2019 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, 2020

Table of Contents

List of Tables

List of Figures

List of Appendices

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

2019 Groundwater Monitoring Annual Report for Hayden Station

I hereby certify to the best of my knowledge that this groundwater monitoring 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, 2021

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. 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, four existing monitoring wells in the adjacent alluvial aquifer were added to the certified monitoring network for the landfill. These four alluvial wells are located both upgradient and downgradient of the CCR landfill, and are used to supplement the colluvial landfill monitoring wells. It is not appropriate to compare alluvial water quality to colluvial water quality; however, collecting samples from the alluvial well network will provide background groundwater that has not been impacted by the CCR unit, as well as groundwater downgradient of the CCR unit in compliance with the CCR Rule. The colluvial wells were sampled for CCR constituents of interest (COIs) background w ater quality between December 2, 2015 and July 11, 2017. The alluvial wells were sampled for background water quality between April 11, 2018 and April 15, 2019 and background threshold values (BTVs) were developed. In addition, detection monitoring samples were collected and compared against the BTVs as specified under CCR Rule Part 257.94 and assessment monitoring was initiated as specified under Part 257.95. This Annual Groundwater Monitoring Report presents the sampling and analysis completed in 2019:

- The status of the groundwater monitoring program for the landfill at the end of 2019 is assessment monitoring.

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 northwest and ultimately discharge to the Sage Creek alluvial aquifer immediately west of the landfill (**Figure 2**).

Within approximately 100 feet west of the landfill, the uppermost aquifer is within the alluvium of the Sage Creek valley. Monitoring wells W-1 through W-7 were drilled to depths of 15 to 20 feet and encountered layers of sand and gravel alternating with finer-grained layers of sand, silt and clay. Groundwater in the Sage Creek alluvial aquifer is 5 to 10 feet below surface (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 on the western waste boundary of the landfill. The three downgradient wells are spaced along the length of the landfill. Upgradient well MW-5 has been consistently dry since monitoring began in 2015 and therefore background water quality could not be established in the colluvial system of wells.

HDR has reviewed site conditions on multiple occasions to evaluate potential locations for a new upgradient colluvial monitoring well. Based upon the documented consistently 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. 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 colluvial monitoring well 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.

Therefore, in 2018 PSCo began sampling four existing monitoring wells in the adjacent alluvial aquifer for CCR constituents of interest (COIs) and the wells were added to the certified monitoring network (HDR 2019). These four wells are screened in the alluvial aquifer west of the landfill (**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 alluvial 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**). No wells were installed or abandoned in 2019.

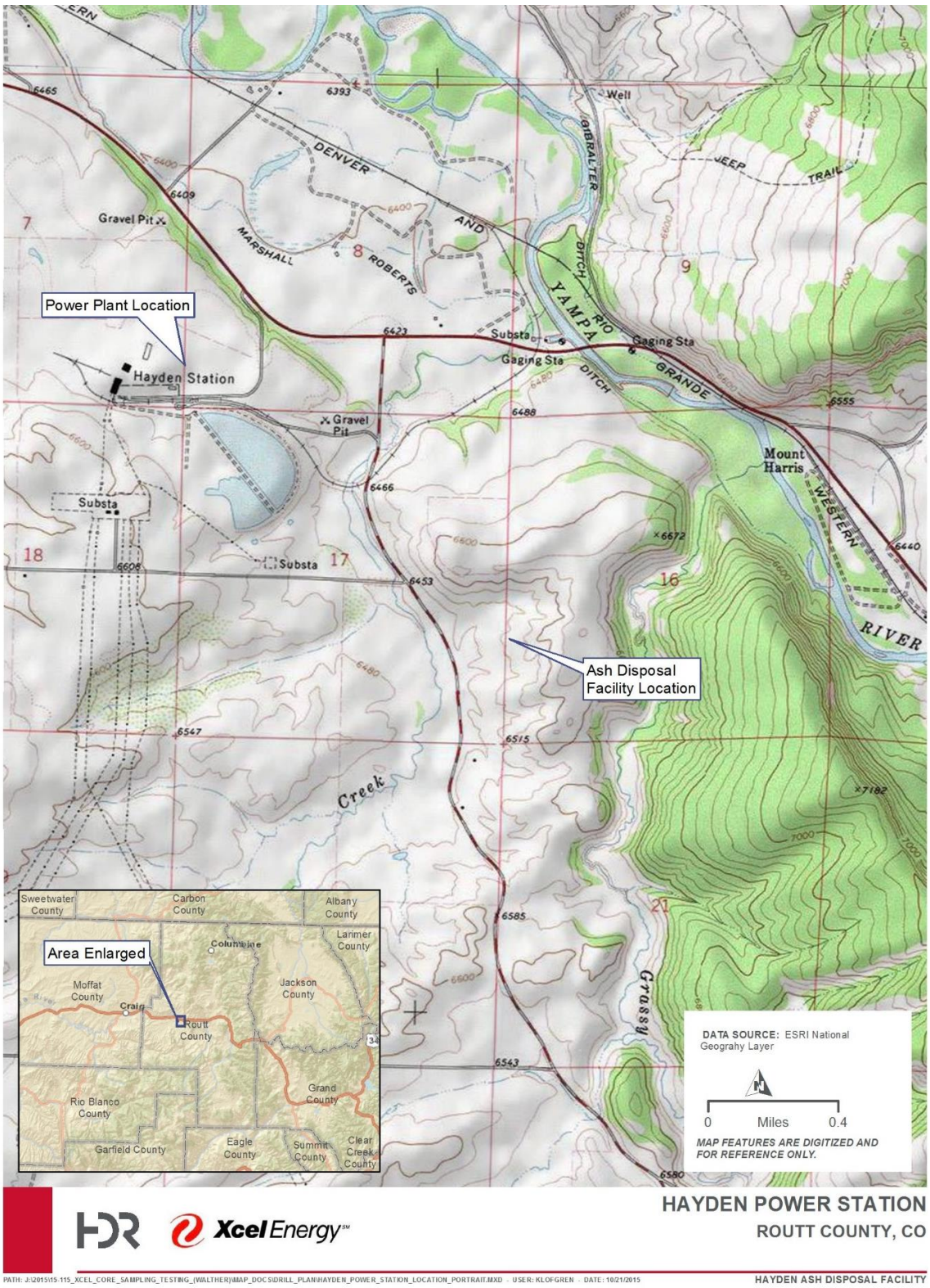


Figure 1. Vicinity map for Hayden Station.

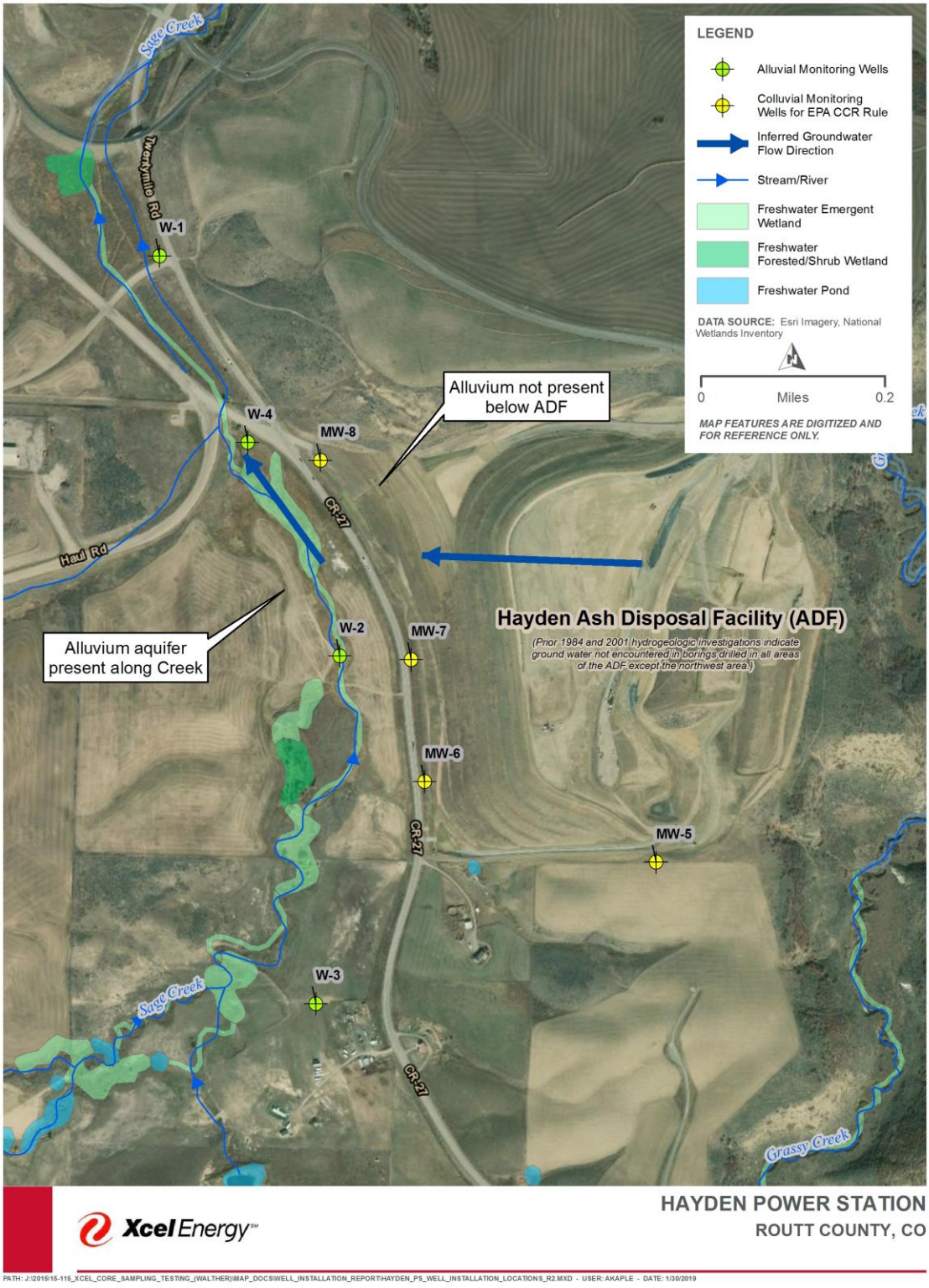


Figure 2. Hayden Station – CCR unit and monitoring well location map.

3.0 Monitoring

3.1 Frequency

In accordance with CCR Rule 257.94 PSCo continued semi-annual detection monitoring in 2019 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 2018 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**). One background sample was missing analysis for boron; therefore the April 15-16, 2019 detection monitoring event analytical data for the upgradient well, W-3, was used to supplement the background data statistical development of the background threshold values (BTVs). **Table 2** provides the well identification, number of samples collected, dates samples were collected in 2019, and whether the sample was required by the detection monitoring or assessment monitoring programs (per (257.90(e)(3))).

The first detection monitoring event was conducted April 15-16, 2019. Samples were collected from all of the certified network of wells, except that MW-5 was dry. Samples were analyzed for Appendix III COIs. The detection monitoring concentrations of Appendix III COIs from each downgradient alluvial well were compared against the BTVs and several COIs were shown to have SSIs over BTVs (UPL). These SSIs triggered the CCR assessment monitoring program for the landfill. The initial assessment monitoring event was completed September 25-26, 2019 to sample all of the certified monitoring network wells for Appendix IV constituents (**Table 1 and Table 4**), except MW-5 was dry. Results from the initial assessment monitoring sample event identified the detected Appendix IV constituents. All Appendix IV constituents were detected in at least one well except for antimony, arsenic, beryllium, chromium, lead, mercury, and thallium.

On December 19, 2019, semi-annual assessment monitoring samples were collected from all wells in the landfill well network (**Table 2**), except MW-5 was dry. Samples were analyzed for Appendix III and detected Appendix IV COIs.

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 in 2019 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 16, 2019*	Detection Monitoring
		September 26, 2019*	Initial Assessment Monitoring
		December 16, 2019*	Semi-Annual Assessment Monitoring
MW-6 (Colluvial)	Downgradient	April 16, 2019	Detection Monitoring
		September 26, 2019	Initial Assessment Monitoring
		December 16, 2019	Semi-Annual Assessment Monitoring
MW-7 (Colluvial)	Downgradient	April 16, 2019	Detection Monitoring
		September 26, 2019	Initial Assessment Monitoring
		December 16, 2019	Semi-Annual Assessment Monitoring
MW-8 (Colluvial)	Downgradient	April 16, 2019	Detection Monitoring
		September 26, 2019	Initial Assessment Monitoring
		December 16, 2019	Semi-Annual Assessment Monitoring
W-1 (Alluvial)	Downgradient	April 15, 2019	Detection Monitoring
		September 25, 2019	Initial Assessment Monitoring
		December 16, 2019	Semi-Annual Assessment Monitoring
W-2 (Alluvial)	Downgradient	April 15, 2019	Detection Monitoring
		September 25, 2019	Initial Assessment Monitoring
		December 16, 2019	Semi-Annual Assessment Monitoring
W-3 (Alluvial)	Upgradient	April 15, 2019	Background Monitoring
		September 25, 2019	Initial Assessment Monitoring
		December 16, 2019	Semi-Annual Assessment Monitoring
W-4 (Alluvial)	Downgradient	April 15, 2019	Detection Monitoring
		September 25, 2019	Initial Assessment Monitoring
		December 16, 2019	Semi-Annual Assessment 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, 2019).

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 less 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-5i has been consistently dry since monitoring began in 2015, 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-northwest.

5.2 Water Quality

As stipulated in the CCR Rule, eight rounds of background groundwater samples were completed in 2015 to 2017 in the colluvial wells (MW-6 through MW-8, MW-5 was dry), and eight rounds of background groundwater samples were collected in 2018 and 2019 in the alluvial monitoring wells west of the landfill. Background samples were analyzed for Appendix III

and IV COIs plus total suspended solids (TSS) (**Table 1**). Laboratory reports from 2019 are provided in **Appendix B**. One background sample was missing analysis for boron for W-3; therefore the April 15-16, 2019 detection monitoring event analytical data for the upgradient well, W-3, was used to supplement the background data statistical development of the background threshold values (BTVs). The BTVs for the landfill are from W-3, an alluvial upgradient well and are available for comparing data from the downgradient alluvial wells only. Data from the colluvial wells will not be compared to the alluvial wells.

The background sampling is described in detail in the *Background Water Quality Statistical Certification* (HDR 2020). The first detection monitoring event was conducted on April 15-16, 2019. In the August 20, 2019 PSCo memorandum, *Determination of Statistically Significant Increases over Background per 257.93(h)(2)*, concentrations of Appendix III COIs from each downgradient monitoring well at the landfill were compared against the BTVs and several COIs were shown to have SSIs over BTVs at two downgradient alluvial wells. These SSIs triggered the assessment monitoring program for the landfill. As stipulated in CCR Rule 257.95(b), within 90 days of the SSI determination an initial assessment monitoring event must be completed. This event was completed September 25-26, 2019 and consisted of sampling the alluvial and colluvial wells for all Appendix IV constituents. Laboratory reports for 2019 are provided in **Appendix B**. All Appendix IV constituents were detected in at least one well with the exception of antimony, arsenic, beryllium, chromium, lead, mercury, and thallium.

On December 19, 2019, the first semi-annual assessment monitoring samples were collected from all of the landfill monitoring wells, except MW-5 was dry. Samples were collected from MW-6, MW-7, MW-8, W-1, W-2, W-3, and W-4 and analyzed for Appendix III and detected Appendix IV COIs plus TSS.. The laboratory report for the December sample event had not been received for inclusion in this annual report.

In 2020, GPS values will be developed and downgradient well concentrations from the alluvial wells from the December 2019 assessment monitoring event will be compared against background values and against GPS values in accordance with CCR Rule 257.95(e-g). In 2020, Xcel will continue to monitor groundwater in accordance with the assessment monitoring program and consistent with 257.93(e).

6.0 Summary

In 2019 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 since monitoring began in 2015, 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 MW-8 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

added to the groundwater certified network for the landfill in 2018 and detection and assessment monitoring were completed 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, 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.
- The colluvium in the area of the landfill has been documented to be dry under baseline conditions and upgradient of the landfill. Therefore, no background water quality is available to develop BTVs for the colluvial system.
- All four of the alluvial and three of the colluvial CCR monitoring wells were sampled in April 2019 for Appendix III COIs for detection monitoring. Consistent with historic observations, colluvial well MW-5 located upgradient of the landfill was dry in both monitoring events in 2019.
- Statistical evaluation of upgradient water quality (from alluvial well W-3) to develop BTVs was completed in 2019.
- Detection monitoring data from the alluvial wells was statistically evaluated and SSIs over background were detected.
- All certified well network wells except MW-5 were sampled in September 2019 for the first assessment monitoring event to determine the detected Appendix IV COIs.
- All certified well network wells except MW-5 were sampled in December 2019 for the first semi-annual assessment monitoring event.
- The Hayden landfill current status is in assessment monitoring. The alluvial well assessment monitoring data from December 2019 will be statistically evaluated to determine if there are any SSLs over GPS in 2020.
- No wells were installed or abandoned in 2019.

7.0 References

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

HDR, 2019. Groundwater Monitoring System Certification - Compliance with the Coal Combustion Residuals Rule Hayden Station. February 26, 2019.

HDR, 2019. Data Management and Statistical Procedures Plan for Compliance with the Coal Combustion Residuals Rule. Updated July 19, 2019.

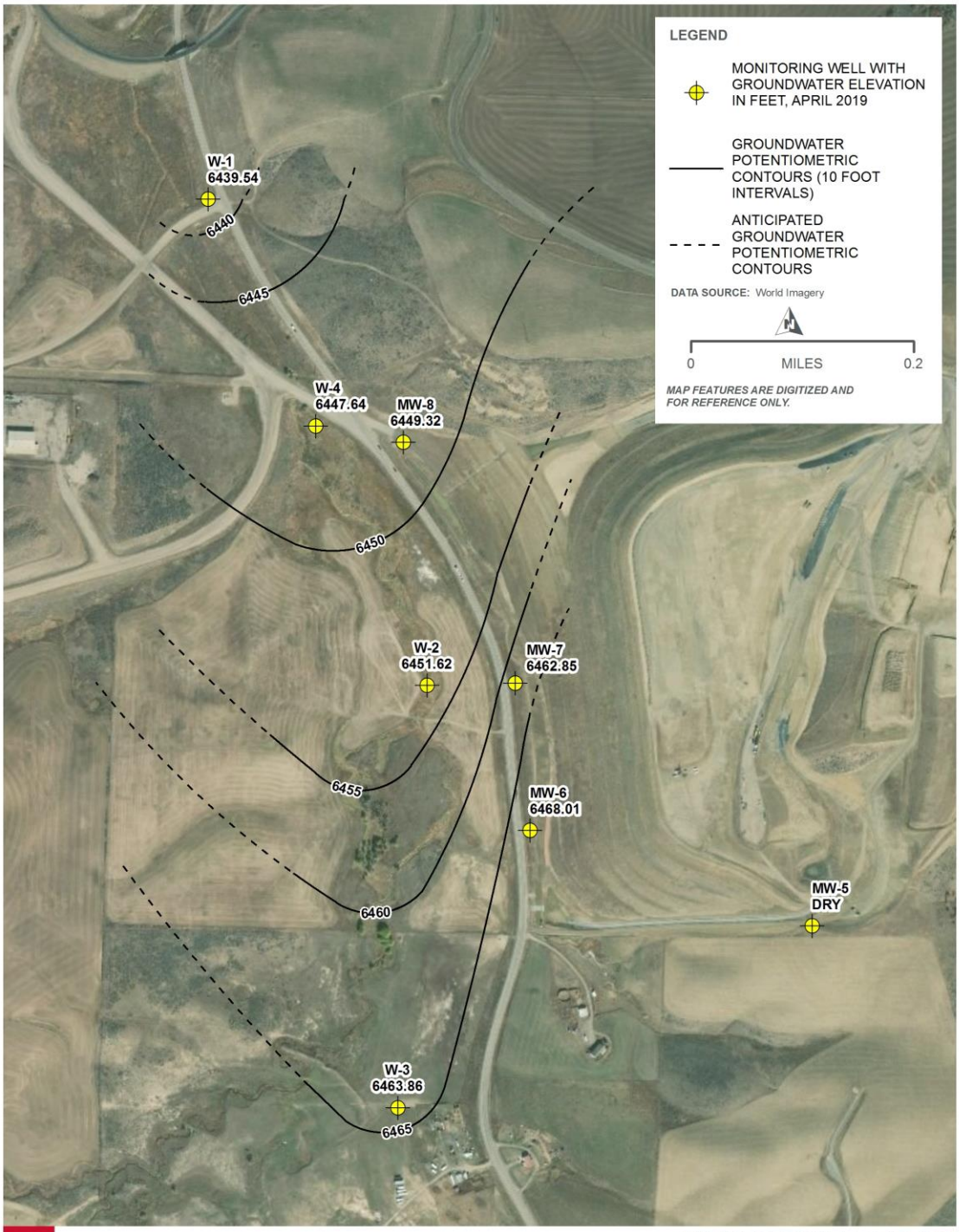
HDR, 2020. Background Water Quality Statistical Certification. January 31, 2020.

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_GWCONTOUR_2019ANNUALREPORT.MXD - USER: AKAPLE - DATE: 1/7/2020

Appendix B

Laboratory Reports

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 280-122696-1
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:
5/16/2019 11:44:19 AM
Ashley Worthy, Project Manager I
ashley.worthy@testamericainc.com

Designee for

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

Table of Contents

Definitions/Glossary

Client: HDR Inc
Job ID: 280-122696-1
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.

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)

Case Narrative

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Job ID: 280-122696-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

Job Narrative
280-122696-1

Comments
No additional comments.

Receipt
The samples were received on 4/17/2019 11:37 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.6° C and 4.6° C.

Receipt Exceptions

The requested 6010C Boron and 6020A Calcium analyses will be performed by TestAmerica's Canton laboratory.

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

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

Detection Summary

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-1 — Lab Sample ID: 280-122696-1

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
Calcium	340		1.0	0.58	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	21.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	41		6.0	2.0	mg/L	2		9056A	Total/NA
Fluoride	0.29	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	4500		250	52	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4600		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-1D — Lab Sample ID: 280-122696-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.52		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	300		1.0	0.58	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	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	42		6.0	2.0	mg/L	2		9056A	Total/NA
Fluoride	0.31	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	3600		250	52	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4400		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-2 — Lab Sample ID: 280-122696-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	8.6		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	350		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	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	110		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	0.64	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	5400		500	100	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	7100		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: W-3 — Lab Sample ID: 280-122696-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.84		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	360		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	22.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	200		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	0.65	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	8200		500	100	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	13000		100	47	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-4 — Lab Sample ID: 280-122696-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.0		0.10	0.023	mg/L	1		6010C	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	22.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	380		30	10	mg/L	10		9056A	Total/NA
Fluoride	0.61	J	5.0	0.60	mg/L	10		9056A	Total/NA
Sulfate	14000		1000	210	mg/L	200		9056A	Total/NA
Total Dissolved Solids (TDS)	21000		200	94	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-6 — Lab Sample ID: 280-122696-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	40		0.50	0.12	mg/L	5		6010C	Total Recoverable
Calcium	420		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	59		6.0	2.0	mg/L	2		9056A	Total/NA
Fluoride	0.32	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	3300		250	52	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4800		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-7 — Lab Sample ID: 280-122696-7

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	420		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	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	150		6.0	2.0	mg/L	2		9056A	Total/NA
Fluoride	0.17	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	3300		250	52	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	5000		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-8 — Lab Sample ID: 280-122696-8

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
Calcium	500		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	22.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	240		15	5.1	mg/L	5		9056A	Total/NA
Sulfate	6300		500	100	mg/L	100		9056A	Total/NA
Total Dissolved Solids (TDS)	9700		100	47	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: MW-8EB
Lab Sample ID: 280-122696-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.034	J	0.10	0.023	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	6.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.6	HF	1.0	1.0	Degrees C	1		9040B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

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

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

Sample Summary

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-122696-1	W-1	Water	04/15/19 14:00	04/18/19 11:37
280-122696-2	W-1D	Water	04/15/19 14:00	04/18/19 11:37
280-122696-3	W-2	Water	04/15/19 15:55	04/18/19 11:37
280-122696-4	W-3	Water	04/15/19 16:55	04/18/19 11:37
280-122696-5	W-4	Water	04/15/19 15:00	04/18/19 11:37
280-122696-6	MW-6	Water	04/16/19 09:45	04/18/19 11:37
280-122696-7	MW-7	Water	04/16/19 08:40	04/18/19 11:37
280-122696-8	MW-8	Water	04/16/19 11:20	04/18/19 11:37
280-122696-9	MW-8EB	Water	04/16/19 12:20	04/18/19 11:37

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

Client Sample ID: W-1
Date Collected: 04/15/19 14:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.62		0.10	0.023	mg/L		04/22/19 14:00	04/23/19 23:21	1

Client Sample ID: W-1D
Date Collected: 04/15/19 14:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.52		0.10	0.023	mg/L		04/22/19 14:00	04/23/19 23:26	1

Client Sample ID: W-2
Date Collected: 04/15/19 15:55
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	8.6		0.10	0.023	mg/L		04/22/19 14:00	04/23/19 23:31	1

Client Sample ID: W-3
Date Collected: 04/15/19 16:55
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.84		0.10	0.023	mg/L		04/22/19 14:00	04/23/19 23:35	1

Client Sample ID: W-4
Date Collected: 04/15/19 15:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.0		0.10	0.023	mg/L		04/22/19 14:00	04/23/19 23:40	1

Client Sample ID: MW-6
Date Collected: 04/16/19 09:45
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	40		0.50	0.12	mg/L		04/22/19 14:00	04/26/19 21:34	5

Client Sample ID: MW-7
Date Collected: 04/16/19 08:40
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	48		0.50	0.12	mg/L		04/22/19 14:00	04/26/19 21:38	5

Client Sample ID: MW-8
Date Collected: 04/16/19 11:20
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.1		0.10	0.023	mg/L		04/22/19 14:00	04/24/19 00:04	1

Client Sample ID: MW-8EB
Date Collected: 04/16/19 12:20
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.034	J	0.10	0.023	mg/L		04/22/19 14:00	04/24/19 00:09	1

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

Client Sample ID: W-1
Date Collected: 04/15/19 14:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	340		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:04	1

Client Sample ID: W-1D
Date Collected: 04/15/19 14:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	300		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:06	1

Client Sample ID: W-2
Date Collected: 04/15/19 15:55
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	350		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:08	1

Client Sample ID: W-3
Date Collected: 04/15/19 16:55
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	360		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:15	1

Client Sample ID: W-4
Date Collected: 04/15/19 15:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	350		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:18	1

Client Sample ID: MW-6
Date Collected: 04/16/19 09:45
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	420		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:20	1

Client Sample ID: MW-7
Date Collected: 04/16/19 08:40
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	420		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:23	1

Client Sample ID: MW-8
Date Collected: 04/16/19 11:20
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	500		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:25	1

Client Sample ID: MW-8EB
Date Collected: 04/16/19 12:20
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 22:28	1

General Chemistry

Client Sample ID: W-1
Date Collected: 04/15/19 14:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-1
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			05/01/19 18:39	1
Temperature	21.9	HF	1.0	1.0	Degrees C			05/01/19 18:39	1
Chloride	41		6.0	2.0	mg/L			05/12/19 21:10	2
Fluoride	0.29	J	1.0	0.12	mg/L			05/12/19 21:10	2
Sulfate	4500		250	52	mg/L			05/12/19 21:29	50
Total Dissolved Solids (TDS)	4600		40	19	mg/L			04/19/19 13:07	1

Client Sample ID: W-1D
Date Collected: 04/15/19 14:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-2
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			05/01/19 18:43	1
Temperature	22.0	HF	1.0	1.0	Degrees C			05/01/19 18:43	1
Chloride	42		6.0	2.0	mg/L			05/12/19 21:47	2
Fluoride	0.31	J	1.0	0.12	mg/L			05/12/19 21:47	2
Sulfate	3600		250	52	mg/L			05/12/19 22:06	50
Total Dissolved Solids (TDS)	4400		40	19	mg/L			04/19/19 13:07	1

Client Sample ID: W-2
Date Collected: 04/15/19 15:55
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-3
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			05/01/19 18:47	1
Temperature	22.0	HF	1.0	1.0	Degrees C			05/01/19 18:47	1
Chloride	110		15	5.1	mg/L			05/12/19 22:25	5
Fluoride	0.64	J	2.5	0.30	mg/L			05/12/19 22:25	5
Sulfate	5400		500	100	mg/L			05/12/19 22:43	100
Total Dissolved Solids (TDS)	7100		40	19	mg/L			04/19/19 13:07	1

Client Sample ID: W-3
Date Collected: 04/15/19 16:55
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-4
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			05/01/19 18:52	1
Temperature	22.5	HF	1.0	1.0	Degrees C			05/01/19 18:52	1
Chloride	200		15	5.1	mg/L			05/12/19 23:02	5
Fluoride	0.65	J	2.5	0.30	mg/L			05/12/19 23:02	5
Sulfate	8200		500	100	mg/L			05/12/19 23:21	100
Total Dissolved Solids (TDS)	13000		100	47	mg/L			04/19/19 13:07	1

Client Sample ID: W-4
Date Collected: 04/15/19 15:00
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-5
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			05/01/19 18:56	1
Temperature	22.5	HF	1.0	1.0	Degrees C			05/01/19 18:56	1
Chloride	380		30	10	mg/L			05/12/19 23:40	10
Fluoride	0.61	J	5.0	0.60	mg/L			05/12/19 23:40	10
Sulfate	14000		1000	210	mg/L			05/12/19 23:58	200
Total Dissolved Solids (TDS)	21000		200	94	mg/L			04/19/19 13:07	1

General Chemistry

Client Sample ID: MW-6
Date Collected: 04/16/19 09:45
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.4	HF	0.1	0.1	SU			05/01/19 18:59	1
Temperature	22.0	HF	1.0	1.0	Degrees C			05/01/19 18:59	1
Chloride	59		6.0	2.0	mg/L			05/13/19 00:54	2
Fluoride	0.32	J	1.0	0.12	mg/L			05/13/19 00:54	2
Sulfate	3300		250	52	mg/L			05/13/19 01:13	50
Total Dissolved Solids (TDS)	4800		40	19	mg/L			04/19/19 13:07	1

Client Sample ID: MW-7
Date Collected: 04/16/19 08:40
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-7
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			05/01/19 19:13	1
Temperature	22.0	HF	1.0	1.0	Degrees C			05/01/19 19:13	1
Chloride	150		6.0	2.0	mg/L			05/13/19 01:32	2
Fluoride	0.17	J	1.0	0.12	mg/L			05/13/19 01:32	2
Sulfate	3300		250	52	mg/L			05/13/19 01:51	50
Total Dissolved Solids (TDS)	5000		40	19	mg/L			04/19/19 13:07	1

Client Sample ID: MW-8
Date Collected: 04/16/19 11:20
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-8
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			05/01/19 19:17	1
Temperature	22.5	HF	1.0	1.0	Degrees C			05/01/19 19:17	1
Chloride	240		15	5.1	mg/L			05/13/19 02:09	5
Fluoride	ND		2.5	0.30	mg/L			05/13/19 02:09	5
Sulfate	6300		500	100	mg/L			05/13/19 02:28	100
Total Dissolved Solids (TDS)	9700		100	47	mg/L			04/19/19 13:07	1

Client Sample ID: MW-8EB
Date Collected: 04/16/19 12:20
Date Received: 04/18/19 11:37
Lab Sample ID: 280-122696-9
Matrix: Water

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			05/01/19 19:21	1
Temperature	22.6	HF	1.0	1.0	Degrees C			05/01/19 19:21	1
Chloride	ND		3.0	1.0	mg/L			05/13/19 02:47	1
Fluoride	ND		0.50	0.060	mg/L			05/13/19 02:47	1
Sulfate	ND		5.0	1.0	mg/L			05/13/19 02:47	1
Total Dissolved Solids (TDS)	ND		100	47	mg/L			04/19/19 13:07	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-377565/1-A
Matrix: Water
Analysis Batch: 377978
Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 377565

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		04/22/19 14:00	04/23/19 21:49	1

Lab Sample ID: LCS 240-377565/2-A
Matrix: Water
Analysis Batch: 377978
Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 377565

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.04		mg/L		104	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-377565/1-A
Matrix: Water
Analysis Batch: 378408
Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 377565

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.0	0.58	mg/L		04/22/19 14:00	04/25/19 21:22	1

Lab Sample ID: LCS 240-377565/3-A
Matrix: Water
Analysis Batch: 378408
Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 377565

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	10.0	9.53		mg/L		95	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-456726/29
Matrix: Water
Analysis Batch: 456726
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 280-457872/6
Matrix: Water
Analysis Batch: 457872
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	1.0	mg/L			05/12/19 17:57	1
Fluoride	ND		0.50	0.060	mg/L			05/12/19 17:57	1
Sulfate	ND		5.0	1.0	mg/L			05/12/19 17:57	1

Lab Sample ID: LCS 280-457872/4
Matrix: Water
Analysis Batch: 457872
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

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

Lab Sample ID: LCS 280-457872/4
Matrix: Water
Analysis Batch: 457872

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	5.00	4.79		mg/L		96	90 - 110
Sulfate	100	99.9		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-457872/5
Matrix: Water
Analysis Batch: 457872

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	101		mg/L		101	90 - 110	0	10
Fluoride	5.00	4.78		mg/L		96	90 - 110	0	10
Sulfate	100	99.5		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-457872/3
Matrix: Water
Analysis Batch: 457872

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	2.58	J	mg/L		103	50 - 150
Fluoride	0.200	0.202	J	mg/L		101	50 - 150
Sulfate	2.50	2.59	J	mg/L		103	50 - 150

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

Lab Sample ID: MB 280-455299/1
Matrix: Water
Analysis Batch: 455299

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			04/19/19 13:07	1

Lab Sample ID: LCS 280-455299/2
Matrix: Water
Analysis Batch: 455299

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	93 - 110

Lab Sample ID: LCSD 280-455299/25
Matrix: Water
Analysis Batch: 455299

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)	500	488		mg/L		98	93 - 110	1	20

Metals

Prep Batch: 377565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122696-1	W-1	Total Recoverable	Water	3005A	
280-122696-2	W-1D	Total Recoverable	Water	3005A	
280-122696-3	W-2	Total Recoverable	Water	3005A	
280-122696-4	W-3	Total Recoverable	Water	3005A	
280-122696-5	W-4	Total Recoverable	Water	3005A	
280-122696-6	MW-6	Total Recoverable	Water	3005A	
280-122696-7	MW-7	Total Recoverable	Water	3005A	
280-122696-8	MW-8	Total Recoverable	Water	3005A	
280-122696-9	MW-8EB	Total Recoverable	Water	3005A	
MB 240-377565/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-377565/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-377565/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 377978

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122696-1	W-1	Total Recoverable	Water	6010C	377565
280-122696-2	W-1D	Total Recoverable	Water	6010C	377565
280-122696-3	W-2	Total Recoverable	Water	6010C	377565
280-122696-4	W-3	Total Recoverable	Water	6010C	377565
280-122696-5	W-4	Total Recoverable	Water	6010C	377565
280-122696-8	MW-8	Total Recoverable	Water	6010C	377565
280-122696-9	MW-8EB	Total Recoverable	Water	6010C	377565
MB 240-377565/1-A	Method Blank	Total Recoverable	Water	6010C	377565
LCS 240-377565/2-A	Lab Control Sample	Total Recoverable	Water	6010C	377565

Analysis Batch: 378408

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122696-1	W-1	Total Recoverable	Water	6020A	377565
280-122696-2	W-1D	Total Recoverable	Water	6020A	377565
280-122696-3	W-2	Total Recoverable	Water	6020A	377565
280-122696-4	W-3	Total Recoverable	Water	6020A	377565
280-122696-5	W-4	Total Recoverable	Water	6020A	377565
280-122696-6	MW-6	Total Recoverable	Water	6020A	377565
280-122696-7	MW-7	Total Recoverable	Water	6020A	377565
280-122696-8	MW-8	Total Recoverable	Water	6020A	377565
280-122696-9	MW-8EB	Total Recoverable	Water	6020A	377565
MB 240-377565/1-A	Method Blank	Total Recoverable	Water	6020A	377565
LCS 240-377565/3-A	Lab Control Sample	Total Recoverable	Water	6020A	377565

Analysis Batch: 378469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122696-6	MW-6	Total Recoverable	Water	6010C	377565
280-122696-7	MW-7	Total Recoverable	Water	6010C	377565

General Chemistry

Analysis Batch: 455299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122696-1	W-1	Total/NA	Water	SM 2540C	
280-122696-2	W-1D	Total/NA	Water	SM 2540C	
280-122696-3	W-2	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 455299 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122696-4	W-3	Total/NA	Water	SM 2540C	
280-122696-5	W-4	Total/NA	Water	SM 2540C	
280-122696-6	MW-6	Total/NA	Water	SM 2540C	
280-122696-7	MW-7	Total/NA	Water	SM 2540C	
280-122696-8	MW-8	Total/NA	Water	SM 2540C	
280-122696-9	MW-8EB	Total/NA	Water	SM 2540C	
MB 280-455299/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-455299/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-455299/25	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

Analysis Batch: 456726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122696-1	W-1	Total/NA	Water	9040B	
280-122696-2	W-1D	Total/NA	Water	9040B	
280-122696-3	W-2	Total/NA	Water	9040B	
280-122696-4	W-3	Total/NA	Water	9040B	
280-122696-5	W-4	Total/NA	Water	9040B	
280-122696-6	MW-6	Total/NA	Water	9040B	
280-122696-7	MW-7	Total/NA	Water	9040B	
280-122696-8	MW-8	Total/NA	Water	9040B	
280-122696-9	MW-8EB	Total/NA	Water	9040B	
LCS 280-456726/29	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 457872

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122696-1	W-1	Total/NA	Water	9056A	
280-122696-1	W-1	Total/NA	Water	9056A	
280-122696-2	W-1D	Total/NA	Water	9056A	
280-122696-2	W-1D	Total/NA	Water	9056A	
280-122696-3	W-2	Total/NA	Water	9056A	
280-122696-3	W-2	Total/NA	Water	9056A	
280-122696-4	W-3	Total/NA	Water	9056A	
280-122696-4	W-3	Total/NA	Water	9056A	
280-122696-5	W-4	Total/NA	Water	9056A	
280-122696-5	W-4	Total/NA	Water	9056A	
280-122696-6	MW-6	Total/NA	Water	9056A	
280-122696-6	MW-6	Total/NA	Water	9056A	
280-122696-7	MW-7	Total/NA	Water	9056A	
280-122696-7	MW-7	Total/NA	Water	9056A	
280-122696-8	MW-8	Total/NA	Water	9056A	
280-122696-8	MW-8	Total/NA	Water	9056A	
280-122696-9	MW-8EB	Total/NA	Water	9056A	
MB 280-457872/6	Method Blank	Total/NA	Water	9056A	
LCS 280-457872/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-457872/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-457872/3	Lab Control Sample	Total/NA	Water	9056A	

Lab Chronicle

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-1
Lab Sample ID: 280-122696-1
Date Collected: 04/15/19 14:00
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			377978	04/23/19 23:21	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:04	DSH	TAL CAN
Total/NA	Analysis	9040B		1			456726	05/01/19 18:39	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	457872	05/12/19 21:10	JAP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	457872	05/12/19 21:29	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Client Sample ID: W-1D
Lab Sample ID: 280-122696-2
Date Collected: 04/15/19 14:00
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			377978	04/23/19 23:26	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:06	DSH	TAL CAN
Total/NA	Analysis	9040B		1			456726	05/01/19 18:43	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	457872	05/12/19 21:47	JAP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	457872	05/12/19 22:06	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Client Sample ID: W-2
Lab Sample ID: 280-122696-3
Date Collected: 04/15/19 15:55
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			377978	04/23/19 23:31	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:08	DSH	TAL CAN
Total/NA	Analysis	9040B		1			456726	05/01/19 18:47	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	457872	05/12/19 22:25	JAP	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	457872	05/12/19 22:43	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Client Sample ID: W-3
Lab Sample ID: 280-122696-4
Date Collected: 04/15/19 16:55
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			377978	04/23/19 23:35	WKD	TAL CAN

Client Sample ID: W-3
Lab Sample ID: 280-122696-4
Date Collected: 04/15/19 16:55
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:15	DSH	TAL CAN
Total/NA	Analysis	9040B		1			456726	05/01/19 18:52	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	457872	05/12/19 23:02	JAP	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	457872	05/12/19 23:21	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Client Sample ID: W-4
Lab Sample ID: 280-122696-5
Date Collected: 04/15/19 15:00
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			377978	04/23/19 23:40	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:18	DSH	TAL CAN
Total/NA	Analysis	9040B		1			456726	05/01/19 18:56	SGB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	457872	05/12/19 23:40	JAP	TAL DEN
Total/NA	Analysis	9056A		200	5 mL	5 mL	457872	05/12/19 23:58	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	5 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Client Sample ID: MW-6
Lab Sample ID: 280-122696-6
Date Collected: 04/16/19 09:45
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		5			378469	04/26/19 21:34	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:20	DSH	TAL CAN
Total/NA	Analysis	9040B		1			456726	05/01/19 18:59	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	457872	05/13/19 00:54	JAP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	457872	05/13/19 01:13	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Client Sample ID: MW-7
Lab Sample ID: 280-122696-7
Date Collected: 04/16/19 08:40
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		5			378469	04/26/19 21:38	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:23	DSH	TAL CAN

Lab Chronicle

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: MW-7
Lab Sample ID: 280-122696-7
Date Collected: 04/16/19 08:40
Matrix: Water
Date Received: 04/18/19 11:37

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			456726	05/01/19 19:13	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	457872	05/13/19 01:32	JAP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	457872	05/13/19 01:51	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Client Sample ID: MW-8
Lab Sample ID: 280-122696-8
Date Collected: 04/16/19 11:20
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			377978	04/24/19 00:04	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:25	DSH	TAL CAN
Total/NA	Analysis	9040B		1			456726	05/01/19 19:17	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	457872	05/13/19 02:09	JAP	TAL DEN
Total/NA	Analysis	9056A		100	5 mL	5 mL	457872	05/13/19 02:28	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Client Sample ID: MW-8EB
Lab Sample ID: 280-122696-9
Date Collected: 04/16/19 12:20
Matrix: Water
Date Received: 04/18/19 11:37

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	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			377978	04/24/19 00:09	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	377565	04/22/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			378408	04/25/19 22:28	DSH	TAL CAN
Total/NA	Analysis	9040B		1			456726	05/01/19 19:21	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	457872	05/13/19 02:47	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	455299	04/19/19 13:07	SGB	TAL DEN

Laboratory References:

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

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

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-122696-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: Eurofins 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		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: Eurofins 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	02-23-20
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	04-30-20
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
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	03-31-20
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-20
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	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

* 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

Denver #280

280-122696 Chain of Custody

Client Information			
Client Contact: Anna Lundin	Sampler: Tara Kent	Lab PM: Bandy, Darlene	Carrier Tracking No(s):
Company: HDR Inc	Phone: 720 933 7496	E-Mail: darlene.bandy@testamericainc.com	Page 1 of 1
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:		Job #:
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:	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_Calcd - Total Dissolved Solids (TDS)	6010C/6020A/7470A - Dissolved Metals (Field Filter) (struck, TK)	9040B - pH, 9056A_28D - Sulfate, Chloride, Flouride	2540D - Total Suspended Solids (struck, TK)	9315_Ra226 - Standard Target List (struck, TK)	9320_Ra228 - Standard Target List (struck, TK)	Ra226Ra228 Combined List (struck, TK)	420.4 - Phenols; SM5310B - TOC (struck, TK)	300_48HR - Nitrate/Nitrite (struck, TK)	total metals	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	N	D	D	D	S	N	D		
W-1	4-15-19	1400	G	W	N	N	X		X							X	3	Appendix III
W-1D	4-15-19	1400	G	W	N	N	X		X							X	3	
W-2	4-15-19	1555	G	W	N	N	X		X							X	3	
W-3	4-15-19	1655	G	W	N	N	X		X							X	3	
W-4	4-15-19	1500	G	W	N	N	X		X							X	3	
MW-6	4-16-19	0945	G	W	N	N	X		X							X	3	
MW-7	4-16-19	0840	G	W	N	N	X		X							X	3	
MW-8	4-16-19	1120	G	W	N	N	X		X							X	3	
MW-8 EB	4-16-19	1220	G	W	N	N	X		X							X	3	

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:

Possible Hazard Identification
[X] 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 [X] 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: 17 APR 2019 1137	Company: HDR	Received by: [signature]	Date/Time: 4-17-19 1137	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, 4.6, t..., IR9, xfer by RDP 4-18-19		

Ver: 08/04/2016

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

0.6 | C6.4
11.6 | C11.4

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-479899.1
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 #: 280-122696-1
Address: 4101 Shuffel Street NW, ,	Due Date Requested: 5/10/2019			
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:

5.3

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 Calcium	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
W-1 (280-122696-1)	4/15/19	14:00 Mountain		Water			X	X	1	, Use Collision Cell
W-1D (280-122696-2)	4/15/19	14:00 Mountain		Water			X	X	1	, Use Collision Cell
W-2 (280-122696-3)	4/15/19	15:55 Mountain		Water			X	X	1	, Use Collision Cell
W-3 (280-122696-4)	4/15/19	16:55 Mountain		Water			X	X	1	, Use Collision Cell
W-4 (280-122696-5)	4/15/19	15:00 Mountain		Water			X	X	1	, Use Collision Cell
MW-6 (280-122696-6)	4/16/19	09:45 Mountain		Water			X	X	1	, Use Collision Cell
MW-7 (280-122696-7)	4/16/19	08:40 Mountain		Water			X	X	1	, Use Collision Cell
MW-8 (280-122696-8)	4/16/19	11:20 Mountain		Water			X	X	1	, Use Collision Cell
MW-8EB (280-122696-9)	4/16/19	12:20 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
	4-19-2019 1934	TAL		4-20-19 935	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: 01/16/2019

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

Client Euro Fins - TA-Denver Site Name _____ Cooler unpacked by: Ryan Crible

Cooler Received on 4-20-19 Opened on 4-20-19 935

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 **-0.2** °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #36 (CF **+0.7**°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3 Total	(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# **HC984738**
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): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : ____________

TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	**IR Gun # (Circle)**	**Observed Temp °C**	**Corrected Temp °C**	**Coolant (Circle)**
(TA) Client Box Other	(IR-8) #36	0.6	0.4	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-8) #36	11.6	11.4	~~(Wet Ice)~~ Blue Ice Dry Ice Water (None) RDC 4-20-19
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
				☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-122696-1

Login Number: 122696
List Number: 1
Creator: Pottruff, Reed W

List Source: Eurofins 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	

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 280-128947-1
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:
10/28/2019 6:16:01 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

Table of Contents

Definitions/Glossary

Client: HDR Inc
Job ID: 280-128947-1
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.

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.

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: 280-128947-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Hayden

Report Number: 280-128947-1

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 9/27/2019 8:07 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.3º C and 4.2º C.

TOTAL RECOVERABLE METALS (ICPMS)
Samples MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8) and W-4 (280-128947-9) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 10/02/2019 and analyzed on 10/03/2019.

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

TOTAL MERCURY
Samples MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8) and W-4 (280-128947-9) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 10/02/2019 and analyzed on 10/03/2019.

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

ANIONS (28 DAYS)
Samples MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8) and W-4 (280-128947-9) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 10/21/2019.

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

RADIUM-226 (GFPC)
Samples MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8) and W-4 (280-128947-9) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 10/02/2019 and analyzed on 10/24/2019.

The following samples had light yellow discoloration:W-3 (280-128947-8) and W-4 (280-128947-9).

Job ID: 280-128947-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8), W-4 (280-128947-9), (LCS 160-444914/1-A), (LCSD 160-444914/2-A) and (MB 160-444914/19-A)

Insufficient sample volume was available to perform a sample duplicate for the following samples: MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8) and W-4 (280-128947-9). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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

RADIUM-228

Samples MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8) and W-4 (280-128947-9) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 10/02/2019 and analyzed on 10/21/2019.

The following samples had light yellow discoloration:W-3 (280-128947-8) and W-4 (280-128947-9).

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8), W-4 (280-128947-9), (LCS 160-444914/1-A), (LCSD 160-444914/2-A) and (MB 160-444914/19-A)

Insufficient sample volume was available to perform a sample duplicate for the following samples: MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8) and W-4 (280-128947-9). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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

RADIUM-226/RADIUM-228 (GFPC)

Samples MW 6 (280-128947-1), MW 7 (280-128947-2), MW 8 (280-128947-3), W-1D (280-128947-4), W-3EB (280-128947-5), W-1 (280-128947-6), W-2 (280-128947-7), W-3 (280-128947-8) and W-4 (280-128947-9) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 10/28/2019.

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

Detection Summary

Client: HDR Inc
Job ID: 280-128947-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: MW 6 — Lab Sample ID: 280-128947-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0054		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00028	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Molybdenum	1.1		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.012		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.095		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	0.46	J	0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: MW 7 — Lab Sample ID: 280-128947-2

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
Molybdenum	0.84		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0079		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.25		0.0080	0.0017	mg/L	1		6020A	Total Recoverable

Client Sample ID: MW 8 — Lab Sample ID: 280-128947-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0060		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.00037	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0027	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.020		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.71		0.0080	0.0017	mg/L	1		6020A	Total Recoverable

Client Sample ID: W-1D — Lab Sample ID: 280-128947-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0092		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.00077	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	0.012		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.27		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	0.32	J	0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: W-3EB — Lab Sample ID: 280-128947-5

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Denver

Detection Summary

Client: HDR Inc
Job ID: 280-128947-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Client Sample ID: W-1 — Lab Sample ID: 280-128947-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.011		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.00078	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	0.013		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.27		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	0.32	J	0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: W-2 — Lab Sample ID: 280-128947-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0062		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.0028		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	0.0026	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.58		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	0.48	J	0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: W-3 — Lab Sample ID: 280-128947-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0071		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00028	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Cobalt	0.0019		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	0.012		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	1.1		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	0.40	J	0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: W-4 — Lab Sample ID: 280-128947-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0086		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00024	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Cobalt	0.0079		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0030	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lithium	0.71		0.0080	0.0017	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Job ID: 280-128947-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9056A	Anions, Ion Chromatography	SW846	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

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

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

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

Sample Summary

Client: HDR Inc
Job ID: 280-128947-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-128947-1	MW 6	Water	09/26/19 09:30	09/27/19 08:07	
280-128947-2	MW 7	Water	09/26/19 08:35	09/27/19 08:07	
280-128947-3	MW 8	Water	09/26/19 10:35	09/27/19 08:07	
280-128947-4	W-1D	Water	09/25/19 13:20	09/27/19 08:07	
280-128947-5	W-3EB	Water	09/25/19 16:20	09/27/19 08:07	
280-128947-6	W-1	Water	09/25/19 13:20	09/27/19 08:07	
280-128947-7	W-2	Water	09/25/19 15:10	09/27/19 08:07	
280-128947-8	W-3	Water	09/25/19 16:05	09/27/19 08:07	
280-128947-9	W-4	Water	09/25/19 14:20	09/27/19 08:07	

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

Client Sample ID: MW 6
Date Collected: 09/26/19 09:30
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:25	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:25	1
Barium	**0.0054**		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:25	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:25	1
Cadmium	**0.00028**	**J**	0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:25	1
Cobalt	ND		0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:25	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:25	1
Molybdenum	**1.1**		0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:25	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:25	1
Selenium	**0.012**		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:25	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:25	1
Lithium	**0.095**		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:25	1

Client Sample ID: MW 7
Date Collected: 09/26/19 08:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:28	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:28	1
Barium	**0.0053**		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:28	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:28	1
Cadmium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:28	1
Cobalt	ND		0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:28	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:28	1
Molybdenum	**0.84**		0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:28	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:28	1
Selenium	**0.0079**		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:28	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:28	1
Lithium	**0.25**		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:28	1

Client Sample ID: MW 8
Date Collected: 09/26/19 10:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:30	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:30	1
Barium	**0.0060**		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:30	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:30	1
Cadmium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:30	1
Cobalt	**0.00037**	**J**	0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:30	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:30	1
Molybdenum	**0.0027**	**J**	0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:30	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:30	1
Selenium	**0.020**		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:30	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:30	1
Lithium	**0.71**		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:30	1

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

Client Sample ID: W-1D
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:32	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:32	1
Barium	**0.0092**		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:32	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:32	1
Cadmium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:32	1
Cobalt	**0.00077**	**J**	0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:32	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:32	1
Molybdenum	**0.0034**	**J**	0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:32	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:32	1
Selenium	**0.012**		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:32	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:32	1
Lithium	**0.27**		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:32	1

Client Sample ID: W-3EB
Date Collected: 09/25/19 16:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:35	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:35	1
Barium	ND		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:35	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:35	1
Cadmium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:35	1
Cobalt	ND		0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:35	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:35	1
Molybdenum	ND		0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:35	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:35	1
Selenium	ND		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:35	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:35	1
Lithium	ND		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:35	1

Client Sample ID: W-1
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:37	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:37	1
Barium	**0.011**		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:37	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:37	1
Cadmium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:37	1
Cobalt	**0.00078**	**J**	0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:37	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:37	1
Molybdenum	**0.0033**	**J**	0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:37	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:37	1
Selenium	**0.013**		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:37	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:37	1
Lithium	**0.27**		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:37	1

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

Client Sample ID: W-2
Date Collected: 09/25/19 15:10
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:40	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:40	1
Barium	**0.0062**		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:40	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:40	1
Cadmium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:40	1
Cobalt	**0.0028**		0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:40	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:40	1
Molybdenum	**0.0033**	**J**	0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:40	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:40	1
Selenium	**0.0026**	**J**	0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:40	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:40	1
Lithium	**0.58**		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:40	1

Client Sample ID: W-3
Date Collected: 09/25/19 16:05
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:42	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:42	1
Barium	**0.0071**		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:42	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:42	1
Cadmium	**0.00028**	**J**	0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:42	1
Cobalt	**0.0019**		0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:42	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:42	1
Molybdenum	**0.0034**	**J**	0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:42	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:42	1
Selenium	**0.012**		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:42	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:42	1
Lithium	**1.1**		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:42	1

Client Sample ID: W-4
Date Collected: 09/25/19 14:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 15:49	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 15:49	1
Barium	**0.0086**		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 15:49	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 15:49	1
Cadmium	**0.00024**	**J**	0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:49	1
Cobalt	**0.0079**		0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 15:49	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 15:49	1
Molybdenum	**0.0030**	**J**	0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 15:49	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 15:49	1
Selenium	ND		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 15:49	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 15:49	1
Lithium	**0.71**		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 15:49	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW 6
Date Collected: 09/26/19 09:30
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:06	1

Client Sample ID: MW 7
Date Collected: 09/26/19 08:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:08	1

Client Sample ID: MW 8
Date Collected: 09/26/19 10:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:14	1

Client Sample ID: W-1D
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:17	1

Client Sample ID: W-3EB
Date Collected: 09/25/19 16:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:19	1

Client Sample ID: W-1
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:21	1

Client Sample ID: W-2
Date Collected: 09/25/19 15:10
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:23	1

Client Sample ID: W-3
Date Collected: 09/25/19 16:05
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:25	1

Client Sample ID: W-4
Date Collected: 09/25/19 14:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 15:27	1

General Chemistry

Client Sample ID: MW 6
Date Collected: 09/26/19 09:30
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.46**	**J**	0.50	0.17	mg/L			10/21/19 20:37	1

Client Sample ID: MW 7
Date Collected: 09/26/19 08:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.17	mg/L			10/21/19 20:53	1

Client Sample ID: MW 8
Date Collected: 09/26/19 10:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.17	mg/L			10/21/19 21:10	1

Client Sample ID: W-1D
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.32**	**J**	0.50	0.17	mg/L			10/21/19 21:26	1

Client Sample ID: W-3EB
Date Collected: 09/25/19 16:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.17	mg/L			10/21/19 21:43	1

Client Sample ID: W-1
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.32**	**J**	0.50	0.17	mg/L			10/21/19 21:59	1

Client Sample ID: W-2
Date Collected: 09/25/19 15:10
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.48**	**J**	0.50	0.17	mg/L			10/21/19 22:48	1

Client Sample ID: W-3
Date Collected: 09/25/19 16:05
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.40**	**J**	0.50	0.17	mg/L			10/21/19 23:05	1

Client Sample ID: W-4
Date Collected: 09/25/19 14:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.17	mg/L			10/21/19 23:21	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW 6
Date Collected: 09/26/19 09:30
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.186	U	0.137	0.138	1.00	0.200	pCi/L	10/02/19 18:18	10/24/19 05:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.9*		*40 - 110*	*10/02/19 18:18*	*10/24/19 05:36*	*1*

Client Sample ID: MW 7
Date Collected: 09/26/19 08:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.162	U	0.126	0.127	1.00	0.188	pCi/L	10/02/19 18:18	10/24/19 05:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*10/02/19 18:18*	*10/24/19 05:37*	*1*

Client Sample ID: MW 8
Date Collected: 09/26/19 10:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.166	U	0.131	0.132	1.00	0.194	pCi/L	10/02/19 18:18	10/24/19 05:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.4*		*40 - 110*	*10/02/19 18:18*	*10/24/19 05:37*	*1*

Client Sample ID: W-1D
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.189	U	0.132	0.133	1.00	0.190	pCi/L	10/02/19 18:18	10/24/19 12:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*40 - 110*	*10/02/19 18:18*	*10/24/19 12:57*	*1*

Client Sample ID: W-3EB
Date Collected: 09/25/19 16:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.131	U	0.140	0.141	1.00	0.226	pCi/L	10/02/19 18:18	10/24/19 12:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.1*		*40 - 110*	*10/02/19 18:18*	*10/24/19 12:57*	*1*

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: W-1
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.248		0.140	0.142	1.00	0.187	pCi/L	10/02/19 18:18	10/24/19 12:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.8*		*40 - 110*	*10/02/19 18:18*	*10/24/19 12:57*	*1*

Client Sample ID: W-2
Date Collected: 09/25/19 15:10
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.195	U	0.137	0.138	1.00	0.201	pCi/L	10/02/19 18:18	10/24/19 12:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.4*		*40 - 110*	*10/02/19 18:18*	*10/24/19 12:57*	*1*

Client Sample ID: W-3
Date Collected: 09/25/19 16:05
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.207	U	0.150	0.151	1.00	0.221	pCi/L	10/02/19 18:18	10/24/19 12:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.0*		*40 - 110*	*10/02/19 18:18*	*10/24/19 12:57*	*1*

Client Sample ID: W-4
Date Collected: 09/25/19 14:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.304		0.156	0.158	1.00	0.204	pCi/L	10/02/19 18:18	10/24/19 12:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.1*		*40 - 110*	*10/02/19 18:18*	*10/24/19 12:57*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW 6
Date Collected: 09/26/19 09:30
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.443		0.278	0.281	1.00	0.429	pCi/L	10/02/19 19:06	10/21/19 09:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.9*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:38*	*1*

Method: 9320 - Radium-228 (GFPC) (Continued)

Client Sample ID: MW 6
Date Collected: 09/26/19 09:30
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-1
Matrix: Water

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Y Carrier	82.6		40 - 110	10/02/19 19:06	10/21/19 09:38	1

Client Sample ID: MW 7
Date Collected: 09/26/19 08:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.213	U	0.231	0.231	1.00	0.378	pCi/L	10/02/19 19:06	10/21/19 09:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110	10/02/19 19:06	10/21/19 09:38	1
Y Carrier	81.9		40 - 110	10/02/19 19:06	10/21/19 09:38	1

Client Sample ID: MW 8
Date Collected: 09/26/19 10:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.594		0.290	0.295	1.00	0.423	pCi/L	10/02/19 19:06	10/21/19 09:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	86.4		40 - 110	10/02/19 19:06	10/21/19 09:38	1
Y Carrier	83.0		40 - 110	10/02/19 19:06	10/21/19 09:38	1

Client Sample ID: W-1D
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.478		0.269	0.273	1.00	0.403	pCi/L	10/02/19 19:06	10/21/19 09:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	88.1		40 - 110	10/02/19 19:06	10/21/19 09:38	1
Y Carrier	84.1		40 - 110	10/02/19 19:06	10/21/19 09:38	1

Client Sample ID: W-3EB
Date Collected: 09/25/19 16:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.158	U	0.280	0.281	1.00	0.475	pCi/L	10/02/19 19:06	10/21/19 09:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	83.1		40 - 110	10/02/19 19:06	10/21/19 09:38	1
Y Carrier	84.1		40 - 110	10/02/19 19:06	10/21/19 09:38	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: W-1
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.408	U	0.291	0.293	1.00	0.455	pCi/L	10/02/19 19:06	10/21/19 09:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.8*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:38*	*1*
Y Carrier	*79.6*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:38*	*1*

Client Sample ID: W-2
Date Collected: 09/25/19 15:10
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.615**		0.285	0.290	1.00	0.415	pCi/L	10/02/19 19:06	10/21/19 09:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.4*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:39*	*1*
Y Carrier	*84.1*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:39*	*1*

Client Sample ID: W-3
Date Collected: 09/25/19 16:05
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.708**		0.287	0.294	1.00	0.400	pCi/L	10/02/19 19:06	10/21/19 09:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.0*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:39*	*1*
Y Carrier	*82.6*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:39*	*1*

Client Sample ID: W-4
Date Collected: 09/25/19 14:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.667**		0.293	0.299	1.00	0.420	pCi/L	10/02/19 19:06	10/21/19 09:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.1*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:39*	*1*
Y Carrier	*83.0*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:39*	*1*

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

Client Sample ID: MW 6
Date Collected: 09/26/19 09:30
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.629		0.310	0.313	5.00	0.429	pCi/L		10/28/19 10:04	1

Client Sample ID: MW 7
Date Collected: 09/26/19 08:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.375	U	0.263	0.264	5.00	0.378	pCi/L		10/28/19 10:04	1

Client Sample ID: MW 8
Date Collected: 09/26/19 10:35
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.760		0.318	0.323	5.00	0.423	pCi/L		10/28/19 10:04	1

Client Sample ID: W-1D
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.666		0.300	0.304	5.00	0.403	pCi/L		10/28/19 10:04	1

Client Sample ID: W-3EB
Date Collected: 09/25/19 16:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.289	U	0.313	0.314	5.00	0.475	pCi/L		10/28/19 10:04	1

Client Sample ID: W-1
Date Collected: 09/25/19 13:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.656		0.323	0.326	5.00	0.455	pCi/L		10/28/19 10:04	1

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

Client Sample ID: W-2
Date Collected: 09/25/19 15:10
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.810		0.316	0.321	5.00	0.415	pCi/L		10/28/19 10:04	1

Client Sample ID: W-3
Date Collected: 09/25/19 16:05
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.915		0.324	0.331	5.00	0.400	pCi/L		10/28/19 10:04	1

Client Sample ID: W-4
Date Collected: 09/25/19 14:20
Date Received: 09/27/19 08:07
Lab Sample ID: 280-128947-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.971		0.332	0.338	5.00	0.420	pCi/L		10/28/19 10:04	1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-403639/1-A
Matrix: Water
Analysis Batch: 404069

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 403639

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/02/19 14:00	10/03/19 14:37	1
Arsenic	ND		0.0050	0.00075	mg/L		10/02/19 14:00	10/03/19 14:37	1
Barium	ND		0.0050	0.0022	mg/L		10/02/19 14:00	10/03/19 14:37	1
Beryllium	ND		0.0010	0.00031	mg/L		10/02/19 14:00	10/03/19 14:37	1
Cadmium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 14:37	1
Cobalt	ND		0.0010	0.00019	mg/L		10/02/19 14:00	10/03/19 14:37	1
Chromium	ND		0.0020	0.00098	mg/L		10/02/19 14:00	10/03/19 14:37	1
Molybdenum	ND		0.010	0.0011	mg/L		10/02/19 14:00	10/03/19 14:37	1
Lead	ND		0.0010	0.00045	mg/L		10/02/19 14:00	10/03/19 14:37	1
Selenium	ND		0.0050	0.00089	mg/L		10/02/19 14:00	10/03/19 14:37	1
Thallium	ND		0.0010	0.00020	mg/L		10/02/19 14:00	10/03/19 14:37	1
Lithium	ND		0.0080	0.0017	mg/L		10/02/19 14:00	10/03/19 14:37	1

Lab Sample ID: LCS 240-403639/3-A
Matrix: Water
Analysis Batch: 404069

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 403639

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.101		mg/L		101	80 - 120
Arsenic	1.00	0.967		mg/L		97	80 - 120
Barium	1.00	0.991		mg/L		99	80 - 120
Beryllium	0.500	0.505		mg/L		101	80 - 120
Cadmium	0.500	0.478		mg/L		96	80 - 120
Cobalt	0.500	0.487		mg/L		97	80 - 120
Chromium	0.500	0.506		mg/L		101	80 - 120
Molybdenum	0.500	0.486		mg/L		97	80 - 120
Lead	0.500	0.486		mg/L		97	80 - 120
Selenium	1.00	0.924		mg/L		92	80 - 120
Thallium	1.00	0.945		mg/L		94	80 - 120
Lithium	0.500	0.488		mg/L		98	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-403653/1-A
Matrix: Water
Analysis Batch: 403957

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 403653

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/02/19 14:00	10/03/19 14:31	1

Lab Sample ID: LCS 240-403653/2-A
Matrix: Water
Analysis Batch: 403957

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 403653

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.78		ug/L		96	80 - 120

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-474760/6
Matrix: Water
Analysis Batch: 474760

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.17	mg/L			10/21/19 12:38	1

Lab Sample ID: LCS 280-474760/4
Matrix: Water
Analysis Batch: 474760

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			5.00	5.01		mg/L		100	90 - 110		

Lab Sample ID: LCSD 280-474760/5
Matrix: Water
Analysis Batch: 474760

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
Fluoride			5.00	5.16		mg/L		103	90 - 110	3	10

Lab Sample ID: MRL 280-474760/3
Matrix: Water
Analysis Batch: 474760

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

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			0.500	0.535		mg/L		107	50 - 150		

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-444912/19-A
Matrix: Water
Analysis Batch: 447519

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444912

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1221	U	0.135	0.136	1.00	0.220	pCi/L	10/02/19 18:18	10/24/19 12:58	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*40 - 110*	*10/02/19 18:18*	*10/24/19 12:58*	*1*

Lab Sample ID: LCS 160-444912/1-A
Matrix: Water
Analysis Batch: 447519

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444912

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.4	10.85		1.25	1.00	0.266	pCi/L	96	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*74.3*		*40 - 110*

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

Lab Sample ID: LCSD 160-444912/2-A
Matrix: Water
Analysis Batch: 447519

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 444912

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			11.4	10.87		1.25	1.00	0.233	pCi/L	96	75 - 125	0.01	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*80.5*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-444914/19-A
Matrix: Water
Analysis Batch: 447095

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444914

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.04348	U	0.316	0.316	1.00	0.550	pCi/L	10/02/19 19:06	10/21/19 09:42	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:42*	*1*
Y Carrier	*81.9*		*40 - 110*	*10/02/19 19:06*	*10/21/19 09:42*	*1*

Lab Sample ID: LCS 160-444914/1-A
Matrix: Water
Analysis Batch: 447097

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444914

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.47	11.57		1.36	1.00	0.546	pCi/L	122	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*74.3*		*40 - 110*
Y Carrier	*83.4*		*40 - 110*

Lab Sample ID: LCSD 160-444914/2-A
Matrix: Water
Analysis Batch: 447097

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 444914

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			9.47	10.30		1.23	1.00	0.506	pCi/L	109	75 - 125	0.49	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*80.5*		*40 - 110*
Y Carrier	*81.1*		*40 - 110*

Metals

Prep Batch: 403639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-128947-1	MW 6	Total Recoverable	Water	3005A	
280-128947-2	MW 7	Total Recoverable	Water	3005A	
280-128947-3	MW 8	Total Recoverable	Water	3005A	
280-128947-4	W-1D	Total Recoverable	Water	3005A	
280-128947-5	W-3EB	Total Recoverable	Water	3005A	
280-128947-6	W-1	Total Recoverable	Water	3005A	
280-128947-7	W-2	Total Recoverable	Water	3005A	
280-128947-8	W-3	Total Recoverable	Water	3005A	
280-128947-9	W-4	Total Recoverable	Water	3005A	
MB 240-403639/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-403639/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 403653

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-128947-1	MW 6	Total/NA	Water	7470A	
280-128947-2	MW 7	Total/NA	Water	7470A	
280-128947-3	MW 8	Total/NA	Water	7470A	
280-128947-4	W-1D	Total/NA	Water	7470A	
280-128947-5	W-3EB	Total/NA	Water	7470A	
280-128947-6	W-1	Total/NA	Water	7470A	
280-128947-7	W-2	Total/NA	Water	7470A	
280-128947-8	W-3	Total/NA	Water	7470A	
280-128947-9	W-4	Total/NA	Water	7470A	
MB 240-403653/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-403653/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 403957

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-128947-1	MW 6	Total/NA	Water	7470A	403653
280-128947-2	MW 7	Total/NA	Water	7470A	403653
280-128947-3	MW 8	Total/NA	Water	7470A	403653
280-128947-4	W-1D	Total/NA	Water	7470A	403653
280-128947-5	W-3EB	Total/NA	Water	7470A	403653
280-128947-6	W-1	Total/NA	Water	7470A	403653
280-128947-7	W-2	Total/NA	Water	7470A	403653
280-128947-8	W-3	Total/NA	Water	7470A	403653
280-128947-9	W-4	Total/NA	Water	7470A	403653
MB 240-403653/1-A	Method Blank	Total/NA	Water	7470A	403653
LCS 240-403653/2-A	Lab Control Sample	Total/NA	Water	7470A	403653

Analysis Batch: 404069

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-128947-1	MW 6	Total Recoverable	Water	6020A	403639
280-128947-2	MW 7	Total Recoverable	Water	6020A	403639
280-128947-3	MW 8	Total Recoverable	Water	6020A	403639
280-128947-4	W-1D	Total Recoverable	Water	6020A	403639
280-128947-5	W-3EB	Total Recoverable	Water	6020A	403639
280-128947-6	W-1	Total Recoverable	Water	6020A	403639
280-128947-7	W-2	Total Recoverable	Water	6020A	403639
280-128947-8	W-3	Total Recoverable	Water	6020A	403639
280-128947-9	W-4	Total Recoverable	Water	6020A	403639

Metals (Continued)

Analysis Batch: 404069 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-403639/1-A	Method Blank	Total Recoverable	Water	6020A	403639
LCS 240-403639/3-A	Lab Control Sample	Total Recoverable	Water	6020A	403639

General Chemistry

Analysis Batch: 474760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-128947-1	MW 6	Total/NA	Water	9056A	
280-128947-2	MW 7	Total/NA	Water	9056A	
280-128947-3	MW 8	Total/NA	Water	9056A	
280-128947-4	W-1D	Total/NA	Water	9056A	
280-128947-5	W-3EB	Total/NA	Water	9056A	
280-128947-6	W-1	Total/NA	Water	9056A	
280-128947-7	W-2	Total/NA	Water	9056A	
280-128947-8	W-3	Total/NA	Water	9056A	
280-128947-9	W-4	Total/NA	Water	9056A	
MB 280-474760/6	Method Blank	Total/NA	Water	9056A	
LCS 280-474760/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-474760/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-474760/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 444912

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-128947-1	MW 6	Total/NA	Water	PrecSep-21	
280-128947-2	MW 7	Total/NA	Water	PrecSep-21	
280-128947-3	MW 8	Total/NA	Water	PrecSep-21	
280-128947-4	W-1D	Total/NA	Water	PrecSep-21	
280-128947-5	W-3EB	Total/NA	Water	PrecSep-21	
280-128947-6	W-1	Total/NA	Water	PrecSep-21	
280-128947-7	W-2	Total/NA	Water	PrecSep-21	
280-128947-8	W-3	Total/NA	Water	PrecSep-21	
280-128947-9	W-4	Total/NA	Water	PrecSep-21	
MB 160-444912/19-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-444912/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-444912/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 444914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-128947-1	MW 6	Total/NA	Water	PrecSep_0	
280-128947-2	MW 7	Total/NA	Water	PrecSep_0	
280-128947-3	MW 8	Total/NA	Water	PrecSep_0	
280-128947-4	W-1D	Total/NA	Water	PrecSep_0	
280-128947-5	W-3EB	Total/NA	Water	PrecSep_0	
280-128947-6	W-1	Total/NA	Water	PrecSep_0	
280-128947-7	W-2	Total/NA	Water	PrecSep_0	
280-128947-8	W-3	Total/NA	Water	PrecSep_0	
280-128947-9	W-4	Total/NA	Water	PrecSep_0	
MB 160-444914/19-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-444914/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-444914/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Client Sample ID: MW 6
Lab Sample ID: 280-128947-1
Date Collected: 09/26/19 09:30
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:25	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:06	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 20:37	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.63 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447519	10/24/19 05:36	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.63 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:38	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Client Sample ID: MW 7
Lab Sample ID: 280-128947-2
Date Collected: 09/26/19 08:35
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:28	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:08	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 20:53	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.56 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447518	10/24/19 05:37	JCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.56 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:38	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Client Sample ID: MW 8
Lab Sample ID: 280-128947-3
Date Collected: 09/26/19 10:35
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:30	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:14	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 21:10	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.44 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447518	10/24/19 05:37	JCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.44 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:38	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Client Sample ID: W-1D
Lab Sample ID: 280-128947-4
Date Collected: 09/25/19 13:20
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:32	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:17	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 21:26	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.72 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447519	10/24/19 12:57	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.72 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:38	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Client Sample ID: W-3EB
Lab Sample ID: 280-128947-5
Date Collected: 09/25/19 16:20
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:35	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:19	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 21:43	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.00 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447519	10/24/19 12:57	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.00 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:38	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Client Sample ID: W-1
Lab Sample ID: 280-128947-6
Date Collected: 09/25/19 13:20
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:37	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:21	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 21:59	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.16 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447519	10/24/19 12:57	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.16 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:38	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Client Sample ID: W-2
Lab Sample ID: 280-128947-7
Date Collected: 09/25/19 15:10
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:40	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:23	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 22:48	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.75 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447519	10/24/19 12:57	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.75 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:39	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Client Sample ID: W-3
Lab Sample ID: 280-128947-8
Date Collected: 09/25/19 16:05
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:42	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:25	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 23:05	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.09 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447519	10/24/19 12:57	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.09 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:39	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Client Sample ID: W-4
Lab Sample ID: 280-128947-9
Date Collected: 09/25/19 14:20
Matrix: Water
Date Received: 09/27/19 08:07

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	403639	10/02/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			404069	10/03/19 15:49	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	403653	10/02/19 14:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			403957	10/03/19 15:27	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	474760	10/21/19 23:21	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.35 mL	1.0 g	444912	10/02/19 18:18	ORM	TAL SL
Total/NA	Analysis	9315		1			447519	10/24/19 12:57	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.35 mL	1.0 g	444914	10/02/19 19:06	ORM	TAL SL
Total/NA	Analysis	9320		1			447097	10/21/19 09:39	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			448003	10/28/19 10:04	SMP	TAL SL

Lab Chronicle

Client: HDR Inc
Job ID: 280-128947-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory References:

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

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

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

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-128947-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	Identification Number	Expiration Date
A2LA	DoD	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
9056A		Water	Fluoride

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-16-00404	12-28-19
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-20
West Virginia DEP	State	210	12-31-19

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-128947-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-19
Iowa	State	373	09-17-20
Iowa	State Program	373	12-01-20
Kansas	NELAP	E-10236	10-31-19 *
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
Washington	State Program	C592	08-30-20
West Virginia DEP	State	381	10-31-19
West Virginia DEP	State Program	381	10-31-19 *

* 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:
Client Contact: ~~Anna Lundin~~ Molly Reeves	Phone: 7209337496	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
M - Hexane
None
AsNaO2
Na2O4S
Na2SO3
Na2S2SO3
H2SO4
TSP Dodecahydrate
Acetone
MCAA
ph 4-5
L - EDA
Z - other (specify)
Other:

280-128947 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) TK Fluoride 9056A	Metals - 6010B TK Total metals 6020A / Mercury 7470A	pH - 9040B, Anions - 9056A_28D TK Ra226 9315	2540D - TSS TK Ra228 9320	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	D	N	N		
~~MW 5~~ TK				Water		N						
MW 6	9/26/19	930	G	Water	N	N	X	X	X	X		APIV
MW 7	9/26/19	835	G	Water	N	N	X	X	X	X		
MW 8	9/26/19	1035	G	Water	N	N	X	X	X	X		
~~Field Duplicate~~ TK W-1D	9/25/19	1320	G	Water	N	N	X	X	X	X		
~~Equipment Blank~~ TK W-3EB	9/25/19	1620	G	Water	N	N	X	X	X	X		
W-1	9/25/19	1320	G	Water	N	N	X	X	X	X		
W-2	9/25/19	1510	G	Water	N	N	X	X	X	X		
W-3	9/25/19	1605	G	Water	N	N	X	X	X	X		
W-4	9/25/19	1420	G	Water	N	N	X	X	X	X		

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: 27Sept2019 807	Company: HDR	Received by: [signature]	Date/Time: 9-27-2019 807	Company: HAYDEN
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: 2.3, 4.2 IR00 IR#8 ST 9-27-19

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

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-500265.1
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 #: 280-128947-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 10/23/2019			
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)	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:								
MW 6 (280-128947-1)	9/26/19	09:30 Mountain		Water			X	X	X	2	
MW 7 (280-128947-2)	9/26/19	08:35 Mountain		Water			X	X	X	2	
MW 8 (280-128947-3)	9/26/19	10:35 Mountain		Water			X	X	X	2	
W-1D (280-128947-4)	9/25/19	13:20 Mountain		Water			X	X	X	2	
W-3EB (280-128947-5)	9/25/19	16:20 Mountain		Water			X	X	X	2	
W-1 (280-128947-6)	9/25/19	13:20 Mountain		Water			X	X	X	2	
W-2 (280-128947-7)	9/25/19	15:10 Mountain		Water			X	X	X	2	
W-3 (280-128947-8)	9/25/19	16:05 Mountain		Water			X	X	X	2	
W-4 (280-128947-9)	9/25/19	14:20 Mountain		Water			X	X	X	2	

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
	9/30/19 1510			10-1-19 08:55	TLA 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: 01/16/2019

21.2/21.9

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

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-500266.1
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 #: 280-128947-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 10/21/2019			
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)	7470A/7470A_Prep Mercury	6020A/3005A (MOD) 12 Total Metals (w/collision cell)	Total Number of containers	Special Instructions/Note:
			Preservation Code:							509
MW 6 (280-128947-1)	9/26/19	09:30 Mountain		Water			X	X	1	, Use Collision Cell
MW 7 (280-128947-2)	9/26/19	08:35 Mountain		Water			X	X	1	, Use Collision Cell
MW 8 (280-128947-3)	9/26/19	10:35 Mountain		Water			X	X	1	, Use Collision Cell
W-1D (280-128947-4)	9/25/19	13:20 Mountain		Water			X	X	1	, Use Collision Cell
W-3EB (280-128947-5)	9/25/19	16:20 Mountain		Water			X	X	1	, Use Collision Cell
W-1 (280-128947-6)	9/25/19	13:20 Mountain		Water			X	X	1	, Use Collision Cell
W-2 (280-128947-7)	9/25/19	15:10 Mountain		Water			X	X	1	, Use Collision Cell
W-3 (280-128947-8)	9/25/19	16:05 Mountain		Water			X	X	1	, Use Collision Cell
W-4 (280-128947-9)	9/25/19	14:20 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	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
1	[signature]	9/30/19 1600	MAEN	Adam Garrett	10-1-19 1554	ETA
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	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: 01/16/2019

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client TA Denver Site Name _____ Cooler unpacked by: Adam Garrett

Cooler Received on 10-1-19 Opened on 10-1-19

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

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-10 (CF +0.7 °C) Observed Cooler Temp. 21.9 °C Corrected Cooler Temp. 21.9 °C
   IR GUN #IR-11 (CF +0.9°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 AJG 10-1-19
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# **HC991818**
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): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-128947-1

Login Number: 128947
List Number: 1
Creator: Petunin, Peter

List Source: Eurofins 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.	False	Not present - client drop off
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").	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: 280-128947-1

Login Number: 128947
List Number: 2
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 10/01/19 02:18 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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	22.0
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").	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
Job ID: 280-128947-1
Project/Site: Xcel Energy GW CCR Monitoring - Hayden

Method: 9315 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba Carrier (40-110)
280-128947-1	MW 6	94.9
280-128947-2	MW 7	102
280-128947-3	MW 8	86.4
280-128947-4	W-1D	88.1
280-128947-5	W-3EB	83.1
280-128947-6	W-1	89.8
280-128947-7	W-2	92.4
280-128947-8	W-3	89.0
280-128947-9	W-4	90.1
LCS 160-444912/1-A	Lab Control Sample	74.3
LCSD 160-444912/2-A	Lab Control Sample Dup	80.5
MB 160-444912/19-A	Method Blank	88.1

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba Carrier (40-110)	Y Carrier (40-110)
280-128947-1	MW 6	94.9	82.6
280-128947-2	MW 7	102	81.9
280-128947-3	MW 8	86.4	83.0
280-128947-4	W-1D	88.1	84.1
280-128947-5	W-3EB	83.1	84.1
280-128947-6	W-1	89.8	79.6
280-128947-7	W-2	92.4	84.1
280-128947-8	W-3	89.0	82.6
280-128947-9	W-4	90.1	83.0
LCS 160-444914/1-A	Lab Control Sample	74.3	83.4
LCSD 160-444914/2-A	Lab Control Sample Dup	80.5	81.1
MB 160-444914/19-A	Method Blank	88.1	81.9

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier