/08/18 05:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*07/13/18 13:31*	*08/08/18 05:28*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1
Lab Sample ID: 280-111779-1
Date Collected: 07/10/18 16:00
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.561		0.339	0.343	1.00	0.514	pCi/L	07/13/18 14:09	07/27/18 09:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.6*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*
Y Carrier	*83.7*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*

Client Sample ID: W-2
Lab Sample ID: 280-111779-2
Date Collected: 07/10/18 13:40
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.674		0.354	0.359	1.00	0.528	pCi/L	07/13/18 14:09	07/27/18 09:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*
Y Carrier	*83.7*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*

Client Sample ID: W-3
Lab Sample ID: 280-111779-3
Date Collected: 07/10/18 12:25
Matrix: Water
Date Received: 07/11/18 08:41

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.703		0.317	0.324	1.00	0.456	pCi/L	07/13/18 14:09	07/27/18 09:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*110*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*
Y Carrier	*86.4*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-4
Date Collected: 07/10/18 15:00
Date Received: 07/11/18 08:41
Lab Sample ID: 280-111779-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.07**		0.381	0.393	1.00	0.512	pCi/L	07/13/18 14:09	07/27/18 09:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*
Y Carrier	*79.6*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*

Client Sample ID: W-2D
Date Collected: 07/10/18 13:40
Date Received: 07/11/18 08:41
Lab Sample ID: 280-111779-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.703**		0.355	0.361	1.00	0.521	pCi/L	07/13/18 14:09	07/27/18 09:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*104*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*
Y Carrier	*78.5*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*

Client Sample ID: W-3EB
Date Collected: 07/10/18 12:45
Date Received: 07/11/18 08:41
Lab Sample ID: 280-111779-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.286	U	0.343	0.344	1.00	0.567	pCi/L	07/13/18 14:09	07/27/18 09:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*
Y Carrier	*77.8*		*40 - 110*	*07/13/18 14:09*	*07/27/18 09:19*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-1
Date Collected: 07/10/18 16:00
Date Received: 07/11/18 08:41
Lab Sample ID: 280-111779-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.919**		0.362	0.368	5.00	0.514	pCi/L		08/16/18 13:48	1

Client Sample ID: W-2
Date Collected: 07/10/18 13:40
Date Received: 07/11/18 08:41
Lab Sample ID: 280-111779-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.14**		0.379	0.386	5.00	0.528	pCi/L		08/16/18 13:48	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-3
Date Collected: 07/10/18 12:25
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.876**		0.332	0.339	5.00	0.456	pCi/L		08/16/18 13:48	1

Client Sample ID: W-4
Date Collected: 07/10/18 15:00
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.36**		0.397	0.409	5.00	0.512	pCi/L		08/16/18 13:48	1

Client Sample ID: W-2D
Date Collected: 07/10/18 13:40
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.959**		0.371	0.378	5.00	0.521	pCi/L		08/16/18 13:48	1

Client Sample ID: W-3EB
Date Collected: 07/10/18 12:45
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.442	U	0.354	0.355	5.00	0.567	pCi/L		08/16/18 13:48	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-340327/1-A
Matrix: Water
Analysis Batch: 340617

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 340327

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		08/10/18 14:00	08/13/18 11:03	1

Lab Sample ID: LCS 240-340327/2-A
Matrix: Water
Analysis Batch: 340617

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 340327

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron			1.00	1.08		mg/L		108	80 - 120		

Lab Sample ID: 280-111779-3 MS
Matrix: Water
Analysis Batch: 340617

Client Sample ID: W-3
Prep Type: Total Recoverable
Prep Batch: 340327

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Boron	0.89		1.00	1.95		mg/L		106	75 - 125		

Lab Sample ID: 280-111779-3 MSD
Matrix: Water
Analysis Batch: 340617

Client Sample ID: W-3
Prep Type: Total Recoverable
Prep Batch: 340327

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.89		1.00	1.86		mg/L		97	75 - 125	5	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-336095/1-A
Matrix: Water
Analysis Batch: 337019

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 336095

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/13/18 14:00	07/18/18 14:26	1
Arsenic	ND		0.0050	0.00075	mg/L		07/13/18 14:00	07/18/18 14:26	1
Barium	ND		0.0050	0.0022	mg/L		07/13/18 14:00	07/18/18 14:26	1
Beryllium	0.000769	J	0.0010	0.00031	mg/L		07/13/18 14:00	07/18/18 14:26	1
Cadmium	0.000220	J	0.0010	0.00021	mg/L		07/13/18 14:00	07/18/18 14:26	1
Cobalt	ND		0.0010	0.00019	mg/L		07/13/18 14:00	07/18/18 14:26	1
Chromium	ND		0.0020	0.00098	mg/L		07/13/18 14:00	07/18/18 14:26	1
Molybdenum	ND		0.010	0.0011	mg/L		07/13/18 14:00	07/18/18 14:26	1
Lead	ND		0.0010	0.00045	mg/L		07/13/18 14:00	07/18/18 14:26	1
Selenium	ND		0.0050	0.00089	mg/L		07/13/18 14:00	07/18/18 14:26	1
Thallium	ND		0.0010	0.00020	mg/L		07/13/18 14:00	07/18/18 14:26	1
Lithium	ND		0.0080	0.0017	mg/L		07/13/18 14:00	07/18/18 14:26	1
Calcium	ND		1.0	0.58	mg/L		07/13/18 14:00	07/18/18 14:26	1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 240-336095/2-A
Matrix: Water
Analysis Batch: 336877

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 336095

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0913		mg/L		91	80 - 120
Arsenic	1.00	1.00		mg/L		100	80 - 120
Barium	1.00	1.08		mg/L		108	80 - 120
Beryllium	1.00	0.982		mg/L		98	80 - 120
Cadmium	1.00	1.07		mg/L		107	80 - 120
Cobalt	1.00	1.09		mg/L		109	80 - 120
Chromium	1.00	1.04		mg/L		104	80 - 120
Molybdenum	0.100	0.0939		mg/L		94	80 - 120
Lead	1.00	0.967		mg/L		97	80 - 120
Selenium	1.00	1.02		mg/L		102	80 - 120
Thallium	0.250	0.243		mg/L		97	80 - 120
Lithium	0.100	0.0974		mg/L		97	80 - 120
Calcium	10.0	10.1		mg/L		101	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-336096/1-A
Matrix: Water
Analysis Batch: 336579

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 336096

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/13/18 14:00	07/16/18 16:34	1

Lab Sample ID: LCS 240-336096/2-A
Matrix: Water
Analysis Batch: 336579

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 336096

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.14		ug/L		103	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-422533/4
Matrix: Water
Analysis Batch: 422533

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 280-422755/4
Matrix: Water
Analysis Batch: 422755

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-423188/6
Matrix: Water
Analysis Batch: 423188

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.461	J	3.0	0.25	mg/L			07/23/18 15:06	1
Fluoride	ND		0.50	0.060	mg/L			07/23/18 15:06	1
Sulfate	0.532	J	5.0	0.23	mg/L			07/23/18 15:06	1

Lab Sample ID: LCS 280-423188/4
Matrix: Water
Analysis Batch: 423188

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	100		mg/L		100	90 - 110
Fluoride	5.00	5.08		mg/L		102	90 - 110
Sulfate	100	100		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-423188/5
Matrix: Water
Analysis Batch: 423188

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	100		mg/L		100	90 - 110	0	10
Fluoride	5.00	5.00		mg/L		100	90 - 110	2	10
Sulfate	100	100		mg/L		100	90 - 110	0	10

Lab Sample ID: MRL 280-423188/3
Matrix: Water
Analysis Batch: 423188

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.29	J	mg/L		91	50 - 150
Fluoride	0.200	0.236	J	mg/L		118	50 - 150
Sulfate	2.50	2.44	J	mg/L		98	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-421798/1
Matrix: Water
Analysis Batch: 421798

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			07/11/18 10:37	1

Lab Sample ID: LCS 280-421798/2
Matrix: Water
Analysis Batch: 421798

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	498		mg/L		100	86 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-422019/1
Matrix: Water
Analysis Batch: 422019
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			07/12/18 14:06	1

Lab Sample ID: LCS 280-422019/2
Matrix: Water
Analysis Batch: 422019
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	92.4		mg/L		92	86 - 114

Lab Sample ID: LCSD 280-422019/3
Matrix: Water
Analysis Batch: 422019
Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids	100	108		mg/L		108	86 - 114	16	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-375564/15-A
Matrix: Water
Analysis Batch: 380986
Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 375564

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1295		0.0706	0.0716	1.00	0.0869	pCi/L	07/13/18 13:31	08/08/18 05:29	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*07/13/18 13:31*	*08/08/18 05:29*	*1*

Lab Sample ID: LCS 160-375564/1-A
Matrix: Water
Analysis Batch: 380986
Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 375564

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.46		1.09	1.00	0.0719	pCi/L	92	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*92.0*		*40 - 110*

Lab Sample ID: LCSD 160-375564/2-A
Matrix: Water
Analysis Batch: 380986
Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 375564

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	10.60		1.10	1.00	0.101	pCi/L	93	68 - 137	0.07	1

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCSD 160-375564/2-A	**Client Sample ID: Lab Control Sample Dup**
Matrix: Water	**Prep Type: Total/NA**
Analysis Batch: 380986	**Prep Batch: 375564**

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	99.7		40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-375578/15-A	**Client Sample ID: Method Blank**
Matrix: Water	**Prep Type: Total/NA**
Analysis Batch: 378362	**Prep Batch: 375578**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.3845	U	0.274	0.276	1.00	0.430	pCi/L	07/13/18 14:09	07/27/18 09:20	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	07/13/18 14:09	07/27/18 09:20	1
Y Carrier	83.4		40 - 110	07/13/18 14:09	07/27/18 09:20	1

Lab Sample ID: LCS 160-375578/1-A	**Client Sample ID: Lab Control Sample**
Matrix: Water	**Prep Type: Total/NA**
Analysis Batch: 378362	**Prep Batch: 375578**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	11.2	11.46		1.31	1.00	0.513	pCi/L	102	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	92.0		40 - 110
Y Carrier	84.9		40 - 110

Lab Sample ID: LCSD 160-375578/2-A	**Client Sample ID: Lab Control Sample Dup**
Matrix: Water	**Prep Type: Total/NA**
Analysis Batch: 378362	**Prep Batch: 375578**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	11.2	10.96		1.25	1.00	0.404	pCi/L	98	56 - 140	0.19	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	99.7		40 - 110
Y Carrier	81.1		40 - 110

Metals

Prep Batch: 336095

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total Recoverable	Water	3005A	
280-111779-2	W-2	Total Recoverable	Water	3005A	
280-111779-3	W-3	Total Recoverable	Water	3005A	
280-111779-4	W-4	Total Recoverable	Water	3005A	
280-111779-5	W-2D	Total Recoverable	Water	3005A	
280-111779-6	W-3EB	Total Recoverable	Water	3005A	
MB 240-336095/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-336095/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 336096

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total/NA	Water	7470A	
280-111779-2	W-2	Total/NA	Water	7470A	
280-111779-3	W-3	Total/NA	Water	7470A	
280-111779-4	W-4	Total/NA	Water	7470A	
280-111779-5	W-2D	Total/NA	Water	7470A	
280-111779-6	W-3EB	Total/NA	Water	7470A	
MB 240-336096/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-336096/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 336579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total/NA	Water	7470A	336096
280-111779-2	W-2	Total/NA	Water	7470A	336096
280-111779-3	W-3	Total/NA	Water	7470A	336096
280-111779-4	W-4	Total/NA	Water	7470A	336096
280-111779-5	W-2D	Total/NA	Water	7470A	336096
280-111779-6	W-3EB	Total/NA	Water	7470A	336096
MB 240-336096/1-A	Method Blank	Total/NA	Water	7470A	336096
LCS 240-336096/2-A	Lab Control Sample	Total/NA	Water	7470A	336096

Analysis Batch: 336877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total Recoverable	Water	6020A	336095
280-111779-2	W-2	Total Recoverable	Water	6020A	336095
280-111779-3	W-3	Total Recoverable	Water	6020A	336095
280-111779-4	W-4	Total Recoverable	Water	6020A	336095
280-111779-5	W-2D	Total Recoverable	Water	6020A	336095
280-111779-6	W-3EB	Total Recoverable	Water	6020A	336095
LCS 240-336095/2-A	Lab Control Sample	Total Recoverable	Water	6020A	336095

Analysis Batch: 337019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-336095/1-A	Method Blank	Total Recoverable	Water	6020A	336095

Prep Batch: 340327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total Recoverable	Water	3005A	
280-111779-2	W-2	Total Recoverable	Water	3005A	
280-111779-3	W-3	Total Recoverable	Water	3005A	
280-111779-4	W-4	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 340327 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-5	W-2D	Total Recoverable	Water	3005A	
280-111779-6	W-3EB	Total Recoverable	Water	3005A	
MB 240-340327/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-340327/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-111779-3 MS	W-3	Total Recoverable	Water	3005A	
280-111779-3 MSD	W-3	Total Recoverable	Water	3005A	

Analysis Batch: 340617

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total Recoverable	Water	6010C	340327
280-111779-2	W-2	Total Recoverable	Water	6010C	340327
280-111779-3	W-3	Total Recoverable	Water	6010C	340327
280-111779-4	W-4	Total Recoverable	Water	6010C	340327
280-111779-5	W-2D	Total Recoverable	Water	6010C	340327
280-111779-6	W-3EB	Total Recoverable	Water	6010C	340327
MB 240-340327/1-A	Method Blank	Total Recoverable	Water	6010C	340327
LCS 240-340327/2-A	Lab Control Sample	Total Recoverable	Water	6010C	340327
280-111779-3 MS	W-3	Total Recoverable	Water	6010C	340327
280-111779-3 MSD	W-3	Total Recoverable	Water	6010C	340327

General Chemistry

Analysis Batch: 421798

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total/NA	Water	SM 2540C	
280-111779-2	W-2	Total/NA	Water	SM 2540C	
280-111779-3	W-3	Total/NA	Water	SM 2540C	
280-111779-4	W-4	Total/NA	Water	SM 2540C	
280-111779-5	W-2D	Total/NA	Water	SM 2540C	
280-111779-6	W-3EB	Total/NA	Water	SM 2540C	
MB 280-421798/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-421798/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 422019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total/NA	Water	SM 2540D	
280-111779-2	W-2	Total/NA	Water	SM 2540D	
280-111779-3	W-3	Total/NA	Water	SM 2540D	
280-111779-4	W-4	Total/NA	Water	SM 2540D	
280-111779-5	W-2D	Total/NA	Water	SM 2540D	
280-111779-6	W-3EB	Total/NA	Water	SM 2540D	
MB 280-422019/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-422019/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-422019/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	

Analysis Batch: 422533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total/NA	Water	9040B	
280-111779-2	W-2	Total/NA	Water	9040B	
280-111779-3	W-3	Total/NA	Water	9040B	

General Chemistry (Continued)

Analysis Batch: 422533 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-4	W-4	Total/NA	Water	9040B	
280-111779-5	W-2D	Total/NA	Water	9040B	
LCS 280-422533/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 422755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-6	W-3EB	Total/NA	Water	9040B	
LCS 280-422755/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 423188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total/NA	Water	9056A	
280-111779-1	W-1	Total/NA	Water	9056A	
280-111779-2	W-2	Total/NA	Water	9056A	
280-111779-2	W-2	Total/NA	Water	9056A	
280-111779-3	W-3	Total/NA	Water	9056A	
280-111779-3	W-3	Total/NA	Water	9056A	
280-111779-4	W-4	Total/NA	Water	9056A	
280-111779-4	W-4	Total/NA	Water	9056A	
280-111779-5	W-2D	Total/NA	Water	9056A	
280-111779-5	W-2D	Total/NA	Water	9056A	
280-111779-6	W-3EB	Total/NA	Water	9056A	
MB 280-423188/6	Method Blank	Total/NA	Water	9056A	
LCS 280-423188/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-423188/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-423188/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 375564

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total/NA	Water	PrecSep-21	
280-111779-2	W-2	Total/NA	Water	PrecSep-21	
280-111779-3	W-3	Total/NA	Water	PrecSep-21	
280-111779-4	W-4	Total/NA	Water	PrecSep-21	
280-111779-5	W-2D	Total/NA	Water	PrecSep-21	
280-111779-6	W-3EB	Total/NA	Water	PrecSep-21	
MB 160-375564/15-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-375564/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-375564/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 375578

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-111779-1	W-1	Total/NA	Water	PrecSep_0	
280-111779-2	W-2	Total/NA	Water	PrecSep_0	
280-111779-3	W-3	Total/NA	Water	PrecSep_0	
280-111779-4	W-4	Total/NA	Water	PrecSep_0	
280-111779-5	W-2D	Total/NA	Water	PrecSep_0	
280-111779-6	W-3EB	Total/NA	Water	PrecSep_0	
MB 160-375578/15-A	Method Blank	Total/NA	Water	PrecSep_0	

Rad (Continued)

Prep Batch: 375578 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 160-375578/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-375578/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Client Sample ID: W-1
Date Collected: 07/10/18 16:00
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	340327	08/10/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			340617	08/13/18 11:44	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	336095	07/13/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			336877	07/17/18 14:49	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336096	07/13/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336579	07/16/18 17:02	AJC	TAL CAN
Total/NA	Analysis	9040B		1			422533	07/14/18 10:20	LPL	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	423188	07/23/18 23:23	CCJ	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	423188	07/23/18 23:40	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	421798	07/11/18 10:37	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	422019	07/12/18 14:06	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.34 mL	1.0 g	375564	07/13/18 13:31	JLC	TAL SL
Total/NA	Analysis	9315		1			380986	08/08/18 05:28	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.34 mL	1.0 g	375578	07/13/18 14:09	JLC	TAL SL
Total/NA	Analysis	9320		1			378362	07/27/18 09:19	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382942	08/16/18 13:48	RTM	TAL SL

Client Sample ID: W-2
Date Collected: 07/10/18 13:40
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	340327	08/10/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			340617	08/13/18 11:49	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	336095	07/13/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			336877	07/17/18 14:54	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336096	07/13/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336579	07/16/18 17:04	AJC	TAL CAN
Total/NA	Analysis	9040B		1			422533	07/14/18 10:24	LPL	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	423188	07/23/18 23:58	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	423188	07/24/18 00:15	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	421798	07/11/18 10:52	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	422019	07/12/18 14:06	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.38 mL	1.0 g	375564	07/13/18 13:31	JLC	TAL SL
Total/NA	Analysis	9315		1			380986	08/08/18 05:28	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.38 mL	1.0 g	375578	07/13/18 14:09	JLC	TAL SL
Total/NA	Analysis	9320		1			378362	07/27/18 09:19	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382942	08/16/18 13:48	RTM	TAL SL

Lab Chronicle

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-111779-1

Client Sample ID: W-3
Date Collected: 07/10/18 12:25
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	340327	08/10/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			340617	08/13/18 11:12	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	336095	07/13/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			336877	07/17/18 14:58	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336096	07/13/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336579	07/16/18 17:06	AJC	TAL CAN
Total/NA	Analysis	9040B		1			422533	07/14/18 10:28	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	423188	07/24/18 00:33	CCJ	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	423188	07/24/18 00:50	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	421798	07/11/18 10:52	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	422019	07/12/18 14:06	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			749.95 mL	1.0 g	375564	07/13/18 13:31	JLC	TAL SL
Total/NA	Analysis	9315		1			380986	08/08/18 05:28	RTM	TAL SL
Total/NA	Prep	PrecSep_0			749.95 mL	1.0 g	375578	07/13/18 14:09	JLC	TAL SL
Total/NA	Analysis	9320		1			378362	07/27/18 09:19	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382942	08/16/18 13:48	RTM	TAL SL

Client Sample ID: W-4
Date Collected: 07/10/18 15:00
Date Received: 07/11/18 08:41

Lab Sample ID: 280-111779-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	340327	08/10/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			340617	08/13/18 11:54	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	336095	07/13/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			336877	07/17/18 15:03	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336096	07/13/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336579	07/16/18 17:08	AJC	TAL CAN
Total/NA	Analysis	9040B		1			422533	07/14/18 10:32	LPL	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	423188	07/24/18 01:08	CCJ	TAL DEN
Total/NA	Analysis	9056A		200	5 mL	5 mL	423188	07/24/18 01:25	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	5 mL	100 mL	421798	07/11/18 10:52	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	422019	07/12/18 14:06	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.31 mL	1.0 g	375564	07/13/18 13:31	JLC	TAL SL
Total/NA	Analysis	9315		1			380986	08/08/18 05:28	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.31 mL	1.0 g	375578	07/13/18 14:09	JLC	TAL SL
Total/NA	Analysis	9320		1			378362	07/27/18 09:19	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382942	08/16/18 13:48	RTM	TAL SL

Lab Chronicle

Client: HDR Inc	TestAmerica Job ID: 280-111779-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-2D — Lab Sample ID: 280-111779-5

Date Collected: 07/10/18 13:40 — **Matrix: Water**
Date Received: 07/11/18 08:41

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	340327	08/10/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			340617	08/13/18 11:59	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	336095	07/13/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			336877	07/17/18 15:07	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336096	07/13/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336579	07/16/18 17:10	AJC	TAL CAN
Total/NA	Analysis	9040B		1			422533	07/14/18 10:36	LPL	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	423188	07/24/18 02:35	CCJ	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	423188	07/24/18 02:53	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	421798	07/11/18 10:52	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	422019	07/12/18 14:06	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			749.89 mL	1.0 g	375564	07/13/18 13:31	JLC	TAL SL
Total/NA	Analysis	9315		1			380986	08/08/18 05:28	RTM	TAL SL
Total/NA	Prep	PrecSep_0			749.89 mL	1.0 g	375578	07/13/18 14:09	JLC	TAL SL
Total/NA	Analysis	9320		1			378362	07/27/18 09:19	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382942	08/16/18 13:48	RTM	TAL SL

Client Sample ID: W-3EB — Lab Sample ID: 280-111779-6

Date Collected: 07/10/18 12:45 — **Matrix: Water**
Date Received: 07/11/18 08:41

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	340327	08/10/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			340617	08/13/18 12:04	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	336095	07/13/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			336877	07/17/18 15:12	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336096	07/13/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336579	07/16/18 17:12	AJC	TAL CAN
Total/NA	Analysis	9040B		1			422755	07/18/18 14:01	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	423188	07/24/18 01:43	CCJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	421798	07/11/18 10:52	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	422019	07/12/18 14:06	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.19 mL	1.0 g	375564	07/13/18 13:31	JLC	TAL SL
Total/NA	Analysis	9315		1			380986	08/08/18 05:28	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.19 mL	1.0 g	375578	07/13/18 14:09	JLC	TAL SL
Total/NA	Analysis	9320		1			378362	07/27/18 09:19	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382942	08/16/18 13:48	RTM	TAL SL

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: HDR Inc TestAmerica Job ID: 280-111779-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-18 *
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: HDR Inc — TestAmerica Job ID: 280-111779-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18 *
West Virginia DEP	State Program	3	381	08-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tara Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No:
Client Contact: Anna Lundin	Phone: 720 933 7496	E-Mail: stephanie.rothmeyer@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc		**Analysis Requested**		Job #:
Address: 9781 S. Meridian Blve Suite 400	**Due Date Requested:**			**Preservation Codes:**
City: Englewood	**TAT Requested (days):** Standard			
State, Zip: CO, 80112				
Phone: 720-633-2380(Tel)	PO #: DEN-001			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Colorado	SSOW#:			**Other:**

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6020A, 7470A	pH - 9040B, Anions - 9056A_28D	2540D - Total Suspended Solids	9315_Ra226, 9320_Ra228	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	D	N	N	D		
W-1	7-10.18	1600	G	Water		N	✓	✓	✓	✓	✓		
W-2	7-10-18	1340	G	Water		N	✓	✓	✓	✓	✓		
W-3	7-10-18	1225	G	Water		N	✓	✓	✓	✓	✓		
W-4	7-10-18	1500	G	Water		N	✓	✓	✓	✓	✓		
~~Field Duplicate~~ W-2D	7-10-18	1340	G	Water		N	✓	✓	✓	✓	✓		
~~Equipment Blank~~ W-3EB	7-10.18	1245	G	Water		N	✓	✓	✓	✓	✓		

280-111779 Chain of Custody

Possible Hazard Identification
☒ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☒ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tara Kent	Date: 7-11-18	Time: 824	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			[signature]	7-11-18 0824	TA-Den

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.6°L, LF 0.0, IR 8 @ 4.6, LF 0.0, IR 8 [initials] 7/11/18

Page 35 of 43

8/20/2018

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-446428.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-111779-1
Address: 13715 Rider Trail North,	Due Date Requested: 8/6/2018	**Analysis Requested**		**Preservation Codes:**
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Total Number of containers	Special Instructions/Note:
				Preservation Code:						
W-1 (280-111779-1)	7/10/18	16:00 Mountain		Water			X	X	1	
W-2 (280-111779-2)	7/10/18	13:40 Mountain		Water			X	X	1	
W-3 (280-111779-3)	7/10/18	12:25 Mountain		Water			X	X	1	
W-4 (280-111779-4)	7/10/18	15:00 Mountain		Water			X	X	1	
W-2D (280-111779-5)	7/10/18	13:40 Mountain		Water			X	X	1	
W-3EB (280-111779-6)	7/10/18	12:45 Mountain		Water			X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ________ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Patrick May	Date/Time: 7-11-18 1415	Company: Test America	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-446427.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-111779-1
Address: 4101 Shuffel Street NW, ,	Due Date Requested: 8/2/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 12 Total Metals (w/collision cell)	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
W-1 (280-111779-1)	7/10/18	16:00 Mountain		Water			X	X	1	Use Collision Cell
W-2 (280-111779-2)	7/10/18	13:40 Mountain		Water			X	X	1	Use Collision Cell
W-3 (280-111779-3)	7/10/18	12:25 Mountain		Water			X	X	1	Use Collision Cell
W-4 (280-111779-4)	7/10/18	15:00 Mountain		Water			X	X	1	Use Collision Cell
W-2D (280-111779-5)	7/10/18	13:40 Mountain		Water			X	X	1	Use Collision Cell
W-3EB (280-111779-6)	7/10/18	12:45 Mountain		Water			X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return To Client *Disposal By Lab* *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Laura Castro	Date/Time: ~~7-11-18~~ 7-11-18 1505	Company THL	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-446428.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-111779-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 8/6/2018	**Analysis Requested**		**Preservation Codes:**
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			Other:

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
W-1 (280-111779-1)	7/10/18	16:00 Mountain		Water			X	X	1	
W-2 (280-111779-2)	7/10/18	13:40 Mountain		Water			X	X	1	
W-3 (280-111779-3)	7/10/18	12:25 Mountain		Water			X	X	1	
W-4 (280-111779-4)	7/10/18	15:00 Mountain		Water			X	X	1	
W-2D (280-111779-5)	7/10/18	13:40 Mountain		Water			X	X	1	
W-3EB (280-111779-6)	7/10/18	12:45 Mountain		Water			X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For ________ Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Patrick May	7-11-18 1415	Test America	Bryan Darman	7-12-18 09:30	TA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-446427.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-111779-1
Address: 4101 Shuffel Street NW, ,	Due Date Requested: 8/2/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

SS2

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 12 Total Metals (w/collision cell)	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
W-1 (280-111779-1)	7/10/18	16:00 Mountain		Water			X	X	1	Use Collision Cell
W-2 (280-111779-2)	7/10/18	13:40 Mountain		Water			X	X	1	Use Collision Cell
W-3 (280-111779-3)	7/10/18	12:25 Mountain		Water			X	X	1	Use Collision Cell
W-4 (280-111779-4)	7/10/18	15:00 Mountain		Water			X	X	1	Use Collision Cell
W-2D (280-111779-5)	7/10/18	13:40 Mountain		Water			X	X	1	Use Collision Cell
W-3EB (280-111779-6)	7/10/18	12:45 Mountain		Water			X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4
Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Laura Castro	7-11-18 1505	TAL	S. Bluts	7/12/18 09:50	TAD
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :**
Canton Facility

Client TAD Site Name / Cooler unpacked by: GilBrown

Cooler Received on 7/12/18 Opened on 7/12/18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF +0 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #36 (CF -0.3°C) Observed Cooler Temp. ___ °C Corrected Cooler Temp. ___ °C
   ~~IR GUN # 627 (CF -1.3°C) Observed Cooler Temp. ___ °C Corrected Cooler Temp. ___ °C~~

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# **HC740840**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ___ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ___ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ______ Date ______ by ______ via Verbal Voice Mail Other

Concerning ______

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ______ were received after the recommended holding time had expired.
Sample(s) ______ were received in a broken container.
Sample(s) ______ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ______ were further preserved in the laboratory.
Time preserved: ______ Preservative(s) added/Lot number(s): ______.

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-111779-1

Login Number: 111779
List Number: 1
Creator: Lujan, Jacob P

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	Refer to Job Narrative for details.
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Refer to Job Narrative for details.
Cooler Temperature is acceptable.	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-111779-1

Login Number: 111779
List Number: 2
Creator: Dameron, Bryan K

List Source: TestAmerica St. Louis
List Creation: 07/12/18 02:19 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	N/A	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-111779-1

Method: 9315 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-111779-1	W-1	95.6
280-111779-2	W-2	101
280-111779-3	W-3	110
280-111779-4	W-4	102
280-111779-5	W-2D	104
280-111779-6	W-3EB	101
LCS 160-375564/1-A	Lab Control Sample	92.0
LCSD 160-375564/2-A	Lab Control Sample Dup	99.7
MB 160-375564/15-A	Method Blank	101

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-111779-1	W-1	95.6	83.7
280-111779-2	W-2	101	83.7
280-111779-3	W-3	110	86.4
280-111779-4	W-4	102	79.6
280-111779-5	W-2D	104	78.5
280-111779-6	W-3EB	101	77.8
LCS 160-375578/1-A	Lab Control Sample	92.0	84.9
LCSD 160-375578/2-A	Lab Control Sample Dup	99.7	81.1
MB 160-375578/15-A	Method Blank	101	83.4

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-113178-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
9/26/2018 2:12:44 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Table of Contents

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-113178-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
B	Compound was found in the blank and sample.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-113178-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-113178-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 8/14/2018 2:25 PM; the samples arrived in good condition except as noted below, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.1º C and 6.9º C.

Receipt Exceptions

The following login was received at the laboratory partially outside the required temperature criteria: 280-113178, at 3.1C and 6.9C. The client was notified on 8/14/2018.

TOTAL RECOVERABLE METALS
Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 08/20/2018 and analyzed on 08/21/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)
Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/20/2018 and analyzed on 08/22/2018 and 09/14/2018.

Chromium, Beryllium and Selenium were detected in method blank MB 240-341612/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The continuing calibration verification (CCV) associated with batch 240-342100 recovered above the upper control limit for Arsenic, Cobalt and Selenium. The samples associated with this CCV were below the requested reporting limit for the affected analyte; therefore, the data have been reported. The following sample is impacted: W-2EB (280-113178-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Job ID: 280-113178-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 08/20/2018 and analyzed on 08/21/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS

Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 08/15/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS

Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 08/15/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)

Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 08/15/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)

Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 08/22/2018 and 08/23/2018.

Fluoride was detected in method blank MB 280-426934/6 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Samples W-1 (280-113178-1)[2X], W-1 (280-113178-1)[20X], W-2 (280-113178-2)[5X], W-2 (280-113178-2)[50X], W-3 (280-113178-3)[5X], W-3 (280-113178-3)[50X], W-4 (280-113178-4)[100X], W-4 (280-113178-4)[5X], W-1D (280-113178-5)[5X] and W-1D (280-113178-5)[50X] required dilution prior to analysis due to analyte concentration and/or the Matrix Conductivity Threshold (MCT) of the instrument. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 (GFPC)

Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 08/17/2018 and analyzed on 09/10/2018.

Sample aliquots were reduced due to limited sample volume: W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6)

Radium-226 was detected in method blank MB 160-383016/23-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 280-113178-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

RADIUM-228
Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 08/17/2018 and analyzed on 08/23/2018.

Sample aliquots were reduced due to limited sample volume: W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226/RADIUM-228 (GFPC)
Samples W-1 (280-113178-1), W-2 (280-113178-2), W-3 (280-113178-3), W-4 (280-113178-4), W-1D (280-113178-5) and W-2EB (280-113178-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 09/11/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: HDR Inc | TestAmerica Job ID: 280-113178-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-1 | Lab Sample ID: 280-113178-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.64		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0096		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00035	J B	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cobalt	0.0012		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0017	J B	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0033	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.013	B	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.32		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	330		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	36		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.22	J B	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2600		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4500		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.0	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-2 | Lab Sample ID: 280-113178-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	8.7		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0055		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.0016		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0015	J B	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0033	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0036	J B	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.76		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	360		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	64		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.53	J B	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	4100		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7200		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-3 | Lab Sample ID: 280-113178-3

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-3 (Continued)

Lab Sample ID: 280-113178-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.89		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0067		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00041	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0020		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0013	J B	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0032	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.014	B	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	1.8		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	240		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	160		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.36	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	7700		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	13000		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.0		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4

Lab Sample ID: 280-113178-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.1		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0090		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00032	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0071		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0019	J B	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0034	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0021	J B	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.99		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	370		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	340		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.56	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	14000		500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	21000		200	94	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.8		4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: HDR Inc | TestAmerica Job ID: 280-113178-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-1D — Lab Sample ID: 280-113178-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.59		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0089		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00021	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0011		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0018	J B	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0032	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.013	B	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.32		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	330		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.6	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	45		15	1.3	mg/L	5		9056A	Total/NA
Sulfate	4300		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4500		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-2EB — Lab Sample ID: 280-113178-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	0.0017	J B	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-113178-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-113178-1	W-1	Water	08/13/18 14:20	08/14/18 14:21
280-113178-2	W-2	Water	08/13/18 16:20	08/14/18 14:21
280-113178-3	W-3	Water	08/13/18 17:35	08/14/18 14:21
280-113178-4	W-4	Water	08/13/18 15:30	08/14/18 14:21
280-113178-5	W-1D	Water	08/13/18 14:20	08/14/18 14:21
280-113178-6	W-2EB	Water	08/13/18 16:35	08/14/18 14:21

Client Sample Results

Client: HDR Inc — TestAmerica Job ID: 280-113178-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: W-1 — **Lab Sample ID: 280-113178-1**
Date Collected: 08/13/18 14:20 — **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.64**		0.10	0.023	mg/L		08/20/18 14:00	08/21/18 18:31	1

Client Sample ID: W-2 — **Lab Sample ID: 280-113178-2**
Date Collected: 08/13/18 16:20 — **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**8.7**		0.10	0.023	mg/L		08/20/18 14:00	08/21/18 18:36	1

Client Sample ID: W-3 — **Lab Sample ID: 280-113178-3**
Date Collected: 08/13/18 17:35 — **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.89**		0.10	0.023	mg/L		08/20/18 14:00	08/21/18 18:41	1

Client Sample ID: W-4 — **Lab Sample ID: 280-113178-4**
Date Collected: 08/13/18 15:30 — **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.1**		0.10	0.023	mg/L		08/20/18 14:00	08/21/18 18:46	1

Client Sample ID: W-1D — **Lab Sample ID: 280-113178-5**
Date Collected: 08/13/18 14:20 — **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.59**		0.10	0.023	mg/L		08/20/18 14:00	08/21/18 18:50	1

Client Sample ID: W-2EB — **Lab Sample ID: 280-113178-6**
Date Collected: 08/13/18 16:35 — **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		08/20/18 14:00	08/21/18 18:55	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1 — **Lab Sample ID: 280-113178-1**
Date Collected: 08/13/18 14:20 — **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		08/20/18 14:00	08/22/18 20:58	1
Arsenic	ND		0.0050	0.00075	mg/L		08/20/18 14:00	09/14/18 16:04	1
Barium	**0.0096**		0.0050	0.0022	mg/L		08/20/18 14:00	08/22/18 20:58	1
Beryllium	**0.00035**	**J B**	0.0010	0.00031	mg/L		08/20/18 14:00	09/14/18 16:04	1
Cadmium	ND		0.0010	0.00021	mg/L		08/20/18 14:00	08/22/18 20:58	1
Cobalt	**0.0012**		0.0010	0.00019	mg/L		08/20/18 14:00	09/14/18 16:04	1
Chromium	**0.0017**	**J B**	0.0020	0.00098	mg/L		08/20/18 14:00	08/22/18 20:58	1
Molybdenum	**0.0033**	**J**	0.010	0.0011	mg/L		08/20/18 14:00	08/22/18 20:58	1
Lead	ND		0.0010	0.00045	mg/L		08/20/18 14:00	08/22/18 20:58	1
Selenium	**0.013**	**B**	0.0050	0.00089	mg/L		08/20/18 14:00	09/14/18 16:04	1
Thallium	ND		0.0010	0.00020	mg/L		08/20/18 14:00	08/22/18 20:58	1
Lithium	**0.32**		0.0080	0.0017	mg/L		08/20/18 14:00	09/14/18 16:04	1
Calcium	**330**		1.0	0.58	mg/L		08/20/18 14:00	08/22/18 20:58	1

Client Sample ID: W-2 **Lab Sample ID: 280-113178-2**
Date Collected: 08/13/18 16:20 **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		08/20/18 14:00	08/22/18 21:02	1
Arsenic	ND		0.0050	0.00075	mg/L		08/20/18 14:00	09/14/18 16:09	1
Barium	**0.0055**		0.0050	0.0022	mg/L		08/20/18 14:00	08/22/18 21:02	1
Beryllium	ND		0.0010	0.00031	mg/L		08/20/18 14:00	09/14/18 16:09	1
Cadmium	ND		0.0010	0.00021	mg/L		08/20/18 14:00	08/22/18 21:02	1
Cobalt	**0.0016**		0.0010	0.00019	mg/L		08/20/18 14:00	09/14/18 16:09	1
Chromium	**0.0015**	**J B**	0.0020	0.00098	mg/L		08/20/18 14:00	08/22/18 21:02	1
Molybdenum	**0.0033**	**J**	0.010	0.0011	mg/L		08/20/18 14:00	08/22/18 21:02	1
Lead	ND		0.0010	0.00045	mg/L		08/20/18 14:00	08/22/18 21:02	1
Selenium	**0.0036**	**J B**	0.0050	0.00089	mg/L		08/20/18 14:00	09/14/18 16:09	1
Thallium	ND		0.0010	0.00020	mg/L		08/20/18 14:00	08/22/18 21:02	1
Lithium	**0.76**		0.0080	0.0017	mg/L		08/20/18 14:00	09/14/18 16:09	1
Calcium	**360**		1.0	0.58	mg/L		08/20/18 14:00	08/22/18 21:02	1

Client Sample ID: W-3 **Lab Sample ID: 280-113178-3**
Date Collected: 08/13/18 17:35 **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		08/20/18 14:00	08/22/18 21:07	1
Arsenic	ND		0.0050	0.00075	mg/L		08/20/18 14:00	09/14/18 16:14	1
Barium	**0.0067**		0.0050	0.0022	mg/L		08/20/18 14:00	08/22/18 21:07	1
Beryllium	ND		0.0010	0.00031	mg/L		08/20/18 14:00	09/14/18 16:14	1
Cadmium	**0.00041**	**J**	0.0010	0.00021	mg/L		08/20/18 14:00	08/22/18 21:07	1
Cobalt	**0.0020**		0.0010	0.00019	mg/L		08/20/18 14:00	09/14/18 16:14	1
Chromium	**0.0013**	**J B**	0.0020	0.00098	mg/L		08/20/18 14:00	08/22/18 21:07	1
Molybdenum	**0.0032**	**J**	0.010	0.0011	mg/L		08/20/18 14:00	08/22/18 21:07	1
Lead	ND		0.0010	0.00045	mg/L		08/20/18 14:00	08/22/18 21:07	1
Selenium	**0.014**	**B**	0.0050	0.00089	mg/L		08/20/18 14:00	09/14/18 16:14	1
Thallium	ND		0.0010	0.00020	mg/L		08/20/18 14:00	08/22/18 21:07	1
Lithium	**1.8**		0.0080	0.0017	mg/L		08/20/18 14:00	09/14/18 16:14	1
Calcium	**240**		1.0	0.58	mg/L		08/20/18 14:00	08/22/18 21:07	1

Client Sample ID: W-4 **Lab Sample ID: 280-113178-4**
Date Collected: 08/13/18 15:30 **Matrix: Water**
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		08/20/18 14:00	08/22/18 21:11	1
Arsenic	ND		0.0050	0.00075	mg/L		08/20/18 14:00	09/14/18 16:18	1
Barium	**0.0090**		0.0050	0.0022	mg/L		08/20/18 14:00	08/22/18 21:11	1
Beryllium	ND		0.0010	0.00031	mg/L		08/20/18 14:00	09/14/18 16:18	1
Cadmium	**0.00032**	**J**	0.0010	0.00021	mg/L		08/20/18 14:00	08/22/18 21:11	1
Cobalt	**0.0071**		0.0010	0.00019	mg/L		08/20/18 14:00	09/14/18 16:18	1
Chromium	**0.0019**	**J B**	0.0020	0.00098	mg/L		08/20/18 14:00	08/22/18 21:11	1
Molybdenum	**0.0034**	**J**	0.010	0.0011	mg/L		08/20/18 14:00	08/22/18 21:11	1
Lead	ND		0.0010	0.00045	mg/L		08/20/18 14:00	08/22/18 21:11	1
Selenium	**0.0021**	**J B**	0.0050	0.00089	mg/L		08/20/18 14:00	09/14/18 16:18	1
Thallium	ND		0.0010	0.00020	mg/L		08/20/18 14:00	08/22/18 21:11	1
Lithium	**0.99**		0.0080	0.0017	mg/L		08/20/18 14:00	09/14/18 16:18	1
Calcium	**370**		1.0	0.58	mg/L		08/20/18 14:00	08/22/18 21:11	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1D
Lab Sample ID: 280-113178-5
Date Collected: 08/13/18 14:20
Matrix: Water
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		08/20/18 14:00	08/22/18 21:16	1
Arsenic	ND		0.0050	0.00075	mg/L		08/20/18 14:00	09/14/18 16:23	1
Barium	**0.0089**		0.0050	0.0022	mg/L		08/20/18 14:00	08/22/18 21:16	1
Beryllium	ND		0.0010	0.00031	mg/L		08/20/18 14:00	09/14/18 16:23	1
Cadmium	**0.00021**	**J**	0.0010	0.00021	mg/L		08/20/18 14:00	08/22/18 21:16	1
Cobalt	**0.0011**		0.0010	0.00019	mg/L		08/20/18 14:00	09/14/18 16:23	1
Chromium	**0.0018**	**J B**	0.0020	0.00098	mg/L		08/20/18 14:00	08/22/18 21:16	1
Molybdenum	**0.0032**	**J**	0.010	0.0011	mg/L		08/20/18 14:00	08/22/18 21:16	1
Lead	ND		0.0010	0.00045	mg/L		08/20/18 14:00	08/22/18 21:16	1
Selenium	**0.013**	**B**	0.0050	0.00089	mg/L		08/20/18 14:00	09/14/18 16:23	1
Thallium	ND		0.0010	0.00020	mg/L		08/20/18 14:00	08/22/18 21:16	1
Lithium	**0.32**		0.0080	0.0017	mg/L		08/20/18 14:00	09/14/18 16:23	1
Calcium	**330**		1.0	0.58	mg/L		08/20/18 14:00	08/22/18 21:16	1

Client Sample ID: W-2EB
Lab Sample ID: 280-113178-6
Date Collected: 08/13/18 16:35
Matrix: Water
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		08/20/18 14:00	08/22/18 21:20	1
Arsenic	ND		0.0050	0.00075	mg/L		08/20/18 14:00	09/14/18 16:28	1
Barium	ND		0.0050	0.0022	mg/L		08/20/18 14:00	08/22/18 21:20	1
Beryllium	ND		0.0010	0.00031	mg/L		08/20/18 14:00	09/14/18 16:28	1
Cadmium	ND		0.0010	0.00021	mg/L		08/20/18 14:00	08/22/18 21:20	1
Cobalt	ND		0.0010	0.00019	mg/L		08/20/18 14:00	09/14/18 16:28	1
Chromium	**0.0017**	**J B**	0.0020	0.00098	mg/L		08/20/18 14:00	08/22/18 21:20	1
Molybdenum	ND		0.010	0.0011	mg/L		08/20/18 14:00	08/22/18 21:20	1
Lead	ND		0.0010	0.00045	mg/L		08/20/18 14:00	08/22/18 21:20	1
Selenium	ND		0.0050	0.00089	mg/L		08/20/18 14:00	09/14/18 16:28	1
Thallium	ND		0.0010	0.00020	mg/L		08/20/18 14:00	08/22/18 21:20	1
Lithium	ND		0.0080	0.0017	mg/L		08/20/18 14:00	09/14/18 16:28	1
Calcium	ND		1.0	0.58	mg/L		08/20/18 14:00	08/22/18 21:20	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-1
Lab Sample ID: 280-113178-1
Date Collected: 08/13/18 14:20
Matrix: Water
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/20/18 14:00	08/21/18 12:30	1

Client Sample ID: W-2
Lab Sample ID: 280-113178-2
Date Collected: 08/13/18 16:20
Matrix: Water
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/20/18 14:00	08/21/18 12:32	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-3
Date Collected: 08/13/18 17:35
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/20/18 14:00	08/21/18 12:34	1

Client Sample ID: W-4
Date Collected: 08/13/18 15:30
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/20/18 14:00	08/21/18 12:40	1

Client Sample ID: W-1D
Date Collected: 08/13/18 14:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/20/18 14:00	08/21/18 12:42	1

Client Sample ID: W-2EB
Date Collected: 08/13/18 16:35
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/20/18 14:00	08/21/18 12:44	1

General Chemistry

Client Sample ID: W-1
Date Collected: 08/13/18 14:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.5**	**HF**	0.1	0.1	SU			08/15/18 15:06	1
Temperature	**19.7**	**HF**	1.0	1.0	Degrees C			08/15/18 15:06	1
Chloride	**36**		6.0	0.51	mg/L			08/22/18 11:46	2
Fluoride	**0.22**	**J B**	1.0	0.12	mg/L			08/22/18 11:46	2
Sulfate	**2600**		100	4.6	mg/L			08/22/18 12:08	20
Total Dissolved Solids (TDS)	**4500**		40	19	mg/L			08/15/18 16:11	1
Total Suspended Solids	**2.0**	**J**	4.0	1.1	mg/L			08/15/18 17:47	1

Client Sample ID: W-2
Date Collected: 08/13/18 16:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.6**	**HF**	0.1	0.1	SU			08/15/18 15:10	1
Temperature	**19.9**	**HF**	1.0	1.0	Degrees C			08/15/18 15:10	1
Chloride	**64**		15	1.3	mg/L			08/22/18 12:31	5
Fluoride	**0.53**	**J B**	2.5	0.30	mg/L			08/22/18 12:31	5
Sulfate	**4100**		250	12	mg/L			08/22/18 12:53	50
Total Dissolved Solids (TDS)	**7200**		100	47	mg/L			08/15/18 16:11	1
Total Suspended Solids	**1.2**	**J**	4.0	1.1	mg/L			08/15/18 17:47	1

Client Sample ID: W-3
Date Collected: 08/13/18 17:35
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.4**	**HF**	0.1	0.1	SU			08/15/18 15:14	1

General Chemistry (Continued)

Client Sample ID: W-3
Lab Sample ID: 280-113178-3
Date Collected: 08/13/18 17:35
Matrix: Water
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	19.9	HF	1.0	1.0	Degrees C			08/15/18 15:14	1
Chloride	160		15	1.3	mg/L			08/22/18 14:00	5
Fluoride	0.36	J	2.5	0.30	mg/L			08/23/18 04:17	5
Sulfate	7700		250	12	mg/L			08/22/18 16:30	50
Total Dissolved Solids (TDS)	13000		100	47	mg/L			08/15/18 16:11	1
Total Suspended Solids	4.0		4.0	1.1	mg/L			08/15/18 17:47	1

Client Sample ID: W-4
Lab Sample ID: 280-113178-4
Date Collected: 08/13/18 15:30
Matrix: Water
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU			08/15/18 15:19	1
Temperature	19.5	HF	1.0	1.0	Degrees C			08/15/18 15:19	1
Chloride	340		15	1.3	mg/L			08/22/18 16:52	5
Fluoride	0.56	J	2.5	0.30	mg/L			08/23/18 04:39	5
Sulfate	14000		500	23	mg/L			08/23/18 05:01	100
Total Dissolved Solids (TDS)	21000		200	94	mg/L			08/15/18 16:11	1
Total Suspended Solids	4.8		4.0	1.1	mg/L			08/15/18 17:47	1

Client Sample ID: W-1D
Lab Sample ID: 280-113178-5
Date Collected: 08/13/18 14:20
Matrix: Water
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			08/15/18 15:24	1
Temperature	19.6	HF	1.0	1.0	Degrees C			08/15/18 15:24	1
Chloride	45		15	1.3	mg/L			08/22/18 11:32	5
Fluoride	ND		2.5	0.30	mg/L			08/22/18 11:32	5
Sulfate	4300		250	12	mg/L			08/22/18 11:54	50
Total Dissolved Solids (TDS)	4500		40	19	mg/L			08/15/18 16:11	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			08/15/18 17:47	1

Client Sample ID: W-2EB
Lab Sample ID: 280-113178-6
Date Collected: 08/13/18 16:35
Matrix: Water
Date Received: 08/14/18 14:21

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.7	HF	0.1	0.1	SU			08/15/18 15:27	1
Temperature	19.5	HF	1.0	1.0	Degrees C			08/15/18 15:27	1
Chloride	ND		3.0	0.25	mg/L			08/22/18 12:16	1
Fluoride	ND		0.50	0.060	mg/L			08/22/18 12:16	1
Sulfate	ND		5.0	0.23	mg/L			08/22/18 12:16	1
Total Dissolved Solids (TDS)	ND		100	47	mg/L			08/15/18 16:11	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			08/15/18 17:47	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1
Date Collected: 08/13/18 14:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.209		0.0972	0.0990	1.00	0.102	pCi/L	08/17/18 09:18	09/10/18 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.6*		*40 - 110*	*08/17/18 09:18*	*09/10/18 07:58*	*1*

Client Sample ID: W-2
Date Collected: 08/13/18 16:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.244		0.105	0.107	1.00	0.114	pCi/L	08/17/18 09:18	09/10/18 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.9*		*40 - 110*	*08/17/18 09:18*	*09/10/18 07:58*	*1*

Client Sample ID: W-3
Date Collected: 08/13/18 17:35
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.352		0.120	0.124	1.00	0.111	pCi/L	08/17/18 09:18	09/10/18 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*08/17/18 09:18*	*09/10/18 07:58*	*1*

Client Sample ID: W-4
Date Collected: 08/13/18 15:30
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.347		0.115	0.119	1.00	0.100	pCi/L	08/17/18 09:18	09/10/18 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.6*		*40 - 110*	*08/17/18 09:18*	*09/10/18 07:59*	*1*

Client Sample ID: W-1D
Date Collected: 08/13/18 14:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.250		0.0979	0.100	1.00	0.0802	pCi/L	08/17/18 09:18	09/10/18 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.9*		*40 - 110*	*08/17/18 09:18*	*09/10/18 07:59*	*1*

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-2EB
Date Collected: 08/13/18 16:35
Date Received: 08/14/18 14:21

Lab Sample ID: 280-113178-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.303**		0.110	0.113	1.00	0.100	pCi/L	08/17/18 09:18	09/10/18 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*08/17/18 09:18*	*09/10/18 07:59*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1
Date Collected: 08/13/18 14:20
Date Received: 08/14/18 14:21

Lab Sample ID: 280-113178-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0525	U	0.305	0.305	1.00	0.539	pCi/L	08/17/18 10:05	08/23/18 16:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.6*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:45*	*1*
Y Carrier	*87.1*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:45*	*1*

Client Sample ID: W-2
Date Collected: 08/13/18 16:20
Date Received: 08/14/18 14:21

Lab Sample ID: 280-113178-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.441	U	0.301	0.304	1.00	0.464	pCi/L	08/17/18 10:05	08/23/18 16:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.9*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:45*	*1*
Y Carrier	*88.6*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:45*	*1*

Client Sample ID: W-3
Date Collected: 08/13/18 17:35
Date Received: 08/14/18 14:21

Lab Sample ID: 280-113178-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.469	U	0.324	0.327	1.00	0.506	pCi/L	08/17/18 10:05	08/23/18 16:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:45*	*1*
Y Carrier	*88.2*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:45*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-4
Date Collected: 08/13/18 15:30
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.365	U	0.305	0.307	1.00	0.486	pCi/L	08/17/18 10:05	08/23/18 16:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.6*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:46*	*1*
Y Carrier	*87.1*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:46*	*1*

Client Sample ID: W-1D
Date Collected: 08/13/18 14:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.576**		0.338	0.342	1.00	0.511	pCi/L	08/17/18 10:05	08/23/18 16:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.9*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:46*	*1*
Y Carrier	*88.2*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:46*	*1*

Client Sample ID: W-2EB
Date Collected: 08/13/18 16:35
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.180	U	0.289	0.290	1.00	0.488	pCi/L	08/17/18 10:05	08/23/18 16:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:46*	*1*
Y Carrier	*88.2*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:46*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-1
Date Collected: 08/13/18 14:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.262	U	0.320	0.321	5.00	0.539	pCi/L		09/11/18 02:43	1

Client Sample ID: W-2
Date Collected: 08/13/18 16:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.686**		0.319	0.322	5.00	0.464	pCi/L		09/11/18 02:43	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-3
Date Collected: 08/13/18 17:35
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.821**		0.346	0.350	5.00	0.506	pCi/L		09/11/18 02:43	1

Client Sample ID: W-4
Date Collected: 08/13/18 15:30
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.712**		0.326	0.329	5.00	0.486	pCi/L		09/11/18 02:43	1

Client Sample ID: W-1D
Date Collected: 08/13/18 14:20
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.826**		0.352	0.356	5.00	0.511	pCi/L		09/11/18 02:43	1

Client Sample ID: W-2EB
Date Collected: 08/13/18 16:35
Date Received: 08/14/18 14:21
Lab Sample ID: 280-113178-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.484	U	0.309	0.311	5.00	0.488	pCi/L		09/11/18 02:43	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-341612/1-A
Matrix: Water
Analysis Batch: 341961

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 341612

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		08/20/18 14:00	08/21/18 17:16	1

Lab Sample ID: LCS 240-341612/2-A
Matrix: Water
Analysis Batch: 341961

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 341612

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.10		mg/L		110	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-341612/1-A
Matrix: Water
Analysis Batch: 342100

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 341612

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		08/20/18 14:00	08/22/18 19:28	1
Barium	ND		0.0050	0.0022	mg/L		08/20/18 14:00	08/22/18 19:28	1
Cadmium	ND		0.0010	0.00021	mg/L		08/20/18 14:00	08/22/18 19:28	1
Chromium	0.00150	J	0.0020	0.00098	mg/L		08/20/18 14:00	08/22/18 19:28	1
Molybdenum	ND		0.010	0.0011	mg/L		08/20/18 14:00	08/22/18 19:28	1
Lead	ND		0.0010	0.00045	mg/L		08/20/18 14:00	08/22/18 19:28	1
Thallium	ND		0.0010	0.00020	mg/L		08/20/18 14:00	08/22/18 19:28	1
Calcium	ND		1.0	0.58	mg/L		08/20/18 14:00	08/22/18 19:28	1

Lab Sample ID: MB 240-341612/1-A
Matrix: Water
Analysis Batch: 345481

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 341612

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.00075	mg/L		08/20/18 14:00	09/14/18 15:55	1
Beryllium	0.000442	J	0.0010	0.00031	mg/L		08/20/18 14:00	09/14/18 15:55	1
Cobalt	ND		0.0010	0.00019	mg/L		08/20/18 14:00	09/14/18 15:55	1
Selenium	0.000892	J	0.0050	0.00089	mg/L		08/20/18 14:00	09/14/18 15:55	1
Lithium	ND		0.0080	0.0017	mg/L		08/20/18 14:00	09/14/18 15:55	1

Lab Sample ID: LCS 240-341612/3-A
Matrix: Water
Analysis Batch: 342100

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 341612

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.101		mg/L		101	80 - 120
Barium	1.00	1.03		mg/L		103	80 - 120
Cadmium	1.00	1.05		mg/L		105	80 - 120
Chromium	1.00	1.07		mg/L		107	80 - 120
Molybdenum	0.100	0.0941		mg/L		94	80 - 120
Lead	1.00	1.04		mg/L		104	80 - 120
Thallium	0.250	0.248		mg/L		99	80 - 120
Calcium	10.0	9.70		mg/L		97	80 - 120

Lab Sample ID: LCS 240-341612/3-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 345481 **Prep Batch: 341612**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.961		mg/L		96	80 - 120
Beryllium	1.00	0.798		mg/L		80	80 - 120
Cobalt	1.00	1.03		mg/L		103	80 - 120
Selenium	1.00	0.975		mg/L		97	80 - 120
Lithium	0.100	0.0846		mg/L		85	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-341614/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 341899 **Prep Batch: 341614**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/20/18 14:00	08/21/18 12:07	1

Lab Sample ID: LCS 240-341614/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 341899 **Prep Batch: 341614**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.07		ug/L		101	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-426373/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 426373

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		101	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-426934/6 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 426934

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			08/21/18 10:55	1
Fluoride	0.0617	J	0.50	0.060	mg/L			08/21/18 10:55	1
Sulfate	ND		5.0	0.23	mg/L			08/21/18 10:55	1

Lab Sample ID: LCS 280-426934/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 426934

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	94.7		mg/L		95	90 - 110
Fluoride	5.00	4.74		mg/L		95	90 - 110
Sulfate	100	91.2		mg/L		91	90 - 110

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-113178-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 280-426934/5
Matrix: Water
Analysis Batch: 426934

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	94.7		mg/L		95	90 - 110	0	10
Fluoride	5.00	4.81		mg/L		96	90 - 110	2	10
Sulfate	100	92.3		mg/L		92	90 - 110	1	10

Lab Sample ID: MRL 280-426934/3
Matrix: Water
Analysis Batch: 426934

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.33	J	mg/L		93	50 - 150
Fluoride	0.200	0.199	J	mg/L		100	50 - 150
Sulfate	2.50	2.42	J	mg/L		97	50 - 150

Lab Sample ID: MB 280-427109/6
Matrix: Water
Analysis Batch: 427109

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			08/22/18 11:03	1
Fluoride	ND		0.50	0.060	mg/L			08/22/18 11:03	1
Sulfate	ND		5.0	0.23	mg/L			08/22/18 11:03	1

Lab Sample ID: LCS 280-427109/4
Matrix: Water
Analysis Batch: 427109

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	103		mg/L		103	90 - 110
Fluoride	5.00	5.31		mg/L		106	90 - 110
Sulfate	100	105		mg/L		105	90 - 110

Lab Sample ID: LCSD 280-427109/5
Matrix: Water
Analysis Batch: 427109

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	103		mg/L		103	90 - 110	0	10
Fluoride	5.00	5.32		mg/L		106	90 - 110	0	10
Sulfate	100	105		mg/L		105	90 - 110	0	10

Lab Sample ID: MRL 280-427109/3
Matrix: Water
Analysis Batch: 427109

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.84	J	mg/L		114	50 - 150
Fluoride	0.200	0.217	J	mg/L		108	50 - 150
Sulfate	2.50	2.85	J	mg/L		114	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-426276/1
Matrix: Water
Analysis Batch: 426276

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			08/15/18 16:11	1

Lab Sample ID: LCS 280-426276/2
Matrix: Water
Analysis Batch: 426276

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	495		mg/L		99	86 - 110

Lab Sample ID: 280-113178-1 DU
Matrix: Water
Analysis Batch: 426276

Client Sample ID: W-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	4500		4520		mg/L		0.5	10

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-426294/1
Matrix: Water
Analysis Batch: 426294

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			08/15/18 17:47	1

Lab Sample ID: LCS 280-426294/2
Matrix: Water
Analysis Batch: 426294

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	91.6		mg/L		92	86 - 114

Lab Sample ID: LCSD 280-426294/3
Matrix: Water
Analysis Batch: 426294

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids	100	92.0		mg/L		92	86 - 114	0	20

Lab Sample ID: 280-113178-1 DU
Matrix: Water
Analysis Batch: 426294

Client Sample ID: W-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	2.0	J	2.00	J	mg/L		0	10

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-383016/23-A
Matrix: Water
Analysis Batch: 388184

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 383016

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.3123		0.111	0.115	1.00	0.105	pCi/L	08/17/18 09:18	09/10/18 09:16	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.4*		*40 - 110*	*08/17/18 09:18*	*09/10/18 09:16*	*1*

Lab Sample ID: LCS 160-383016/1-A
Matrix: Water
Analysis Batch: 388183

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 383016

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	15.1	15.78		1.59	1.00	0.116	pCi/L	104	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*102*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-383032/23-A
Matrix: Water
Analysis Batch: 384835

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 383032

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.06023	U	0.355	0.355	1.00	0.635	pCi/L	08/17/18 10:05	08/23/18 16:38	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.4*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:38*	*1*
Y Carrier	*88.6*		*40 - 110*	*08/17/18 10:05*	*08/23/18 16:38*	*1*

Lab Sample ID: LCS 160-383032/1-A
Matrix: Water
Analysis Batch: 384834

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 383032

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	14.8	14.73		1.64	1.00	0.453	pCi/L	100	56 - 140

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*102*		*40 - 110*
Y Carrier	*89.7*		*40 - 110*

Metals

Prep Batch: 341612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total Recoverable	Water	3005A	
280-113178-2	W-2	Total Recoverable	Water	3005A	
280-113178-3	W-3	Total Recoverable	Water	3005A	
280-113178-4	W-4	Total Recoverable	Water	3005A	
280-113178-5	W-1D	Total Recoverable	Water	3005A	
280-113178-6	W-2EB	Total Recoverable	Water	3005A	
MB 240-341612/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-341612/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-341612/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 341614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total/NA	Water	7470A	
280-113178-2	W-2	Total/NA	Water	7470A	
280-113178-3	W-3	Total/NA	Water	7470A	
280-113178-4	W-4	Total/NA	Water	7470A	
280-113178-5	W-1D	Total/NA	Water	7470A	
280-113178-6	W-2EB	Total/NA	Water	7470A	
MB 240-341614/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-341614/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 341899

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total/NA	Water	7470A	341614
280-113178-2	W-2	Total/NA	Water	7470A	341614
280-113178-3	W-3	Total/NA	Water	7470A	341614
280-113178-4	W-4	Total/NA	Water	7470A	341614
280-113178-5	W-1D	Total/NA	Water	7470A	341614
280-113178-6	W-2EB	Total/NA	Water	7470A	341614
MB 240-341614/1-A	Method Blank	Total/NA	Water	7470A	341614
LCS 240-341614/2-A	Lab Control Sample	Total/NA	Water	7470A	341614

Analysis Batch: 341961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total Recoverable	Water	6010C	341612
280-113178-2	W-2	Total Recoverable	Water	6010C	341612
280-113178-3	W-3	Total Recoverable	Water	6010C	341612
280-113178-4	W-4	Total Recoverable	Water	6010C	341612
280-113178-5	W-1D	Total Recoverable	Water	6010C	341612
280-113178-6	W-2EB	Total Recoverable	Water	6010C	341612
MB 240-341612/1-A	Method Blank	Total Recoverable	Water	6010C	341612
LCS 240-341612/2-A	Lab Control Sample	Total Recoverable	Water	6010C	341612

Analysis Batch: 342100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total Recoverable	Water	6020A	341612
280-113178-2	W-2	Total Recoverable	Water	6020A	341612
280-113178-3	W-3	Total Recoverable	Water	6020A	341612
280-113178-4	W-4	Total Recoverable	Water	6020A	341612
280-113178-5	W-1D	Total Recoverable	Water	6020A	341612
280-113178-6	W-2EB	Total Recoverable	Water	6020A	341612

Metals (Continued)

Analysis Batch: 342100 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-341612/1-A	Method Blank	Total Recoverable	Water	6020A	341612
LCS 240-341612/3-A	Lab Control Sample	Total Recoverable	Water	6020A	341612

Analysis Batch: 345481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total Recoverable	Water	6020A	341612
280-113178-2	W-2	Total Recoverable	Water	6020A	341612
280-113178-3	W-3	Total Recoverable	Water	6020A	341612
280-113178-4	W-4	Total Recoverable	Water	6020A	341612
280-113178-5	W-1D	Total Recoverable	Water	6020A	341612
280-113178-6	W-2EB	Total Recoverable	Water	6020A	341612
MB 240-341612/1-A	Method Blank	Total Recoverable	Water	6020A	341612
LCS 240-341612/3-A	Lab Control Sample	Total Recoverable	Water	6020A	341612

General Chemistry

Analysis Batch: 426276

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total/NA	Water	SM 2540C	
280-113178-2	W-2	Total/NA	Water	SM 2540C	
280-113178-3	W-3	Total/NA	Water	SM 2540C	
280-113178-4	W-4	Total/NA	Water	SM 2540C	
280-113178-5	W-1D	Total/NA	Water	SM 2540C	
280-113178-6	W-2EB	Total/NA	Water	SM 2540C	
MB 280-426276/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-426276/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-113178-1 DU	W-1	Total/NA	Water	SM 2540C	

Analysis Batch: 426294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total/NA	Water	SM 2540D	
280-113178-2	W-2	Total/NA	Water	SM 2540D	
280-113178-3	W-3	Total/NA	Water	SM 2540D	
280-113178-4	W-4	Total/NA	Water	SM 2540D	
280-113178-5	W-1D	Total/NA	Water	SM 2540D	
280-113178-6	W-2EB	Total/NA	Water	SM 2540D	
MB 280-426294/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-426294/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-426294/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	
280-113178-1 DU	W-1	Total/NA	Water	SM 2540D	

Analysis Batch: 426373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total/NA	Water	9040B	
280-113178-2	W-2	Total/NA	Water	9040B	
280-113178-3	W-3	Total/NA	Water	9040B	
280-113178-4	W-4	Total/NA	Water	9040B	
280-113178-5	W-1D	Total/NA	Water	9040B	
280-113178-6	W-2EB	Total/NA	Water	9040B	
LCS 280-426373/4	Lab Control Sample	Total/NA	Water	9040B	

General Chemistry (Continued)

Analysis Batch: 426934

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total/NA	Water	9056A	
280-113178-1	W-1	Total/NA	Water	9056A	
280-113178-2	W-2	Total/NA	Water	9056A	
280-113178-2	W-2	Total/NA	Water	9056A	
280-113178-3	W-3	Total/NA	Water	9056A	
280-113178-3	W-3	Total/NA	Water	9056A	
280-113178-4	W-4	Total/NA	Water	9056A	
MB 280-426934/6	Method Blank	Total/NA	Water	9056A	
LCS 280-426934/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-426934/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-426934/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 427109

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-3	W-3	Total/NA	Water	9056A	
280-113178-4	W-4	Total/NA	Water	9056A	
280-113178-4	W-4	Total/NA	Water	9056A	
280-113178-5	W-1D	Total/NA	Water	9056A	
280-113178-5	W-1D	Total/NA	Water	9056A	
280-113178-6	W-2EB	Total/NA	Water	9056A	
MB 280-427109/6	Method Blank	Total/NA	Water	9056A	
LCS 280-427109/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-427109/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-427109/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 383016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total/NA	Water	PrecSep-21	
280-113178-2	W-2	Total/NA	Water	PrecSep-21	
280-113178-3	W-3	Total/NA	Water	PrecSep-21	
280-113178-4	W-4	Total/NA	Water	PrecSep-21	
280-113178-5	W-1D	Total/NA	Water	PrecSep-21	
280-113178-6	W-2EB	Total/NA	Water	PrecSep-21	
MB 160-383016/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-383016/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 383032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113178-1	W-1	Total/NA	Water	PrecSep_0	
280-113178-2	W-2	Total/NA	Water	PrecSep_0	
280-113178-3	W-3	Total/NA	Water	PrecSep_0	
280-113178-4	W-4	Total/NA	Water	PrecSep_0	
280-113178-5	W-1D	Total/NA	Water	PrecSep_0	
280-113178-6	W-2EB	Total/NA	Water	PrecSep_0	
MB 160-383032/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-383032/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: HDR Inc

TestAmerica Job ID: 280-113178-1

Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-1

Lab Sample ID: 280-113178-1

Date Collected: 08/13/18 14:20

Matrix: Water

Date Received: 08/14/18 14:21

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			341961	08/21/18 18:31	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			342100	08/22/18 20:58	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			345481	09/14/18 16:04	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	341614	08/20/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			341899	08/21/18 12:30	AJC	TAL CAN
Total/NA	Analysis	9040B		1			426373	08/15/18 15:06	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	426934	08/22/18 11:46	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	426934	08/22/18 12:08	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	426276	08/15/18 16:11	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	426294	08/15/18 17:47	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			749.80 mL	1.0 g	383016	08/17/18 09:18	JLC	TAL SL
Total/NA	Analysis	9315		1			388183	09/10/18 07:58	CDR	TAL SL
Total/NA	Prep	PrecSep_0			749.80 mL	1.0 g	383032	08/17/18 10:05	JLC	TAL SL
Total/NA	Analysis	9320		1			384834	08/23/18 16:45	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			388346	09/11/18 02:43	MAR	TAL SL

Client Sample ID: W-2

Lab Sample ID: 280-113178-2

Date Collected: 08/13/18 16:20

Matrix: Water

Date Received: 08/14/18 14:21

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			341961	08/21/18 18:36	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			342100	08/22/18 21:02	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			345481	09/14/18 16:09	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	341614	08/20/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			341899	08/21/18 12:32	AJC	TAL CAN
Total/NA	Analysis	9040B		1			426373	08/15/18 15:10	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	426934	08/22/18 12:31	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	426934	08/22/18 12:53	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	426276	08/15/18 16:11	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	426294	08/15/18 17:47	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.23 mL	1.0 g	383016	08/17/18 09:18	JLC	TAL SL
Total/NA	Analysis	9315		1			388183	09/10/18 07:58	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.23 mL	1.0 g	383032	08/17/18 10:05	JLC	TAL SL
Total/NA	Analysis	9320		1			384834	08/23/18 16:45	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			388346	09/11/18 02:43	MAR	TAL SL

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-113178-1

Client Sample ID: W-3

Lab Sample ID: 280-113178-3

Date Collected: 08/13/18 17:35
Matrix: Water
Date Received: 08/14/18 14:21

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			341961	08/21/18 18:41	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			342100	08/22/18 21:07	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			345481	09/14/18 16:14	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	341614	08/20/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			341899	08/21/18 12:34	AJC	TAL CAN
Total/NA	Analysis	9040B		1			426373	08/15/18 15:14	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	426934	08/22/18 14:00	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	426934	08/22/18 16:30	TLP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	427109	08/23/18 04:17	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	426276	08/15/18 16:11	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	426294	08/15/18 17:47	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.28 mL	1.0 g	383016	08/17/18 09:18	JLC	TAL SL
Total/NA	Analysis	9315		1			388183	09/10/18 07:58	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.28 mL	1.0 g	383032	08/17/18 10:05	JLC	TAL SL
Total/NA	Analysis	9320		1			384834	08/23/18 16:45	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			388346	09/11/18 02:43	MAR	TAL SL

Client Sample ID: W-4

Lab Sample ID: 280-113178-4

Date Collected: 08/13/18 15:30
Matrix: Water
Date Received: 08/14/18 14:21

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			341961	08/21/18 18:46	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			342100	08/22/18 21:11	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			345481	09/14/18 16:18	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	341614	08/20/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			341899	08/21/18 12:40	AJC	TAL CAN
Total/NA	Analysis	9040B		1			426373	08/15/18 15:19	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	426934	08/22/18 16:52	TLP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	427109	08/23/18 04:39	TLP	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	427109	08/23/18 05:01	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	5 mL	100 mL	426276	08/15/18 16:11	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	426294	08/15/18 17:47	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.27 mL	1.0 g	383016	08/17/18 09:18	JLC	TAL SL
Total/NA	Analysis	9315		1			388184	09/10/18 07:59	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.27 mL	1.0 g	383032	08/17/18 10:05	JLC	TAL SL

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client Sample ID: W-4 — Lab Sample ID: 280-113178-4

Date Collected: 08/13/18 15:30 — **Matrix: Water**
Date Received: 08/14/18 14:21

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9320		1			384834	08/23/18 16:46	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			388346	09/11/18 02:43	MAR	TAL SL

Client Sample ID: W-1D — Lab Sample ID: 280-113178-5

Date Collected: 08/13/18 14:20 — **Matrix: Water**
Date Received: 08/14/18 14:21

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			341961	08/21/18 18:50	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			342100	08/22/18 21:16	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			345481	09/14/18 16:23	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	341614	08/20/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			341899	08/21/18 12:42	AJC	TAL CAN
Total/NA	Analysis	9040B		1			426373	08/15/18 15:24	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	427109	08/22/18 11:32	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	427109	08/22/18 11:54	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	426276	08/15/18 16:11	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	426294	08/15/18 17:47	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.42 mL	1.0 g	383016	08/17/18 09:18	JLC	TAL SL
Total/NA	Analysis	9315		1			388184	09/10/18 07:59	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.42 mL	1.0 g	383032	08/17/18 10:05	JLC	TAL SL
Total/NA	Analysis	9320		1			384834	08/23/18 16:46	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			388346	09/11/18 02:43	MAR	TAL SL

Client Sample ID: W-2EB — Lab Sample ID: 280-113178-6

Date Collected: 08/13/18 16:35 — **Matrix: Water**
Date Received: 08/14/18 14:21

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			341961	08/21/18 18:55	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			342100	08/22/18 21:20	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	341612	08/20/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			345481	09/14/18 16:28	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	341614	08/20/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			341899	08/21/18 12:44	AJC	TAL CAN
Total/NA	Analysis	9040B		1			426373	08/15/18 15:27	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	427109	08/22/18 12:16	TLP	TAL DEN

Client Sample ID: W-2EB

Lab Sample ID: 280-113178-6

Date Collected: 08/13/18 16:35

Matrix: Water

Date Received: 08/14/18 14:21

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	426276	08/15/18 16:11	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	426294	08/15/18 17:47	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.24 mL	1.0 g	383016	08/17/18 09:18	JLC	TAL SL
Total/NA	Analysis	9315		1			388184	09/10/18 07:59	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.24 mL	1.0 g	383032	08/17/18 10:05	JLC	TAL SL
Total/NA	Analysis	9320		1			384834	08/23/18 16:46	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			388346	09/11/18 02:43	MAR	TAL SL

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: HDR Inc TestAmerica Job ID: 280-113178-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	10-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

Client Information
Client Contact: Anna Lundin
Company: HDR Inc
Address: 9781 S. Meridian Blvd Suite 400
City: Englewood
State, Zip: CO, 80112
Phone: 734-263-7138(Tel)
Email: anna.lundin@hdrinc.com
Project Name: Xcel Energy GW CCR Monitoring - Hayden
Site: Colorado

Sampler: Tara Kent
Phone: 720 933 7496
Due Date Requested:
TAT Requested (days):
PO #: DEN-018
WO #:
Project #: 28014377
SSOW#:

Lab PM: Rothmeyer, Stephanie K
E-Mail: stephanie.rothmeyer@testamericainc.com
Carrier Tracking No(s):

COC No: 280-77543-25460.1
Page: Page 1 of 1
Job #:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C_Calcd - Total Dissolved Solids (TDS)	6010C, 6020A, 7470A	9040B, 9056A_28D	2540D - Total Suspended Solids	9315_Ra226, 9320_Ra228	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D		
W-1	8-13-18	1420	G	Water			✓	✓	✓	✓	✓		
W-2	8-13-18	1630	G	Water			✓	✓	✓	✓	✓		
W-3	8-13-18	1735	G	Water			✓	✓	✓	✓	✓		
W-4	8-13-18	1530	G	Water			✓	✓	✓	✓	✓		
~~Field Duplicate~~ W-1D	8-13-18	1420	G	Water			✓	✓	✓	✓	✓		
~~Equipment Blank~~ W-2EB	8-13-18	1635	G	Water			✓	✓	✓	✓	✓		
				Water									

280-113178 Chain of Custody

Possible Hazard Identification
☒ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☒ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)
Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tara Kent	Date: 14 AUG 2018		Time: 1925	Method of Shipment:	
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 8/14/18 1925	Company: TA-Den
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 3.6

Ver: 08/04/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA	
Address: 13715 Rider Trail North,	Due Date Requested: 9/10/2018		
City: Earth City	TAT Requested (days):		
State, Zip: MO, 63045			
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:		
Email:	WO #:		
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377		
Site: Xcel Energy CCR - Hayden Station	SSOW#:		

COC No: 280-451241.1
Page: Page 1 of 1
Job #: 280-113178-1

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
W-1 (280-113178-1)	8/13/18	14:20 Mountain		Water			X	X	X	1	
W-2 (280-113178-2)	8/13/18	16:20 Mountain		Water			X	X	X	1	
W-3 (280-113178-3)	8/13/18	17:35 Mountain		Water			X	X	X	1	
W-4 (280-113178-4)	8/13/18	15:30 Mountain		Water			X	X	X	1	
W-1D (280-113178-5)	8/13/18	14:20 Mountain		Water			X	X	X	1	
W-2EB (280-113178-6)	8/13/18	16:35 Mountain		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:	Method of Shipment:	
Relinquished by: Laura Castro	Date/Time: 8-15-18 1430	Company: TA	Received by: [signature]	Date/Time: 8/16/18 0900	Company: TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

20.2 | C20.2

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-451240.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-113178-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 9/6/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

517

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 12 Total Metals (w/collision cell)	6010C/3005A (MOD) Boron	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
W-1 (280-113178-1)	8/13/18	14:20 Mountain		Water			X	X	X	1	Use Collision Cell
W-2 (280-113178-2)	8/13/18	16:20 Mountain		Water			X	X	X	1	Use Collision Cell
W-3 (280-113178-3)	8/13/18	17:35 Mountain		Water			X	X	X	1	Use Collision Cell
W-4 (280-113178-4)	8/13/18	15:30 Mountain		Water			X	X	X	1	Use Collision Cell
W-1D (280-113178-5)	8/13/18	14:20 Mountain		Water			X	X	X	1	Use Collision Cell
W-2EB (280-113178-6)	8/13/18	16:35 Mountain		Water			X	X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:		Method of Shipment:	
Relinquished by: Laura Castro	Date/Time: 8-15-18 1510	Company: TAL Den	Received by: [signature]	Date/Time: 8/17/18 920	Company: TAC
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :**
Canton Facility

Client TA Denver Site Name ____ Cooler unpacked by: 8/1

Cooler Received on 8/17/18 Opened on 8/17/18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time ____ Storage Location ____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ____

Packing material used: Bubble Wrap Foam Plastic Bag None Other ____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF +0 °C) Observed Cooler Temp. 20.2 °C Corrected Cooler Temp. 20.2 °C
   IR GUN #36 (CF -0.3°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   - Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   - Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   - Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# **HC849161**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ____ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____.

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-113178-1

Login Number: 113178 | **List Source: TestAmerica Denver**
List Number: 1
Creator: Diffendall, Jessica L

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-113178-1

Login Number: 113178
List Number: 2
Creator: Carter, Kevin M

List Source: TestAmerica St. Louis
List Creation: 08/16/18 11:06 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.4
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-113178-1

Method: 9315 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-113178-1	W-1	90.6
280-113178-2	W-2	97.9
280-113178-3	W-3	102
280-113178-4	W-4	97.6
280-113178-5	W-1D	92.9
280-113178-6	W-2EB	97.3
LCS 160-383016/1-A	Lab Control Sample	102
MB 160-383016/23-A	Method Blank	94.4

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-113178-1	W-1	90.6	87.1
280-113178-2	W-2	97.9	88.6
280-113178-3	W-3	102	88.2
280-113178-4	W-4	97.6	87.1
280-113178-5	W-1D	92.9	88.2
280-113178-6	W-2EB	97.3	88.2
LCS 160-383032/1-A	Lab Control Sample	102	89.7
MB 160-383032/23-A	Method Blank	94.4	88.6

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-114168-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
10/11/2018 9:09:11 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
H	Sample was prepped or analyzed beyond the specified holding time

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.
X	Carrier is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Job ID: 280-114168-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-114168-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 9/11/2018 12:55 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.3º C and 4.9º C.

TOTAL RECOVERABLE METALS
Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/18/2018 and analyzed on 09/19/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)
Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 09/18/2018 and analyzed on 10/04/2018.

Calcium failed the recovery criteria low for the MS of sample W-1 (280-114168-1) in batch 240-348697. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY
Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 09/18/2018 and analyzed on 09/25/2018.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS
Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 09/12/2018 and

Job ID: 280-114168-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

09/24/2018.

Total Dissolved Solids (TDS) was detected in method blank MB 280-429451/1 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details. The following samples are associated:

Reanalysis of the following sample was performed outside of the analytical holding time: W-4EB (280-114168-6). The sample was initially analyzed within hold on 9/12/2018, but at a tenth of the nominal volume. The sample was reanalyzed out of hold on 9/24/2018 at the full nominal volume.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS

Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 09/11/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)

Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 09/12/2018 and 09/14/2018.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)

Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 09/26/2018.

Sulfate was detected in method blank MB 280-430880/6 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Samples W-1 (280-114168-1)[2X], W-1 (280-114168-1)[20X], W-2 (280-114168-2)[5X], W-2 (280-114168-2)[50X], W-3 (280-114168-3)[5X], W-3 (280-114168-3)[50X], W-4 (280-114168-4)[100X], W-4 (280-114168-4)[5X], W-1D (280-114168-5)[2X] and W-1D (280-114168-5)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 (GFPC)

Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 09/17/2018 and analyzed on 10/09/2018.

Sample aliquots for W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5), and W-4EB (280-114168-6) were reduced due to limited sample volume.

Radium-226 was detected in method blank MB 160-389670/22-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The barium carrier recovery is outside the upper control limit (110%)for the following samples: W-3 (280-114168-3) and W-4 (280-114168-4). . The QC samples associated with the batch have acceptable carrier recovery indicating the presence of matrix interference. The pellets were noted as larger during the initial precipitation during the out of ingrowth process.

Job ID: 280-114168-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

The barium carrier recovery is outside the upper control limit (110%) for the following sample: W-3 (280-114168-3) and W-4 (280-114168-4). There was physical evidence of matrix interference apparent during the initial preparation of the sample. The pellets were noted as larger during the initial precipitation during the out of ingrowth process. The LCS/LCSD (laboratory control sample/laboratory control sample duplicate) have acceptable spike recoveries demonstrating acceptable sample preparation and instrument performance. The sample have been truncated to 100% to reduce any potential bias a high carrier recovery may have. The data have been reported with this narrative.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228

Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 09/17/2018 and analyzed on 09/24/2018.

Sample aliquots for W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5), and W-4EB (280-114168-6) were reduced due to limited sample volume.

The barium carrier recovery is outside the upper control limit (110%)for the following samples: W-3 (280-114168-3) and W-4 (280-114168-4). . The QC samples associated with the batch have acceptable carrier recovery indicating the presence of matrix interference. The pellets were noted as larger during the initial precipitation during the out of ingrowth process.

The following samples have barium recoveries above the 110% QC limit; 280-114168-A-3-B (117%), 280-114168-A-4-B (111%): W-3 (280-114168-3) and W-4 (280-114168-4). The LCS/LCSD (laboratory control sample/laboratory control sample duplicate) have acceptable spike recoveries demonstrating acceptable sample preparation and instrument performance. The samples have been truncated to 100% to reduce any potential bias a high carrier recovery may have. The data have been reported with this narrative.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226/RADIUM-228 (GFPC)

Samples W-1 (280-114168-1), W-2 (280-114168-2), W-3 (280-114168-3), W-4 (280-114168-4), W-1D (280-114168-5) and W-4EB (280-114168-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 10/10/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-114168-1

Client Sample ID: W-1

Lab Sample ID: 280-114168-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.58		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.011		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00071	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00024	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.00088	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0037	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.016		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.28		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	340		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.6	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	41		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.25	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2500	B	100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4500	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-2

Lab Sample ID: 280-114168-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	8.8		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0060		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00068	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cobalt	0.0018		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0037	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0039	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.63		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	370		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	82		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.45	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	4600	B	250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7300	B	100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-3

Lab Sample ID: 280-114168-3

This Detection Summary does not include radiochemical test results.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client Sample ID: W-3 (Continued) — Lab Sample ID: 280-114168-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.79		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0071		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00034	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0021		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0031	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.015		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	1.2		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	390		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.50	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	8000	B	250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	12000	B	200	94	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.4	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4 — Lab Sample ID: 280-114168-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.88		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0083		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00023	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0073		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0032	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0015	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.72		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	360		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	370		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.57	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	15000	B	500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	20000	B	200	94	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-1D — Lab Sample ID: 280-114168-5

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-1D (Continued)
Lab Sample ID: 280-114168-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.66		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0099		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.00085	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0037	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.015		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.29		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	350		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	41		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.25	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2600	B	100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4400	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4EB
Lab Sample ID: 280-114168-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH adj. to 25 deg C	6.2	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Sulfate	0.33	J B	5.0	0.23	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-114168-1	W-1	Water	09/10/18 14:10	09/11/18 12:55
280-114168-2	W-2	Water	09/10/18 16:50	09/11/18 12:55
280-114168-3	W-3	Water	09/10/18 18:00	09/11/18 12:55
280-114168-4	W-4	Water	09/10/18 15:25	09/11/18 12:55
280-114168-5	W-1D	Water	09/10/18 14:10	09/11/18 12:55
280-114168-6	W-4EB	Water	09/10/18 15:35	09/11/18 12:55

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: W-1 — **Lab Sample ID: 280-114168-1**
Date Collected: 09/10/18 14:10 — **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.58**		0.10	0.023	mg/L		09/18/18 15:00	09/19/18 13:03	1

Client Sample ID: W-2 — **Lab Sample ID: 280-114168-2**
Date Collected: 09/10/18 16:50 — **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**8.8**		0.10	0.023	mg/L		09/18/18 15:00	09/19/18 13:33	1

Client Sample ID: W-3 — **Lab Sample ID: 280-114168-3**
Date Collected: 09/10/18 18:00 — **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.79**		0.10	0.023	mg/L		09/18/18 15:00	09/19/18 13:38	1

Client Sample ID: W-4 — **Lab Sample ID: 280-114168-4**
Date Collected: 09/10/18 15:25 — **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.88**		0.10	0.023	mg/L		09/18/18 15:00	09/19/18 13:43	1

Client Sample ID: W-1D — **Lab Sample ID: 280-114168-5**
Date Collected: 09/10/18 14:10 — **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.66**		0.10	0.023	mg/L		09/18/18 15:00	09/19/18 13:47	1

Client Sample ID: W-4EB — **Lab Sample ID: 280-114168-6**
Date Collected: 09/10/18 15:35 — **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		09/18/18 15:00	09/19/18 13:52	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1 — **Lab Sample ID: 280-114168-1**
Date Collected: 09/10/18 14:10 — **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/18/18 15:00	10/04/18 20:46	1
Arsenic	ND		0.0050	0.00075	mg/L		09/18/18 15:00	10/04/18 20:46	1
Barium	**0.011**		0.0050	0.0022	mg/L		09/18/18 15:00	10/04/18 20:46	1
Beryllium	**0.00071**	**J**	0.0010	0.00031	mg/L		09/18/18 15:00	10/04/18 20:46	1
Cadmium	**0.00024**	**J**	0.0010	0.00021	mg/L		09/18/18 15:00	10/04/18 20:46	1
Cobalt	**0.00088**	**J**	0.0010	0.00019	mg/L		09/18/18 15:00	10/04/18 20:46	1
Chromium	ND		0.0020	0.00098	mg/L		09/18/18 15:00	10/04/18 20:46	1
Molybdenum	**0.0037**	**J**	0.010	0.0011	mg/L		09/18/18 15:00	10/04/18 20:46	1
Lead	ND		0.0010	0.00045	mg/L		09/18/18 15:00	10/04/18 20:46	1
Selenium	**0.016**		0.0050	0.00089	mg/L		09/18/18 15:00	10/04/18 20:46	1
Thallium	ND		0.0010	0.00020	mg/L		09/18/18 15:00	10/04/18 20:46	1
Lithium	**0.28**		0.0080	0.0017	mg/L		09/18/18 15:00	10/04/18 20:46	1
Calcium	**340**		1.0	0.58	mg/L		09/18/18 15:00	10/04/18 20:46	1

Client: HDR Inc TestAmerica Job ID: 280-114168-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-2 **Lab Sample ID: 280-114168-2**
Date Collected: 09/10/18 16:50 **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/18/18 15:00	10/04/18 20:56	1
Arsenic	ND		0.0050	0.00075	mg/L		09/18/18 15:00	10/04/18 20:56	1
Barium	**0.0060**		0.0050	0.0022	mg/L		09/18/18 15:00	10/04/18 20:56	1
Beryllium	**0.00068**	**J**	0.0010	0.00031	mg/L		09/18/18 15:00	10/04/18 20:56	1
Cadmium	ND		0.0010	0.00021	mg/L		09/18/18 15:00	10/04/18 20:56	1
Cobalt	**0.0018**		0.0010	0.00019	mg/L		09/18/18 15:00	10/04/18 20:56	1
Chromium	ND		0.0020	0.00098	mg/L		09/18/18 15:00	10/04/18 20:56	1
Molybdenum	**0.0037**	**J**	0.010	0.0011	mg/L		09/18/18 15:00	10/04/18 20:56	1
Lead	ND		0.0010	0.00045	mg/L		09/18/18 15:00	10/04/18 20:56	1
Selenium	**0.0039**	**J**	0.0050	0.00089	mg/L		09/18/18 15:00	10/04/18 20:56	1
Thallium	ND		0.0010	0.00020	mg/L		09/18/18 15:00	10/04/18 20:56	1
Lithium	**0.63**		0.0080	0.0017	mg/L		09/18/18 15:00	10/04/18 20:56	1
Calcium	**370**		1.0	0.58	mg/L		09/18/18 15:00	10/04/18 20:56	1

Client Sample ID: W-3 **Lab Sample ID: 280-114168-3**
Date Collected: 09/10/18 18:00 **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/18/18 15:00	10/04/18 20:59	1
Arsenic	ND		0.0050	0.00075	mg/L		09/18/18 15:00	10/04/18 20:59	1
Barium	**0.0071**		0.0050	0.0022	mg/L		09/18/18 15:00	10/04/18 20:59	1
Beryllium	ND		0.0010	0.00031	mg/L		09/18/18 15:00	10/04/18 20:59	1
Cadmium	**0.00034**	**J**	0.0010	0.00021	mg/L		09/18/18 15:00	10/04/18 20:59	1
Cobalt	**0.0021**		0.0010	0.00019	mg/L		09/18/18 15:00	10/04/18 20:59	1
Chromium	ND		0.0020	0.00098	mg/L		09/18/18 15:00	10/04/18 20:59	1
Molybdenum	**0.0031**	**J**	0.010	0.0011	mg/L		09/18/18 15:00	10/04/18 20:59	1
Lead	ND		0.0010	0.00045	mg/L		09/18/18 15:00	10/04/18 20:59	1
Selenium	**0.015**		0.0050	0.00089	mg/L		09/18/18 15:00	10/04/18 20:59	1
Thallium	ND		0.0010	0.00020	mg/L		09/18/18 15:00	10/04/18 20:59	1
Lithium	**1.2**		0.0080	0.0017	mg/L		09/18/18 15:00	10/04/18 20:59	1
Calcium	**390**		1.0	0.58	mg/L		09/18/18 15:00	10/04/18 20:59	1

Client Sample ID: W-4 **Lab Sample ID: 280-114168-4**
Date Collected: 09/10/18 15:25 **Matrix: Water**
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/18/18 15:00	10/04/18 21:01	1
Arsenic	ND		0.0050	0.00075	mg/L		09/18/18 15:00	10/04/18 21:01	1
Barium	**0.0083**		0.0050	0.0022	mg/L		09/18/18 15:00	10/04/18 21:01	1
Beryllium	ND		0.0010	0.00031	mg/L		09/18/18 15:00	10/04/18 21:01	1
Cadmium	**0.00023**	**J**	0.0010	0.00021	mg/L		09/18/18 15:00	10/04/18 21:01	1
Cobalt	**0.0073**		0.0010	0.00019	mg/L		09/18/18 15:00	10/04/18 21:01	1
Chromium	ND		0.0020	0.00098	mg/L		09/18/18 15:00	10/04/18 21:01	1
Molybdenum	**0.0032**	**J**	0.010	0.0011	mg/L		09/18/18 15:00	10/04/18 21:01	1
Lead	ND		0.0010	0.00045	mg/L		09/18/18 15:00	10/04/18 21:01	1
Selenium	**0.0015**	**J**	0.0050	0.00089	mg/L		09/18/18 15:00	10/04/18 21:01	1
Thallium	ND		0.0010	0.00020	mg/L		09/18/18 15:00	10/04/18 21:01	1
Lithium	**0.72**		0.0080	0.0017	mg/L		09/18/18 15:00	10/04/18 21:01	1
Calcium	**360**		1.0	0.58	mg/L		09/18/18 15:00	10/04/18 21:01	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1D
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55
Lab Sample ID: 280-114168-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/18/18 15:00	10/04/18 21:03	1
Arsenic	ND		0.0050	0.00075	mg/L		09/18/18 15:00	10/04/18 21:03	1
Barium	**0.0099**		0.0050	0.0022	mg/L		09/18/18 15:00	10/04/18 21:03	1
Beryllium	ND		0.0010	0.00031	mg/L		09/18/18 15:00	10/04/18 21:03	1
Cadmium	ND		0.0010	0.00021	mg/L		09/18/18 15:00	10/04/18 21:03	1
Cobalt	**0.00085**	**J**	0.0010	0.00019	mg/L		09/18/18 15:00	10/04/18 21:03	1
Chromium	ND		0.0020	0.00098	mg/L		09/18/18 15:00	10/04/18 21:03	1
Molybdenum	**0.0037**	**J**	0.010	0.0011	mg/L		09/18/18 15:00	10/04/18 21:03	1
Lead	ND		0.0010	0.00045	mg/L		09/18/18 15:00	10/04/18 21:03	1
Selenium	**0.015**		0.0050	0.00089	mg/L		09/18/18 15:00	10/04/18 21:03	1
Thallium	ND		0.0010	0.00020	mg/L		09/18/18 15:00	10/04/18 21:03	1
Lithium	**0.29**		0.0080	0.0017	mg/L		09/18/18 15:00	10/04/18 21:03	1
Calcium	**350**		1.0	0.58	mg/L		09/18/18 15:00	10/04/18 21:03	1

Client Sample ID: W-4EB
Date Collected: 09/10/18 15:35
Date Received: 09/11/18 12:55
Lab Sample ID: 280-114168-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/18/18 15:00	10/04/18 21:10	1
Arsenic	ND		0.0050	0.00075	mg/L		09/18/18 15:00	10/04/18 21:10	1
Barium	ND		0.0050	0.0022	mg/L		09/18/18 15:00	10/04/18 21:10	1
Beryllium	ND		0.0010	0.00031	mg/L		09/18/18 15:00	10/04/18 21:10	1
Cadmium	ND		0.0010	0.00021	mg/L		09/18/18 15:00	10/04/18 21:10	1
Cobalt	ND		0.0010	0.00019	mg/L		09/18/18 15:00	10/04/18 21:10	1
Chromium	ND		0.0020	0.00098	mg/L		09/18/18 15:00	10/04/18 21:10	1
Molybdenum	ND		0.010	0.0011	mg/L		09/18/18 15:00	10/04/18 21:10	1
Lead	ND		0.0010	0.00045	mg/L		09/18/18 15:00	10/04/18 21:10	1
Selenium	ND		0.0050	0.00089	mg/L		09/18/18 15:00	10/04/18 21:10	1
Thallium	ND		0.0010	0.00020	mg/L		09/18/18 15:00	10/04/18 21:10	1
Lithium	ND		0.0080	0.0017	mg/L		09/18/18 15:00	10/04/18 21:10	1
Calcium	ND		1.0	0.58	mg/L		09/18/18 15:00	10/04/18 21:10	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-1
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55
Lab Sample ID: 280-114168-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/18/18 14:00	09/25/18 10:34	1

Client Sample ID: W-2
Date Collected: 09/10/18 16:50
Date Received: 09/11/18 12:55
Lab Sample ID: 280-114168-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/18/18 14:00	09/25/18 10:37	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-3
Date Collected: 09/10/18 18:00
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/18/18 14:00	09/25/18 10:39	1

Client Sample ID: W-4
Date Collected: 09/10/18 15:25
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/18/18 14:00	09/25/18 10:41	1

Client Sample ID: W-1D
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/18/18 14:00	09/25/18 10:43	1

Client Sample ID: W-4EB
Date Collected: 09/10/18 15:35
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/18/18 14:00	09/25/18 10:44	1

General Chemistry

Client Sample ID: W-1
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.6**	**HF**	0.1	0.1	SU			09/12/18 22:22	1
Temperature	**20.6**	**HF**	1.0	1.0	Degrees C			09/12/18 22:22	1
Chloride	**41**		6.0	0.51	mg/L			09/26/18 08:50	2
Fluoride	**0.25**	**J**	1.0	0.12	mg/L			09/26/18 08:50	2
Sulfate	**2500**	**B**	100	4.6	mg/L			09/26/18 09:08	20
Total Dissolved Solids (TDS)	**4500**	**B**	40	19	mg/L			09/12/18 19:49	1
Total Suspended Solids	ND		4.0	1.1	mg/L			09/11/18 18:17	1

Client Sample ID: W-2
Date Collected: 09/10/18 16:50
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.7**	**HF**	0.1	0.1	SU			09/12/18 22:46	1
Temperature	**20.8**	**HF**	1.0	1.0	Degrees C			09/12/18 22:46	1
Chloride	**82**		15	1.3	mg/L			09/26/18 10:25	5
Fluoride	**0.45**	**J**	2.5	0.30	mg/L			09/26/18 10:25	5
Sulfate	**4600**	**B**	250	12	mg/L			09/26/18 09:27	50
Total Dissolved Solids (TDS)	**7300**	**B**	100	47	mg/L			09/12/18 19:49	1
Total Suspended Solids	**1.2**	**J**	4.0	1.1	mg/L			09/11/18 18:17	1

Client Sample ID: W-3
Date Collected: 09/10/18 18:00
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.6**	**HF**	0.1	0.1	SU			09/12/18 22:51	1

General Chemistry (Continued)

Client Sample ID: W-3
Date Collected: 09/10/18 18:00
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	21.3	HF	1.0	1.0	Degrees C			09/12/18 22:51	1
Chloride	190		15	1.3	mg/L			09/26/18 10:44	5
Fluoride	0.50	J	2.5	0.30	mg/L			09/26/18 10:44	5
Sulfate	8000	B	250	12	mg/L			09/26/18 11:03	50
Total Dissolved Solids (TDS)	12000	B	200	94	mg/L			09/12/18 19:49	1
Total Suspended Solids	2.4	J	4.0	1.1	mg/L			09/11/18 18:17	1

Client Sample ID: W-4
Date Collected: 09/10/18 15:25
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			09/12/18 22:37	1
Temperature	20.4	HF	1.0	1.0	Degrees C			09/12/18 22:37	1
Chloride	370		15	1.3	mg/L			09/26/18 11:21	5
Fluoride	0.57	J	2.5	0.30	mg/L			09/26/18 11:21	5
Sulfate	15000	B	500	23	mg/L			09/26/18 11:40	100
Total Dissolved Solids (TDS)	20000	B	200	94	mg/L			09/12/18 19:49	1
Total Suspended Solids	3.2	J	4.0	1.1	mg/L			09/11/18 18:17	1

Client Sample ID: W-1D
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			09/12/18 21:16	1
Temperature	20.5	HF	1.0	1.0	Degrees C			09/12/18 21:16	1
Chloride	41		6.0	0.51	mg/L			09/26/18 11:59	2
Fluoride	0.25	J	1.0	0.12	mg/L			09/26/18 11:59	2
Sulfate	2600	B	100	4.6	mg/L			09/26/18 12:18	20
Total Dissolved Solids (TDS)	4400	B	40	19	mg/L			09/12/18 19:49	1
Total Suspended Solids	1.2	J	4.0	1.1	mg/L			09/11/18 18:17	1

Client Sample ID: W-4EB
Date Collected: 09/10/18 15:35
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.2	HF	0.1	0.1	SU			09/14/18 20:07	1
Temperature	20.9	HF	1.0	1.0	Degrees C			09/14/18 20:07	1
Chloride	ND		3.0	0.25	mg/L			09/26/18 12:53	1
Fluoride	ND		0.50	0.060	mg/L			09/26/18 12:53	1
Sulfate	0.33	J B	5.0	0.23	mg/L			09/26/18 12:53	1
Total Dissolved Solids (TDS)	ND	H	10	4.7	mg/L			09/24/18 08:04	1
Total Suspended Solids	ND		4.0	1.1	mg/L			09/11/18 18:17	1

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-114168-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.404		0.121	0.126	1.00	0.0957	pCi/L	09/17/18 08:49	10/09/18 04:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*109*		*40 - 110*	*09/17/18 08:49*	*10/09/18 04:45*	*1*

Client Sample ID: W-2
Date Collected: 09/10/18 16:50
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.299		0.108	0.111	1.00	0.102	pCi/L	09/17/18 08:49	10/09/18 04:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*108*		*40 - 110*	*09/17/18 08:49*	*10/09/18 04:46*	*1*

Client Sample ID: W-3
Date Collected: 09/10/18 18:00
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.228		0.0991	0.101	1.00	0.0996	pCi/L	09/17/18 08:49	10/09/18 04:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*117*	*X*	*40 - 110*	*09/17/18 08:49*	*10/09/18 04:46*	*1*

Client Sample ID: W-4
Date Collected: 09/10/18 15:25
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.443		0.135	0.141	1.00	0.120	pCi/L	09/17/18 08:49	10/09/18 04:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*111*	*X*	*40 - 110*	*09/17/18 08:49*	*10/09/18 04:46*	*1*

Client Sample ID: W-1D
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.295		0.108	0.111	1.00	0.0992	pCi/L	09/17/18 08:49	10/09/18 04:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*09/17/18 08:49*	*10/09/18 04:46*	*1*

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-114168-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-4EB
Date Collected: 09/10/18 15:35
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.242**		0.108	0.110	1.00	0.120	pCi/L	09/17/18 08:49	10/09/18 04:49	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*110*		*40 - 110*	*09/17/18 08:49*	*10/09/18 04:49*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.649**		0.351	0.356	1.00	0.533	pCi/L	09/17/18 09:36	09/24/18 16:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*109*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*
Y Carrier	*82.6*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*

Client Sample ID: W-2
Date Collected: 09/10/18 16:50
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0864	U	0.293	0.293	1.00	0.508	pCi/L	09/17/18 09:36	09/24/18 16:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*108*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*
Y Carrier	*82.6*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*

Client Sample ID: W-3
Date Collected: 09/10/18 18:00
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.413	U	0.346	0.348	1.00	0.553	pCi/L	09/17/18 09:36	09/24/18 16:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*117*	*X*	*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*
Y Carrier	*81.9*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-114168-1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-4
Date Collected: 09/10/18 15:25
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.560**		0.347	0.351	1.00	0.534	pCi/L	09/17/18 09:36	09/24/18 16:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*111*	*X*	*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*
Y Carrier	*82.6*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*

Client Sample ID: W-1D
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.587**		0.304	0.309	1.00	0.448	pCi/L	09/17/18 09:36	09/24/18 16:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*
Y Carrier	*83.4*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*

Client Sample ID: W-4EB
Date Collected: 09/10/18 15:35
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.311	U	0.269	0.270	1.00	0.429	pCi/L	09/17/18 09:36	09/24/18 16:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*110*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*
Y Carrier	*83.4*		*40 - 110*	*09/17/18 09:36*	*09/24/18 16:40*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-1
Date Collected: 09/10/18 14:10
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.05**		0.371	0.378	5.00	0.533	pCi/L		10/10/18 11:39	1

Client Sample ID: W-2
Date Collected: 09/10/18 16:50
Date Received: 09/11/18 12:55

Lab Sample ID: 280-114168-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.385	U	0.312	0.313	5.00	0.508	pCi/L		10/10/18 11:39	1

Client: HDR Inc
TestAmerica Job ID: 280-114168-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-3
Lab Sample ID: 280-114168-3
Date Collected: 09/10/18 18:00
Matrix: Water
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.641		0.360	0.362	5.00	0.553	pCi/L		10/10/18 11:39	1

Client Sample ID: W-4
Lab Sample ID: 280-114168-4
Date Collected: 09/10/18 15:25
Matrix: Water
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.00		0.372	0.378	5.00	0.534	pCi/L		10/10/18 11:39	1

Client Sample ID: W-1D
Lab Sample ID: 280-114168-5
Date Collected: 09/10/18 14:10
Matrix: Water
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.881		0.323	0.328	5.00	0.448	pCi/L		10/10/18 11:39	1

Client Sample ID: W-4EB
Lab Sample ID: 280-114168-6
Date Collected: 09/10/18 15:35
Matrix: Water
Date Received: 09/11/18 12:55

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.552		0.290	0.292	5.00	0.429	pCi/L		10/10/18 11:39	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-345933/1-A
Matrix: Water
Analysis Batch: 346249

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 345933

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		09/18/18 15:00	09/19/18 12:55	1

Lab Sample ID: LCS 240-345933/2-A
Matrix: Water
Analysis Batch: 346249

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 345933

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.03		mg/L		103	80 - 120

Lab Sample ID: 280-114168-1 MS
Matrix: Water
Analysis Batch: 346249

Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 345933

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.58		1.00	1.69		mg/L		111	75 - 125

Lab Sample ID: 280-114168-1 MSD
Matrix: Water
Analysis Batch: 346249

Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 345933

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.58		1.00	1.64		mg/L		106	75 - 125	3	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-345933/1-A
Matrix: Water
Analysis Batch: 348697

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 345933

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/18/18 15:00	10/04/18 20:38	1
Arsenic	ND		0.0050	0.00075	mg/L		09/18/18 15:00	10/04/18 20:38	1
Barium	ND		0.0050	0.0022	mg/L		09/18/18 15:00	10/04/18 20:38	1
Beryllium	ND		0.0010	0.00031	mg/L		09/18/18 15:00	10/04/18 20:38	1
Cadmium	ND		0.0010	0.00021	mg/L		09/18/18 15:00	10/04/18 20:38	1
Cobalt	ND		0.0010	0.00019	mg/L		09/18/18 15:00	10/04/18 20:38	1
Chromium	ND		0.0020	0.00098	mg/L		09/18/18 15:00	10/04/18 20:38	1
Molybdenum	ND		0.010	0.0011	mg/L		09/18/18 15:00	10/04/18 20:38	1
Lead	ND		0.0010	0.00045	mg/L		09/18/18 15:00	10/04/18 20:38	1
Selenium	ND		0.0050	0.00089	mg/L		09/18/18 15:00	10/04/18 20:38	1
Thallium	ND		0.0010	0.00020	mg/L		09/18/18 15:00	10/04/18 20:38	1
Lithium	ND		0.0080	0.0017	mg/L		09/18/18 15:00	10/04/18 20:38	1
Calcium	ND		1.0	0.58	mg/L		09/18/18 15:00	10/04/18 20:38	1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 240-345933/3-A
Matrix: Water
Analysis Batch: 348697

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 345933

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0987		mg/L		99	80 - 120
Arsenic	1.00	0.949		mg/L		95	80 - 120
Barium	1.00	0.989		mg/L		99	80 - 120
Beryllium	1.00	0.948		mg/L		95	80 - 120
Cadmium	1.00	0.993		mg/L		99	80 - 120
Cobalt	1.00	0.925		mg/L		93	80 - 120
Chromium	1.00	0.967		mg/L		97	80 - 120
Molybdenum	0.100	0.0995		mg/L		99	80 - 120
Lead	1.00	1.01		mg/L		101	80 - 120
Selenium	1.00	0.961		mg/L		96	80 - 120
Thallium	0.250	0.247		mg/L		99	80 - 120
Lithium	0.100	0.0999		mg/L		100	80 - 120
Calcium	10.0	9.66		mg/L		97	80 - 120

Lab Sample ID: 280-114168-1 MS
Matrix: Water
Analysis Batch: 348697

Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 345933

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.103		mg/L		103	75 - 125
Arsenic	ND		1.00	0.969		mg/L		97	75 - 125
Barium	0.011		1.00	1.04		mg/L		103	75 - 125
Beryllium	0.00071	J	1.00	0.999		mg/L		100	75 - 125
Cadmium	0.00024	J	1.00	0.975		mg/L		98	75 - 125
Cobalt	0.00088	J	1.00	0.974		mg/L		97	75 - 125
Chromium	ND		1.00	0.975		mg/L		97	75 - 125
Molybdenum	0.0037	J	0.100	0.112		mg/L		109	75 - 125
Lead	ND		1.00	0.967		mg/L		97	75 - 125
Selenium	0.016		1.00	1.07		mg/L		105	75 - 125
Thallium	ND		0.250	0.238		mg/L		95	75 - 125
Lithium	0.28		0.100	0.371		mg/L		92	75 - 125
Calcium	340		10.0	343	4	mg/L		34	75 - 125

Lab Sample ID: 280-114168-1 MSD
Matrix: Water
Analysis Batch: 348697

Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 345933

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.103		mg/L		103	75 - 125	0	20
Arsenic	ND		1.00	0.986		mg/L		99	75 - 125	2	20
Barium	0.011		1.00	1.06		mg/L		104	75 - 125	1	20
Beryllium	0.00071	J	1.00	1.01		mg/L		101	75 - 125	1	20
Cadmium	0.00024	J	1.00	0.989		mg/L		99	75 - 125	1	20
Cobalt	0.00088	J	1.00	0.967		mg/L		97	75 - 125	1	20
Chromium	ND		1.00	0.982		mg/L		98	75 - 125	1	20
Molybdenum	0.0037	J	0.100	0.110		mg/L		106	75 - 125	2	20
Lead	ND		1.00	0.986		mg/L		99	75 - 125	2	20
Selenium	0.016		1.00	1.09		mg/L		107	75 - 125	2	20

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 280-114168-1 MSD
Client Sample ID: W-1
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 348697
Prep Batch: 345933

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Thallium	ND		0.250	0.241		mg/L		96	75 - 125	1	20
Lithium	0.28		0.100	0.367		mg/L		88	75 - 125	1	20
Calcium	340		10.0	349	4	mg/L		86	75 - 125	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-345936/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 347280
Prep Batch: 345936

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/18/18 14:00	09/25/18 10:31	1

Lab Sample ID: LCS 240-345936/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 347280
Prep Batch: 345936

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.96		ug/L		99	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-429537/29
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 429537

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 280-429537/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 429537

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-430880/6
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 430880

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			09/25/18 18:26	1
Fluoride	ND		0.50	0.060	mg/L			09/25/18 18:26	1
Sulfate	0.692	J	5.0	0.23	mg/L			09/25/18 18:26	1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 280-430880/4
Matrix: Water
Analysis Batch: 430880

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.3		mg/L		99	90 - 110
Fluoride	5.00	5.14		mg/L		103	90 - 110
Sulfate	100	102		mg/L		102	90 - 110

Lab Sample ID: LCSD 280-430880/5
Matrix: Water
Analysis Batch: 430880

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	99.3		mg/L		99	90 - 110	0	10
Fluoride	5.00	5.14		mg/L		103	90 - 110	0	10
Sulfate	100	102		mg/L		102	90 - 110	0	10

Lab Sample ID: MRL 280-430880/3
Matrix: Water
Analysis Batch: 430880

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.64	J	mg/L		106	50 - 150
Fluoride	0.200	0.192	J	mg/L		96	50 - 150
Sulfate	2.50	2.95	J	mg/L		118	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-429451/1
Matrix: Water
Analysis Batch: 429451

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	7.00	J	10	4.7	mg/L			09/12/18 19:49	1

Lab Sample ID: LCS 280-429451/2
Matrix: Water
Analysis Batch: 429451

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	494		mg/L		99	86 - 110

Lab Sample ID: 280-114168-1 DU
Matrix: Water
Analysis Batch: 429451

Client Sample ID: W-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	4500	B	4460		mg/L		2	10

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: MB 280-430673/1
Matrix: Water
Analysis Batch: 430673

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			09/24/18 08:04	1

Lab Sample ID: LCS 280-430673/2
Matrix: Water
Analysis Batch: 430673

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	498		mg/L		100	86 - 110

Lab Sample ID: 280-114168-6 DU
Matrix: Water
Analysis Batch: 430673

Client Sample ID: W-4EB
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	ND	H	ND		mg/L		NC	10

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-429298/1
Matrix: Water
Analysis Batch: 429298

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			09/11/18 18:17	1

Lab Sample ID: LCS 280-429298/2
Matrix: Water
Analysis Batch: 429298

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	92.4		mg/L		92	86 - 114

Lab Sample ID: LCSD 280-429298/3
Matrix: Water
Analysis Batch: 429298

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids	100	96.4		mg/L		96	86 - 114	4	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-389670/22-A
Matrix: Water
Analysis Batch: 393784

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 389670

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.2649		0.106	0.108	1.00	0.106	pCi/L	09/17/18 08:49	10/09/18 04:50	1

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: MB 160-389670/22-A
Matrix: Water
Analysis Batch: 393784

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 389670

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	109		40 - 110	09/17/18 08:49	10/09/18 04:50	1

Lab Sample ID: LCS 160-389670/1-A
Matrix: Water
Analysis Batch: 393786

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 389670

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	15.1	13.87		1.42	1.00	0.0920	pCi/L	92	68 - 137

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	104		40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-389674/22-A
Matrix: Water
Analysis Batch: 391132

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 389674

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.2427	U	0.239	0.240	1.00	0.476	pCi/L	09/17/18 09:36	09/24/18 16:40	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	109		40 - 110	09/17/18 09:36	09/24/18 16:40	1
Y Carrier	80.0		40 - 110	09/17/18 09:36	09/24/18 16:40	1

Lab Sample ID: LCS 160-389674/1-A
Matrix: Water
Analysis Batch: 391132

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 389674

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	14.6	16.07		1.78	1.00	0.511	pCi/L	110	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	104		40 - 110
Y Carrier	78.5		40 - 110

Metals

Prep Batch: 345933

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total Recoverable	Water	3005A	
280-114168-2	W-2	Total Recoverable	Water	3005A	
280-114168-3	W-3	Total Recoverable	Water	3005A	
280-114168-4	W-4	Total Recoverable	Water	3005A	
280-114168-5	W-1D	Total Recoverable	Water	3005A	
280-114168-6	W-4EB	Total Recoverable	Water	3005A	
MB 240-345933/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-345933/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-345933/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-114168-1 MS	W-1	Total Recoverable	Water	3005A	
280-114168-1 MS	W-1	Total Recoverable	Water	3005A	
280-114168-1 MSD	W-1	Total Recoverable	Water	3005A	
280-114168-1 MSD	W-1	Total Recoverable	Water	3005A	

Prep Batch: 345936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total/NA	Water	7470A	
280-114168-2	W-2	Total/NA	Water	7470A	
280-114168-3	W-3	Total/NA	Water	7470A	
280-114168-4	W-4	Total/NA	Water	7470A	
280-114168-5	W-1D	Total/NA	Water	7470A	
280-114168-6	W-4EB	Total/NA	Water	7470A	
MB 240-345936/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-345936/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 346249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total Recoverable	Water	6010C	345933
280-114168-2	W-2	Total Recoverable	Water	6010C	345933
280-114168-3	W-3	Total Recoverable	Water	6010C	345933
280-114168-4	W-4	Total Recoverable	Water	6010C	345933
280-114168-5	W-1D	Total Recoverable	Water	6010C	345933
280-114168-6	W-4EB	Total Recoverable	Water	6010C	345933
MB 240-345933/1-A	Method Blank	Total Recoverable	Water	6010C	345933
LCS 240-345933/2-A	Lab Control Sample	Total Recoverable	Water	6010C	345933
280-114168-1 MS	W-1	Total Recoverable	Water	6010C	345933
280-114168-1 MSD	W-1	Total Recoverable	Water	6010C	345933

Analysis Batch: 347280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total/NA	Water	7470A	345936
280-114168-2	W-2	Total/NA	Water	7470A	345936
280-114168-3	W-3	Total/NA	Water	7470A	345936
280-114168-4	W-4	Total/NA	Water	7470A	345936
280-114168-5	W-1D	Total/NA	Water	7470A	345936
280-114168-6	W-4EB	Total/NA	Water	7470A	345936
MB 240-345936/1-A	Method Blank	Total/NA	Water	7470A	345936
LCS 240-345936/2-A	Lab Control Sample	Total/NA	Water	7470A	345936

Metals (Continued)

Analysis Batch: 348697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total Recoverable	Water	6020A	345933
280-114168-2	W-2	Total Recoverable	Water	6020A	345933
280-114168-3	W-3	Total Recoverable	Water	6020A	345933
280-114168-4	W-4	Total Recoverable	Water	6020A	345933
280-114168-5	W-1D	Total Recoverable	Water	6020A	345933
280-114168-6	W-4EB	Total Recoverable	Water	6020A	345933
MB 240-345933/1-A	Method Blank	Total Recoverable	Water	6020A	345933
LCS 240-345933/3-A	Lab Control Sample	Total Recoverable	Water	6020A	345933
280-114168-1 MS	W-1	Total Recoverable	Water	6020A	345933
280-114168-1 MSD	W-1	Total Recoverable	Water	6020A	345933

General Chemistry

Analysis Batch: 429298

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total/NA	Water	SM 2540D	
280-114168-2	W-2	Total/NA	Water	SM 2540D	
280-114168-3	W-3	Total/NA	Water	SM 2540D	
280-114168-4	W-4	Total/NA	Water	SM 2540D	
280-114168-5	W-1D	Total/NA	Water	SM 2540D	
280-114168-6	W-4EB	Total/NA	Water	SM 2540D	
MB 280-429298/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-429298/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-429298/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	

Analysis Batch: 429451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total/NA	Water	SM 2540C	
280-114168-2	W-2	Total/NA	Water	SM 2540C	
280-114168-3	W-3	Total/NA	Water	SM 2540C	
280-114168-4	W-4	Total/NA	Water	SM 2540C	
280-114168-5	W-1D	Total/NA	Water	SM 2540C	
MB 280-429451/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-429451/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-114168-1 DU	W-1	Total/NA	Water	SM 2540C	

Analysis Batch: 429537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total/NA	Water	9040B	
280-114168-2	W-2	Total/NA	Water	9040B	
280-114168-3	W-3	Total/NA	Water	9040B	
280-114168-4	W-4	Total/NA	Water	9040B	
280-114168-5	W-1D	Total/NA	Water	9040B	
LCS 280-429537/29	Lab Control Sample	Total/NA	Water	9040B	
LCS 280-429537/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 429847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-6	W-4EB	Total/NA	Water	9040B	
LCS 280-429847/29	Lab Control Sample	Total/NA	Water	9040B	

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-114168-1

General Chemistry (Continued)

Analysis Batch: 430673

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-6	W-4EB	Total/NA	Water	SM 2540C	
MB 280-430673/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-430673/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-114168-6 DU	W-4EB	Total/NA	Water	SM 2540C	

Analysis Batch: 430880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total/NA	Water	9056A	
280-114168-1	W-1	Total/NA	Water	9056A	
280-114168-2	W-2	Total/NA	Water	9056A	
280-114168-2	W-2	Total/NA	Water	9056A	
280-114168-3	W-3	Total/NA	Water	9056A	
280-114168-3	W-3	Total/NA	Water	9056A	
280-114168-4	W-4	Total/NA	Water	9056A	
280-114168-4	W-4	Total/NA	Water	9056A	
280-114168-5	W-1D	Total/NA	Water	9056A	
280-114168-5	W-1D	Total/NA	Water	9056A	
280-114168-6	W-4EB	Total/NA	Water	9056A	
MB 280-430880/6	Method Blank	Total/NA	Water	9056A	
LCS 280-430880/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-430880/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-430880/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 389670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total/NA	Water	PrecSep-21	
280-114168-2	W-2	Total/NA	Water	PrecSep-21	
280-114168-3	W-3	Total/NA	Water	PrecSep-21	
280-114168-4	W-4	Total/NA	Water	PrecSep-21	
280-114168-5	W-1D	Total/NA	Water	PrecSep-21	
280-114168-6	W-4EB	Total/NA	Water	PrecSep-21	
MB 160-389670/22-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-389670/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 389674

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114168-1	W-1	Total/NA	Water	PrecSep_0	
280-114168-2	W-2	Total/NA	Water	PrecSep_0	
280-114168-3	W-3	Total/NA	Water	PrecSep_0	
280-114168-4	W-4	Total/NA	Water	PrecSep_0	
280-114168-5	W-1D	Total/NA	Water	PrecSep_0	
280-114168-6	W-4EB	Total/NA	Water	PrecSep_0	
MB 160-389674/22-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-389674/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client Sample ID: W-1

Lab Sample ID: 280-114168-1

Date Collected: 09/10/18 14:10

Matrix: Water

Date Received: 09/11/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			346249	09/19/18 13:03	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348697	10/04/18 20:46	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	345936	09/18/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347280	09/25/18 10:34	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429537	09/12/18 22:22	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	430880	09/26/18 08:50	ARM	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	430880	09/26/18 09:08	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	429451	09/12/18 19:49	ARM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	429298	09/11/18 18:17	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			749.70 mL	1.0 g	389670	09/17/18 08:49	JLC	TAL SL
Total/NA	Analysis	9315		1			393785	10/09/18 04:45	CDR	TAL SL
Total/NA	Prep	PrecSep_0			749.70 mL	1.0 g	389674	09/17/18 09:36	JLC	TAL SL
Total/NA	Analysis	9320		1			391132	09/24/18 16:40	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			394198	10/10/18 11:39	ALS	TAL SL

Client Sample ID: W-2

Lab Sample ID: 280-114168-2

Date Collected: 09/10/18 16:50

Matrix: Water

Date Received: 09/11/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			346249	09/19/18 13:33	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348697	10/04/18 20:56	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	345936	09/18/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347280	09/25/18 10:37	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429537	09/12/18 22:46	SGB	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	430880	09/26/18 09:27	ARM	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	430880	09/26/18 10:25	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	429451	09/12/18 19:49	ARM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	429298	09/11/18 18:17	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.17 mL	1.0 g	389670	09/17/18 08:49	JLC	TAL SL
Total/NA	Analysis	9315		1			393785	10/09/18 04:46	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.17 mL	1.0 g	389674	09/17/18 09:36	JLC	TAL SL
Total/NA	Analysis	9320		1			391132	09/24/18 16:40	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			394198	10/10/18 11:39	ALS	TAL SL

Client Sample ID: W-3 Lab Sample ID: 280-114168-3

Date Collected: 09/10/18 18:00 Matrix: Water
Date Received: 09/11/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			346249	09/19/18 13:38	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348697	10/04/18 20:59	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	345936	09/18/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347280	09/25/18 10:39	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429537	09/12/18 22:51	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	430880	09/26/18 10:44	ARM	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	430880	09/26/18 11:03	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	5 mL	100 mL	429451	09/12/18 19:49	ARM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	429298	09/11/18 18:17	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.28 mL	1.0 g	389670	09/17/18 08:49	JLC	TAL SL
Total/NA	Analysis	9315		1			393785	10/09/18 04:46	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.28 mL	1.0 g	389674	09/17/18 09:36	JLC	TAL SL
Total/NA	Analysis	9320		1			391132	09/24/18 16:40	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			394198	10/10/18 11:39	ALS	TAL SL

Client Sample ID: W-4 Lab Sample ID: 280-114168-4

Date Collected: 09/10/18 15:25 Matrix: Water
Date Received: 09/11/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			346249	09/19/18 13:43	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348697	10/04/18 21:01	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	345936	09/18/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347280	09/25/18 10:41	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429537	09/12/18 22:37	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	430880	09/26/18 11:21	ARM	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	430880	09/26/18 11:40	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	5 mL	100 mL	429451	09/12/18 19:49	ARM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	429298	09/11/18 18:17	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.39 mL	1.0 g	389670	09/17/18 08:49	JLC	TAL SL
Total/NA	Analysis	9315		1			393785	10/09/18 04:46	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.39 mL	1.0 g	389674	09/17/18 09:36	JLC	TAL SL
Total/NA	Analysis	9320		1			391132	09/24/18 16:40	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			394198	10/10/18 11:39	ALS	TAL SL

Client Sample ID: W-1D Lab Sample ID: 280-114168-5

Date Collected: 09/10/18 14:10 **Matrix: Water**
Date Received: 09/11/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			346249	09/19/18 13:47	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348697	10/04/18 21:03	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	345936	09/18/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347280	09/25/18 10:43	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429537	09/12/18 21:16	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	430880	09/26/18 11:59	ARM	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	430880	09/26/18 12:18	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	429451	09/12/18 19:49	ARM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	429298	09/11/18 18:17	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			749.84 mL	1.0 g	389670	09/17/18 08:49	JLC	TAL SL
Total/NA	Analysis	9315		1			393785	10/09/18 04:46	CDR	TAL SL
Total/NA	Prep	PrecSep_0			749.84 mL	1.0 g	389674	09/17/18 09:36	JLC	TAL SL
Total/NA	Analysis	9320		1			391132	09/24/18 16:40	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			394198	10/10/18 11:39	ALS	TAL SL

Client Sample ID: W-4EB Lab Sample ID: 280-114168-6

Date Collected: 09/10/18 15:35 **Matrix: Water**
Date Received: 09/11/18 12:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			346249	09/19/18 13:52	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	345933	09/18/18 15:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348697	10/04/18 21:10	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	345936	09/18/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347280	09/25/18 10:44	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429847	09/14/18 20:07	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	430880	09/26/18 12:53	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	430673	09/24/18 08:04	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	429298	09/11/18 18:17	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			750.14 mL	1.0 g	389670	09/17/18 08:49	JLC	TAL SL
Total/NA	Analysis	9315		1	1.0 mL	1.0 mL	393784	10/09/18 04:49	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.14 mL	1.0 g	389674	09/17/18 09:36	JLC	TAL SL
Total/NA	Analysis	9320		1			391132	09/24/18 16:40	MAR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			394198	10/10/18 11:39	ALS	TAL SL

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18 *
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18 *
Kansas	NELAP	7	E-10236	10-31-18 *
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	10-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tara Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-77529-25460.1
Client Contact: Anna Lundin	Phone: 7209337496	E-Mail: stephanie.rothmeyer@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc				Job #:
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days):			
State, Zip: CO, 80112				
Phone: 734-263-7138(Tel)	PO #: DEN-018			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Colorado	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C_Calcd - Total Dissolved Solids (TDS)	6010C, 6020A, 7470A metals	9040B, 9056A_28D pH	2540D - Total Suspended Solids	9315_Ra226, 9320_Ra228	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D		
W-1	9-10-18	1410	G	Water			✓	✓	✓	✓	✓		
W-2	9.10.18	1650	G	Water			✓	✓	✓	✓	✓		
W-3	9.10-18	1800	G	Water			✓	✓	✓	✓	✓		
W-4	9-10-18	1525	G	Water			✓	✓	✓	✓	✓		
~~Field Duplicate~~ TK W-1D	9.10.18	1410	G	Water			✓	✓	✓	✓	✓		
~~Equipment Blank~~ TK W-4EB	9-10-18	1535	G	Water			✓	✓	✓	✓	✓		
				Water			~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~ TK		

280-114168 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tara Kent TK	Date: 9-11-18	Time: 1253	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by: Tara Kent 1256	Date/Time: 11 Sept 2018	Company: HDR	Received by: [signature]	Date/Time: 9/11/18 1255	Company: TA Den
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.8 4.4 8 +0.5 by AP 9/11/18

Ver: 08/04/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-454281.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-114168-1
Address: 13715 Rider Trail North,	**Due Date Requested:** 10/5/2018			
City: Earth City	**TAT Requested (days):**			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA
M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)
Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
W-1 (280-114168-1)	9/10/18	14:10 Mountain		Water			X	X	X	1	
W-2 (280-114168-2)	9/10/18	16:50 Mountain		Water			X	X	X	1	
W-3 (280-114168-3)	9/10/18	18:00 Mountain		Water			X	X	X	1	
W-4 (280-114168-4)	9/10/18	15:25 Mountain		Water			X	X	X	1	
W-1D (280-114168-5)	9/10/18	14:10 Mountain		Water			X	X	X	1	
W-4EB (280-114168-6)	9/10/18	15:35 Mountain		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For ________ Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Laura Castro	9-12-18 1540	TAL Den	Michael Hleem	9.13.18 0915	TA STL

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

2.6/3.5

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-454282.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-114168-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 10/3/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA
M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)
Other:

S-41

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 12 Total Metals (w/collision cell)	6010C/3005A (MOD) Boron	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
W-1 (280-114168-1)	9/10/18	14:10 Mountain		Water			X	X	X	1	Use Collision Cell
W-2 (280-114168-2)	9/10/18	16:50 Mountain		Water			X	X	X	1	Use Collision Cell
W-3 (280-114168-3)	9/10/18	18:00 Mountain		Water			X	X	X	1	Use Collision Cell
W-4 (280-114168-4)	9/10/18	15:25 Mountain		Water			X	X	X	1	Use Collision Cell
W-1D (280-114168-5)	9/10/18	14:10 Mountain		Water			X	X	X	1	Use Collision Cell
W-4EB (280-114168-6)	9/10/18	15:35 Mountain		Water			X	X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) | Primary Deliverable Rank: 4 | Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:		Method of Shipment:	
Relinquished by: Laura Castro	Date/Time: 9-12-18 1635	Company: TALDen	Received by: [signature]	Date/Time: 9-13-18 910	Company: TAC
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** ______________

Canton Facility

Client TA DENVER Site Name —

Cooler unpacked by: GDP

Cooler Received on 9-13-18 Opened on 9-14-18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time ______ Storage Location ______

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ______

Packing material used: Bubble Wrap Foam Plastic Bag None Other ______

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 3.5 °C
   IR GUN #36 (CF +0.6°C) Observed Cooler Temp. ______ °C Corrected Cooler Temp. ______ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   - Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   - Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   - Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# **HC849161**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ______ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ______ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ______ Date ______ by ______ via Verbal Voice Mail Other

Concerning ______

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

18. SAMPLE CONDITION

Sample(s) ______ were received after the recommended holding time had expired.

Sample(s) ______ were received in a broken container.

Sample(s) ______ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ______ were further preserved in the laboratory.

Time preserved: ______ Preservative(s) added/Lot number(s): ______

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-114168-1

Login Number: 114168
List Number: 1
Creator: Paul, Amanda E

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-114168-1

Login Number: 114168
List Number: 2
Creator: Hellm, Michael

List Source: TestAmerica St. Louis
List Creation: 09/13/18 01:07 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 9315 - Radium-226 (GFPC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-114168-1	W-1	109
280-114168-2	W-2	108
280-114168-3	W-3	117 X
280-114168-4	W-4	111 X
280-114168-5	W-1D	106
280-114168-6	W-4EB	110
LCS 160-389670/1-A	Lab Control Sample	104
MB 160-389670/22-A	Method Blank	109

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-114168-1	W-1	109	82.6
280-114168-2	W-2	108	82.6
280-114168-3	W-3	117 X	81.9
280-114168-4	W-4	111 X	82.6
280-114168-5	W-1D	106	83.4
280-114168-6	W-4EB	110	83.4
LCS 160-389674/1-A	Lab Control Sample	104	78.5
MB 160-389674/22-A	Method Blank	109	80.0

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-115507-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
11/20/2018 10:29:31 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
B	Compound was found in the blank and sample.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-115507-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-115507-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 10/12/2018 2:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.3º C and 5.8º C.

TOTAL RECOVERABLE METALS

Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4), W-4D (280-115507-5), MW-6 (280-115507-6), MW-7 (280-115507-7), MW-8 (280-115507-8) and MW-8EB (280-115507-9) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 10/17/2018 and analyzed on 10/18/2018.

Samples MW-6 (280-115507-6)[5X] and MW-7 (280-115507-7)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)

Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4), W-4D (280-115507-5), MW-6 (280-115507-6), MW-7 (280-115507-7), MW-8 (280-115507-8) and MW-8EB (280-115507-9) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 10/17/2018 and analyzed on 10/19/2018, 10/23/2018 and 10/24/2018.

Calcium failed the recovery criteria low for the MS/MSD of sample W-1 (280-115507-1) in batch 240-351121. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount; therefore, control limits are not applicable. Lithium failed the recovery criteria low for the MSD of sample W-1 (280-115507-1) in batch 240-351620. Refer to the QC report for details. The acceptable LCS data indicate that the analytical system was operating within control.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4), W-4D (280-115507-5), MW-6 (280-115507-6), MW-7 (280-115507-7), MW-8 (280-115507-8) and MW-8EB (280-115507-9) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 10/17/2018 and analyzed on 10/18/2018.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Job ID: 280-115507-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS
Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4), W-4D (280-115507-5), MW-6 (280-115507-6), MW-7 (280-115507-7), MW-8 (280-115507-8) and MW-8EB (280-115507-9) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 10/16/2018 and 10/18/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS
Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4), W-4D (280-115507-5), MW-6 (280-115507-6), MW-7 (280-115507-7), MW-8 (280-115507-8) and MW-8EB (280-115507-9) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 10/16/2018 and 10/17/2018.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)
Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4), W-4D (280-115507-5), MW-6 (280-115507-6), MW-7 (280-115507-7), MW-8 (280-115507-8) and MW-8EB (280-115507-9) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 10/17/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)
Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4), W-4D (280-115507-5), MW-6 (280-115507-6), MW-7 (280-115507-7), MW-8 (280-115507-8) and MW-8EB (280-115507-9) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 10/27/2018, 10/28/2018, 10/30/2018 and 10/31/2018.

Samples W-1 (280-115507-1)[2X], W-1 (280-115507-1)[20X], W-2 (280-115507-2)[2X], W-2 (280-115507-2)[50X], W-3 (280-115507-3)[100X], W-3 (280-115507-3)[5X], W-4 (280-115507-4)[100X], W-4 (280-115507-4)[5X], W-4D (280-115507-5)[100X], W-4D (280-115507-5)[5X], MW-6 (280-115507-6)[2X], MW-6 (280-115507-6)[50X], MW-7 (280-115507-7)[2X], MW-7 (280-115507-7)[50X], MW-8 (280-115507-8)[5X] and MW-8 (280-115507-8)[50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Chloride and Sulfate were detected in method blank MB 280-435513/13 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount; therefore, control limits are not applicable. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 (GFPC)
Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4) and W-4D (280-115507-5) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 10/18/2018 and analyzed on 11/09/2018.

Radium-226 was detected in method blank MB 160-395714/19-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate. Refer to the QC report for details.

The following samples were prepared at a reduced aliquot due to limited sample volume: W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4) and W-4D (280-115507-5)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Job ID: 280-115507-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4) and W-4D (280-115507-5) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 10/18/2018 and analyzed on 11/07/2018.

The following samples were prepared at a reduced aliquot due to limited sample volume: W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4) and W-4D (280-115507-5)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226/RADIUM-228 (GFPC)
Samples W-1 (280-115507-1), W-2 (280-115507-2), W-3 (280-115507-3), W-4 (280-115507-4) and W-4D (280-115507-5) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 11/15/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client: HDR Inc

TestAmerica Job ID: 280-115507-1

Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-1

Lab Sample ID: 280-115507-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.58		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0099		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00095	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Calcium	320		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00036	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.00094	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0035	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.010		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.29	F1	0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	41		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.29	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2700	B	100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	1300		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.4	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-2

Lab Sample ID: 280-115507-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	8.2		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0051		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00092	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00028	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0014		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0031	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0030	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.64		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	83		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.50	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	4500	B	250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4100		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.8	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-3 Lab Sample ID: 280-115507-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.70		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0065		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	330		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00037	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0023		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0030	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.011		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	1.2		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.56	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	7800	B	500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	17000		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	5.2		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4 Lab Sample ID: 280-115507-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.64		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0074		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00022	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0064		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0029	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0019	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.69		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	360		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.50	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	13000	B	500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	11000		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	7.2		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4D Lab Sample ID: 280-115507-5

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-4D (Continued)
Lab Sample ID: 280-115507-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.75		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0086		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	180		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00024	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0074		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0032	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lithium	0.75		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.6	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	370		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.49	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	13000	B	500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	19000		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	28		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-6
Lab Sample ID: 280-115507-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	45		0.50	0.12	mg/L	5		6010C	Total Recoverable
Barium	0.0054		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	370		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00040	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Molybdenum	1.5		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.012		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.11		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	68		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.32	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	3000	B	250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4700		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.8	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-7
Lab Sample ID: 280-115507-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	47		0.50	0.12	mg/L	5		6010C	Total Recoverable
Barium	0.0051		0.0050	0.0022	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-115507-1

Client Sample ID: MW-7 (Continued) — Lab Sample ID: 280-115507-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	390		1.0	0.58	mg/L	1		6020A	Total Recoverable
Molybdenum	0.92		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0070		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.31		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	140		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.16	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	3100	B	250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	5200		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.8	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-8 — Lab Sample ID: 280-115507-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.1		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0054		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	450		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.00029	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Selenium	0.040		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.74		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	230		15	1.3	mg/L	5		9056A	Total/NA
Sulfate	5400	B	250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	8200		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-8EB — Lab Sample ID: 280-115507-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.064	J	0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	6.3	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Sulfate	0.27	J	5.0	0.23	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-115507-1	W-1	Water	10/10/18 15:10	10/12/18 14:15
280-115507-2	W-2	Water	10/10/18 14:10	10/12/18 14:15
280-115507-3	W-3	Water	10/10/18 16:25	10/12/18 14:15
280-115507-4	W-4	Water	10/10/18 13:00	10/12/18 14:15
280-115507-5	W-4D	Water	10/10/18 13:00	10/12/18 14:15
280-115507-6	MW-6	Water	10/11/18 10:30	10/12/18 14:15
280-115507-7	MW-7	Water	10/11/18 09:35	10/12/18 14:15
280-115507-8	MW-8	Water	10/11/18 12:20	10/12/18 14:15
280-115507-9	MW-8EB	Water	10/11/18 12:40	10/12/18 14:15

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: W-1
Date Collected: 10/10/18 15:10
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.58		0.10	0.023	mg/L		10/17/18 14:00	10/18/18 12:12	1

Client Sample ID: W-2
Date Collected: 10/10/18 14:10
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	8.2		0.10	0.023	mg/L		10/17/18 14:00	10/18/18 12:43	1

Client Sample ID: W-3
Date Collected: 10/10/18 16:25
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.70		0.10	0.023	mg/L		10/17/18 14:00	10/18/18 12:47	1

Client Sample ID: W-4
Date Collected: 10/10/18 13:00
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.64		0.10	0.023	mg/L		10/17/18 14:00	10/18/18 12:52	1

Client Sample ID: W-4D
Date Collected: 10/10/18 13:00
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.75		0.10	0.023	mg/L		10/17/18 14:00	10/18/18 12:56	1

Client Sample ID: MW-6
Date Collected: 10/11/18 10:30
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	45		0.50	0.12	mg/L		10/17/18 14:00	10/18/18 13:54	5

Client Sample ID: MW-7
Date Collected: 10/11/18 09:35
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	47		0.50	0.12	mg/L		10/17/18 14:00	10/18/18 13:59	5

Client Sample ID: MW-8
Date Collected: 10/11/18 12:20
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.1		0.10	0.023	mg/L		10/17/18 14:00	10/18/18 13:10	1

Client Sample ID: MW-8EB
Date Collected: 10/11/18 12:40
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.064	J	0.10	0.023	mg/L		10/17/18 14:00	10/18/18 13:23	1

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-115507-1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1
Date Collected: 10/10/18 15:10
Date Received: 10/12/18 14:15

Lab Sample ID: 280-115507-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 16:31	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 16:31	1
Barium	**0.0099**		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 16:31	1
Beryllium	**0.00095**	**J**	0.0010	0.00031	mg/L		10/17/18 14:00	10/23/18 15:42	1
Calcium	**320**		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 16:31	1
Cadmium	**0.00036**	**J**	0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 16:31	1
Cobalt	**0.00094**	**J**	0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 16:31	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 16:31	1
Molybdenum	**0.0035**	**J**	0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 16:31	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 16:31	1
Selenium	**0.010**		0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 16:31	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 16:31	1
Lithium	**0.29**	**F1**	0.0080	0.0017	mg/L		10/17/18 14:00	10/23/18 15:42	1

Client Sample ID: W-2
Date Collected: 10/10/18 14:10
Date Received: 10/12/18 14:15

Lab Sample ID: 280-115507-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 16:41	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 16:41	1
Barium	**0.0051**		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 16:41	1
Beryllium	**0.00092**	**J**	0.0010	0.00031	mg/L		10/17/18 14:00	10/23/18 15:59	1
Calcium	**300**		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 16:41	1
Cadmium	**0.00028**	**J**	0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 16:41	1
Cobalt	**0.0014**		0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 16:41	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 16:41	1
Molybdenum	**0.0031**	**J**	0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 16:41	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 16:41	1
Selenium	**0.0030**	**J**	0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 16:41	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 16:41	1
Lithium	**0.64**		0.0080	0.0017	mg/L		10/17/18 14:00	10/23/18 15:59	1

Client Sample ID: W-3
Date Collected: 10/10/18 16:25
Date Received: 10/12/18 14:15

Lab Sample ID: 280-115507-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 16:44	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 16:44	1
Barium	**0.0065**		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 16:44	1
Beryllium	ND		0.0010	0.00031	mg/L		10/17/18 14:00	10/23/18 16:01	1
Calcium	**330**		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 16:44	1
Cadmium	**0.00037**	**J**	0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 16:44	1
Cobalt	**0.0023**		0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 16:44	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 16:44	1
Molybdenum	**0.0030**	**J**	0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 16:44	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 16:44	1
Selenium	**0.011**		0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 16:44	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 16:44	1
Lithium	**1.2**		0.0080	0.0017	mg/L		10/17/18 14:00	10/23/18 16:01	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-4
Lab Sample ID: 280-115507-4
Date Collected: 10/10/18 13:00
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 16:46	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 16:46	1
Barium	**0.0074**		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 16:46	1
Beryllium	ND		0.0010	0.00031	mg/L		10/17/18 14:00	10/23/18 16:03	1
Calcium	**300**		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 16:46	1
Cadmium	**0.00022**	**J**	0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 16:46	1
Cobalt	**0.0064**		0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 16:46	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 16:46	1
Molybdenum	**0.0029**	**J**	0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 16:46	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 16:46	1
Selenium	**0.0019**	**J**	0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 16:46	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 16:46	1
Lithium	**0.69**		0.0080	0.0017	mg/L		10/17/18 14:00	10/23/18 16:03	1

Client Sample ID: W-4D
Lab Sample ID: 280-115507-5
Date Collected: 10/10/18 13:00
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 16:53	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 16:53	1
Barium	**0.0086**		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 16:53	1
Beryllium	ND		0.0010	0.00031	mg/L		10/17/18 14:00	10/23/18 16:06	1
Calcium	**180**		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 16:53	1
Cadmium	**0.00024**	**J**	0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 16:53	1
Cobalt	**0.0074**		0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 16:53	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 16:53	1
Molybdenum	**0.0032**	**J**	0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 16:53	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 16:53	1
Selenium	ND		0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 16:53	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 16:53	1
Lithium	**0.75**		0.0080	0.0017	mg/L		10/17/18 14:00	10/23/18 16:06	1

Client Sample ID: MW-6
Lab Sample ID: 280-115507-6
Date Collected: 10/11/18 10:30
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 16:55	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 16:55	1
Barium	**0.0054**		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 16:55	1
Beryllium	ND		0.0010	0.00031	mg/L		10/17/18 14:00	10/23/18 16:08	1
Calcium	**370**		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 16:55	1
Cadmium	**0.00040**	**J**	0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 16:55	1
Cobalt	ND		0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 16:55	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 16:55	1
Molybdenum	**1.5**		0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 16:55	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 16:55	1
Selenium	**0.012**		0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 16:55	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 16:55	1
Lithium	**0.11**		0.0080	0.0017	mg/L		10/17/18 14:00	10/23/18 16:08	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-7
Date Collected: 10/11/18 09:35
Date Received: 10/12/18 14:15

Lab Sample ID: 280-115507-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 17:02	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 17:02	1
Barium	**0.0051**		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 17:02	1
Beryllium	ND		0.0010	0.00031	mg/L		10/17/18 14:00	10/23/18 16:10	1
Calcium	**390**		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 17:02	1
Cadmium	ND		0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 17:02	1
Cobalt	ND		0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 17:02	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 17:02	1
Molybdenum	**0.92**		0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 17:02	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 17:02	1
Selenium	**0.0070**		0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 17:02	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 17:02	1
Lithium	**0.31**		0.0080	0.0017	mg/L		10/17/18 14:00	10/23/18 16:10	1

Client Sample ID: MW-8
Date Collected: 10/11/18 12:20
Date Received: 10/12/18 14:15

Lab Sample ID: 280-115507-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 17:04	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 17:04	1
Barium	**0.0054**		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 17:04	1
Beryllium	ND		0.0010	0.00031	mg/L		10/17/18 14:00	10/24/18 14:17	1
Calcium	**450**		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 17:04	1
Cadmium	ND		0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 17:04	1
Cobalt	**0.00029**	**J**	0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 17:04	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 17:04	1
Molybdenum	ND		0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 17:04	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 17:04	1
Selenium	**0.040**		0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 17:04	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 17:04	1
Lithium	**0.74**		0.0080	0.0017	mg/L		10/17/18 14:00	10/24/18 14:17	1

Client Sample ID: MW-8EB
Date Collected: 10/11/18 12:40
Date Received: 10/12/18 14:15

Lab Sample ID: 280-115507-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 17:06	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 17:06	1
Barium	ND		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 17:06	1
Beryllium	ND		0.0010	0.00031	mg/L		10/17/18 14:00	10/24/18 14:19	1
Calcium	ND		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 17:06	1
Cadmium	ND		0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 17:06	1
Cobalt	ND		0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 17:06	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 17:06	1
Molybdenum	ND		0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 17:06	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 17:06	1
Selenium	ND		0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 17:06	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 17:06	1
Lithium	ND		0.0080	0.0017	mg/L		10/17/18 14:00	10/24/18 14:19	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-1 | **Lab Sample ID: 280-115507-1**
Date Collected: 10/10/18 15:10 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:01	1

Client Sample ID: W-2 | **Lab Sample ID: 280-115507-2**
Date Collected: 10/10/18 14:10 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:03	1

Client Sample ID: W-3 | **Lab Sample ID: 280-115507-3**
Date Collected: 10/10/18 16:25 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:16	1

Client Sample ID: W-4 | **Lab Sample ID: 280-115507-4**
Date Collected: 10/10/18 13:00 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:18	1

Client Sample ID: W-4D | **Lab Sample ID: 280-115507-5**
Date Collected: 10/10/18 13:00 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:20	1

Client Sample ID: MW-6 | **Lab Sample ID: 280-115507-6**
Date Collected: 10/11/18 10:30 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:22	1

Client Sample ID: MW-7 | **Lab Sample ID: 280-115507-7**
Date Collected: 10/11/18 09:35 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:24	1

Client Sample ID: MW-8 | **Lab Sample ID: 280-115507-8**
Date Collected: 10/11/18 12:20 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:26	1

Client Sample ID: MW-8EB | **Lab Sample ID: 280-115507-9**
Date Collected: 10/11/18 12:40 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 10:28	1

General Chemistry

Client Sample ID: W-1
Lab Sample ID: 280-115507-1
Date Collected: 10/10/18 15:10
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			10/17/18 14:30	1
Temperature	20.7	HF	1.0	1.0	Degrees C			10/17/18 14:30	1
Chloride	41		6.0	0.51	mg/L			10/27/18 18:42	2
Fluoride	0.29	J	1.0	0.12	mg/L			10/27/18 18:42	2
Sulfate	2700	B	100	4.6	mg/L			10/30/18 21:05	20
Total Dissolved Solids (TDS)	1300		40	19	mg/L			10/16/18 15:30	1
Total Suspended Solids	2.4	J	4.0	1.1	mg/L			10/16/18 13:04	1

Client Sample ID: W-2
Lab Sample ID: 280-115507-2
Date Collected: 10/10/18 14:10
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			10/17/18 14:45	1
Temperature	22.2	HF	1.0	1.0	Degrees C			10/17/18 14:45	1
Chloride	83		6.0	0.51	mg/L			10/27/18 19:19	2
Fluoride	0.50	J	1.0	0.12	mg/L			10/27/18 19:19	2
Sulfate	4500	B	250	12	mg/L			10/31/18 03:29	50
Total Dissolved Solids (TDS)	4100		40	19	mg/L			10/16/18 15:30	1
Total Suspended Solids	2.8	J	4.0	1.1	mg/L			10/16/18 13:04	1

Client Sample ID: W-3
Lab Sample ID: 280-115507-3
Date Collected: 10/10/18 16:25
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			10/17/18 14:58	1
Temperature	21.2	HF	1.0	1.0	Degrees C			10/17/18 14:58	1
Chloride	190		15	1.3	mg/L			10/27/18 20:34	5
Fluoride	0.56	J	2.5	0.30	mg/L			10/27/18 20:34	5
Sulfate	7800	B	500	23	mg/L			10/31/18 04:39	100
Total Dissolved Solids (TDS)	17000		100	47	mg/L			10/16/18 15:30	1
Total Suspended Solids	5.2		4.0	1.1	mg/L			10/16/18 13:04	1

Client Sample ID: W-4
Lab Sample ID: 280-115507-4
Date Collected: 10/10/18 13:00
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU			10/17/18 15:03	1
Temperature	21.2	HF	1.0	1.0	Degrees C			10/17/18 15:03	1
Chloride	360		15	1.3	mg/L			10/27/18 21:12	5
Fluoride	0.50	J	2.5	0.30	mg/L			10/27/18 21:12	5
Sulfate	13000	B	500	23	mg/L			10/31/18 04:57	100
Total Dissolved Solids (TDS)	11000		100	47	mg/L			10/16/18 15:30	1
Total Suspended Solids	7.2		4.0	1.1	mg/L			10/16/18 13:04	1

Client Sample ID: W-4D
Lab Sample ID: 280-115507-5
Date Collected: 10/10/18 13:00
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			10/17/18 14:49	1
Temperature	21.6	HF	1.0	1.0	Degrees C			10/17/18 14:49	1

General Chemistry (Continued)

Client Sample ID: W-4D
Date Collected: 10/10/18 13:00
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	370		15	1.3	mg/L			10/27/18 21:49	5
Fluoride	0.49	J	2.5	0.30	mg/L			10/27/18 21:49	5
Sulfate	13000	B	500	23	mg/L			10/31/18 05:14	100
Total Dissolved Solids (TDS)	19000		100	47	mg/L			10/16/18 15:30	1
Total Suspended Solids	28		4.0	1.1	mg/L			10/16/18 13:04	1

Client Sample ID: MW-6
Date Collected: 10/11/18 10:30
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU			10/17/18 14:54	1
Temperature	21.1	HF	1.0	1.0	Degrees C			10/17/18 14:54	1
Chloride	68		6.0	0.51	mg/L			10/27/18 22:27	2
Fluoride	0.32	J	1.0	0.12	mg/L			10/27/18 22:27	2
Sulfate	3000	B	250	12	mg/L			10/31/18 05:31	50
Total Dissolved Solids (TDS)	4700		40	19	mg/L			10/16/18 15:30	1
Total Suspended Solids	2.8	J	4.0	1.1	mg/L			10/17/18 13:01	1

Client Sample ID: MW-7
Date Collected: 10/11/18 09:35
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.8	HF	0.1	0.1	SU			10/17/18 15:18	1
Temperature	22.2	HF	1.0	1.0	Degrees C			10/17/18 15:18	1
Chloride	140		6.0	0.51	mg/L			10/27/18 23:04	2
Fluoride	0.16	J	1.0	0.12	mg/L			10/27/18 23:04	2
Sulfate	3100	B	250	12	mg/L			10/31/18 05:49	50
Total Dissolved Solids (TDS)	5200		40	19	mg/L			10/16/18 15:30	1
Total Suspended Solids	2.8	J	4.0	1.1	mg/L			10/17/18 13:01	1

Client Sample ID: MW-8
Date Collected: 10/11/18 12:20
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			10/17/18 15:09	1
Temperature	21.7	HF	1.0	1.0	Degrees C			10/17/18 15:09	1
Chloride	230		15	1.3	mg/L			10/28/18 00:19	5
Fluoride	ND		2.5	0.30	mg/L			10/28/18 00:19	5
Sulfate	5400	B	250	12	mg/L			10/31/18 06:06	50
Total Dissolved Solids (TDS)	8200		100	47	mg/L			10/16/18 15:30	1
Total Suspended Solids	3.6	J	4.0	1.1	mg/L			10/17/18 13:01	1

Client Sample ID: MW-8EB
Date Collected: 10/11/18 12:40
Date Received: 10/12/18 14:15
Lab Sample ID: 280-115507-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.3	HF	0.1	0.1	SU			10/17/18 15:14	1
Temperature	22.0	HF	1.0	1.0	Degrees C			10/17/18 15:14	1
Chloride	ND		3.0	0.25	mg/L			10/28/18 00:56	1
Fluoride	ND		0.50	0.060	mg/L			10/28/18 00:56	1

Client: HDR Inc
TestAmerica Job ID: 280-115507-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

General Chemistry (Continued)

Client Sample ID: MW-8EB
Lab Sample ID: 280-115507-9
Date Collected: 10/11/18 12:40
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**0.27**	**J**	5.0	0.23	mg/L			10/28/18 00:56	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			10/18/18 20:26	1
Total Suspended Solids	ND		4.0	1.1	mg/L			10/17/18 13:01	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1
Lab Sample ID: 280-115507-1
Date Collected: 10/10/18 15:10
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.373**		0.213	0.216	1.00	0.275	pCi/L	10/18/18 09:34	11/09/18 08:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*10/18/18 09:34*	*11/09/18 08:34*	*1*

Client Sample ID: W-2
Lab Sample ID: 280-115507-2
Date Collected: 10/10/18 14:10
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.285**		0.165	0.167	1.00	0.194	pCi/L	10/18/18 09:34	11/09/18 08:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*105*		*40 - 110*	*10/18/18 09:34*	*11/09/18 08:34*	*1*

Client Sample ID: W-3
Lab Sample ID: 280-115507-3
Date Collected: 10/10/18 16:25
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.294**		0.179	0.181	1.00	0.231	pCi/L	10/18/18 09:34	11/09/18 08:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*10/18/18 09:34*	*11/09/18 08:34*	*1*

Client Sample ID: W-4
Lab Sample ID: 280-115507-4
Date Collected: 10/10/18 13:00
Matrix: Water
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.183	U	0.148	0.149	1.00	0.209	pCi/L	10/18/18 09:34	11/09/18 08:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.5*		*40 - 110*	*10/18/18 09:34*	*11/09/18 08:34*	*1*

Client: HDR Inc — TestAmerica Job ID: 280-115507-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-4D — **Lab Sample ID: 280-115507-5**
Date Collected: 10/10/18 13:00 — **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.566**		0.207	0.213	1.00	0.171	pCi/L	10/18/18 09:34	11/09/18 08:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*107*		*40 - 110*	*10/18/18 09:34*	*11/09/18 08:34*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1 — **Lab Sample ID: 280-115507-1**
Date Collected: 10/10/18 15:10 — **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.456	U	0.341	0.344	1.00	0.536	pCi/L	10/18/18 10:59	11/07/18 10:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*
Y Carrier	*76.6*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*

Client Sample ID: W-2 — **Lab Sample ID: 280-115507-2**
Date Collected: 10/10/18 14:10 — **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.00**		0.365	0.377	1.00	0.500	pCi/L	10/18/18 10:59	11/07/18 10:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*105*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*
Y Carrier	*79.3*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*

Client Sample ID: W-3 — **Lab Sample ID: 280-115507-3**
Date Collected: 10/10/18 16:25 — **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.360	U	0.322	0.323	1.00	0.516	pCi/L	10/18/18 10:59	11/07/18 10:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*
Y Carrier	*77.0*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-4 **Lab Sample ID: 280-115507-4**
Date Collected: 10/10/18 13:00 **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.753**		0.362	0.368	1.00	0.521	pCi/L	10/18/18 10:59	11/07/18 10:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.5*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*
Y Carrier	*74.8*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*

Client Sample ID: W-4D **Lab Sample ID: 280-115507-5**
Date Collected: 10/10/18 13:00 **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.410	U	0.305	0.307	1.00	0.476	pCi/L	10/18/18 10:59	11/07/18 10:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*107*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*
Y Carrier	*74.8*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:19*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-1 **Lab Sample ID: 280-115507-1**
Date Collected: 10/10/18 15:10 **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.830**		0.402	0.406	5.00	0.536	pCi/L		11/15/18 17:00	1

Client Sample ID: W-2 **Lab Sample ID: 280-115507-2**
Date Collected: 10/10/18 14:10 **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.29**		0.401	0.412	5.00	0.500	pCi/L		11/15/18 17:00	1

Client Sample ID: W-3 **Lab Sample ID: 280-115507-3**
Date Collected: 10/10/18 16:25 **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.653**		0.368	0.370	5.00	0.516	pCi/L		11/15/18 17:00	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-4 | **Lab Sample ID: 280-115507-4**
Date Collected: 10/10/18 13:00 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.936		0.391	0.397	5.00	0.521	pCi/L		11/15/18 17:00	1

Client Sample ID: W-4D | **Lab Sample ID: 280-115507-5**
Date Collected: 10/10/18 13:00 | **Matrix: Water**
Date Received: 10/12/18 14:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.976		0.369	0.374	5.00	0.476	pCi/L		11/15/18 17:00	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-350481/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 350777 — **Prep Batch: 350481**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		10/17/18 14:00	10/18/18 10:27	1

Lab Sample ID: LCS 240-350481/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 350777 — **Prep Batch: 350481**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.02		mg/L		102	80 - 120

Lab Sample ID: 280-115507-1 MS — **Client Sample ID: W-1**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 350777 — **Prep Batch: 350481**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.58		1.00	1.48		mg/L		90	75 - 125

Lab Sample ID: 280-115507-1 MSD — **Client Sample ID: W-1**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 350777 — **Prep Batch: 350481**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.58		1.00	1.42		mg/L		84	75 - 125	4	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-350481/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 351121 — **Prep Batch: 350481**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/17/18 14:00	10/19/18 16:27	1
Arsenic	ND		0.0050	0.00075	mg/L		10/17/18 14:00	10/19/18 16:27	1
Barium	ND		0.0050	0.0022	mg/L		10/17/18 14:00	10/19/18 16:27	1
Calcium	ND		1.0	0.58	mg/L		10/17/18 14:00	10/19/18 16:27	1
Cadmium	ND		0.0010	0.00021	mg/L		10/17/18 14:00	10/19/18 16:27	1
Cobalt	ND		0.0010	0.00019	mg/L		10/17/18 14:00	10/19/18 16:27	1
Chromium	ND		0.0020	0.00098	mg/L		10/17/18 14:00	10/19/18 16:27	1
Molybdenum	ND		0.010	0.0011	mg/L		10/17/18 14:00	10/19/18 16:27	1
Lead	ND		0.0010	0.00045	mg/L		10/17/18 14:00	10/19/18 16:27	1
Selenium	ND		0.0050	0.00089	mg/L		10/17/18 14:00	10/19/18 16:27	1
Thallium	ND		0.0010	0.00020	mg/L		10/17/18 14:00	10/19/18 16:27	1

Lab Sample ID: MB 240-350481/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 351620 — **Prep Batch: 350481**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010	0.00031	mg/L		10/17/18 14:00	10/23/18 15:38	1
Lithium	ND		0.0080	0.0017	mg/L		10/17/18 14:00	10/23/18 15:38	1

QC Sample Results

Client: HDR Inc — TestAmerica Job ID: 280-115507-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Lab Sample ID: LCS 240-350481/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 351121 — **Prep Batch: 350481**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0980		mg/L		98	80 - 120
Arsenic	1.00	0.862		mg/L		86	80 - 120
Barium	1.00	1.01		mg/L		101	80 - 120
Calcium	10.0	8.99		mg/L		90	80 - 120
Cadmium	1.00	0.980		mg/L		98	80 - 120
Cobalt	1.00	0.910		mg/L		91	80 - 120
Chromium	1.00	0.963		mg/L		96	80 - 120
Molybdenum	0.100	0.0969		mg/L		97	80 - 120
Lead	1.00	0.993		mg/L		99	80 - 120
Selenium	1.00	0.889		mg/L		89	80 - 120
Thallium	0.250	0.245		mg/L		98	80 - 120

Lab Sample ID: LCS 240-350481/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 351620 — **Prep Batch: 350481**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	1.00	0.964		mg/L		96	80 - 120
Lithium	0.100	0.0948		mg/L		95	80 - 120

Lab Sample ID: 280-115507-1 MS — **Client Sample ID: W-1**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 351121 — **Prep Batch: 350481**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.0946		mg/L		95	75 - 125
Arsenic	ND		1.00	0.934		mg/L		93	75 - 125
Barium	0.0099		1.00	0.962		mg/L		95	75 - 125
Calcium	320		10.0	315	4	mg/L		-37	75 - 125
Cadmium	0.00036	J	1.00	0.906		mg/L		91	75 - 125
Cobalt	0.00094	J	1.00	0.925		mg/L		92	75 - 125
Chromium	ND		1.00	0.861		mg/L		86	75 - 125
Molybdenum	0.0035	J	0.100	0.103		mg/L		100	75 - 125
Lead	ND		1.00	0.886		mg/L		89	75 - 125
Selenium	0.010		1.00	0.904		mg/L		89	75 - 125
Thallium	ND		0.250	0.220		mg/L		88	75 - 125

Lab Sample ID: 280-115507-1 MS — **Client Sample ID: W-1**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 351620 — **Prep Batch: 350481**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	0.00095	J	1.00	1.05		mg/L		105	75 - 125
Lithium	0.29	F1	0.100	0.389		mg/L		99	75 - 125

Lab Sample ID: 280-115507-1 MSD — **Client Sample ID: W-1**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 351121 — **Prep Batch: 350481**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.0921		mg/L		92	75 - 125	3	20

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 280-115507-1 MSD
Matrix: Water
Analysis Batch: 351121

Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 350481

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		1.00	0.915		mg/L		91	75 - 125	2	20
Barium	0.0099		1.00	0.939		mg/L		93	75 - 125	2	20
Calcium	320		10.0	301	4	mg/L		-178	75 - 125	5	20
Cadmium	0.00036	J	1.00	0.884		mg/L		88	75 - 125	3	20
Cobalt	0.00094	J	1.00	0.903		mg/L		90	75 - 125	2	20
Chromium	ND		1.00	0.839		mg/L		84	75 - 125	2	20
Molybdenum	0.0035	J	0.100	0.101		mg/L		97	75 - 125	2	20
Lead	ND		1.00	0.861		mg/L		86	75 - 125	3	20
Selenium	0.010		1.00	0.883		mg/L		87	75 - 125	2	20
Thallium	ND		0.250	0.216		mg/L		87	75 - 125	2	20

Lab Sample ID: 280-115507-1 MSD
Matrix: Water
Analysis Batch: 351620

Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 350481

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	0.00095	J	1.00	0.911		mg/L		91	75 - 125	14	20
Lithium	0.29	F1	0.100	0.340	F1	mg/L		50	75 - 125	13	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-350490/1-A
Matrix: Water
Analysis Batch: 350791

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350490

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/17/18 14:00	10/18/18 09:57	1

Lab Sample ID: LCS 240-350490/2-A
Matrix: Water
Analysis Batch: 350791

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350490

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.34		ug/L		87	80 - 120

Lab Sample ID: 280-115507-2 MS
Matrix: Water
Analysis Batch: 350791

Client Sample ID: W-2
Prep Type: Total/NA
Prep Batch: 350490

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		1.00	1.17		ug/L		117	80 - 120

Lab Sample ID: 280-115507-2 MSD
Matrix: Water
Analysis Batch: 350791

Client Sample ID: W-2
Prep Type: Total/NA
Prep Batch: 350490

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		1.00	1.08		ug/L		108	80 - 120	8	20

Method: 9040B - pH

Lab Sample ID: LCS 280-433929/29
Matrix: Water
Analysis Batch: 433929

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.1		SU		101	99 - 101

Lab Sample ID: LCS 280-433929/4
Matrix: Water
Analysis Batch: 433929

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		101	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-435201/6
Matrix: Water
Analysis Batch: 435201

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			10/27/18 11:51	1
Fluoride	ND		0.50	0.060	mg/L			10/27/18 11:51	1
Sulfate	ND		5.0	0.23	mg/L			10/27/18 11:51	1

Lab Sample ID: LCS 280-435201/4
Matrix: Water
Analysis Batch: 435201

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	100		mg/L		100	90 - 110
Fluoride	5.00	5.04		mg/L		101	90 - 110
Sulfate	100	102		mg/L		102	90 - 110

Lab Sample ID: LCSD 280-435201/5
Matrix: Water
Analysis Batch: 435201

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	100		mg/L		100	90 - 110	0	10
Fluoride	5.00	5.06		mg/L		101	90 - 110	0	10
Sulfate	100	102		mg/L		102	90 - 110	0	10

Lab Sample ID: MRL 280-435201/3
Matrix: Water
Analysis Batch: 435201

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.61	J	mg/L		105	50 - 150
Fluoride	0.200	0.194	J	mg/L		97	50 - 150
Sulfate	2.50	2.71	J	mg/L		108	50 - 150

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 280-435513/13
Matrix: Water
Analysis Batch: 435513

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.450	J	3.0	0.25	mg/L			10/30/18 13:39	1
Fluoride	ND		0.50	0.060	mg/L			10/30/18 13:39	1
Sulfate	0.470	J	5.0	0.23	mg/L			10/30/18 13:39	1

Lab Sample ID: LCS 280-435513/11
Matrix: Water
Analysis Batch: 435513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.9		mg/L		100	90 - 110
Fluoride	5.00	4.72		mg/L		94	90 - 110
Sulfate	100	99.8		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-435513/12
Matrix: Water
Analysis Batch: 435513

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	99.8		mg/L		100	90 - 110	0	10
Fluoride	5.00	4.69		mg/L		94	90 - 110	1	10
Sulfate	100	99.7		mg/L		100	90 - 110	0	10

Lab Sample ID: MRL 280-435513/10
Matrix: Water
Analysis Batch: 435513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.29	J	mg/L		92	50 - 150
Fluoride	0.200	0.228	J	mg/L		114	50 - 150
Sulfate	2.50	2.23	J	mg/L		89	50 - 150

Lab Sample ID: 280-115507-1 MS
Matrix: Water
Analysis Batch: 435513

Client Sample ID: W-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	40	J B	500	568		mg/L		106	80 - 120
Fluoride	1.9	J	100	95.9		mg/L		94	80 - 120
Sulfate	2700	B	500	3270	4	mg/L		109	80 - 120

Lab Sample ID: 280-115507-1 MSD
Matrix: Water
Analysis Batch: 435513

Client Sample ID: W-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	40	J B	500	571		mg/L		106	80 - 120	1	20
Fluoride	1.9	J	100	96.5		mg/L		95	80 - 120	1	20
Sulfate	2700	B	500	3290	4	mg/L		112	80 - 120	0	20

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: 280-115507-2 MS
Matrix: Water
Analysis Batch: 435513

Client Sample ID: W-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	83	J B	1250	1400		mg/L		105	80 - 120
Fluoride	ND		250	240		mg/L		96	80 - 120
Sulfate	4500	B	1250	5900		mg/L		111	80 - 120

Lab Sample ID: 280-115507-2 MSD
Matrix: Water
Analysis Batch: 435513

Client Sample ID: W-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	83	J B	1250	1400		mg/L		106	80 - 120	1	20
Fluoride	ND		250	241		mg/L		97	80 - 120	1	20
Sulfate	4500	B	1250	5890		mg/L		111	80 - 120	0	20

Lab Sample ID: 280-115507-1 DU
Matrix: Water
Analysis Batch: 435513

Client Sample ID: W-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	40	J B	40.3	J	mg/L		0.1	15
Fluoride	1.9	J	1.90	J	mg/L		0.4	15
Sulfate	2700	B	2740		mg/L		0.3	15

Lab Sample ID: 280-115507-2 DU
Matrix: Water
Analysis Batch: 435513

Client Sample ID: W-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	83	J B	82.7	J	mg/L		0.2	15
Fluoride	ND		ND		mg/L		NC	15
Sulfate	4500	B	4490		mg/L		0.3	15

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-433648/1
Matrix: Water
Analysis Batch: 433648

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			10/16/18 15:30	1

Lab Sample ID: LCS 280-433648/2
Matrix: Water
Analysis Batch: 433648

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	476		mg/L		95	86 - 110

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: MB 280-434060/1
Matrix: Water
Analysis Batch: 434060
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			10/18/18 20:26	1

Lab Sample ID: LCS 280-434060/2
Matrix: Water
Analysis Batch: 434060
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	489		mg/L		98	86 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-433623/1
Matrix: Water
Analysis Batch: 433623
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			10/16/18 13:04	1

Lab Sample ID: LCS 280-433623/2
Matrix: Water
Analysis Batch: 433623
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	104		mg/L		104	86 - 114

Lab Sample ID: LCSD 280-433623/3
Matrix: Water
Analysis Batch: 433623
Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids	100	99.6		mg/L		100	86 - 114	4	20

Lab Sample ID: MB 280-433797/1
Matrix: Water
Analysis Batch: 433797
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			10/17/18 13:01	1

Lab Sample ID: LCS 280-433797/2
Matrix: Water
Analysis Batch: 433797
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	97.2		mg/L		97	86 - 114

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCSD 280-433797/3 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 433797

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids	100	95.2		mg/L		95	86 - 114	2	20

Lab Sample ID: 280-115507-9 DU **Client Sample ID: MW-8EB**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 433797

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	ND		ND		mg/L		NC	10

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-395714/19-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 400077 **Prep Batch: 395714**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.2060		0.136	0.138	1.00	0.189	pCi/L	10/18/18 09:34	11/09/18 10:03	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*10/18/18 09:34*	*11/09/18 10:03*	*1*

Lab Sample ID: LCS 160-395714/1-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 400066 **Prep Batch: 395714**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	12.80		1.44	1.00	0.200	pCi/L	113	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.7*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-395732/19-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 399720 **Prep Batch: 395732**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2512	U	0.276	0.277	1.00	0.453	pCi/L	10/18/18 10:59	11/07/18 10:20	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:20*	*1*
Y Carrier	*73.6*		*40 - 110*	*10/18/18 10:59*	*11/07/18 10:20*	*1*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-395732/1-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 399720
Prep Batch: 395732

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.24	8.644		1.11	1.00	0.536	pCi/L	94	56 - 140

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.7*		*40 - 110*
Y Carrier	*64.7*		*40 - 110*

Metals

Prep Batch: 350481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total Recoverable	Water	3005A	
280-115507-2	W-2	Total Recoverable	Water	3005A	
280-115507-3	W-3	Total Recoverable	Water	3005A	
280-115507-4	W-4	Total Recoverable	Water	3005A	
280-115507-5	W-4D	Total Recoverable	Water	3005A	
280-115507-6	MW-6	Total Recoverable	Water	3005A	
280-115507-7	MW-7	Total Recoverable	Water	3005A	
280-115507-8	MW-8	Total Recoverable	Water	3005A	
280-115507-9	MW-8EB	Total Recoverable	Water	3005A	
MB 240-350481/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-350481/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-350481/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-115507-1 MS	W-1	Total Recoverable	Water	3005A	
280-115507-1 MS	W-1	Total Recoverable	Water	3005A	
280-115507-1 MSD	W-1	Total Recoverable	Water	3005A	
280-115507-1 MSD	W-1	Total Recoverable	Water	3005A	

Prep Batch: 350490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	7470A	
280-115507-2	W-2	Total/NA	Water	7470A	
280-115507-3	W-3	Total/NA	Water	7470A	
280-115507-4	W-4	Total/NA	Water	7470A	
280-115507-5	W-4D	Total/NA	Water	7470A	
280-115507-6	MW-6	Total/NA	Water	7470A	
280-115507-7	MW-7	Total/NA	Water	7470A	
280-115507-8	MW-8	Total/NA	Water	7470A	
280-115507-9	MW-8EB	Total/NA	Water	7470A	
MB 240-350490/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-350490/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-115507-2 MS	W-2	Total/NA	Water	7470A	
280-115507-2 MSD	W-2	Total/NA	Water	7470A	

Analysis Batch: 350777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total Recoverable	Water	6010C	350481
280-115507-2	W-2	Total Recoverable	Water	6010C	350481
280-115507-3	W-3	Total Recoverable	Water	6010C	350481
280-115507-4	W-4	Total Recoverable	Water	6010C	350481
280-115507-5	W-4D	Total Recoverable	Water	6010C	350481
280-115507-6	MW-6	Total Recoverable	Water	6010C	350481
280-115507-7	MW-7	Total Recoverable	Water	6010C	350481
280-115507-8	MW-8	Total Recoverable	Water	6010C	350481
280-115507-9	MW-8EB	Total Recoverable	Water	6010C	350481
MB 240-350481/1-A	Method Blank	Total Recoverable	Water	6010C	350481
LCS 240-350481/2-A	Lab Control Sample	Total Recoverable	Water	6010C	350481
280-115507-1 MS	W-1	Total Recoverable	Water	6010C	350481
280-115507-1 MSD	W-1	Total Recoverable	Water	6010C	350481

Metals (Continued)

Analysis Batch: 350791

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	7470A	350490
280-115507-2	W-2	Total/NA	Water	7470A	350490
280-115507-3	W-3	Total/NA	Water	7470A	350490
280-115507-4	W-4	Total/NA	Water	7470A	350490
280-115507-5	W-4D	Total/NA	Water	7470A	350490
280-115507-6	MW-6	Total/NA	Water	7470A	350490
280-115507-7	MW-7	Total/NA	Water	7470A	350490
280-115507-8	MW-8	Total/NA	Water	7470A	350490
280-115507-9	MW-8EB	Total/NA	Water	7470A	350490
MB 240-350490/1-A	Method Blank	Total/NA	Water	7470A	350490
LCS 240-350490/2-A	Lab Control Sample	Total/NA	Water	7470A	350490
280-115507-2 MS	W-2	Total/NA	Water	7470A	350490
280-115507-2 MSD	W-2	Total/NA	Water	7470A	350490

Analysis Batch: 351121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total Recoverable	Water	6020A	350481
280-115507-2	W-2	Total Recoverable	Water	6020A	350481
280-115507-3	W-3	Total Recoverable	Water	6020A	350481
280-115507-4	W-4	Total Recoverable	Water	6020A	350481
280-115507-5	W-4D	Total Recoverable	Water	6020A	350481
280-115507-6	MW-6	Total Recoverable	Water	6020A	350481
280-115507-7	MW-7	Total Recoverable	Water	6020A	350481
280-115507-8	MW-8	Total Recoverable	Water	6020A	350481
280-115507-9	MW-8EB	Total Recoverable	Water	6020A	350481
MB 240-350481/1-A	Method Blank	Total Recoverable	Water	6020A	350481
LCS 240-350481/3-A	Lab Control Sample	Total Recoverable	Water	6020A	350481
280-115507-1 MS	W-1	Total Recoverable	Water	6020A	350481
280-115507-1 MSD	W-1	Total Recoverable	Water	6020A	350481

Analysis Batch: 351620

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total Recoverable	Water	6020A	350481
280-115507-2	W-2	Total Recoverable	Water	6020A	350481
280-115507-3	W-3	Total Recoverable	Water	6020A	350481
280-115507-4	W-4	Total Recoverable	Water	6020A	350481
280-115507-5	W-4D	Total Recoverable	Water	6020A	350481
280-115507-6	MW-6	Total Recoverable	Water	6020A	350481
280-115507-7	MW-7	Total Recoverable	Water	6020A	350481
MB 240-350481/1-A	Method Blank	Total Recoverable	Water	6020A	350481
LCS 240-350481/3-A	Lab Control Sample	Total Recoverable	Water	6020A	350481
280-115507-1 MS	W-1	Total Recoverable	Water	6020A	350481
280-115507-1 MSD	W-1	Total Recoverable	Water	6020A	350481

Analysis Batch: 351820

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-8	MW-8	Total Recoverable	Water	6020A	350481
280-115507-9	MW-8EB	Total Recoverable	Water	6020A	350481

General Chemistry

Analysis Batch: 433623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	SM 2540D	
280-115507-2	W-2	Total/NA	Water	SM 2540D	
280-115507-3	W-3	Total/NA	Water	SM 2540D	
280-115507-4	W-4	Total/NA	Water	SM 2540D	
280-115507-5	W-4D	Total/NA	Water	SM 2540D	
MB 280-433623/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-433623/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-433623/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	

Analysis Batch: 433648

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	SM 2540C	
280-115507-2	W-2	Total/NA	Water	SM 2540C	
280-115507-3	W-3	Total/NA	Water	SM 2540C	
280-115507-4	W-4	Total/NA	Water	SM 2540C	
280-115507-5	W-4D	Total/NA	Water	SM 2540C	
280-115507-6	MW-6	Total/NA	Water	SM 2540C	
280-115507-7	MW-7	Total/NA	Water	SM 2540C	
280-115507-8	MW-8	Total/NA	Water	SM 2540C	
MB 280-433648/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-433648/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 433797

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-6	MW-6	Total/NA	Water	SM 2540D	
280-115507-7	MW-7	Total/NA	Water	SM 2540D	
280-115507-8	MW-8	Total/NA	Water	SM 2540D	
280-115507-9	MW-8EB	Total/NA	Water	SM 2540D	
MB 280-433797/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-433797/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-433797/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	
280-115507-9 DU	MW-8EB	Total/NA	Water	SM 2540D	

Analysis Batch: 433929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	9040B	
280-115507-2	W-2	Total/NA	Water	9040B	
280-115507-3	W-3	Total/NA	Water	9040B	
280-115507-4	W-4	Total/NA	Water	9040B	
280-115507-5	W-4D	Total/NA	Water	9040B	
280-115507-6	MW-6	Total/NA	Water	9040B	
280-115507-7	MW-7	Total/NA	Water	9040B	
280-115507-8	MW-8	Total/NA	Water	9040B	
280-115507-9	MW-8EB	Total/NA	Water	9040B	
LCS 280-433929/29	Lab Control Sample	Total/NA	Water	9040B	
LCS 280-433929/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 434060

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-9	MW-8EB	Total/NA	Water	SM 2540C	
MB 280-434060/1	Method Blank	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 434060 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-434060/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 435201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	9056A	
280-115507-2	W-2	Total/NA	Water	9056A	
280-115507-3	W-3	Total/NA	Water	9056A	
280-115507-4	W-4	Total/NA	Water	9056A	
280-115507-5	W-4D	Total/NA	Water	9056A	
280-115507-6	MW-6	Total/NA	Water	9056A	
280-115507-7	MW-7	Total/NA	Water	9056A	
280-115507-8	MW-8	Total/NA	Water	9056A	
280-115507-9	MW-8EB	Total/NA	Water	9056A	
MB 280-435201/6	Method Blank	Total/NA	Water	9056A	
LCS 280-435201/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-435201/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-435201/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 435513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	9056A	
280-115507-2	W-2	Total/NA	Water	9056A	
280-115507-3	W-3	Total/NA	Water	9056A	
280-115507-4	W-4	Total/NA	Water	9056A	
280-115507-5	W-4D	Total/NA	Water	9056A	
280-115507-6	MW-6	Total/NA	Water	9056A	
280-115507-7	MW-7	Total/NA	Water	9056A	
280-115507-8	MW-8	Total/NA	Water	9056A	
MB 280-435513/13	Method Blank	Total/NA	Water	9056A	
LCS 280-435513/11	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-435513/12	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-435513/10	Lab Control Sample	Total/NA	Water	9056A	
280-115507-1 MS	W-1	Total/NA	Water	9056A	
280-115507-1 MSD	W-1	Total/NA	Water	9056A	
280-115507-2 MS	W-2	Total/NA	Water	9056A	
280-115507-2 MSD	W-2	Total/NA	Water	9056A	
280-115507-1 DU	W-1	Total/NA	Water	9056A	
280-115507-2 DU	W-2	Total/NA	Water	9056A	

Rad

Prep Batch: 395714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	PrecSep-21	
280-115507-2	W-2	Total/NA	Water	PrecSep-21	
280-115507-3	W-3	Total/NA	Water	PrecSep-21	
280-115507-4	W-4	Total/NA	Water	PrecSep-21	
280-115507-5	W-4D	Total/NA	Water	PrecSep-21	
MB 160-395714/19-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-395714/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Rad (Continued)

Prep Batch: 395732

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115507-1	W-1	Total/NA	Water	PrecSep_0	
280-115507-2	W-2	Total/NA	Water	PrecSep_0	
280-115507-3	W-3	Total/NA	Water	PrecSep_0	
280-115507-4	W-4	Total/NA	Water	PrecSep_0	
280-115507-5	W-4D	Total/NA	Water	PrecSep_0	
MB 160-395732/19-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-395732/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Client Sample ID: W-1 Lab Sample ID: 280-115507-1

Date Collected: 10/10/18 15:10 **Matrix: Water**
Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350777	10/18/18 12:12	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 16:31	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351620	10/23/18 15:42	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:01	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 14:30	SGB	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	435513	10/30/18 21:05	A1D	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	435201	10/27/18 18:42	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	433648	10/16/18 15:30	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433623	10/16/18 13:04	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			749.93 mL	1.0 g	395714	10/18/18 09:34	JLC	TAL SL
Total/NA	Analysis	9315		1			400066	11/09/18 08:34	KLS	TAL SL
Total/NA	Prep	PrecSep_0			749.93 mL	1.0 g	395732	10/18/18 10:59	JLC	TAL SL
Total/NA	Analysis	9320		1			399720	11/07/18 10:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			401115	11/15/18 17:00	RTM	TAL SL

Client Sample ID: W-2 Lab Sample ID: 280-115507-2

Date Collected: 10/10/18 14:10 **Matrix: Water**
Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350777	10/18/18 12:43	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 16:41	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351620	10/23/18 15:59	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:03	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 14:45	SGB	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	435513	10/31/18 03:29	A1D	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	435201	10/27/18 19:19	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	433648	10/16/18 15:30	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433623	10/16/18 13:04	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			749.69 mL	1.0 g	395714	10/18/18 09:34	JLC	TAL SL
Total/NA	Analysis	9315		1			400066	11/09/18 08:34	KLS	TAL SL
Total/NA	Prep	PrecSep_0			749.69 mL	1.0 g	395732	10/18/18 10:59	JLC	TAL SL
Total/NA	Analysis	9320		1			399720	11/07/18 10:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			401115	11/15/18 17:00	RTM	TAL SL

Client Sample ID: W-3

Lab Sample ID: 280-115507-3

Date Collected: 10/10/18 16:25
Matrix: Water
Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350777	10/18/18 12:47	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 16:44	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351620	10/23/18 16:01	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:16	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 14:58	SGB	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	435513	10/31/18 04:39	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	435201	10/27/18 20:34	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	433648	10/16/18 15:30	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433623	10/16/18 13:04	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			750.01 mL	1.0 g	395714	10/18/18 09:34	JLC	TAL SL
Total/NA	Analysis	9315		1			400066	11/09/18 08:34	KLS	TAL SL
Total/NA	Prep	PrecSep_0			750.01 mL	1.0 g	395732	10/18/18 10:59	JLC	TAL SL
Total/NA	Analysis	9320		1			399720	11/07/18 10:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			401115	11/15/18 17:00	RTM	TAL SL

Client Sample ID: W-4

Lab Sample ID: 280-115507-4

Date Collected: 10/10/18 13:00
Matrix: Water
Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350777	10/18/18 12:52	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 16:46	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351620	10/23/18 16:03	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:18	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 15:03	SGB	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	435513	10/31/18 04:57	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	435201	10/27/18 21:12	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	433648	10/16/18 15:30	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433623	10/16/18 13:04	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			750.02 mL	1.0 g	395714	10/18/18 09:34	JLC	TAL SL
Total/NA	Analysis	9315		1			400066	11/09/18 08:34	KLS	TAL SL
Total/NA	Prep	PrecSep_0			750.02 mL	1.0 g	395732	10/18/18 10:59	JLC	TAL SL
Total/NA	Analysis	9320		1			399720	11/07/18 10:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			401115	11/15/18 17:00	RTM	TAL SL

Client Sample ID: W-4D
Lab Sample ID: 280-115507-5
Date Collected: 10/10/18 13:00
Matrix: Water
Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350777	10/18/18 12:56	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 16:53	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351620	10/23/18 16:06	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:20	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 14:49	SGB	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	435513	10/31/18 05:14	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	435201	10/27/18 21:49	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	433648	10/16/18 15:30	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433623	10/16/18 13:04	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			749.71 mL	1.0 g	395714	10/18/18 09:34	JLC	TAL SL
Total/NA	Analysis	9315		1			400066	11/09/18 08:34	KLS	TAL SL
Total/NA	Prep	PrecSep_0			749.71 mL	1.0 g	395732	10/18/18 10:59	JLC	TAL SL
Total/NA	Analysis	9320		1			399720	11/07/18 10:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			401115	11/15/18 17:00	RTM	TAL SL

Client Sample ID: MW-6
Lab Sample ID: 280-115507-6
Date Collected: 10/11/18 10:30
Matrix: Water
Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		5			350777	10/18/18 13:54	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 16:55	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351620	10/23/18 16:08	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:22	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 14:54	SGB	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	435513	10/31/18 05:31	A1D	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	435201	10/27/18 22:27	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	433648	10/16/18 15:30	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433797	10/17/18 13:01	JAP	TAL DEN

Client Sample ID: MW-7

Lab Sample ID: 280-115507-7

Date Collected: 10/11/18 09:35

Matrix: Water

Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		5			350777	10/18/18 13:59	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 17:02	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351620	10/23/18 16:10	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:24	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 15:18	SGB	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	435513	10/31/18 05:49	A1D	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	435201	10/27/18 23:04	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	433648	10/16/18 15:30	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433797	10/17/18 13:01	JAP	TAL DEN

Client Sample ID: MW-8

Lab Sample ID: 280-115507-8

Date Collected: 10/11/18 12:20

Matrix: Water

Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350777	10/18/18 13:10	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 17:04	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351820	10/24/18 14:17	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:26	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 15:09	SGB	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	435513	10/31/18 06:06	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	435201	10/28/18 00:19	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	433648	10/16/18 15:30	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433797	10/17/18 13:01	JAP	TAL DEN

Client Sample ID: MW-8EB

Lab Sample ID: 280-115507-9

Date Collected: 10/11/18 12:40

Matrix: Water

Date Received: 10/12/18 14:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350777	10/18/18 13:23	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351121	10/19/18 17:06	DSH	TAL CAN

Lab Chronicle

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-115507-1

Client Sample ID: MW-8EB
Date Collected: 10/11/18 12:40
Date Received: 10/12/18 14:15

Lab Sample ID: 280-115507-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	350481	10/17/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			351820	10/24/18 14:19	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350490	10/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350791	10/18/18 10:28	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 15:14	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	435201	10/28/18 00:56	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	434060	10/18/18 20:26	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433797	10/17/18 13:01	JAP	TAL DEN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: HDR Inc
TestAmerica Job ID: 280-115507-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18 *
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18 *
Iowa	State Program	7	373	12-01-18 *
Kansas	NELAP	7	E-10236	10-31-18 *
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver

4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tara Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-77542-25460.1
Client Contact: Anna Lundin	Phone: 720 933 7496	E-Mail: stephanie.rothmeyer@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc				Job #:

Client Information		
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:	
City: Englewood	TAT Requested (days):	
State, Zip: CO, 80112		
Phone: 734-263-7138(Tel)	PO #: DEN-018	
Email: anna.lundin@hdrinc.com	WO #:	
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377	
Site: Colorado	SSOW#:	

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C_Calcd - Total Dissolved Solids (TDS)	6010C, 6020A, 7470A	9040B, 9056A_28D	2540D - Total Suspended Solids	9315_Ra226, 9320_Ra228	Total Number of containers	Special Instructions/Note:
				Preservation Code:	X	X	N	D	N	N	D	X	
W-1	10.10.18	1510	G	Water			✓	✓	✓	✓	✓		
W-2	10.10.18	1410	G	Water			✓	✓	✓	✓	✓		
W-3	10.10.18	1625	G	Water			✓	✓	✓	✓	✓		
W-4	10.10.18	1300	G	Water			✓	✓	✓	✓	✓		
~~Field Duplicate~~ TK W-4D	10.10.18	1300	G	Water			✓	✓	✓	✓	✓		
~~Equipment Blank~~ TK				Water									
MW-6	10.11.18	1030	G	Water			✓	✓	✓	✓			
MW-7	10.11.18	0935	G	Water			✓	✓	✓	✓			
MW-8	10.11.18	1220	G	Water			✓	✓	✓	✓			
MW-8EB	10.11.18	1240	G	Water			✓	✓	✓	✓			

280-115507 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: Tara Kent	Date/Time: 10-12-18 1415	Company: HDR	Received by: [signature]	Date/Time: 10/12/18 1415	Company: TA Denver
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 5.1, 3.6 +0.7 IR #9

Ver: 08/04/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-458237.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-115507-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 11/7/2018	Analysis Requested		Preservation Codes:
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			Other:
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
W-1 (280-115507-1)	10/10/18	15:10 Mountain		Water			X	X	X	1	
W-2 (280-115507-2)	10/10/18	14:10 Mountain		Water			X	X	X	1	
W-3 (280-115507-3)	10/10/18	16:25 Mountain		Water			X	X	X	1	
W-4 (280-115507-4)	10/10/18	13:00 Mountain		Water			X	X	X	1	
W-4D (280-115507-5)	10/10/18	13:00 Mountain		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*
Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 10/15/18 1530	Company	Received by:	Date/Time: 10/16/18 0945	Company: TA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

12.2/13.1

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-458236.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-115507-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 11/5/2018	Analysis Requested		Preservation Codes:
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 13 Total Metals (w/collision cell)	6010C/3005A (MOD) Boron	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note: S10
			Preservation Code:								
W-1 (280-115507-1)	10/10/18	15:10 Mountain		Water			X	X	X	1	Use Collision Cell
W-2 (280-115507-2)	10/10/18	14:10 Mountain		Water			X	X	X	1	Use Collision Cell
W-3 (280-115507-3)	10/10/18	16:25 Mountain		Water			X	X	X	1	Use Collision Cell
W-4 (280-115507-4)	10/10/18	13:00 Mountain		Water			X	X	X	1	Use Collision Cell
W-4D (280-115507-5)	10/10/18	13:00 Mountain		Water			X	X	X	1	Use Collision Cell
MW-6 (280-115507-6)	10/11/18	10:30 Mountain		Water			X	X	X	1	Use Collision Cell
MW-7 (280-115507-7)	10/11/18	09:35 Mountain		Water			X	X	X	1	Use Collision Cell
MW-8 (280-115507-8)	10/11/18	12:20 Mountain		Water			X	X	X	1	Use Collision Cell
MW-8EB (280-115507-9)	10/11/18	12:40 Mountain		Water			X	X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) | Primary Deliverable Rank: 4 | Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:		Method of Shipment:
Relinquished by:	Date/Time: 10/15/18 16:57	Company	Received by:	Date/Time: 10/16/18 930	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** ______________
Canton Facility

Client TA Denver Site Name ______________ Cooler unpacked by:
Cooler Received on 10/16/18 Opened on 10/16/18
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ______________

Receipt After-hours: Drop-off Date/Time ______________ Storage Location ______________

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ______________
Packing material used: Bubble Wrap Foam Plastic Bag None Other ______________
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp. 12.2 °C Corrected Cooler Temp. 13.1 °C
   IR GUN #36 (CF +0.6°C) Observed Cooler Temp.______ °C Corrected Cooler Temp.______ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC849161**
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬅ Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #______________ Yes No
16. Was a LL Hg or Me Hg trip blank present? ______________ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____________ Date ____________ by ____________ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

____

____

____

____

____

18. SAMPLE CONDITION

Sample(s) ______________ were received after the recommended holding time had expired.
Sample(s) ______________ were received in a broken container.
Sample(s) ______________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ______________ were further preserved in the laboratory.
Time preserved: ____________ Preservative(s) added/Lot number(s): ______________

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc	Job Number: 280-115507-1

Login Number: 115507
List Number: 1
Creator: Diffendall, Jessica L

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-115507-1

Login Number: 115507
List Number: 3
Creator: Dupart, Lacee S

List Source: TestAmerica St. Louis
List Creation: 10/17/18 11:32 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 9315 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-115507-1	W-1	101
280-115507-2	W-2	105
280-115507-3	W-3	101
280-115507-4	W-4	98.5
280-115507-5	W-4D	107
LCS 160-395714/1-A	Lab Control Sample	91.7
MB 160-395714/19-A	Method Blank	102

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-115507-1	W-1	101	76.6
280-115507-2	W-2	105	79.3
280-115507-3	W-3	101	77.0
280-115507-4	W-4	98.5	74.8
280-115507-5	W-4D	107	74.8
LCS 160-395732/1-A	Lab Control Sample	91.7	64.7
MB 160-395732/19-A	Method Blank	102	73.6

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-116939-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Hayden

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
12/17/2018 4:43:31 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 280-116939-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-116939-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 11/14/2018 9:26 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.7º C, 1.4º C and 2.2º C.

TOTAL RECOVERABLE METALS
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/20/2018 and analyzed on 11/23/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/20/2018 and analyzed on 11/21/2018.

Calcium failed the recovery criteria low for the MS/MSD of sample W-1 (280-116939-1) in batch 240-356632. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details. The acceptable LCS data indicate that the analytical system was operating within control.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 11/20/2018 and analyzed on 11/21/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 11/15/2018 and

Job ID: 280-116939-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

11/19/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 11/16/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 12/05/2018 and 12/06/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 11/30/2018.

Samples W-1 (280-116939-1)[2X], W-1 (280-116939-1)[20X], W-2 (280-116939-2)[2X], W-2 (280-116939-2)[50X], W-3 (280-116939-3)[5X], W-3 (280-116939-3)[50X], W-4 (280-116939-4)[100X], W-4 (280-116939-4)[5X], W-1D (280-116939-5)[2X] and W-1D (280-116939-5)[20X] required dilution prior to analysis dilution due to the Matrix Conductivity Threshold (MCT) of the instrument for Fluoride and/or analyte concentration. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 (GFPC)
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 11/20/2018 and analyzed on 12/12/2018.

The following samples were prepared at a reduced aliquot due to limited volume: W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 11/20/2018 and analyzed on 12/10/2018.

The following samples were prepared at a reduced aliquot due to limited volume: W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226/RADIUM-228 (GFPC)
Samples W-1 (280-116939-1), W-2 (280-116939-2), W-3 (280-116939-3), W-4 (280-116939-4), W-1D (280-116939-5) and W-3EB (280-116939-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 12/17/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-116939-1

Client Sample ID: W-1

Lab Sample ID: 280-116939-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.62		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0093		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.0011		0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00037	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.00095	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0034	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.010		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.28		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	41		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.32	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2700		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4300		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-2

Lab Sample ID: 280-116939-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	9.3		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0057		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	320		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.0013		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0034	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0028	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.62		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	83		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.52	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	4700		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7000		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-3

Lab Sample ID: 280-116939-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.81		0.10	0.023	mg/L	1		6010C	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-3 (Continued) — Lab Sample ID: 280-116939-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0061		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	230		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cadmium	0.00029	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0021		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0028	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0094		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	1.2		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.58	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	8100		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	12000		100	47	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: W-4 — Lab Sample ID: 280-116939-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.96		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0077		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	320		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.0069		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0028	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0016	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.71		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	360		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.65	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	13000		500	23	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	19000		100	47	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-1D — Lab Sample ID: 280-116939-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.64		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.0091		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	310		1.0	0.58	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: W-1D (Continued) — Lab Sample ID: 280-116939-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.00075	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0033	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0089		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.28		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	41		6.0	0.51	mg/L	2		9056A	Total/NA
Fluoride	0.28	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2700		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4200		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-3EB — Lab Sample ID: 280-116939-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0026	J	0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.1	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Sulfate	0.26	J	5.0	0.23	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: HDR Inc TestAmerica Job ID: 280-116939-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-116939-1	W-1	Water	11/13/18 10:00	11/14/18 09:26
280-116939-2	W-2	Water	11/13/18 14:20	11/14/18 09:26
280-116939-3	W-3	Water	11/13/18 12:20	11/14/18 09:26
280-116939-4	W-4	Water	11/13/18 13:30	11/14/18 09:26
280-116939-5	W-1D	Water	11/13/18 10:00	11/14/18 09:26
280-116939-6	W-3EB	Water	11/13/18 12:35	11/14/18 09:26

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden
TestAmerica Job ID: 280-116939-1

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: W-1
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.62**		0.10	0.023	mg/L		11/20/18 14:00	11/23/18 17:48	1

Client Sample ID: W-2
Date Collected: 11/13/18 14:20
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**9.3**		0.10	0.023	mg/L		11/20/18 14:00	11/23/18 18:18	1

Client Sample ID: W-3
Date Collected: 11/13/18 12:20
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.81**		0.10	0.023	mg/L		11/20/18 14:00	11/23/18 18:23	1

Client Sample ID: W-4
Date Collected: 11/13/18 13:30
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.96**		0.10	0.023	mg/L		11/20/18 14:00	11/23/18 18:28	1

Client Sample ID: W-1D
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.64**		0.10	0.023	mg/L		11/20/18 14:00	11/23/18 18:32	1

Client Sample ID: W-3EB
Date Collected: 11/13/18 12:35
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		11/20/18 14:00	11/23/18 18:37	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/20/18 14:00	11/21/18 13:02	1
Arsenic	ND		0.0050	0.00075	mg/L		11/20/18 14:00	11/21/18 13:02	1
Barium	**0.0093**		0.0050	0.0022	mg/L		11/20/18 14:00	11/21/18 13:02	1
Beryllium	**0.0011**		0.0010	0.00031	mg/L		11/20/18 14:00	11/21/18 13:02	1
Calcium	**300**		1.0	0.58	mg/L		11/20/18 14:00	11/21/18 13:02	1
Cadmium	**0.00037**	**J**	0.0010	0.00021	mg/L		11/20/18 14:00	11/21/18 13:02	1
Cobalt	**0.00095**	**J**	0.0010	0.00019	mg/L		11/20/18 14:00	11/21/18 13:02	1
Chromium	ND		0.0020	0.00098	mg/L		11/20/18 14:00	11/21/18 13:02	1
Molybdenum	**0.0034**	**J**	0.010	0.0011	mg/L		11/20/18 14:00	11/21/18 13:02	1
Lead	ND		0.0010	0.00045	mg/L		11/20/18 14:00	11/21/18 13:02	1
Selenium	**0.010**		0.0050	0.00089	mg/L		11/20/18 14:00	11/21/18 13:02	1
Thallium	ND		0.0010	0.00020	mg/L		11/20/18 14:00	11/21/18 13:02	1
Lithium	**0.28**		0.0080	0.0017	mg/L		11/20/18 14:00	11/21/18 13:02	1

Client Sample ID: W-2 — **Lab Sample ID: 280-116939-2**
Date Collected: 11/13/18 14:20 — **Matrix: Water**
Date Received: 11/14/18 09:26

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/20/18 14:00	11/21/18 13:31	1
Arsenic	ND		0.0050	0.00075	mg/L		11/20/18 14:00	11/21/18 13:31	1
Barium	**0.0057**		0.0050	0.0022	mg/L		11/20/18 14:00	11/21/18 13:31	1
Beryllium	ND		0.0010	0.00031	mg/L		11/20/18 14:00	11/21/18 13:31	1
Calcium	**320**		1.0	0.58	mg/L		11/20/18 14:00	11/21/18 13:31	1
Cadmium	ND		0.0010	0.00021	mg/L		11/20/18 14:00	11/21/18 13:31	1
Cobalt	**0.0013**		0.0010	0.00019	mg/L		11/20/18 14:00	11/21/18 13:31	1
Chromium	ND		0.0020	0.00098	mg/L		11/20/18 14:00	11/21/18 13:31	1
Molybdenum	**0.0034**	**J**	0.010	0.0011	mg/L		11/20/18 14:00	11/21/18 13:31	1
Lead	ND		0.0010	0.00045	mg/L		11/20/18 14:00	11/21/18 13:31	1
Selenium	**0.0028**	**J**	0.0050	0.00089	mg/L		11/20/18 14:00	11/21/18 13:31	1
Thallium	ND		0.0010	0.00020	mg/L		11/20/18 14:00	11/21/18 13:31	1
Lithium	**0.62**		0.0080	0.0017	mg/L		11/20/18 14:00	11/21/18 13:31	1

Client Sample ID: W-3 — **Lab Sample ID: 280-116939-3**
Date Collected: 11/13/18 12:20 — **Matrix: Water**
Date Received: 11/14/18 09:26

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/20/18 14:00	11/21/18 13:33	1
Arsenic	ND		0.0050	0.00075	mg/L		11/20/18 14:00	11/21/18 13:33	1
Barium	**0.0061**		0.0050	0.0022	mg/L		11/20/18 14:00	11/21/18 13:33	1
Beryllium	ND		0.0010	0.00031	mg/L		11/20/18 14:00	11/21/18 13:33	1
Calcium	**230**		1.0	0.58	mg/L		11/20/18 14:00	11/21/18 13:33	1
Cadmium	**0.00029**	**J**	0.0010	0.00021	mg/L		11/20/18 14:00	11/21/18 13:33	1
Cobalt	**0.0021**		0.0010	0.00019	mg/L		11/20/18 14:00	11/21/18 13:33	1
Chromium	ND		0.0020	0.00098	mg/L		11/20/18 14:00	11/21/18 13:33	1
Molybdenum	**0.0028**	**J**	0.010	0.0011	mg/L		11/20/18 14:00	11/21/18 13:33	1
Lead	ND		0.0010	0.00045	mg/L		11/20/18 14:00	11/21/18 13:33	1
Selenium	**0.0094**		0.0050	0.00089	mg/L		11/20/18 14:00	11/21/18 13:33	1
Thallium	ND		0.0010	0.00020	mg/L		11/20/18 14:00	11/21/18 13:33	1
Lithium	**1.2**		0.0080	0.0017	mg/L		11/20/18 14:00	11/21/18 13:33	1

Client Sample ID: W-4 — **Lab Sample ID: 280-116939-4**
Date Collected: 11/13/18 13:30 — **Matrix: Water**
Date Received: 11/14/18 09:26

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/20/18 14:00	11/21/18 13:36	1
Arsenic	ND		0.0050	0.00075	mg/L		11/20/18 14:00	11/21/18 13:36	1
Barium	**0.0077**		0.0050	0.0022	mg/L		11/20/18 14:00	11/21/18 13:36	1
Beryllium	ND		0.0010	0.00031	mg/L		11/20/18 14:00	11/21/18 13:36	1
Calcium	**320**		1.0	0.58	mg/L		11/20/18 14:00	11/21/18 13:36	1
Cadmium	ND		0.0010	0.00021	mg/L		11/20/18 14:00	11/21/18 13:36	1
Cobalt	**0.0069**		0.0010	0.00019	mg/L		11/20/18 14:00	11/21/18 13:36	1
Chromium	ND		0.0020	0.00098	mg/L		11/20/18 14:00	11/21/18 13:36	1
Molybdenum	**0.0028**	**J**	0.010	0.0011	mg/L		11/20/18 14:00	11/21/18 13:36	1
Lead	ND		0.0010	0.00045	mg/L		11/20/18 14:00	11/21/18 13:36	1
Selenium	**0.0016**	**J**	0.0050	0.00089	mg/L		11/20/18 14:00	11/21/18 13:36	1
Thallium	ND		0.0010	0.00020	mg/L		11/20/18 14:00	11/21/18 13:36	1
Lithium	**0.71**		0.0080	0.0017	mg/L		11/20/18 14:00	11/21/18 13:36	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: W-1D
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/20/18 14:00	11/21/18 13:38	1
Arsenic	ND		0.0050	0.00075	mg/L		11/20/18 14:00	11/21/18 13:38	1
Barium	**0.0091**		0.0050	0.0022	mg/L		11/20/18 14:00	11/21/18 13:38	1
Beryllium	ND		0.0010	0.00031	mg/L		11/20/18 14:00	11/21/18 13:38	1
Calcium	**310**		1.0	0.58	mg/L		11/20/18 14:00	11/21/18 13:38	1
Cadmium	ND		0.0010	0.00021	mg/L		11/20/18 14:00	11/21/18 13:38	1
Cobalt	**0.00075**	**J**	0.0010	0.00019	mg/L		11/20/18 14:00	11/21/18 13:38	1
Chromium	ND		0.0020	0.00098	mg/L		11/20/18 14:00	11/21/18 13:38	1
Molybdenum	**0.0033**	**J**	0.010	0.0011	mg/L		11/20/18 14:00	11/21/18 13:38	1
Lead	ND		0.0010	0.00045	mg/L		11/20/18 14:00	11/21/18 13:38	1
Selenium	**0.0089**		0.0050	0.00089	mg/L		11/20/18 14:00	11/21/18 13:38	1
Thallium	ND		0.0010	0.00020	mg/L		11/20/18 14:00	11/21/18 13:38	1
Lithium	**0.28**		0.0080	0.0017	mg/L		11/20/18 14:00	11/21/18 13:38	1

Client Sample ID: W-3EB
Date Collected: 11/13/18 12:35
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/20/18 14:00	11/21/18 13:40	1
Arsenic	ND		0.0050	0.00075	mg/L		11/20/18 14:00	11/21/18 13:40	1
Barium	ND		0.0050	0.0022	mg/L		11/20/18 14:00	11/21/18 13:40	1
Beryllium	ND		0.0010	0.00031	mg/L		11/20/18 14:00	11/21/18 13:40	1
Calcium	ND		1.0	0.58	mg/L		11/20/18 14:00	11/21/18 13:40	1
Cadmium	ND		0.0010	0.00021	mg/L		11/20/18 14:00	11/21/18 13:40	1
Cobalt	ND		0.0010	0.00019	mg/L		11/20/18 14:00	11/21/18 13:40	1
Chromium	ND		0.0020	0.00098	mg/L		11/20/18 14:00	11/21/18 13:40	1
Molybdenum	ND		0.010	0.0011	mg/L		11/20/18 14:00	11/21/18 13:40	1
Lead	ND		0.0010	0.00045	mg/L		11/20/18 14:00	11/21/18 13:40	1
Selenium	ND		0.0050	0.00089	mg/L		11/20/18 14:00	11/21/18 13:40	1
Thallium	ND		0.0010	0.00020	mg/L		11/20/18 14:00	11/21/18 13:40	1
Lithium	**0.0026**	**J**	0.0080	0.0017	mg/L		11/20/18 14:00	11/21/18 13:40	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-1
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/20/18 14:00	11/21/18 11:55	1

Client Sample ID: W-2
Date Collected: 11/13/18 14:20
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/20/18 14:00	11/21/18 11:57	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: W-3
Date Collected: 11/13/18 12:20
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/20/18 14:00	11/21/18 12:59	1

Client Sample ID: W-4
Date Collected: 11/13/18 13:30
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/20/18 14:00	11/21/18 13:01	1

Client Sample ID: W-1D
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/20/18 14:00	11/21/18 13:03	1

Client Sample ID: W-3EB
Date Collected: 11/13/18 12:35
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/20/18 14:00	11/21/18 13:05	1

General Chemistry

Client Sample ID: W-1
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.8**	**HF**	0.1	0.1	SU			12/05/18 21:24	1
Temperature	**21.0**	**HF**	1.0	1.0	Degrees C			12/05/18 21:24	1
Chloride	**41**		6.0	0.51	mg/L			11/30/18 02:25	2
Fluoride	**0.32**	**J**	1.0	0.12	mg/L			11/30/18 02:25	2
Sulfate	**2700**		100	4.6	mg/L			11/30/18 02:44	20
Total Dissolved Solids (TDS)	**4300**		40	19	mg/L			11/15/18 10:11	1
Total Suspended Solids	ND		4.0	1.1	mg/L			11/16/18 10:14	1

Client Sample ID: W-2
Date Collected: 11/13/18 14:20
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.7**	**HF**	0.1	0.1	SU			12/05/18 21:49	1
Temperature	**20.9**	**HF**	1.0	1.0	Degrees C			12/05/18 21:49	1
Chloride	**83**		6.0	0.51	mg/L			11/30/18 03:03	2
Fluoride	**0.52**	**J**	1.0	0.12	mg/L			11/30/18 03:03	2
Sulfate	**4700**		250	12	mg/L			11/30/18 03:21	50
Total Dissolved Solids (TDS)	**7000**		40	19	mg/L			11/15/18 10:11	1
Total Suspended Solids	ND		4.0	1.1	mg/L			11/16/18 10:14	1

Client Sample ID: W-3
Date Collected: 11/13/18 12:20
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.7**	**HF**	0.1	0.1	SU			12/05/18 21:44	1

General Chemistry (Continued)

Client Sample ID: W-3
Date Collected: 11/13/18 12:20
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	21.5	HF	1.0	1.0	Degrees C			12/05/18 21:44	1
Chloride	190		15	1.3	mg/L			11/30/18 04:18	5
Fluoride	0.58	J	2.5	0.30	mg/L			11/30/18 04:18	5
Sulfate	8100		250	12	mg/L			11/30/18 04:36	50
Total Dissolved Solids (TDS)	12000		100	47	mg/L			11/15/18 10:11	1
Total Suspended Solids	3.2	J	4.0	1.1	mg/L			11/16/18 10:14	1

Client Sample ID: W-4
Date Collected: 11/13/18 13:30
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			12/05/18 21:15	1
Temperature	20.8	HF	1.0	1.0	Degrees C			12/05/18 21:15	1
Chloride	360		15	1.3	mg/L			11/30/18 04:55	5
Fluoride	0.65	J	2.5	0.30	mg/L			11/30/18 04:55	5
Sulfate	13000		500	23	mg/L			11/30/18 05:14	100
Total Dissolved Solids (TDS)	19000		100	47	mg/L			11/15/18 10:11	1
Total Suspended Solids	ND		4.0	1.1	mg/L			11/16/18 10:14	1

Client Sample ID: W-1D
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU			12/05/18 21:40	1
Temperature	22.1	HF	1.0	1.0	Degrees C			12/05/18 21:40	1
Chloride	41		6.0	0.51	mg/L			11/30/18 05:32	2
Fluoride	0.28	J	1.0	0.12	mg/L			11/30/18 05:32	2
Sulfate	2700		100	4.6	mg/L			11/30/18 05:51	20
Total Dissolved Solids (TDS)	4200		40	19	mg/L			11/15/18 10:11	1
Total Suspended Solids	ND		4.0	1.1	mg/L			11/16/18 10:14	1

Client Sample ID: W-3EB
Date Collected: 11/13/18 12:35
Date Received: 11/14/18 09:26
Lab Sample ID: 280-116939-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.1	HF	0.1	0.1	SU			12/06/18 13:38	1
Temperature	21.0	HF	1.0	1.0	Degrees C			12/06/18 13:38	1
Chloride	ND		3.0	0.25	mg/L			11/30/18 06:10	1
Fluoride	ND		0.50	0.060	mg/L			11/30/18 06:10	1
Sulfate	0.26	J	5.0	0.23	mg/L			11/30/18 06:10	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			11/19/18 09:52	1
Total Suspended Solids	ND		4.0	1.1	mg/L			11/16/18 10:14	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.125	U	0.140	0.140	1.00	0.224	pCi/L	11/20/18 12:49	12/12/18 07:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.1*		*40 - 110*	*11/20/18 12:49*	*12/12/18 07:16*	*1*

Client Sample ID: W-2
Date Collected: 11/13/18 14:20
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0919	U	0.124	0.124	1.00	0.209	pCi/L	11/20/18 12:49	12/12/18 07:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*11/20/18 12:49*	*12/12/18 07:16*	*1*

Client Sample ID: W-3
Date Collected: 11/13/18 12:20
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.167	U	0.135	0.136	1.00	0.191	pCi/L	11/20/18 12:49	12/12/18 07:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*107*		*40 - 110*	*11/20/18 12:49*	*12/12/18 07:16*	*1*

Client Sample ID: W-4
Date Collected: 11/13/18 13:30
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.131	U	0.123	0.124	1.00	0.184	pCi/L	11/20/18 12:49	12/12/18 07:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.5*		*40 - 110*	*11/20/18 12:49*	*12/12/18 07:19*	*1*

Client Sample ID: W-1D
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.101	U	0.126	0.126	1.00	0.208	pCi/L	11/20/18 12:49	12/12/18 07:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*11/20/18 12:49*	*12/12/18 07:19*	*1*

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-116939-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-3EB
Date Collected: 11/13/18 12:35
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00827	U	0.0772	0.0772	1.00	0.171	pCi/L	11/20/18 12:49	12/12/18 07:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*11/20/18 12:49*	*12/12/18 07:19*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.359	U	0.283	0.285	1.00	0.445	pCi/L	11/20/18 14:23	12/10/18 08:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.1*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:33*	*1*
Y Carrier	*79.3*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:33*	*1*

Client Sample ID: W-2
Date Collected: 11/13/18 14:20
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.629**		0.299	0.304	1.00	0.431	pCi/L	11/20/18 14:23	12/10/18 08:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:33*	*1*
Y Carrier	*84.1*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:33*	*1*

Client Sample ID: W-3
Date Collected: 11/13/18 12:20
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.461**		0.289	0.292	1.00	0.441	pCi/L	11/20/18 14:23	12/10/18 08:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*107*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:33*	*1*
Y Carrier	*80.0*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:33*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-4 **Lab Sample ID: 280-116939-4**
Date Collected: 11/13/18 13:30 **Matrix: Water**
Date Received: 11/14/18 09:26

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.415	U	0.317	0.319	1.00	0.499	pCi/L	11/20/18 14:23	12/10/18 08:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.5*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:35*	*1*
Y Carrier	*82.2*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:35*	*1*

Client Sample ID: W-1D **Lab Sample ID: 280-116939-5**
Date Collected: 11/13/18 10:00 **Matrix: Water**
Date Received: 11/14/18 09:26

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.610**		0.316	0.321	1.00	0.467	pCi/L	11/20/18 14:23	12/10/18 08:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:35*	*1*
Y Carrier	*81.9*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:35*	*1*

Client Sample ID: W-3EB **Lab Sample ID: 280-116939-6**
Date Collected: 11/13/18 12:35 **Matrix: Water**
Date Received: 11/14/18 09:26

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.104	U	0.300	0.301	1.00	0.522	pCi/L	11/20/18 14:23	12/10/18 08:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:35*	*1*
Y Carrier	*72.9*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:35*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-1 **Lab Sample ID: 280-116939-1**
Date Collected: 11/13/18 10:00 **Matrix: Water**
Date Received: 11/14/18 09:26

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.485**		0.316	0.318	5.00	0.445	pCi/L		12/17/18 16:03	1

Client Sample ID: W-2 **Lab Sample ID: 280-116939-2**
Date Collected: 11/13/18 14:20 **Matrix: Water**
Date Received: 11/14/18 09:26

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.721**		0.324	0.328	5.00	0.431	pCi/L		12/17/18 16:03	1

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-116939-1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: W-3
Date Collected: 11/13/18 12:20
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.628**		0.319	0.322	5.00	0.441	pCi/L		12/17/18 16:03	1

Client Sample ID: W-4
Date Collected: 11/13/18 13:30
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.546**		0.340	0.342	5.00	0.499	pCi/L		12/17/18 16:03	1

Client Sample ID: W-1D
Date Collected: 11/13/18 10:00
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.711**		0.340	0.345	5.00	0.467	pCi/L		12/17/18 16:03	1

Client Sample ID: W-3EB
Date Collected: 11/13/18 12:35
Date Received: 11/14/18 09:26

Lab Sample ID: 280-116939-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.112	U	0.310	0.311	5.00	0.522	pCi/L		12/17/18 16:03	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-356334/1-A
Matrix: Water
Analysis Batch: 356857

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 356334

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		11/20/18 14:00	11/23/18 17:39	1

Lab Sample ID: LCS 240-356334/2-A
Matrix: Water
Analysis Batch: 356857

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 356334

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	0.989		mg/L		99	80 - 120

Lab Sample ID: 280-116939-1 MS
Matrix: Water
Analysis Batch: 356857

Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 356334

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.62		1.00	1.67		mg/L		104	75 - 125

Lab Sample ID: 280-116939-1 MSD
Matrix: Water
Analysis Batch: 356857

Client Sample ID: W-1
Prep Type: Total Recoverable
Prep Batch: 356334

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.62		1.00	1.66		mg/L		103	75 - 125	1	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-356334/1-A
Matrix: Water
Analysis Batch: 356632

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 356334

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/20/18 14:00	11/21/18 12:58	1
Arsenic	ND		0.0050	0.00075	mg/L		11/20/18 14:00	11/21/18 12:58	1
Barium	ND		0.0050	0.0022	mg/L		11/20/18 14:00	11/21/18 12:58	1
Beryllium	ND		0.0010	0.00031	mg/L		11/20/18 14:00	11/21/18 12:58	1
Calcium	ND		1.0	0.58	mg/L		11/20/18 14:00	11/21/18 12:58	1
Cadmium	ND		0.0010	0.00021	mg/L		11/20/18 14:00	11/21/18 12:58	1
Cobalt	ND		0.0010	0.00019	mg/L		11/20/18 14:00	11/21/18 12:58	1
Chromium	ND		0.0020	0.00098	mg/L		11/20/18 14:00	11/21/18 12:58	1
Molybdenum	ND		0.010	0.0011	mg/L		11/20/18 14:00	11/21/18 12:58	1
Lead	ND		0.0010	0.00045	mg/L		11/20/18 14:00	11/21/18 12:58	1
Selenium	ND		0.0050	0.00089	mg/L		11/20/18 14:00	11/21/18 12:58	1
Thallium	ND		0.0010	0.00020	mg/L		11/20/18 14:00	11/21/18 12:58	1
Lithium	ND		0.0080	0.0017	mg/L		11/20/18 14:00	11/21/18 12:58	1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 240-356334/3-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 356632 **Prep Batch: 356334**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0939		mg/L		94	80 - 120
Arsenic	1.00	0.874		mg/L		87	80 - 120
Barium	1.00	0.912		mg/L		91	80 - 120
Beryllium	1.00	0.950		mg/L		95	80 - 120
Calcium	10.0	9.10		mg/L		91	80 - 120
Cadmium	1.00	0.911		mg/L		91	80 - 120
Cobalt	1.00	0.882		mg/L		88	80 - 120
Chromium	1.00	0.903		mg/L		90	80 - 120
Molybdenum	0.100	0.0934		mg/L		93	80 - 120
Lead	1.00	0.942		mg/L		94	80 - 120
Selenium	1.00	0.926		mg/L		93	80 - 120
Thallium	0.250	0.231		mg/L		93	80 - 120
Lithium	0.100	0.0964		mg/L		96	80 - 120

Lab Sample ID: 280-116939-1 MS **Client Sample ID: W-1**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 356632 **Prep Batch: 356334**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.100	0.0906		mg/L		91	75 - 125
Arsenic	ND		1.00	0.893		mg/L		89	75 - 125
Barium	0.0093		1.00	0.888		mg/L		88	75 - 125
Beryllium	0.0011		1.00	0.935		mg/L		93	75 - 125
Calcium	300		10.0	288	4	mg/L		-135	75 - 125
Cadmium	0.00037	J	1.00	0.841		mg/L		84	75 - 125
Cobalt	0.00095	J	1.00	0.871		mg/L		87	75 - 125
Chromium	ND		1.00	0.825		mg/L		83	75 - 125
Molybdenum	0.0034	J	0.100	0.0990		mg/L		96	75 - 125
Lead	ND		1.00	0.847		mg/L		85	75 - 125
Selenium	0.010		1.00	0.862		mg/L		85	75 - 125
Thallium	ND		0.250	0.209		mg/L		84	75 - 125
Lithium	0.28		0.100	0.354		mg/L		77	75 - 125

Lab Sample ID: 280-116939-1 MSD **Client Sample ID: W-1**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 356632 **Prep Batch: 356334**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.100	0.0946		mg/L		95	75 - 125	4	20
Arsenic	ND		1.00	0.936		mg/L		94	75 - 125	5	20
Barium	0.0093		1.00	0.928		mg/L		92	75 - 125	4	20
Beryllium	0.0011		1.00	0.970		mg/L		97	75 - 125	4	20
Calcium	300		10.0	301	4	mg/L		3	75 - 125	5	20
Cadmium	0.00037	J	1.00	0.893		mg/L		89	75 - 125	6	20
Cobalt	0.00095	J	1.00	0.920		mg/L		92	75 - 125	6	20
Chromium	ND		1.00	0.858		mg/L		86	75 - 125	4	20
Molybdenum	0.0034	J	0.100	0.104		mg/L		100	75 - 125	5	20
Lead	ND		1.00	0.881		mg/L		88	75 - 125	4	20

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 280-116939-1 MSD **Client Sample ID: W-1**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 356632 **Prep Batch: 356334**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Selenium	0.010		1.00	0.888		mg/L		88	75 - 125	3	20
Thallium	ND		0.250	0.219		mg/L		88	75 - 125	5	20
Lithium	0.28		0.100	0.379		mg/L		102	75 - 125	7	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-356339/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 356610 **Prep Batch: 356339**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/20/18 14:00	11/21/18 11:46	1

Lab Sample ID: LCS 240-356339/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 356610 **Prep Batch: 356339**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.67		ug/L		93	80 - 120

Lab Sample ID: 280-116939-2 MS **Client Sample ID: W-2**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 356610 **Prep Batch: 356339**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		1.00	0.959		ug/L		96	80 - 120

Lab Sample ID: 280-116939-2 MSD **Client Sample ID: W-2**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 356610 **Prep Batch: 356339**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		1.00	0.907		ug/L		91	80 - 120	6	20

Method: 9040B - pH

Lab Sample ID: LCS 280-440159/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 440159

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 280-440228/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 440228

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Client: HDR Inc	TestAmerica Job ID: 280-116939-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-439229/6
Matrix: Water
Analysis Batch: 439229

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			11/29/18 13:32	1
Fluoride	ND		0.50	0.060	mg/L			11/29/18 13:32	1
Sulfate	ND		5.0	0.23	mg/L			11/29/18 13:32	1

Lab Sample ID: LCS 280-439229/4
Matrix: Water
Analysis Batch: 439229

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.6		mg/L		100	90 - 110
Fluoride	5.00	5.28		mg/L		106	90 - 110
Sulfate	100	101		mg/L		101	90 - 110

Lab Sample ID: LCSD 280-439229/5
Matrix: Water
Analysis Batch: 439229

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	99.7		mg/L		100	90 - 110	0	10
Fluoride	5.00	5.27		mg/L		105	90 - 110	0	10
Sulfate	100	102		mg/L		102	90 - 110	0	10

Lab Sample ID: MRL 280-439229/3
Matrix: Water
Analysis Batch: 439229

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.59	J	mg/L		104	50 - 150
Fluoride	0.200	0.198	J	mg/L		99	50 - 150
Sulfate	2.50	2.79	J	mg/L		111	50 - 150

Lab Sample ID: MB 280-439798/6
Matrix: Water
Analysis Batch: 439798

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			12/04/18 15:54	1
Fluoride	ND		0.50	0.060	mg/L			12/04/18 15:54	1
Sulfate	ND		5.0	0.23	mg/L			12/04/18 15:54	1

Lab Sample ID: LCS 280-439798/4
Matrix: Water
Analysis Batch: 439798

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	101		mg/L		101	90 - 110
Fluoride	5.00	5.25		mg/L		105	90 - 110
Sulfate	100	103		mg/L		103	90 - 110

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 280-439798/5
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 439798

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	101		mg/L		101	90 - 110	0	10
Fluoride	5.00	5.25		mg/L		105	90 - 110	0	10
Sulfate	100	103		mg/L		103	90 - 110	0	10

Lab Sample ID: MRL 280-439798/3
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 439798

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.78	J	mg/L		111	50 - 150
Fluoride	0.200	0.210	J	mg/L		105	50 - 150
Sulfate	2.50	2.74	J	mg/L		110	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-437741/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 437741

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			11/15/18 10:11	1

Lab Sample ID: LCS 280-437741/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 437741

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	500		mg/L		100	93 - 110

Lab Sample ID: LCSD 280-437741/3
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 437741

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	500	493		mg/L		99	93 - 110	1	20

Lab Sample ID: MB 280-438116/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 438116

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			11/19/18 09:52	1

Lab Sample ID: LCS 280-438116/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 438116

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	491		mg/L		98	93 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-437900/1 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 437900

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			11/16/18 10:14	1

Lab Sample ID: LCS 280-437900/2 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 437900

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	85.6		mg/L		86	79 - 114

Lab Sample ID: LCSD 280-437900/3 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 437900

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids	100	102		mg/L		102	79 - 114	18	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-401892/20-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 405211 **Prep Batch: 401892**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1088	U	0.0965	0.0970	1.00	0.143	pCi/L	11/20/18 12:49	12/12/18 07:19	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*103*		*40 - 110*	*11/20/18 12:49*	*12/12/18 07:19*	*1*

Lab Sample ID: LCS 160-401892/1-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 405210 **Prep Batch: 401892**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	11.44		1.28	1.00	0.155	pCi/L	101	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.6*		*40 - 110*

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-116939-1

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-401907/20-A
Matrix: Water
Analysis Batch: 404802

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 401907

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1980	U	0.214	0.215	1.00	0.351	pCi/L	11/20/18 14:23	12/10/18 08:35	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*103*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:35*	*1*
Y Carrier	*83.7*		*40 - 110*	*11/20/18 14:23*	*12/10/18 08:35*	*1*

Lab Sample ID: LCS 160-401907/1-A
Matrix: Water
Analysis Batch: 404801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 401907

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.14	8.489		1.01	1.00	0.380	pCi/L	93	56 - 140

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.6*		*40 - 110*
Y Carrier	*76.6*		*40 - 110*

Metals

Prep Batch: 356334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total Recoverable	Water	3005A	
280-116939-2	W-2	Total Recoverable	Water	3005A	
280-116939-3	W-3	Total Recoverable	Water	3005A	
280-116939-4	W-4	Total Recoverable	Water	3005A	
280-116939-5	W-1D	Total Recoverable	Water	3005A	
280-116939-6	W-3EB	Total Recoverable	Water	3005A	
MB 240-356334/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-356334/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-356334/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-116939-1 MS	W-1	Total Recoverable	Water	3005A	
280-116939-1 MS	W-1	Total Recoverable	Water	3005A	
280-116939-1 MSD	W-1	Total Recoverable	Water	3005A	
280-116939-1 MSD	W-1	Total Recoverable	Water	3005A	

Prep Batch: 356339

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total/NA	Water	7470A	
280-116939-2	W-2	Total/NA	Water	7470A	
280-116939-3	W-3	Total/NA	Water	7470A	
280-116939-4	W-4	Total/NA	Water	7470A	
280-116939-5	W-1D	Total/NA	Water	7470A	
280-116939-6	W-3EB	Total/NA	Water	7470A	
MB 240-356339/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-356339/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-116939-2 MS	W-2	Total/NA	Water	7470A	
280-116939-2 MSD	W-2	Total/NA	Water	7470A	

Analysis Batch: 356610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total/NA	Water	7470A	356339
280-116939-2	W-2	Total/NA	Water	7470A	356339
280-116939-3	W-3	Total/NA	Water	7470A	356339
280-116939-4	W-4	Total/NA	Water	7470A	356339
280-116939-5	W-1D	Total/NA	Water	7470A	356339
280-116939-6	W-3EB	Total/NA	Water	7470A	356339
MB 240-356339/1-A	Method Blank	Total/NA	Water	7470A	356339
LCS 240-356339/2-A	Lab Control Sample	Total/NA	Water	7470A	356339
280-116939-2 MS	W-2	Total/NA	Water	7470A	356339
280-116939-2 MSD	W-2	Total/NA	Water	7470A	356339

Analysis Batch: 356632

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total Recoverable	Water	6020A	356334
280-116939-2	W-2	Total Recoverable	Water	6020A	356334
280-116939-3	W-3	Total Recoverable	Water	6020A	356334
280-116939-4	W-4	Total Recoverable	Water	6020A	356334
280-116939-5	W-1D	Total Recoverable	Water	6020A	356334
280-116939-6	W-3EB	Total Recoverable	Water	6020A	356334
MB 240-356334/1-A	Method Blank	Total Recoverable	Water	6020A	356334
LCS 240-356334/3-A	Lab Control Sample	Total Recoverable	Water	6020A	356334
280-116939-1 MS	W-1	Total Recoverable	Water	6020A	356334

Metals (Continued)

Analysis Batch: 356632 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1 MSD	W-1	Total Recoverable	Water	6020A	356334

Analysis Batch: 356857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total Recoverable	Water	6010C	356334
280-116939-2	W-2	Total Recoverable	Water	6010C	356334
280-116939-3	W-3	Total Recoverable	Water	6010C	356334
280-116939-4	W-4	Total Recoverable	Water	6010C	356334
280-116939-5	W-1D	Total Recoverable	Water	6010C	356334
280-116939-6	W-3EB	Total Recoverable	Water	6010C	356334
MB 240-356334/1-A	Method Blank	Total Recoverable	Water	6010C	356334
LCS 240-356334/2-A	Lab Control Sample	Total Recoverable	Water	6010C	356334
280-116939-1 MS	W-1	Total Recoverable	Water	6010C	356334
280-116939-1 MSD	W-1	Total Recoverable	Water	6010C	356334

General Chemistry

Analysis Batch: 437741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total/NA	Water	SM 2540C	
280-116939-2	W-2	Total/NA	Water	SM 2540C	
280-116939-3	W-3	Total/NA	Water	SM 2540C	
280-116939-4	W-4	Total/NA	Water	SM 2540C	
280-116939-5	W-1D	Total/NA	Water	SM 2540C	
MB 280-437741/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-437741/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-437741/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

Analysis Batch: 437900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total/NA	Water	SM 2540D	
280-116939-2	W-2	Total/NA	Water	SM 2540D	
280-116939-3	W-3	Total/NA	Water	SM 2540D	
280-116939-4	W-4	Total/NA	Water	SM 2540D	
280-116939-5	W-1D	Total/NA	Water	SM 2540D	
280-116939-6	W-3EB	Total/NA	Water	SM 2540D	
MB 280-437900/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-437900/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-437900/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	

Analysis Batch: 438116

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-6	W-3EB	Total/NA	Water	SM 2540C	
MB 280-438116/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-438116/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 439229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total/NA	Water	9056A	
280-116939-1	W-1	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 439229 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-2	W-2	Total/NA	Water	9056A	
280-116939-2	W-2	Total/NA	Water	9056A	
280-116939-3	W-3	Total/NA	Water	9056A	
280-116939-3	W-3	Total/NA	Water	9056A	
280-116939-4	W-4	Total/NA	Water	9056A	
280-116939-4	W-4	Total/NA	Water	9056A	
280-116939-5	W-1D	Total/NA	Water	9056A	
280-116939-5	W-1D	Total/NA	Water	9056A	
280-116939-6	W-3EB	Total/NA	Water	9056A	
MB 280-439229/6	Method Blank	Total/NA	Water	9056A	
LCS 280-439229/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-439229/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-439229/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 439798

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 280-439798/6	Method Blank	Total/NA	Water	9056A	
LCS 280-439798/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-439798/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-439798/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 440159

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total/NA	Water	9040B	
280-116939-2	W-2	Total/NA	Water	9040B	
280-116939-3	W-3	Total/NA	Water	9040B	
280-116939-4	W-4	Total/NA	Water	9040B	
280-116939-5	W-1D	Total/NA	Water	9040B	
LCS 280-440159/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 440228

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-6	W-3EB	Total/NA	Water	9040B	
LCS 280-440228/4	Lab Control Sample	Total/NA	Water	9040B	

Rad

Prep Batch: 401892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total/NA	Water	PrecSep-21	
280-116939-2	W-2	Total/NA	Water	PrecSep-21	
280-116939-3	W-3	Total/NA	Water	PrecSep-21	
280-116939-4	W-4	Total/NA	Water	PrecSep-21	
280-116939-5	W-1D	Total/NA	Water	PrecSep-21	
280-116939-6	W-3EB	Total/NA	Water	PrecSep-21	
MB 160-401892/20-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-401892/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Rad (Continued)

Prep Batch: 401907

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116939-1	W-1	Total/NA	Water	PrecSep_0	
280-116939-2	W-2	Total/NA	Water	PrecSep_0	
280-116939-3	W-3	Total/NA	Water	PrecSep_0	
280-116939-4	W-4	Total/NA	Water	PrecSep_0	
280-116939-5	W-1D	Total/NA	Water	PrecSep_0	
280-116939-6	W-3EB	Total/NA	Water	PrecSep_0	
MB 160-401907/20-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-401907/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-116939-1

Client Sample ID: W-1

Lab Sample ID: 280-116939-1

Date Collected: 11/13/18 10:00
Matrix: Water
Date Received: 11/14/18 09:26

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			356857	11/23/18 17:48	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			356632	11/21/18 13:02	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	356339	11/20/18 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			356610	11/21/18 11:55	AJC	TAL CAN
Total/NA	Analysis	9040B		1			440159	12/05/18 21:24	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	439229	11/30/18 02:25	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	439229	11/30/18 02:44	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	437741	11/15/18 10:11	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	437900	11/16/18 10:14	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			749.57 mL	1.0 g	401892	11/20/18 12:49	REG	TAL SL
Total/NA	Analysis	9315		1			405210	12/12/18 07:16	KLS	TAL SL
Total/NA	Prep	PrecSep_0			749.57 mL	1.0 g	401907	11/20/18 14:23	REG	TAL SL
Total/NA	Analysis	9320		1			404801	12/10/18 08:33	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			406213	12/17/18 16:03	RTM	TAL SL

Client Sample ID: W-2

Lab Sample ID: 280-116939-2

Date Collected: 11/13/18 14:20
Matrix: Water
Date Received: 11/14/18 09:26

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			356857	11/23/18 18:18	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			356632	11/21/18 13:31	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	356339	11/20/18 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			356610	11/21/18 11:57	AJC	TAL CAN
Total/NA	Analysis	9040B		1			440159	12/05/18 21:49	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	439229	11/30/18 03:03	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	439229	11/30/18 03:21	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	437741	11/15/18 10:11	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	437900	11/16/18 10:14	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			750.14 mL	1.0 g	401892	11/20/18 12:49	REG	TAL SL
Total/NA	Analysis	9315		1			405210	12/12/18 07:16	KLS	TAL SL
Total/NA	Prep	PrecSep_0			750.14 mL	1.0 g	401907	11/20/18 14:23	REG	TAL SL
Total/NA	Analysis	9320		1			404801	12/10/18 08:33	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			406213	12/17/18 16:03	RTM	TAL SL

Client Sample ID: W-3
Lab Sample ID: 280-116939-3
Date Collected: 11/13/18 12:20
Matrix: Water
Date Received: 11/14/18 09:26

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			356857	11/23/18 18:23	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			356632	11/21/18 13:33	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	356339	11/20/18 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			356610	11/21/18 12:59	AJC	TAL CAN
Total/NA	Analysis	9040B		1			440159	12/05/18 21:44	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	439229	11/30/18 04:18	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	439229	11/30/18 04:36	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	437741	11/15/18 10:11	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	437900	11/16/18 10:14	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			750.57 mL	1.0 g	401892	11/20/18 12:49	REG	TAL SL
Total/NA	Analysis	9315		1			405210	12/12/18 07:16	KLS	TAL SL
Total/NA	Prep	PrecSep_0			750.57 mL	1.0 g	401907	11/20/18 14:23	REG	TAL SL
Total/NA	Analysis	9320		1			404801	12/10/18 08:33	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			406213	12/17/18 16:03	RTM	TAL SL

Client Sample ID: W-4
Lab Sample ID: 280-116939-4
Date Collected: 11/13/18 13:30
Matrix: Water
Date Received: 11/14/18 09:26

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			356857	11/23/18 18:28	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			356632	11/21/18 13:36	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	356339	11/20/18 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			356610	11/21/18 13:01	AJC	TAL CAN
Total/NA	Analysis	9040B		1			440159	12/05/18 21:15	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	439229	11/30/18 04:55	TLP	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	439229	11/30/18 05:14	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	437741	11/15/18 10:11	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	437900	11/16/18 10:14	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			750.11 mL	1.0 g	401892	11/20/18 12:49	REG	TAL SL
Total/NA	Analysis	9315		1			405211	12/12/18 07:19	KLS	TAL SL
Total/NA	Prep	PrecSep_0			750.11 mL	1.0 g	401907	11/20/18 14:23	REG	TAL SL
Total/NA	Analysis	9320		1			404802	12/10/18 08:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			406213	12/17/18 16:03	RTM	TAL SL

Lab Chronicle

Client: HDR Inc
TestAmerica Job ID: 280-116939-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-1D
Lab Sample ID: 280-116939-5
Date Collected: 11/13/18 10:00
Matrix: Water
Date Received: 11/14/18 09:26

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			356857	11/23/18 18:32	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			356632	11/21/18 13:38	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	356339	11/20/18 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			356610	11/21/18 13:03	AJC	TAL CAN
Total/NA	Analysis	9040B		1			440159	12/05/18 21:40	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	439229	11/30/18 05:32	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	439229	11/30/18 05:51	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	437741	11/15/18 10:11	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	437900	11/16/18 10:14	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			750.55 mL	1.0 g	401892	11/20/18 12:49	REG	TAL SL
Total/NA	Analysis	9315		1			405211	12/12/18 07:19	KLS	TAL SL
Total/NA	Prep	PrecSep_0			750.55 mL	1.0 g	401907	11/20/18 14:23	REG	TAL SL
Total/NA	Analysis	9320		1			404802	12/10/18 08:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			406213	12/17/18 16:03	RTM	TAL SL

Client Sample ID: W-3EB
Lab Sample ID: 280-116939-6
Date Collected: 11/13/18 12:35
Matrix: Water
Date Received: 11/14/18 09:26

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			356857	11/23/18 18:37	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	356334	11/20/18 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			356632	11/21/18 13:40	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	356339	11/20/18 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			356610	11/21/18 13:05	AJC	TAL CAN
Total/NA	Analysis	9040B		1			440228	12/06/18 13:38	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	439229	11/30/18 06:10	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	438116	11/19/18 09:52	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	437900	11/16/18 10:14	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			749.71 mL	1.0 g	401892	11/20/18 12:49	REG	TAL SL
Total/NA	Analysis	9315		1			405211	12/12/18 07:19	KLS	TAL SL
Total/NA	Prep	PrecSep_0			749.71 mL	1.0 g	401907	11/20/18 14:23	REG	TAL SL
Total/NA	Analysis	9320		1			404802	12/10/18 08:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			406213	12/17/18 16:03	RTM	TAL SL

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18 *
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18 *
Iowa	State Program	7	373	12-01-18 *
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tara Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No:
Client Contact: Anna Lundin	Phone: 720 933 7496	E-Mail: stephanie.rothmeyer@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc				Job #:
Address: 9781 S. Meridian Blve Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days): Standard			
State, Zip: CO, 80112				
Phone: 720-633-2380(Tel)	PO #: DEN-001			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Colorado	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6010C	pH - 9040B, Anions - 9056A_28D	Ra 226/228	TSS	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	D	N	D	N		
W-1	11-13-18	1000	G	Water		N	✓	✓	✓	✓	✓		
W-2	11-13-18	1420	G	Water		N	✓	✓	✓	✓	✓		
W-3	11-13-18	1220	G	Water		N	✓	✓	✓	✓	✓		
W-4	11-13-18	1330	G	Water		N	✓	✓	✓	✓	✓		
~~Field Duplicate~~ TK W-1D	11-13-18	1000	G	Water		N	✓	✓	✓	✓	✓		
~~Equipment Blank~~ TK W-3EB	11-13-18	1235	G	Water		N	✓	✓	✓	✓	✓		
HQ-1	11-13-18	1555	G	Water			✓	✓	✓	✓	✓		
HQ-2	11-12-18	1535	G	Water			✓	✓	✓	✓	✓		
HQ-3	11-12-18	1650	G	Water			✓	✓	✓	✓✓	✓		

280-116939 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Tara Kent	11-14-18/926	HDR	Killinda Stovall	11/14/18 926	TA Den

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.2,-0.3, 0.4 r1.0 [illegible] JAR

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-462731.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-116939-1
Address: 13715 Rider Trail North, ,	**Due Date Requested:** 12/11/2018	**Analysis Requested**		**Preservation Codes:**
City: Earth City	**TAT Requested (days):**			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
W-1 (280-116939-1)	11/13/18	10:00 Mountain		Water			X	X	X	1	
W-2 (280-116939-2)	11/13/18	14:20 Mountain		Water			X	X	X	1	
W-3 (280-116939-3)	11/13/18	12:20 Mountain		Water			X	X	X	1	
W-4 (280-116939-4)	11/13/18	13:30 Mountain		Water			X	X	X	1	
W-1D (280-116939-5)	11/13/18	10:00 Mountain		Water			X	X	X	1	
W-3EB (280-116939-6)	11/13/18	12:35 Mountain		Water			X	X	X	1	
HQ-1 (280-116939-7)	11/13/18	15:55 Mountain		Water			X	X	X	1	
HQ-2 (280-116939-8)	11/12/18	15:35 Mountain		Water			X	X	X	1	
HQ-3 (280-116939-9)	11/12/18	16:50 Mountain		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification		*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed		☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For ____ Months*
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:		Method of Shipment:
Relinquished by: [signature]	Date/Time: 11-15-2018 1919	Company: TTAPen	Received by: [signature]	Date/Time: 11/16/18 10:00	Company: TASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-462731.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-116939-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 12/11/2018			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	9315_Ra226/PrecSep_21 Radium-226 (1/3 for Ra-226/Ra-228) SUB	9320_Ra228/PrecSep_0 Radium-228 (2/3 for Ra-226/Ra-228) SUB	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
W-1 (280-116939-1)	11/13/18	10:00 Mountain		Water			X	X	X	1	
W-2 (280-116939-2)	11/13/18	14:20 Mountain		Water			X	X	X	1	
W-3 (280-116939-3)	11/13/18	12:20 Mountain		Water			X	X	X	1	
W-4 (280-116939-4)	11/13/18	13:30 Mountain		Water			X	X	X	1	
W-1D (280-116939-5)	11/13/18	10:00 Mountain		Water			X	X	X	1	
W-3EB (280-116939-6)	11/13/18	12:35 Mountain		Water			X	X	X	1	
HQ-1 (280-116939-7)	11/13/18	15:55 Mountain		Water			X	X	X	1	
HQ-2 (280-116939-8)	11/12/18	15:35 Mountain		Water			X	X	X	1	
HQ-3 (280-116939-9)	11/12/18	16:50 Mountain		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:	Method of Shipment:	
Relinquished by: [signature]	Date/Time: 11-15-2018 1919	Company: TTA Den	Received by: [signature]	Date/Time: 11/16/18 10:00	Company: TASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

0.2/1.1

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-462732.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD ELAP - A2LA		Job #: 280-116939-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 12/7/2018			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Hayden	Project #: 28014377			
Site: Xcel Energy CCR - Hayden Station	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C/3005A (MOD) Boron	6020A/3005A (MOD) 13 Total Metals (w/collision cell) (Hold)	7470A/7470A_Prep Mercury (Hold)	Total Number of containers	Special Instructions/Note: 551
			Preservation Code:								
W-1 (280-116939-1)	11/13/18	10:00 Mountain		Water			X	X	X	1	, Use Collision Cell
W-2 (280-116939-2)	11/13/18	14:20 Mountain		Water			X	X	X	1	, Use Collision Cell
W-3 (280-116939-3)	11/13/18	12:20 Mountain		Water			X	X	X	1	, Use Collision Cell
W-4 (280-116939-4)	11/13/18	13:30 Mountain		Water			X	X	X	1	, Use Collision Cell
W-1D (280-116939-5)	11/13/18	10:00 Mountain		Water			X	X	X	1	, Use Collision Cell
W-3EB (280-116939-6)	11/13/18	12:35 Mountain		Water			X	X	X	1	, Use Collision Cell
HQ-1 (280-116939-7)	11/13/18	15:55 Mountain		Water			X	X	X	1	, Use Collision Cell
HQ-2 (280-116939-8)	11/12/18	15:35 Mountain		Water			X	X	X	1	, Use Collision Cell
HQ-3 (280-116939-9)	11/12/18	16:50 Mountain		Water			X	X	X	1	, Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification Unconfirmed		*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months	
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 4	Special Instructions/QC Requirements:	
Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: Christina Baca	Date/Time: 11-15-18 1430	Company: TA Den	Received by: Pof / Date/Time: 11-16-18 1030 / Company: TAL
Relinquished by:	Date/Time:	Company:	Received by: / Date/Time: / Company:
Relinquished by:	Date/Time:	Company:	Received by: / Date/Time: / Company:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** ________________
Canton Facility

Client TA DENVER Site Name — Cooler unpacked by:

Cooler Received on 11-16-18 Opened on 11-16-18 BBP

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ________

Receipt After-hours: Drop-off Date/Time ________ Storage Location ________

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ________

Packing material used: Bubble Wrap Foam Plastic Bag None Other ________

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **+0.9** °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 1.1 °C
   IR GUN #36 (CF **+0.6**°C) Observed Cooler Temp. ______ °C Corrected Cooler Temp. ______ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# **HC850248**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ________ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ________ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ________ Date ________ by ________ via Verbal Voice Mail Other

Concerning ________________________________

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ________ were received after the recommended holding time had expired.

Sample(s) ________ were received in a broken container.

Sample(s) ________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ________ were further preserved in the laboratory.

Time preserved: ________ Preservative(s) added/Lot number(s): ________

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-116939-1

Login Number: 116939
List Number: 1
Creator: Quint, Jessica A

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-116939-1

Login Number: 116939
List Number: 3
Creator: Dupart, Lacee S

List Source: TestAmerica St. Louis
List Creation: 11/16/18 05:56 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	-0.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

TestAmerica Job ID: 280-116939-1

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-116939-1	W-1	99.1
280-116939-2	W-2	101
280-116939-3	W-3	107
280-116939-4	W-4	96.5
280-116939-5	W-1D	100
280-116939-6	W-3EB	97.3
LCS 160-401892/1-A	Lab Control Sample	95.6
MB 160-401892/20-A	Method Blank	103

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-116939-1	W-1	99.1	79.3
280-116939-2	W-2	101	84.1
280-116939-3	W-3	107	80.0
280-116939-4	W-4	96.5	82.2
280-116939-5	W-1D	100	81.9
280-116939-6	W-3EB	97.3	72.9
LCS 160-401907/1-A	Lab Control Sample	95.6	76.6
MB 160-401907/20-A	Method Blank	103	83.7

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier