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Platte River Power Authority Ash Monofill **Annual Groundwater Monitoring and** Corrective Action Report for 2020



Platte River Power Authority Ash Monofill Annual Groundwater Monitoring and Corrective Action Report for 2020

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Acronyms and Abbreviations

± plus or minus

ACM Assessment of Corrective Measure
AECOM Technical Services, Inc.

bgs below ground surface

CCR Coal Combustion Residuals
CFR Code of Federal Regulations

EROP Engineering Report and Operational Plan

ft/day foot per day ft/ft feet per foot

GWPS groundwater protection standard

LCL lower confidence limit mg/L milligrams per liter

PRPA Platte River Power Authority

Site Rawhide Energy Station (Rawhide Station)

SSI statistically significant increase
SSL statistically significant level

TDS total dissolved solids
UPL upper prediction limit

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1.0 Introduction

This is the 2020 Annual Groundwater Monitoring and Corrective Action Report for the Coal Combustion Residuals (CCR) Ash Monofill at the Platte River Power Authority (PRPA) Rawhide Energy Station (Rawhide Station or Site) in Larimer County, Colorado. This report was developed by AECOM Technical Services, Inc. (AECOM) at the request of PRPA. The purpose of this report is to provide a summary of the groundwater monitoring activities performed at the Ash Monofill in 2020 to comply with the requirements of Title 40 of the Code of Federal Regulations (CFR) Part 257 Subpart D, known as the CCR Rule, which became effective on October 19, 2015. The rule provides standards for the disposal of CCR in landfills and surface impoundments (CCR units) and establishes groundwater monitoring requirements in 40 CFR 257.90 through 257.94. In accordance with 40 CFR 257.90(e), an annual report must document the status of the groundwater monitoring and correction action program (as applicable) for the CCR unit, summarize the key actions completed the previous year, describe any problems encountered, discuss actions taken to resolve the problems, and project key activities for the upcoming year. The annual report will be considered complete when it is placed in the facility operating record by January 31, 2021.

1.1 Report Organization

This Annual Report is divided into eight sections as outlined below and includes text, tables, figures, and appendices. The sections include:

- Section 1.0 includes this introduction and report organization;
- Section 2.0 provides a facility description that includes the facility location and operational history, a description of the CCR unit and a summary of the areal and site hydrogeology;
- Section 3.0 summarizes the groundwater monitoring and corrective action activities performed in 2020, and references appendices to this report that contain detailed documentation of those activities;
- Section 4.0 summarizes the groundwater sampling and analysis results;
- Section 5.0 provides the statistical analyses and results;
- Section 6.0 provides a projection of the key activities anticipated in 2021;
- Section 7.0 provides a summary of findings; and
- Section 8.0 provides a list of references cited in the report.

The report also includes three appendices that provide supporting documentation of the groundwater monitoring and related activities conducted in 2020 that include:

- Appendix A Groundwater Sampling Forms
- Appendix B Laboratory Analytical Reports and Data Validation Reports
- Appendix C Statistical Analysis Results

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2.0 Facility Description

2.1 Facility Location and Operational History

The Rawhide Station encompasses approximately 4,560 acres north of Wellington in Larimer County, Colorado. In addition to the plant buildings, the major feature of the facility is an approximately 500-acre dry-land construction reservoir of reclaimed wastewater from the City of Fort Collins, also known as Hamilton Reservoir, which contains approximately 15,000 acre-feet of water and is used for cooling processes. The power block area contains the boiler and turbine buildings, the air quality control equipment, and the administrative offices. A rail spur along the northern edge of the Site connects the Rawhide Facility with the mainline of the Burlington Northern Santa Fe Railway Company Railway Company and is used to deliver coal and construction materials for plant operations. Six generating units are located at the Rawhide Station. Units A, B, C, D, and F are fueled by natural gas, and Unit 1 is fueled by coal from the Powder River Basin in Wyoming.

2.2 Ash Monofill Description

The Ash Monofill is located northwest of the main plant and north of Hamilton Reservoir. CCR solid waste from Unit 1 operations is disposed in the Ash Monofill which is comprised of two cells, Cell 1 and Cell 2, as shown on **Figure 1**. Cell 1 was operated from approximately 1980 to 2007 and is no longer in use. It is capped with cover soils but has not undergone final closure. Cell 2 is active, lies to the west of Cell 1, and is progressively advancing northwards as further ash material is placed within the cell.

2.3 Rawhide Station Hydrogeology

The hydrogeology of the Rawhide Station is discussed in the Engineering Report and Operational Plan (EROP) for the Solid Waste Disposal Facility (PRPA 1980), and in the Final Report Investigation of the Groundwater Monitoring Program for the Bottom Ash Disposal Site conducted by Lidstone and Anderson (1989). According to the 1980 EROP, hydrogeology of the Rawhide Station was originally investigated by drilling and installing 23 piezometers in conjunction with the original geotechnical investigation of the site prior to construction of the facility. Data from the piezometers indicated that a groundwater table exists within the weathered and fractured Pierre Shale bedrock beneath the Site, and in alluvial deposits along Coal Creek. The report indicated that the depth to groundwater varied across the Site from 11 to 67 feet below ground surface (bgs), with groundwater generally flowing to the south-southeast. The shallow water table, as explained in the 1980 EROP, was reported to be directly recharged by infiltration from precipitation and surface runoff.

Following construction and operation of the Rawhide Station, Lidstone and Anderson (1989) concluded that sufficient groundwater data were collected to determine that a mound had formed in the shallow, weathered, and fractured Pierre Shale in the vicinity of Hamilton Reservoir. After a review of available groundwater level information for Rawhide Station, AECOM concluded that the CCR units present at the Site are located hydraulically upgradient of any groundwater mound created by Hamilton Reservoir.

2.4 Ash Monofill Hydrogeology

The Ash Monofill is constructed within a narrow south-sloping valley with bedrock highs along both sides. The uppermost water-bearing stratum at the Ash Monofill was identified during groundwater monitoring well installation as the weathered and fractured Pierre Shale. Groundwater at the Ash Monofill is under water table conditions and, in 2020, lied at depths from approximately 16 to 33 feet bgs at wells located within the footprint of cell 2 in piezometers PZ-2 through PZ-6. Groundwater flow is generally from northwest to south-southeast, from the Ash Monofill towards Hamilton Reservoir, generally following the topographic slope of the valley.

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3.0 Groundwater Monitoring Activities in 2020

This section summarizes groundwater monitoring activities conducted during 2020 to comply with the CCR Rule. Groundwater monitoring activities included:

- Measured groundwater levels at each monitoring well prior to purging and sampling to provide potentiometric data;
- Groundwater sampling and analysis of detection (Appendix III) and assessment (Appendix IV)
 monitoring constituents to identify potential releases from the Ash Monofill and to collect
 supplemental data to update the background statistics in the future; and
- Statistical analysis of the 2020 Appendix III detection and Appendix IV assessment monitoring data to determine if there were any statistically significant increases (SSIs) over background and whether any of the SSIs were above groundwater protection standards (GWPS) at a statistically significant level (SSL).

3.1 Water Level Measurements

During each monitoring event, groundwater levels were measured using an electronic water level meter. AECOM also measured the total depth of each monitoring well by lowering the meter sensor to the bottom of the well. Groundwater levels and total depth measurements were recorded to the nearest hundredth (0.01) of a foot. The water level meter cable and sensor were decontaminated at the start of field activities and after use at each well to limit the potential for cross-contamination between wells. Water level measurements were recorded on groundwater sampling forms, provided in **Appendix A**, and are tabulated in **Table 2** for the January, February, May, July, and October 2020 monitoring events.

3.2 Groundwater Sample Collection

Two rounds of semi-annual Appendix III detection monitoring and Appendix IV assessment monitoring groundwater samples were collected at the Ash Monofill wells (ASH-01, ASH-02, ASH-03, ASH-04, ASH-05, ASH-06, ASH-07, and ASH-08) on April 10 to 20, 2020 and October 5 to 20, 2020. In addition, baseline detection and assessment monitoring was also conducted at wells ASH-02, ASH-06, ASH-07, and ASH-08 on January 15, 2020 and July 16-24, 2020. Four rounds (January, May, July, and October) of baseline data were collected at wells ASH-02, ASH-06, ASH-07, and ASH-08.

Groundwater samples were collected in general accordance with the CCR Ash Monofill Groundwater Detection Monitoring Plan (AECOM 2017). Each well was initially purged using a submersible bladder pump and dedicated polyethylene bonded tubing. Disposable bladder liners were replaced before sampling each monitoring well and the pump casing was decontaminated prior to purging and sampling each monitoring well to avoid cross contamination between wells. The bladder pump tubing was lowered into the well to a depth within the screen interval that was at least 1 to 2 feet off the bottom of the well to avoid disturbing accumulated sediment in the lower part of the well screen. Monitoring wells were purged using low flow sampling techniques until field parameter measurements of pH, temperature, dissolved oxygen, oxidation reduction potential, turbidity, and conductivity stabilized within plus or minus (±)10 percent and water level drawdown was observed to be less than 0.33 feet between measurement readings. Purge water volumes were recorded on groundwater sampling forms (**Appendix A**).

Groundwater samples were collected after purging each monitoring well. The samples were collected from the discharge tube of the bladder pump directly into laboratory-supplied sample containers. Sample water was slowly pumped into each laboratory sample container until the containers were appropriately filled, taking care not to spill the laboratory preservative contained in sample bottles. The sample containers were then labeled and placed on ice in a sample cooler. At the conclusion of the field day, the samples

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were shipped by overnight carrier to Pace Analytical in Lenexa, Kansas and Greensburg, Pennsylvania, for analysis.

3.3 Analytical Program

Groundwater samples collected from the Ash Monofill wells were analyzed using U.S. Environmental Protection Agency SW-846 methods for Appendix III and Appendix IV constituents. All analytical results are reported as totals (unfiltered). **Table 3** (January), **Table 4** (April), **Table 5** (July), and **Table 6** (October) summarize the groundwater analytical results for each sampling event. The laboratory analytical reports are provided in **Appendix B**.

Appendix III constituents included: boron (Method 6010C), chloride (Method 9056A), calcium (Method 6010C), fluoride (Method 9056A), pH (field), sulfate (Method 9056A), and total dissolved solids (TDS) (American Public Health Association et al. [1998] Standard Method 2540C). The analytical method used for each constituent is shown in parenthesis following the analyte name.

Appendix IV constituents included: antimony (Method 6020A), arsenic (Method 6020A), barium (Method 6020A), beryllium (Method 6020A), cadmium (Method 6020A), chromium (Method 6020A), cobalt (Method 6020A), fluoride (Method 9056A), lead (Method 6020A), lithium (Method 6010C), mercury (Method 7470A), molybdenum (Method 6020A), radium 226/228 combined (Method 9315), selenium (Method 6020A), and thallium (Method 6020A).

3.4 Quality Control/Quality Assurance

Quality assurance and quality control samples collected during sampling activities included one field duplicate for each round of detection and assessment monitoring, one equipment rinse blank, and one matrix spike/matrix spike duplicate sample. The field duplicate samples were collected immediately following collection of the primary samples using the same sampling procedures. The equipment rinse blank samples were collected after decontaminating the bladder pump casing using techniques outlined in the sampling and analysis plan.

3.5 Data Validation

The laboratory data were validated by AECOM chemists using U.S. Environmental Protection Agency guidance. Data validation reports are provided in **Appendix B**.

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4.0 Monitoring Results and Evaluation

This section discusses potentiometric surface elevations, groundwater flow directions, and analytical sampling results for the samples collected during the two assessment monitoring events conducted in April and October 2020 and the two-baseline detection and assessment monitoring events conducted in January and July 2020 at the Ash Monofill.

4.1 Groundwater Potentiometric Surface

As required by 40 CFR 257.93(c), the static depth to groundwater was measured at each well during each sampling round prior to purging. The depth to groundwater measurements (**Table 2**) were used with the top of casing elevations (**Table 1**) to calculate the groundwater elevations and prepare potentiometric surface maps for May, July, and October sampling events (**Figure 2**, **Figure 3**, and **Figure 4**). These maps were used to determine that groundwater in the uppermost aquifer beneath the Ash Monofill flows from northwest to southeast at an average hydraulic gradient of 0.0149 feet per foot (ft/ft) between monitoring wells ASH-01 and ASH-08 in 2020. This is very similar to the gradient calculated in 2019 of 0.14 ft/ft and is consistent with the average gradients previously reported in past annual reports (AECOM 2018 and 2019).

4.2 Groundwater Flow

An average flow rate was calculated for groundwater in the uppermost aquifer beneath the Ash Monofill using the historic average hydraulic gradient (0.016 ft/ft) determined between monitoring wells ASH-01 and ASH-06, the minimum and maximum hydraulic conductivities determined from aquifer slug tests, and an assumed effective porosity of 15 percent. The results indicate that groundwater in the uppermost aquifer beneath the Ash Monofill flows at a rate ranging from approximately 0.051 to 0.131 foot per day (ft/day), with a geometric mean of 0.073 ft/day.

4.3 Groundwater Analytical Results

Groundwater samples were collected and analyzed for Appendix III and IV parameters specified in Section 3.3 in January, April, July, and October 2020. The samples were analyzed by Pace Analytical in Lenexa, Kansas. The laboratory analytical reports are provided in **Appendix B** and included in the facility operating record. The laboratory results were reviewed for completeness against the project-required analytical methods and the chain-of-custody forms and subsequently validated by AECOM. The data were found to be valid and useable with qualification as outlined in the data verification reports found in **Appendix B**. **Table 3** (January), **Table 4** (April), **Table 5** (July), and **Table 6** (October) summarize the groundwater analytical results for each sampling round. Monitoring wells ASH-01, ASH-02, ASH-03, ASH-04, ASH-05, ASH-06, ASH-07, and ASH-08 were sampled during the April and October events to comply with assessment monitoring requirements. Monitoring wells ASH-02, ASH-06, ASH-07, and ASH-08 also were sampled during the January and July 2020 events to collect quarterly baseline detection monitoring data.

4.4 Groundwater Monitoring System Evaluation

All monitoring wells comprising the Ash Monofill groundwater monitoring system were inspected during each sampling round and were found to be in good condition and capable of supplying a representative sample. However, several of the wells within the ash groundwater monitoring network have had increased turbidity due to the fine-grained composition of the Pierre Shale and may require further well development into the future.

Analysis of potentiometric surface maps constructed using the depth to groundwater measurements obtained during each sampling round (**Figure 2**, **Figure 3**, **Figure 4**, and **Figure 5**) indicate that groundwater beneath the Ash Monofill generally flows from northwest to southeast at average gradient in 2020 of 0.0149 ft/ft and a historic mean groundwater flow rate of approximately 0.073 ft/day. This flow

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direction is consistent with the groundwater flow directions observed between 2016 and 2020. These data confirm that monitoring wells ASH-01 and ASH-06 are located upgradient of the Ash Monofill and represent background groundwater quality and that monitoring wells ASH-02, ASH-03, ASH-04, ASH-05, ASH-07, and ASH-08 are located downgradient of the Ash Monofill and represent downgradient groundwater quality.

4.5 Problems Encountered and Actions Taken

There were no problems encountered or actions taken during 2020.

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5.0 Statistical Analysis Results

The Ash Monofill groundwater quality data were evaluated using the certified statistical approach presented in the CCR Ash Monofill Groundwater Detection Monitoring Plan (AECOM 2017). Groundwater quality data were evaluated using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at background monitoring wells. For the PRPA Ash Landfill, monitoring wells ASH-01 and ASH-06 are designated as the background wells because they are located upgradient of the northern landfill boundary, whereas monitoring wells ASH-02, ASH-03, ASH-04, ASH-05, ASH-07, and ASH-08 are designated as compliance wells because they are located downgradient of the southern monofill boundary.

The statistical analyses were performed in accordance with 40 CFR Parts 257.93(f), 257.93(g), and 257.93(h) and the Statistical Method Certification (AECOM 2017). Prediction limits (i.e., parametric or nonparametric) with 1 of 2 retesting were developed for each constituent based on the frequency of nondetect values and whether the background data for that constituent exhibited a normal, lognormal, or nonparametric distribution. For the statistical analysis, non-detect values were represented as one-half the detection limit. No outliers were identified in the data. Analytical data from the background monitoring wells collected between March 2016 and October 2019 were used to develop an upper prediction limit (UPL) for the background data at 95 percent confidence. Data from the downgradient monitoring wells for the same time period were compared to the UPL to identify SSIs over background. ProUCL Version 5.1 was used to store the data and run the statistical analyses. The results of the statistical analyses, including the Appendix III and IV UPLs, are provided in **Table 7** and **Table 8**, respectively. The statistical analysis output is provided in **Appendix C**.

5.1 Appendix III SSI Determination

The Appendix III detection monitoring results were compared against their respective background UPLs to determine if they exhibited SSIs above background. This comparison indicates that some of the boron, calcium, chloride, sulfate, and TDS concentrations at monitoring wells ASH-01, ASH-02, ASH-03, ASH-04, ASH-05, ASH-07, and ASH-08 have confirmed SSIs above the background UPLs as shown in the table below. Fluoride and pH did not show any SSIs above background at any of the downgradient compliance wells. The Appendix III SSIs found during 2020 are consistent with those identified during 2019.

Well	Boron	Calcium	Chloride	Fluoride	рН	Sulfate	TDS
ASH-02	SSI						
ASH-02	SSI						SSI
ASH-03	SSI	SSI	SSI			SSI	SSI
ASH-04	SSI	SSI	SSI			SSI	SSI
ASH-05	SSI	SSI	SSI			SSI	SSI
ASH-07	SSI	SSI	SSI			SSI	SSI
ASH-08	SSI	SSI				SSI	SSI

Notes:

SSI = statistically significant increase

TDS = total dissolved solids

5.2 Appendix IV SSI Determination

The Appendix IV assessment monitoring results were compared against their respective background UPLs to determine if they exhibited SSIs above background. This comparison indicates that selenium at monitoring wells ASH-03, ASH-04, ASH-05, and ASH-07 and lithium at ASH-07 exhibit SSIs over the background UPL (**Table 9**). No other Appendix IV constituents exhibited verified SSIs over background.

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5.3 Establishment of Groundwater Protection Standards

GWPS were selected for the Ash Monofill Appendix IV constituents using the criteria specified in 40 CFR 257.95(h). The GWPS listed on **Table 8** were selected from the U.S. Environmental Protection Agency drinking water maximum contaminant limits, groundwater standards provided in 40 CFR 257.95(3)(h)(2), or the background UPLs where they exceed either of the other standards.

5.4 Appendix IV SSL Determination

Constituents exhibiting an SSI over the background UPL were further evaluated to determine whether they are present at SSLs relative to GWPS established under the CCR Rule (40 CFR 257.95(d)(2)). SSLs were identified by calculating the 95 percent lower confidence limit (95 LCL) at each well where the assessment monitoring constituents exhibited an SSI over background and comparing the 95 LCL to the GWPS. A constituent is present at an SSL over the GWPS if the 95 LCL is greater than the GWPS. Selenium concentrations at monitoring wells ASH-03, ASH-05, and ASH-07 were found at an SSL above the GWPS because their 95 LCLs were greater than the selenium GWPS (0.05 milligram per liter [mg/L]) as shown in the table below. The 95 LCL for lithium at monitoring well ASH-07 did not exceed its GWPS at an SSL. Appendix IV constituents that exceed the GWPS at an SSL require an alternate source demonstration or corrective action. Selenium is the only Appendix IV constituent requiring corrective action at this time.

Well No.	Parameter	95% LCL (mg/L)	GWPS (mg/L)
ASH-03	Selenium	0.0557	0.05
ASH-04	Selenium	0.0349	0.05
ASH-05	Selenium	0.0801	0.05
ASH-07	Selenium	0.0814	0.05
ASH-07	Lithium	0.517	0.570

Notes:

Constituent's 95 LCL exceeds the GWPS

GWPS = groundwater protection standard

LCL = lower confidence limit mg/L = milligrams per liter AECOM Environment 6-1

6.0 Projected Activities in 2021

The following activities are anticipated to be performed at the Ash Monofill during calendar year 2021:

- PRPA will continue groundwater monitoring at the Ash Monofill on a semiannual basis for the Appendix III detection monitoring constituents and Appendix IV assessment monitoring constituents that were detected as specified in 40 CFR 257.95(d)(1) or 40 CFR 257.95(f). The full list of Appendix IV constituents also will be sampled annually.
- Baseline data will continue to be collected at ASH-02 and ASH-08 wells for Appendix III and IV constituents for one additional sampling event in 2021 to complete the eight rounds of quarterly sampling required. The wells will then be incorporated into the routine detection or assessment monitoring programs as appropriate. Sampling and analysis will be performed in accordance with the Ash Monofill Groundwater Monitoring Plan (AECOM 2017). The new data will be incorporated into the statistical analyses as appropriate.
- High turbidities reported at some of the Ash Monofill monitoring wells has led to increased sample purge times to achieve an acceptable groundwater sample turbidity. To improve yield and reduce turbidity, wells with elevated turbidity values or excessive purge times will be re-developed using a surge block and bailer or a submersible electric pump. During well development, AECOM personnel will sample the development water for pH, temperature, specific conductance, turbidity, and other observations (i.e., color and clarity) after each well casing volume is removed. Each well will be developed to obtain water that is relatively clear (i.e., turbidity is less than 50 nephelometric turbidity units) and/or all field parameters stabilized (i.e., less than a 10 percent change between measurements). A well is considered developed when the field parameters have stabilized, when 10 well casing volumes have been removed, or when the well is pumped dry.
- An Assessment of Corrective Measure (ACM) was prepared in August 2019 to identify potential remedial alternatives for selenium in groundwater at the Ash Monofill. The ACM included a range of cleanup options that included monitored natural attenuation, groundwater pump and treat, and a permeable reactive barrier. The ACM options were presented at a public meeting in November 2019. In 2021, the corrective actions presented in ACM will be evaluated for a final remedy selection and implementation.

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7.0 Summary and Findings

AECOM, on behalf of PRPA, oversaw groundwater sampling and analysis of detection (Appendix III) and assessment (Appendix IV) monitoring at the Ash Monofill. Monitoring data and analytical results collected as part of the detection and assessment monitoring programs were evaluated to determine potentiometric surface elevations, groundwater flow directions and rates, and whether any constituents are present at an SSI above background UPLs or exceeded GWPS at an SSL.

The existing Ash Monofill monitoring well network was not modified this year as no new monitoring wells were installed. Quarterly baseline sampling was conducted at monitoring wells ASH-06, ASH-07 (installed in 2018), and ASH-08 (installed in 2019). Additional baseline sampling will be conducted in 2021 until 8 quarterly rounds have been collected at these wells. These data will be incorporated into the monitoring program as collected.

Selenium concentrations in groundwater at monitoring wells ASH-03, ASH-04, ASH-05, and selenium and lithium at monitor well ASH-07 were found to have SSIs above background UPLs. Additional statistical analysis found that selenium exceeds the GWPS at a SSL at wells ASH-03, ASH-05, and ASH-07. Selenium at monitor well ASH-04 and lithium at monitor well ASH-07 did not exceed the GWPS at a SSL. These results require continued assessment monitoring and corrective action for selenium at the Ash Monofill. Lithium does not require corrective action at this time.

An ACM was prepared in August 2019 to identify potential remedial alternatives for selenium in groundwater at the Ash Monofill. The ACM included a range of cleanup options that included monitored natural attenuation, groundwater pump and treat, and a permeable reactive barrier. The ACM options were presented at a public meeting in November 2019. Assessment monitoring results indicate that selenium exceeds the GWPS at an SSL at monitoring wells ASH-03, ASH-05, and ASH-07 and will require corrective action. No other constituent requires corrective action at this time. In 2021, the corrective actions presented in ACM will be evaluated for a final remedy selection and implementation.

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8.0 References

AECOM Technical Services, Inc. (AECOM). 2017. Coal Combustion Residuals (CCR) Ash Monofill Groundwater Detection Monitoring Plan Revision 0. Prepared for Platte River Power Authority Rawhide Energy Station Larimer County, Colorado. October 10, 2017.

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- American Public Health Association, American Water Works Association, and Water Environment Federation. 1998. Standard Methods for the Examination of Water and Wastewater, 20th Edition.
- Lidstone and Anderson, Inc. 1989. Investigation of the Ground-Water Monitoring Program for the Bottom Ash Disposal Site. March 1989.
- Platte River Power Authority (PRPA). 1980. Engineering Report and Operational Plan for the Solid Waste Disposal Facility, Rawhide Energy Project, December 1980.

Title 40 of the Code of Federal Regulations (CFR) Part 257 Subpart D.

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Tables

Table 1
Ash Monofill Monitoring Well Construction Details
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

Well Name Location Relative to Waste Unit		Easting (ft)	Northing (ft)	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Total Depth (ft bgs)	Well Screen Interval (ft bgs)	Well Screen Lithology
ASH-01	Upgradient Well	3124781.307	1562659.296	5759.29	5760.15	31	26-29	Shale
ASH-02	Downgradient Well	3127250.213	1558450.627	5679.25	5679.87	55	51-54	Shale
ASH-03	Downgradient Well	3126904.393	1558820.854	5714.21	5717.18	49	39-49	Shale
ASH-04	Downgradient Well	3126544.377	1558803.996	5689.58	5692.57	29	19-29	Shale
ASH-05	Downgradient Well	3126255.648	1558603.939	5696.68	5698.71	29	19-29	Shale
ASH-06	Upgradient Well	3126039.957	1562657.603	5783.23	5786.41	65	50-65	Shale
ASH-07	Downgradient Well	3127068.621	1558643.688	5687.58	5690.56	25	15-25	Shale
ASH-08	Downgradient Well	3126672.477	1558046.977	5681.22	5684.41	29	19-29	Shale

ft amsl = feet above mean sea level; ft bgs = feet below ground surface

ASH-01 was installed in December 1980 as MW-1 by Black & Veatch.

ASH-02 was installed in December 1980 as MW-2 by Black & Veatch.

Wells surveyed in North American Datum 1983 (NAD83)

Table 2
Ash Monofill Groundwater Level Measurements 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

Well ID	Sampling Event	Measurement Date	Measuring Point Elevation (ft amsl)	Depth To Water (ft btoc)	Measured Depth of Well (ft btoc)	(ft amsl)
ASH-01	January 2020	1/9/2020	5760.15	13.34	NM	5746.81
ASH-01	February 2020	2/20/2020	5760.15	13.78	NM	5746.37
ASH-01	April 2020	4/14/2020	5760.15	13.11	NM	5747.04
ASH-01	July 2020	7/17/2020	5760.15	13.35	29.88	5746.79
ASH-01	October 2020	10/5/2020	5760.15	13.36	29.88	5746.79
ASH-02	January 2020	1/6/2020	5679.87	2.45	NM	5677.42
ASH-02	February 2020	2/20/2020	5679.87	2.17	NM	5677.70
ASH-02	April 2020	4/6/2020	5679.87	1.9	NM	5677.97
ASH-02	July 2020	7/13/2020	5679.87	2.93	53.7	5676.94
ASH-02	October 2020	10/5/2020	5679.87	4.42	53.7	5675.45
ASH-03	January 2020	1/6/2020	5717.18	37.18	NM	5680.00
ASH-03	February 2020	2/20/2020	5717.18	37.09	NM	5680.09
ASH-03	April 2020	4/6/2020	5717.18	36.61	NM	5680.57
ASH-03	July 2020	7/13/2020	5717.18	36.91	51.74	5680.27
ASH-03	October 2020	10/5/2020	5717.18	37.85	51.74	5679.33
ASH-04	January 2020	1/6/2020	5692.57	12.89	NM	5679.68
ASH-04	February 2020	2/20/2020	5692.57	12.77	NM	5679.80
ASH-04	April 2020	4/6/2020	5692.57	12.35	NM	5680.22
ASH-04	July 2020	7/13/2020	5692.57	12.37	32.34	5680.20
ASH-04	October 2020	10/5/2020	5692.57	12.97	32.34	5679.60
ASH-05	January 2020	1/6/2020	5698.71	20.94	NM	5677.77
ASH-05	February 2020	2/20/2020	5698.71	20.78	NM	5677.93
ASH-05	April 2020	4/6/2020	5698.71	20.41	NM	5678.30
ASH-05	July 2020	7/13/2020	5698.71	20.25	31.31	5678.46
ASH-05	October 2020	10/5/2020	5698.71	20.69	31.31	5678.02
ASH-06	January 2020	1/6/2020	5786.41	62.73	NM	5723.68
ASH-06	February 2020	2/20/2020	5786.41	63.19	NM	5723.22
ASH-06	April 2020	4/6/2020	5786.41	62.71	NM	5723.70
ASH-06	July 2020	7/13/2020	5786.41	62.75	70.09	5723.66
ASH-06	October 2020	10/5/2020	5786.41	62.79	70.09	5723.62
ASH-07	January 2020	1/6/2020	5690.56	13.92	NM	5676.64
ASH-07	February 2020	2/20/2020	5690.56	13.67	NM	5676.89
ASH-07	April 2020	4/6/2020	5690.56	13.11	NM	5677.45
ASH-07	July 2020	7/13/2020	5690.56	14.02	30.08	5676.54
ASH-07	October 2020	10/5/2020	5690.56	15.41	30.08	5675.15
ASH-08	January 2020	1/6/2020	5684.41	10.45	NM	5673.96
ASH-08	February 2020	2/20/2020	5684.41	10.07	NM	5674.34
ASH-08	April 2020	4/6/2020	5684.41	9.43	NM	5674.98
ASH-08	July 2020	7/13/2020	5684.41	9.95	29.92	5674.46
ASH-08	October 2020	10/5/2020	5684.41	11.06	29.92	5673.35

ft = feet

ft amsl = feet above mean sea level ft btoc = feet below top of casing

NM = not measured

Table 3
Ash Impoundments Analytical Results January 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

		Sample Location	ASH-02	ASH-02	ASH-06	ASH-07	ASH-08
		Sample Type		Duplicate			
		Sample Date	01/15/2020	01/15/2020	01/15/2020	01/15/2020	01/15/2020
Chemical Name	Analytical Method	Unit					
Appendix III Parameters	_						
Boron	SW6010	μg/L	2010	2000	304	781	960
Calcium	SW6010	μg/L	169000	170000	24300	434000	447000
Chloride	EPA9056	mg/L	21.4	21.3	7.0	74.1	19.3
Fluoride	EPA9056	mg/L	< 0.20	< 0.20	0.72	< 0.20	< 0.20
Sulfate	EPA9056	mg/L	2420	2440	68.3	3990	2800
Total Dissolved Solids	SM2540C	mg/L	4320	3490	500	6620	4560
Appendix IV Parameters							
Antimony	SW6020	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Arsenic	SW6020	μg/L	< 1.0	< 1.0	1.2	< 1.0	1.0
Barium	SW6020	μg/L	19.8	20.5	61.6	19.1	19.7
Beryllium	SW6020	μg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	SW6020	μg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chromium	SW6020	μg/L	< 1.0	< 1.0	2.3	< 1.0	1.8 J-
Cobalt	SW6020	μg/L	< 1.0	< 1.0	< 1.0	1.3	< 1.0
Lead	SW6020	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Lithium	SW6010	μg/L	290	294	56.3	537	297
Mercury	EPA7470	μg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Molybdenum	SW6020	μg/L	8.2	8.2	17.3	1.0	1.9
Radium, total	TRC	pCi/L	0.652 J+	0.740 J+	0.812 J+	0.311 J+	0.487 J+
Radium-226	E903.1	pCi/L	-0.175	0.194 J+	0.122 J+	0.175 J+	0.0379 J+
Radium-228	E904.0	pCi/L	0.652 J+	0.546 J+	0.690 J+	0.136 J+	0.449 J+
Selenium	SW6020	μg/L	< 1.0	< 1.0	23.5	51.0	< 1.0
Thallium	SW6020	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Field Parameters							
Dissolved Oxygen	Field Measure	mg/L	3.38	3.38	4.35	1.16	2.67
•		mv	23.23	23.23	12.8	15.3	21.8
pH	Field Measure	SU	7	7	7.47	6.67	6.69
Specific Conductivity	Field Measure	μS/cm	3670	3670	6.67	5349	3964
Temperature	Field Measure	degC	10.34	10.34	10.78	11.74	9.88
Turbidity	Field Measure	NTU	2.44	2.44	3.62	16.2	5.28

mg/L = milligram per liter μ g/L = microgram per liter μ y = millivolts μ g/L = picocuries per liter

SU = standard units <= not detected above indicated reporting limit

degC = degrees Centigrade µS/cm = microSiemens per centimeter

NTU = nephelometric turbidity units

J+ = estimated concentration, biased high

Table 4
Ash Impoundments Analytical Results April 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

		Sample Location	ASH-01	ASH-02	ASH-02	ASH-03	ASH-04	ASH-05	ASH-06	ASH-07	ASH-08
		Sample Type			Duplicate						
		Sample Date	04/14/2020	04/14/2020	04/14/2020	04/20/2020	04/10/2020	04/13/2020	04/20/2020	04/10/2020	04/13/2020
Chemical Name	Analytical Method	Unit									
Appendix III Parameters											
Boron	SW6010	μg/L	486	1990	1980	807	639	817	308	760	956
Calcium	SW6010	μg/L	381000	173000	172000	467000	470000	517000	24100	449000	455000
Chloride	EPA9056	mg/L	23.1	20.4	21.2	76.8	197	241	7.0	146	21.2
Fluoride	EPA9056	mg/L	0.24	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.69	< 0.20	< 0.20
Sulfate	EPA9056	mg/L	2000	2090	2150	3190	3330	2950	63.6	4000	3070
Total Dissolved Solids	SM2540C	mg/L	3250	3430	2910	5760	6100	4570	443	7160	3130
Appendix IV Parameters											
Antimony	SW6020	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Arsenic	SW6020	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0
Barium	SW6020	μg/L	9.6	23.9	22.0	8.8	11.4	16.9	58.8	14.8	15.7
Beryllium	SW6020	μg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	SW6020	μg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chromium		μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.6 U	< 1.0	< 1.0
Cobalt	SW6020	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.3	1.4
Lead	SW6020	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Lithium	SW6010	μg/L	439	320	316	428	362	288	60.2	547	291
Mercury	EPA7470	μg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Molybdenum	SW6020	μg/L	< 1.0	8.4	8.4	< 1.0	1.3	< 1.0	15.4	1.3	1.0
Radium, total	TRC	pCi/L	0.981	0.321	0.801	1.09	1.21	1.43	0.481	1.32	4.04
Radium-226	E903.1	pCi/L	0.238 J	-0.115	0.201	0.337	0.516	0.404	0.0661	0.166 J	0.351 J
Radium-228	E904.0	pCi/L	0.743	0.321	0.600	0.753	0.696	1.03	0.415	1.15	3.69
Selenium	SW6020	μg/L	< 1.0	< 1.0	< 1.0	121	109	62.5	24.5	147	< 1.0
Thallium	SW6020	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Field Parameters											
Dissolved Oxygen	Field Measure	mg/L	1.96	4.28	4.28	0.19	0.3	0.56	6.1	0.61	0.56
Oxidation Reduction Potential	Field Measure	mv	58.2	47.9	47.9	108.5	55.5	55.7	79.9	68.5	52.8
рН		SU	7.93	8.56	8.56	7.46	7.97	6.95	8.19	7.48	7.18
Specific Conductivity	Field Measure	μS/cm	3537	3930	3930	5154	5412	4959	609	6077	4495
Temperature	Field Measure	degC	10.66	10.61	10.61	12.5	12.28	10.68	12.81	12.6	9.11
Turbidity	Field Measure	NTU	1.27	2.6	2.6	3.43	9.35	4.84	5.79	6.36	2.67

mg/L = milligram per liter μ g/L = microgram per liter μ g/L = picocuries per liter

SU = standard units = = not detected above indicated reporting limit degC = degrees Centigrade = μ S/cm = microSiemens per centimeter

NTU = nephelometric turbidity units
J = estimated concentration

Table 5
Ash Impoundments Analytical Results July 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

		Sample Location Sample Type	ASH-02 N	ASH-02 FD	ASH-06 N	ASH-06 N	ASH-07 N	ASH-08 N
		Sample Date	07/16/2020	07/16/2020	07/22/2020	07/24/2020	07/16/2020	07/16/2020
Chemical Name	Analytical Method	Unit						
Appendix III Parameters								
Boron	SW6010	μg/L	2040	2040		334	742	942
Calcium	SW6010	μg/L	164000	165000		37600	431000	432000
Chloride		mg/L	21.0	20.6	7.9		180	20.5
Fluoride	EPA9056	mg/L	0.24	0.24	0.77		< 0.20	< 0.20
Sulfate	EPA9056	mg/L	2090	2080	101		4200	2880
Total Dissolved Solids	SM2540C	mg/L	3270	3110	472		6890	4520
Appendix IV Parameters								
Antimony	SW6020	μg/L	< 1.0	< 1.0		< 5.0	< 1.0	< 1.0
Arsenic	SW6020	μg/L	< 1.0	< 1.0		< 5.0	< 1.0	< 1.0
Barium	SW6020	μg/L	20.0	19.8		64.7	11.7	14.3
Beryllium	SW6020	μg/L	< 0.50	< 0.50		< 2.5	< 1.0	< 0.50
Cadmium	SW6020	μg/L	< 0.50	< 0.50		< 2.5	< 0.50	< 0.50
Chromium	SW6020	μg/L	< 1.0	< 1.0		12.6	< 1.0	< 1.0
Cobalt	SW6020	μg/L	< 1.0	< 1.0		< 5.0	< 1.0	1.5
Lead	SW6020	μg/L	< 1.0	< 1.0		< 5.0	< 1.0	< 1.0
Lithium	SW6010	μg/L	314	317		57.5	589	311
Mercury	EPA7470	μg/L	< 0.20	< 0.20		< 0.20	< 0.20	< 0.20
Molybdenum	SW6020	μg/L	8.2	8.1		22.4	1.6	1.0
Radium, total	TRC	pCi/L	0.850	1.80		0.998*	0.328	0.481
Radium-226	E903.1	pCi/L	0.0466	0.377 J		0.0586*	0.256	0.253
Radium-228	E904.0	pCi/L	0.803	1.42		0.939*	0.0718	0.228
Selenium	SW6020	μg/L	< 1.0	< 1.0		25.9	220	< 1.0
Thallium	SW6020	μg/L	< 1.0	< 1.0		< 5.0	< 1.0	< 1.0
Field Parameters								
Dissolved Oxygen		mg/L	1.32	1.32	7.08	7.08	0.38	0.24
Oxidation Reduction Potential		mv	64.1	64.1	55.3	55.3	45.8	41.9
рН	Field Measure	SU	7.08	7.08	7.71	7.71	7	6.93
Specific Conductivity	Field Measure	μS/cm	4072	4072	681	681	6921	4442
Temperature	Field Measure	degC	15.06	15.06	15.84	15.84	14.95	15.4
Turbidity	Field Measure	NTU	3.38	3.38	3.87	3.87	3.8	2.64

 $\begin{array}{ll} mg/L = milligram \ per \ liter \\ mv = millivolts \end{array} \qquad \qquad \mu g/L = microgram \ per \ liter \\ pCi/L = picocuries \ per \ liter \\ \end{array}$

SU = standard units = = not detected above indicated reporting limit degC = degrees Centigrade = μ S/cm = microSiemens per centimeter

NTU = nephelometric turbidity units

J = estimated concentration

^{* =} data from July 2020 CDPHE sample

Table 6
Ash Impoundments Analytical Results October 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

		Sample Location	ASH-01	ASH-02	ASH-02	ASH-03	ASH-04	ASH-05	ASH-06	ASH-06	ASH-07	ASH-08
		Sample Type			Duplicate							
		Sample Date	10/05/2020	10/09/2020	10/09/2020	10/15/2020	10/15/2020	10/09/2020	10/16/2020	10/20/2020	10/15/2020	10/08/2020
Chemical Name	Analytical Method	Unit										
Appendix III Parameters												
Boron		μg/L	487	2140	2100	782	640	884	312		766	1020
Calcium		μg/L	329000	176000	172000	445000	446000	557000	24500		413000	425000
Chloride		mg/L	23.0	20.4	21.4	90.5	211	242	7.7		197	21.0
Fluoride		mg/L	0.24	0.23	0.23	< 0.20	0.29	< 0.20	0.84		R	0.22 J-
Sulfate		mg/L	2100	1050	1090	3290	3340	2710	82.8		4390	2610
Total Dissolved Solids	SM2540C	mg/L	3330	3350	3270	5400	5840	4810	417		8140	4830
Appendix IV Parameters												
Antimony		μg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0		< 3.0	< 3.0
Arsenic		μg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0		< 3.0	< 3.0
Barium		μg/L	9.3	19.0	17.2	8.6	13.5	15.4	47.7		13.0	16.6
Beryllium		μg/L	< 0.50	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5		< 1.5	< 0.50
Cadmium		μg/L	< 0.50	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5		< 1.5	< 0.50
Chromium		μg/L	< 1.0	< 3.0	< 3.0	8.4	< 3.0	< 3.0	5.1		< 3.0 UJ-	< 3.0
Cobalt		μg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0		< 3.0	1.7
Lead		μg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0		< 3.0	< 1.0 UJ-
Lithium		μg/L	413	303	302	374	341	313	51.6		494	339
Mercury		μg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20		< 0.20	< 0.20
Molybdenum		μg/L	< 1.0	8.5	8.4	< 3.0	< 3.0	< 3.0	17.7		< 3.0	1.5
Radium, total		pCi/L	1.32	0.355	0.339	0.911	1.83 J+	1.31		1.11	0.470	1.98 J+
Radium-226		pCi/L	0.202	-0.0655	0	0.622	0.309 J	0.687		0.213	0.261 J	0.615
Radium-228		pCi/L	1.12 J+	0.355	0.339	0.289	1.52 J+	0.619		0.899	0.209	1.36 J+
Selenium		μg/L	< 1.0	< 3.0	< 3.0	114	95.5	57.8	27.6		183	< 3.0
Thallium	SW6020	μg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0		< 3.0	< 1.0
Field Parameters												
Dissolved Oxygen		mg/L	1.65	1.21	1.21	1.74	0.32	0.53	8.71		1.13	0.64
Oxidation Reduction Potential		mv	29.7	38.6	38.6	-16.5	-7.4	13.1	19.1		-11.4	1.2
рН		SU	7.31	7.45	7.45	7.08	7.09	7.11	7.22		7.12	7.01
Specific Conductivity		μS/cm	3754	4236	4236	4977	5292	5128	655		6580	4534
Temperature		degC	12.35	12.89	12.89	10.99	12.98	13.69	12.75		12.6	16.4
Turbidity	Field Measure	NTU	4.11	3.41	3.41	3.01	7.36	6.98	2.84		3.06	2.5

mg/L = milligram per liter μ g/L = microgram per liter μ g/L = picocuries per liter μ g/L = picocuries per liter

SU = standard units < = not detected above indicated reporting limit degC = degrees Centigrade μ S/cm = microSiemens per centimeter

NTU = nephelometric turbidity units

J = estimated concentration

UJ- = non detect, estimated biased low UJ+ = non detect, estimated biased high

J+ = estimated concentration, biased high

R = rejected data, not usable

Table 7
Ash Monofill Appendix III Background Upper Prediction Limits
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

Parameter (Units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Test	Background UPL
Boron (mg/L)	17	0	Yes/No	Parametric	0.63
Calcium (mg/L)	17	0	No/No	Nonparametric	380
Chloride (mg/L)	15	0	No/No	Nonparametric	29
Fluoride (mg/L)	17	29	Yes/Yes	Parametric	1.17
pH (standard units)	15	0	No/Yes	Parametric	9.28
Sulfate (mg/L)	15	7	No/No	Nonparametric	2,740
Total Dissolved Solids (mg/L)	17	0	No/No	Nonparametric	3,900

mg/L = milligrams per liter

UPL = upper prediction limit

Table 8
Ash Monofill Appendix IV Background Upper Prediction Limits
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

Parameter (Units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Test	Background Limit	GWPS
Antimony (mg/L)	17	100	No/No	MDL	0.004	0.006
Arsenic (mg/L)	17	82	No/No	MDL	0.004	0.05
Barium (mg/L)	17	0	No/No	Nonparametric	0.072	2.0
Beryllium (mg/L)	17	100	No/No	MDL	0.002	0.004
Cadmium (mg/L)	17	100	No/No	MDL	0.002	0.005
Chromium (mg/L)	17	100	No/No	MDL	0.004	0.1
Cobalt (mg/L)	17	76	No/No	Nonparametric	0.042	0.042
Fluoride (mg/L)	17	29	Yes/Yes	Parametric	1.17	4.0
Lead (mg/L)	17	88	No/No	MDL	0.004	0.015
Lithium (mg/L)	17	0	No/No	Nonparametric	0.57	0.57
Mercury (mg/L)	17	100	No/No	MDL	0.0002	0.002
Molybdenum (mg/L)	17	71	No/No	Nonparametric	0.056	0.1
Selenium (mg/L)	17	35	No/No	Nonparametric	0.034	0.05
Thallium (mg/L)	17	100	No/No	MDL	0.004	0.004
Radium-226+228 Combined (pCi//L)	15	20	Yes/Yes	Parametric	2.63	5

GWPS = groundwater protection standard

mg/L = milligrams per liter pCi/L = picoCuries per liter

MDL = background limit set at maximum detection or reporting limit

All of the antimony, beryllium, cadmium, chromium, cobalt, mercury, molybdenum, and thallium results in the background monitoring wells were reported as not detected or detected less than 5 percent. For these constituents, the maximum detection or reporting limit was selected as the UPL per the double quantification rule in the U.S. Environmental Protection Agency's Unified Statistical Guidance (2009).

Table 9
Ash Monofill Appendix IV Statistical Results
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

			Well Number	ASH-01	ASH-01	ASH-02	ASH-03	ASH-03	ASH-04	ASH-04	ASH-05	ASH-05	ASH-06	ASH-06	ASH-06	ASH-06	ASH-06	ASH-06	ASH-07	ASH-07	ASH-07	ASH-07	ASH-08	ASH-08	ASH-08	ASH-08							
			Sample Date	04/14/2020	10/05/2020	01/15/2020	01/15/2020	04/14/2020	04/14/2020	07/16/2020	07/16/2020	10/09/2020	10/09/2020	04/20/2020	10/15/2020	04/10/2020	10/15/2020	04/13/2020	10/09/2020	01/15/2020	04/20/2020	07/22/2020	07/24/2020	10/16/2020	10/20/2020	01/15/2020	04/10/2020	07/16/2020	10/15/2020	01/15/2020	04/13/2020	07/16/2020	10/08/2020
			Sample Type	N	N	N	FD	N	FD	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit	Background UPL	GWPS																														
Antimony	mg/L	0.004	0.006	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.001		< 0.005	< 0.003		< 0.001	< 0.001	< 0.001	< 0.003	< 0.001	< 0.001	< 0.001	< 0.003
Arsenic	mg/L	0.004	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 1.0	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	0.0012	0.0012		< 0.005	< 0.003		< 0.001	< 0.001	< 0.001	< 0.003	0.001	< 0.001	< 0.001	< 0.003
Barium	mg/L	0.072	2.0	0.0096	0.0093	0.0198	0.0205	0.0239	0.022	0.02	0.0198	0.019	0.0172	0.0088	0.0086	0.0114	0.0135	0.0169	0.0154	0.0616	0.0588		0.0647	0.0477		0.0191	0.0148	0.0117	0.013	0.0197	0.0157	0.0143	0.0166
Beryllium	mg/L	0.002	0.004	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0005		< 0.0025	< 0.0015	-	< 0.0005	< 0.0005	< 0.001	< 0.0015	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	0.002	0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0005		< 0.0025	< 0.0015		< 0.0005	< 0.0005	< 0.0006	< 0.0015	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.004	0.10	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	0.0084	< 0.001	< 0.003	< 0.001	< 0.003	0.0023	< 0.0026 U		0.0126	0.0051		< 0.001	< 0.001	< 0.001	< 0.003	0.0018 J-	< 0.001	< 0.001	< 0.003
Cobalt	mg/L	0.042	0.042	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.001		< 0.005	< 0.003		0.0013	0.0013	< 0.001	< 0.003	< 0.001	0.0014	0.0015	0.0017
Fluoride	mg/L	1.17	4.0	0.24	0.24	< 0.20	< 0.20	< 0.20	< 0.20	0.24	0.24	0.23	0.23	< 0.20	< 0.20	< 0.20	0.29	< 0.20	< 0.20	0.72	0.69	0.77		0.84		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.22
Lead	mg/L	0.004	0.015	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.001		< 0.005	< 0.003		< 0.001	< 0.001	< 0.001	< 0.003	< 0.001	< 0.001	< 0.001	< 0.001
Lithium	mg/L	0.57	0.57	0.439	0.413	0.29	0.294	0.32	0.316	0.314	0.317	0.303	0.302	0.428	0.374	0.362	0.341	0.288	0.313	0.0563	0.0602		0.0575	0.0516		0.537	0.547	0.589	0.494	0.297	0.291	0.311	0.339
Mercury	mg/L	0.0002	0.002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002		< 0.0002	< 0.0002		< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.056	0.10	< 0.001	< 0.001	0.0082	0.0082	0.0084	0.0084	0.0082	0.0081	0.0085	0.0084	< 0.001	< 0.003	0.0013	< 0.003	< 0.001	< 0.003	0.0173	0.0154		0.0224	0.0177		0.001	0.0013	0.0016	< 0.003	0.0019	0.001	0.001	0.0015
Selenium	mg/L	0.034	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	0.121	0.114	0.109	0.0955	0.0625	0.0578	0.0235	0.0245		0.0259	0.0276		0.051	0.147	0.22	0.183	< 0.001	< 0.001	< 0.001	< 0.003
Thallium	mg/L	0.004	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.001		< 0.005	< 0.003		< 0.001	< 0.001	< 0.001	< 0.003	< 0.001	< 0.001	< 0.001	< 0.001
Radium, total	pCi/L	2.63	5.0	0.981	1.32	0.652 J+	0.740 J+	0.321	0.801	0.85	1.8	0.355	0.339	1.09	0.911	1.21	1.83	1.43	1.31	0.812 J+	0.481			-	1.11	0.311 J+	1.32	0.328	0.47	0.487 J+	4.04	0.481	1.98

Notes:

N = primary sample
FD = field duplicate
mg/L = milligrams per liter
pCi/L = picocCuries per liter
Bold black value is detected result
Bold red value exceeds groundwater protection standard (GWPS)
SSI = statistically significant increase over background upper prediction limit (UPL)
SSL = statistically significant level above the GWPS

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Figures

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Appendix A

Groundwater Sampling Forms

Ground Water Sample Collection Record

Client: Project No: Site Location:		ver Power Au	thority - Ra	awhide Energ	y Station	Date: 1-15-20 Time: Start 6:20 Finish 9:55							
Weather Cond	TT Chilling	Sunny 1	Vindy	Collector(s)	W Weichert &	Finish 9:55							
WATER LEVE				1]			
a. Total Well I	EL DATA: (meas Length	ured from To	p of Casi	n g) asing Materia	DVC	Well		Piezome	ter 🗆	(a-b)			
. Water Tab	le Depth	2.38		asing Materia asing Diamete		2000	th of Water	Volume (see	e back)	- (4.5)			
WELL PURG	ING DATA	1	FI										
	The state of the state of	-	-					-					
	Acceptance Cri Minimum Requ Maximum Allo Stabilization of		from work flume (@ _	VA well	volumes) La NTUs	n Flo	J)	-					
	c. Field Testing E		t:	Make 45(Model 556		Serial Num	nber					
	d. Field Testing E	quinment Cali	bration Do	Hach	2100 C		Po	on #	-				
200	Volume	1	T T	Spec. Cond		DO DO	Turbidity	ge #	15	1			
Time Stabilization	Removed (gal)		рН	(µs/cm)	ORP	mg/L	(NTU)	Color	Other				
222		+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	5.00	0.00					
335	181	9.89	6.47	3652	20.3	23.78	4.70	Klen	L.78				
2 28	256	10.96	6-82	3658	36.3	6.26 1112	456	Cleur		Trul 119.	110		
व्या.	2.5L	10.29	6.90	3659	26-8	3.83	5.35	Clean	3.42	Turbety	7.74		
रूपम	454	10.31	10-95	3668	72 5	3.55		Clear	4.27				
847	5.5	10.34	700	3670	23. 2	3.38		CLECW					
		1		34.1	23.2 3	3.3		CICCI	1.43				
								-					
	. Acceptance crit	eria pass/fail		Yes	No	N/A							
	Has required vo	lume been rer	noved		8	1							
	Has required to Have paramete	rbidity been re	ached	2		poo							
		- Explain belo		D									
	Car 10 (37)	2141003 5334	112										
										c			
SAMPLE CO	LI ECTION:		Method:	C. A.	. ble Blodde	. D.	to -						
SAMIFEE CO	LLECTION.		Metriod:	STOUR	AND DOUGH	4 Low	P						
Sample I	D Container	Type	No. of (Containers	Preservation		Analysis		Time				
W-2(AsH-	02)-CDPHE	su coc	16		se coc	(DPHE		7ime				
541-02 (MW-	2)-UR	See LOC	5		See COL	(CR		9:00				
UP-2-CC	R	wilou	5		sector	20.	CCR	- 11					
omments	CA	Nect	Dist	inte	Sample	Ca-		2	n lub	11			
			VUV	imi	JUMPIL	tor	LUCE	VOCIVAL	a Lib	0107			
illilicins	7	110	10 - 2'-	CCR"				TIMP	11 142	cied			

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Ground Water Sample Collection Record

Client: Project No:	Platte Rive	er Power Aut	nority - Ray	-	Time: Star Finish	Date: 1-	15-20						
Site Location:						-	Finish	15:13					
Veather Con	ds: 40°F	40°F Sunny Collector(s) W Weichert & C Ahrendt											
ATER I EV	EL DATA: (measu	red from Tou	of Casin	n)		Well	1	Piezomete	or 🗆				
. Total Well			c. Ca	sing Material	PVC	-	h of Water (and the same of th					
		62.82		sing Diameter	7 11	0.0			hank) —				
. Water Tab	le Depth	WL.0L	d. Ca	sing Diameter		f. Calcul	ated Well V	olume (see	Dack)				
ELL PURG	iNG DATA a. Purge Method	Low	Flau)				-6/					
	b. Acceptance Crite - Minimum Requi - Maximum Allow - Stabilization of p	red Purge Vo able Turbidity	luma /@	NA well v 20 - 30	volumes) Law NTUs %	Flan)						
	c. Field Testing Equ	uipment Used	b.	Make	Model		Serial Num	ber					
				751	2100	2							
	d. Field Testing Eq	uipment Calif	bration Doc		Complete s		Pag	je #					
	Volume			Spec. Cond		I DO	Turbidity		DIW				
Time	Removed (gal)	T° (C)	pH	(µs/cm)	ORP	mg/L	(NTU)	Color	Other				
Stabilization	-	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	5.00	1	1-07				
13:28	0,5	70.43	345	781	23.5	11.90	4.55	Clear	63.10				
13.34	1.0	10.80	7.47	700	15.3		3200		62.30				
13.37	1.8	10.78	7-47	647	12.8	4.38	3.62	clear					
		1000.000		322		K 14	Lit. Dark No. 1		10,2,12				
								- 3					
	 Acceptance crite Has required vol 	lume been re bidity been re		Yes 🔲	≥□□4	d							
	Have parameter If no or N/A -	Explain belo	w. secas	se of	draw do	w							
	Have parameter If no or N/A -	Explain belo	w. De (CA) : Method:		draw do								
SAMPLE CO	Have parameter If no or N/A - Saux DLLECTION:	Explain belo	Method:	Bladd	w pom p		Analysis		Time				
SAMPLE CO	Have parameter If no or N/A - Saux DLLECTION:	Explain belo	Method:	Blodd	er pomp	c	Analysis OPME		Time				

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Well/Piezo ID: ASH-07

Ground Water Sample Collection Record

WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length	Client: Project No:		Platte River	r Power Auth 2	nority - Ra	_	Time: Sta	Date: 1/	0					
Well can be considered Well can be conside	Site Location:					-	Finis	13:10						
a. Total Well Length D. Water Table Depth A. Casing Material D. Water Table Depth A. Purge Method A. Purge Method D. Well PURGING DATA A. Purge Method D. Well volume (see back) D. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (see DA) Maximum Allowable Turbicity - Stabilization of parameters C. Field Testing Equipment Used: Make Model Serial Number D. Volume Time Removed (gal) To (C) PH (us/cm) Container Nove 11-10-10-10-10-10-10-10-10-10-10-10-10-1	Neather Cond	ds:	28°F Sunny Collector(s) W Weichert & C Ahrendt											
Total Well Length Water Table Depth A. Casing Diameter 2" f. Calculated Well Volume (see back) WELL PURGING DATA a. Purge Method D. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (see DATE) - Maximum Allowable Turbidity - Stabilization of parameters C. Field Testing Equipment Used: Make M	VATER LEVE	EL DAT	A: (measure	ed from Tor	of Casir	ig)	21.0	Well D	4	Piezomel	er 🗆			
A Purge Method a. Purge Method b. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (© DA well volumes) - Maximum Allowable Turbidity - Stabilization of parameters c. Field Testing Equipment Used: Make Model 555 - Loo Q d. Field Testing Equipment Calibration Documentation Found in Field Notebook # Page # Time Removed (gal) Tim				_			PVC							
a. Purge Method LOW Flow b. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (© LOW Flow) - Maximum Allowable Turbidity - Stabilization of parameters - LOW Flow - Maximum Allowable Turbidity - Stabilization of parameters - LOW Flow - Maximum Allowable Turbidity - Stabilization of parameters - LOW Flow - Maxe Model Serial Number - LOW Flow - Make Model Serial Number - LOW Flow - Maximum Allowable Turbidity - LOW Flow - Maximum Allow - Maximum Allowable - LOW Flow - M	. Water Tab	le Depti	1	14.03	d. Ca	sing Diamete	2"	f. Calcu	lated Well V	olume (see	back)			
- Minimum Required Purge Volume (© JPH well volumes) - Maximum Allowable Turbidity - Stabilization of parameters c. Field Testing Equipment Used: Make Model Serial Number -				Low	F	low								
d. Field Testing Equipment Calibration Documentation Found in Field Notebook # Page # Time Removed (gal) T° (C) pH Spec. Cond (µs/cm) ORP mg/L (NTU) Color Stabilization +/- 10% +/- 10% +/- 10% +/- 10% +/- 10% +/- 10% 5.00 12.0c 0 147 +0.10% 5.0c 12.0c 1447 +0.10% 5.0c 1447	ı	 Minin Maxin 	num Require mum Allowa	ed Purge Vol ble Turbidity	lume (@	20-30	NTUs	ow F	-(ow)					
d. Field Testing Equipment Calibration Documentation Found in Field Notebook # Page # Time Removed (gal) T° (C) pH (µs/cm) ORP mg/L (NTU) Color Stabilization +/-10% +/-10% +/-10% +/-10% +/-10% -/-10% 5.00 10-0 11-17 1-04 533 6 38.5 79.8 +14 6 Clean 1/4. 1/2. 1/2. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- 00	c. Field	Testing Equi	pment Used	t-	No. L. Carlos	Model 656		Serial Num	ber				
Time Removed (gal) T° (C) pH						Hair		Q						
Sample Collection: Method:	100	d. Field	Testing Equ	ipment Calib	oration Do	cumentation I	Found in Field No	tebook #_	Pag	ge #				
Stabilization	71111			1							DTW			
206	the same of the same of the same of	Hem								Color	Other-			
e. Acceptance criteria pass/fail Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. Method: Bluddy 2 mp Sample ID Container Type No. of Containers Wes No N/A Container Type No. of Containers Preservation Analysis Time	1206	(2	11.47	7-04				Daniel	Cleew	14.44			
e. Acceptance criteria pass/fail Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method:		1.	54		6.81.	5327		2.44	42.2		14.27			
e. Acceptance criteria pass/fail Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: Bludd(/ 2mp) Sample ID Container Type No. of Containers Preservation Analysis Tim ASH-07-COPIE SUCOL SELECT SELEC	202	_2	.0.0		6-74		11 11 1	1.45			14.23			
e. Acceptance criteria pass/fail Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: Met	15/2	- 2	2-	1111	19.09			1773	30.2		14.42			
e. Acceptance criteria pass/fail Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: Met				11,50	6-62		16-3	14	4-1	CLECK	7473			
Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: Bladdy 2mp Sample ID Container Type No. of Containers Preservation Analysis Time ASH-07-COPHE Succes Garage Garage Garage Succes Garage		- 1			G. X.F	321	1503	1.10	10. 5		7 14 2			
Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: Bluddy 2mp Sample ID Container Type No. of Containers Preservation Analysis Times Hash-07-COPHE Second 16 Second COPHE 123 SM-07-CCR Second 123														
Sample ID Container Type No. of Containers Preservation Analysis Tim ASH-07-COPHE Secol 16 Secol COPHE 123 ASH-07-CCR Secol 5 Secol CCR 123		Has i Has i Have	required volu required turb parameters	me been rer idity been re stabilized	ached	是	8			11				
ASH-07-COPHE SUCOL 16 SUCOC COPHE 123 ASH-07-CCR SUCOL 5 SUCOC CCR 123	SAMPLE CO	OLLECT	TION:		Method:	Bludde	v pump							
ASH-07-COPHE SUCOL 16 SUCOL COPHE 123	Sample	ID	Container T	уре	No. of	Containers	Preservation		Analysis		Time			
54-07-UR SULOU 5 SULOU CCR 123			E 50	col	14	•	See COC	(DPHE		1230			
comments	15H-07	ur.	5	ecoc			su coc	-	CR		1230			
	comments	1												
ignature Wh Wynni Date 1/15/20	1	11	11/10	in				Date 1	/15	170				

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Well/Piezo ID: A5 H-08

Client: Project No:		Platte Rive	er Power Aut 2	hority - Ra	Date: [-15-20							
ite Location:		Wellington	, CO			Finish 11:55						
Veather Con	ds:	s: 300 Sunny Windy Collector(s) W Weichert & C Ahrendt										
ATER LEV	EL DAT	TA: (measur	ed from To	p of Casir	ng)	1	Well 1	7	Piezomet	er 🗆		
Total Well			_		sing Material	PUC		th of Water				
Water Tab	le Dept	th	10.37	d. Ca	asing Diamete	er_2"	f. Calcu	lated Well \	/olume (see	back)		
LL PURG		ATA e Method	law	Flou)							
- 0i	- Mini	ptance Criter mum Require imum Allowa illization of pa	ed Purge Vo	lume (@	Dian) NA well 20:30	volumes)	w Fle	w				
	c. Field	Testing Equi	ipment Used	1:	Make (5)	Model 556	he.	Serial Nun	nber			
	d. Field	Testing Equ	ipment Cali	bration Do	cumentation	2100 Q Found in Field No		Pa	ge #	-		
		/olume		1	Spec. Cond		DO.	Turbidity	16	INTIA		
Time	Rem	loved (gal)	T° (C)	pH	(µs/cm)	ORP	mg/L	(NTU)	Color	DTW		
o Ce		•	+/- 10%	4/- 10%	+/- 10% 39 7 4	+/- 10%	+/- 10%	5.00		-		
09	1	56	10. 11	4.46	3986	38.0	9.51	10.2	clear	11.50		
13	3	SL	10.42	6.64	3976	26.0	1.62	1110	Clear	14:52		
316	9	.2 L	10.36	668	3977	22.3	1.84	5 94	Clear	15.05		
020	_5	101	9.81	6.65	3971	21.9	2-14	5.34	clear	15.45		
223	- 5	5.56	9.94	6.69	3957	21.6	2.45	4.63	clear	15.6		
02.6	Ý	.06	9,89	6.69	3964	21.8	2.67	5.20	Clear	15.87		
	Acce	ntanaa asitar	io pass/feil		V	N.						
	Has i Has i Have	ptance criteri required volu required turbi parameters no or N/A - I	me been re- idity been re- stabilized	ached	Yes	No.	≨ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					
MPLE CO	LLECT	ION:		Method:	Badde	amp						
Sample I	D	Container T	ype	No. of	Containers	Preservation		Analysis		Time		
1-08-CF	PHE	Su coo		16		see coi	(PPHE		1045		
-08-11		se La		13		Lucoc		E (CR	1045		
nments		Colle	ect 2.	Y W	s/Msp	for CU	R Pro	gram				
nature \	In	WM	Kin				Date_\	/15	10			

Well/Piezo ID:	MW-1/45H-01)	COPHE
	10000 11.1311	CCR

Site Location: Rawhide Finish	Client:		PRPA	V.			Date: 414/20				
Water Level Data: (measured from Top of Casing) a. Total Well Length	Project No:		Dawbi	ida		_	Time: Start 850				
WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length D. Water Table Depth 13.11 d. Casing Diameter F. Calculated Well Volume (see back) WELL PURGING DATA a. Purge Method _ bladder pump b. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (@ well volumes) Low flow c. Field Testing Equipment Used:					serve	Collector(s)	Ahrendt	Finish _			
Casing Material Casing Diameter Calculated Well Volume (see back)			-	,00 10			o. Haromitan, o	. r im ond			
a. Total Well Length	WATER LE	VEL DAT	ΓA: (me	asured fro	m Top of	Casing)		Well [1	Piezomet	er 🗆
### A PURGING DATA a. Purge Methodbladder pump b. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (@			4.000		c. Ca	sing Material		7			A. C. Carlotte
a. Purge Methodbladder pump	o. Water Ta	ble Dept	h ,	13.11	d. Ca	sing Diameter	4	f. Calcul	ated Well Volu	ume (see ba	ack)
a. Purge Methodbladder pump											
b. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (@	WELL PUR			dbladde	r pump						
- Minimum Required Purge Volume (@ well volumes) _ Low flow c. Field Testing Equipment Used:		b. Acce	ptance (Criteria defi	ned (from						
YSI 556 Hach 2100							well volumes) _	_Low flow			
A. Field Testing Equipment Calibration Documentation Found in Field Notebook # Page		c. Field Testing Equipment Used				YSI 556			er	-	
Time Removed (gal) T° (C) pH (µs/cm) ORP mg/L (NTU) Color (ft (µs/cm) ORP mg/L (µs/cm) ORP mg/L (µs/cm) ORP mg/L (µs/cm) ORP (µs/cm) ORP mg/L (µs/cm) ORP (µs/cm) ORP (µs/cm) ORP (µs/cm) ORP (µs/cm) ORP OR		0. 5.164	Carlos I				als an indicate	10.17 (A) 1 (A)	Calca.	Name Lon.	
Time Removed (gal) T° (C) pH (µs/cm) ORP mg/L (NTU) Color (ft Stabilization		d. Field	Testing	g Equipmen	t Calibrati	on Documenta	ition Found in Fi	eld Notebo	ok #	Page #	_
Stabilization		Volu	ıme			Spec. Cond		DO	Turbidity		DTW
Q2A			ed (gal)							Color	(ft)
Color Colo			-								0.3 ft
140						3492					13.20
Companies Comp											
SAMPLE COLLECTION: Method:	GUE					3530					
1									-		15.50
1000 1,8			_								13.52
10 10 10 10 10 10 10 10											
e. Acceptance criteria pass/fail Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. Sample ID Container Type No. of Containers Preservation Analysis Tim ASH-01-CD/No.	The second second										13.52
e. Acceptance criteria pass/fail Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: Met						3546					
e. Acceptance criteria pass/fail Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: Method: Sample ID Container Type No. of Containers Preservation Analysis Tim ASH-01-02716 Str (VC) ASH-01-02716 Time Str (VC) ASH-01-02716 Time Str (VC) ASH-01-02716 Time Str (VC) Time Str (VC)										-	
Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. Sample ID Container Type No. of Containers Preservation Analysis Tim ASIA-01-02 State (VC	1013	-		(0,00	4.13	3557	55, 6	11.10	1.67	1180	15,32
Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. Sample ID Container Type No. of Containers Preservation Analysis Tim ASIA-01-02 State (VC											
Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. Sample ID Container Type No. of Containers Preservation Analysis Tim ASIA-01-02 State (VC						7					
Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. Sample ID Container Type No. of Containers Preservation Analysis Tim ASIA-01-02 State (VC											
Has required volume been removed Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. Sample ID Container Type No. of Containers Preservation Analysis Tim ASIA-01-02 State (VC											
Has required turbidity been reached Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: bludder Sample ID Container Type No. of Containers Preservation Analysis Times As Not - 01 - 02 Str. (VC) 107						The state of the s	No				
Have parameters stabilized If no or N/A - Explain below. SAMPLE COLLECTION: Method: Sample ID Container Type No. of Containers Preservation Analysis Tim ASNA-01-CC R STE (VC ASNA-01-COPPRE							H	The state of the s			
Sample ID Container Type No. of Containers Preservation Analysis Tim							H	H			
Sample ID Container Type No. of Containers Preservation Analysis Time ASAL-01-CC STEE UC TO TO TO THE TOTAL STEEL OF THE TOTAL											
Sample ID Container Type No. of Containers Preservation Analysis Tim ASH-01-CO No. of Containers Preservation No. of Containers N				m, Explui	, bolow,						
Sample ID Container Type No. of Containers Preservation Analysis Time Asharate Container Type No. of Containers Preservation Analysis Time Asharate Container Type No. of Containers Preservation Analysis Time Asharate Container Type No. of Container Type No. of Container Preservation Analysis Time Asharate Container Type No. of Container Type No. of Container Type No. of Container Preservation Analysis Time Asharate Container Type No. of	SAMPLE C	OLLECT	ION:		Method:	bluc	Hor				
ASH-01-CD24E 100 311 CD24E 100 3	Sample	· ID	Contair	ner Type	No. of	Containers	Preservation		Analysis		Time
ASH-01-CDPHE 1					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-	Troco. ration	->	7 111017010		1020
omments (CR/MS/MSD) Collected. 3x volume collected.	ASH-01	-COPH				4					
omments <u>CCR (MS/MSD)</u> Collected. 3× volume collected.											
ignature Date 4/14/ 2020				10	. 34	1 0					
ignature	omments		Ccl	e/m	s/ms	D) Coll	icted. 3	× 101	une Col	lected.	
ignature Date 11141 7020									ni I	24	
	ignature	-	>	>T	WI	_		Date	1111 20	20	
			-								

All the second s	
Well/Piezo ID: ASH-0 Z	CCR
MSM-CE	COPITE

Client: PRPA Project No:						<u>.</u>	Time: Start	Date: 41	tlzo
Site Locatio	n: Ra	whide				-		100	
Weather Co	nds: Su	1, wordy	65°	Collector(s)	J. Hurshman, C	. Ahrendt			
WATER LE	VEL DATA: (measured fro		7 1 2 1 2 2 3		Well 7	1	Piezomete	er 🗆
a. Total Wel	Length	NW	c. Ca	sing Material	Pvc	e. Lengt	h of Water Co	olumn	(a
b. Water Ta	ble Depth	4/6/20		sing Diameter	4"	f. Calcul	ated Well Vol	ume (see ba	ıck)
WELL PUR	GING DATA	41610							
.,		thodbladde	er pump						-
	b. Acceptan	ce Criteria def Required Pu	ined (from ge Volume	workplan) e (@	well volumes) _	_ Low flow			
	c. Field Test	ing Equipmen	t Used:	Make YSI 556 Hach 2100	Model		Serial Number	er	-
	a estate							40000	-
	d. Field Les	ting Equipmei	nt Calibrati	on Documenta	ition Found in Fi	eld Notebo	ok #	Page #	_
Time	Volume Removed (g	al) T° (C)	n l l	Spec. Cond	ODD	DO	Turbidity	Oalas	DTW
Stabilization		0.03	pH +/- 0.1	(µs/cm) +/- 3%	+/- 10 MV	mg/L +/- 10%	(NTU) 5 NTU, 10%	Color	(ft) 0.3 ft
1308	instal	9.65	8.44	3914	49.0	6.57		Clear	2.27
1313	0.3	10.43		3917	47.8	4.65	4.01	Clear	2.70
1318	0.5	10.54	8.57	3928	47.5	4.42	2.79	Claer	3.0
1373	0.7	10,61	8,56	3930	41.9	4.78	2.60	clear	3,4
					17.	1.63			
				4					
				W					
						1			
		1							
									1
		ce criteria pas		Yes	No	N/A			
	Has requi Have para	red volume be red turbidity b ameters stabil r N/A - Explai	een reach ized						
SAMPLE C	OLLECTION		Method:	blad	der				
Sample	ID Icor	tainer Type	No of	Containers	Preservation		Analysis		Time
ASHOZ.		SLL CCC	140.01	Jonanie is	reservation	-3	Allalysis		7330
18H-02.		ec cou				-3			1330
I Shire									13-0
Comments		Dup-3	- CCP	Course	ted				
do mila 650									
lenat.		-T	11			6.00	4/14/202	20	
ignature	>	>1	ild			Date	11191100	U	

Well/Piezo ID:	ASH-03	CCR
		COPHE

The second secon		PRPA	١.				_		Date: 4	20/20
Project No: Site Location	n'	Rawh	ido				-	Time: Start		
Weather Co		-	outy,		Collector(s)	J. Hurshman, C	_ . Ahrendt	Finish		
14 60 17 17 17		7)/			3, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,				
NATER LE	VEL DA	TA: (me	asured fro	m Top of	Casing)		Well 🔽	(Piezomet	er 🔲
a. Total Well	I Length		NM	c. Ca	sing Material	PVC	e. Lengti	of Water C		
. Water Ta	ble Dep	th			sing Diameter		f. Calcula	ated Well Vo	lume (see h	ack)
ALL SENSON AS			16/20							
WELL PUR		ATA								
	a. Purg	e Metho	dbladde	r pump						
			Criteria defi			20021603210323234	mana mana			
						well volumes) _				
	c. Field	Testing	Equipment	Used:	Make Model Serial Number YSI 556					
					Hach 2100					
	d. Field	d Testing	g Equipmer	t Calibrati	on Documenta	ition Found in Fi	eld Noteboo	ok #	Page #	
	I Vol	ume			Spec. Cond		I DO	Turbidity	10000	I DTW
Time	100 E 200 PT	ed (gal)	T° (C)	pН	(µs/cm)	ORP	mg/L	(NTU)	Color	(ft)
Stabilization			0.03	+/- 0.1	+/- 3%	+/- 10 MV		5 NTU, 10%		0.3 ft
1252	Init	iul	17:91	3.77	5113	93.3	1.91	404	clear	34.34
1255		12	12.84	7.54	5176	99.0	1.04	3,04	Clear	37.60
1302		4	12.38	7.51	5154	105.0	0.66	3.91	Clear	37.7
1306		.8	12.48	7.49	2121	106.6	0.46	3.22	acov	31.95
1309		.0	12.45	7,51	5128	107.3	0.30	2,91	Clear	37.95
1313		2	12.49	7.47	2149	108.0	0.74	2.83	acar	37.9
1316		4	17.48	7-48	5151	108.1	0.21	2.46	aco	36.03
1319	1	6	12.50	7.46	5154	108.5	0.19	243	des	38,03
	e. Acce	eptance	criteria pas	s/fail	Yes	No	N/A			
			volume be							
			I turbidity be eters stabili			H				
			I/A - Explain							
				17.17						
		-			4 1 4					
SAMPLE C	OLLEC	TION:		Method:	blado	es				
Sample		Contai	ner Type	No. of	Containers	Preservation		Analysis		Time
ASH-03			Lion	-			7			1325
ISH-03	COPH	5	sie coc				->			1325
N. S. of V		4								
omments		-								
		,	1000	111				1-1-		
gnature	7	-	T	M			Date	1/20/20		

CCR

Client: PRPA				Date: flool 20					
Project No: Site Locatio	n: Par	whide			Finish				
Weather Co		1,70% Su	FILIISH _						
Tourier Co	, <u>, , , , , , , , , , , , , , , , , , </u>	1,90 100	10)	_ Collector(a)	o. Harsiinan, c	, Alliendt			
VATER LE	VEL DATA: (r	measured fro	m Top of	Casing)	016	Well Z		Piezomete	
. Total Wel		NM	c. Ca	sing Material	10-	e. Lengt	h of Water Co	lumn	
. Water Ta	ible Depth	416120	d. Ca	sing Diameter	2	f. Calcul	ated Well Volu	ume (see ba	ick)
VELL PUR	GING DATA								
	2.14.14.14	e Criteria defi		State of the second					
		Required Purg		e (@ \ Make	well volumes) _ Model		Serial Number	er	
	o. How resting Equipment esecu.				/SI 556 Hach 2100				
	d. Field Test	ing Equipmen	t Calibrati	on Documentat	tion Found in Fi	ield Notebo	ok#	Page #	_
	Volume		- 6	Spec. Cond	TA LIE	DO	Turbidity		DTW
Time	Removed (ga		pН	(µs/cm)	ORP	mg/L	(NTU)	Color	(ft)
tabilization		0.03	+/- 0.1	+/- 3%	+/- 10 MV		5 NTU, 10%	In et a	0.3 ft
1336	motion	13,61	8.10	5464	49-1	3.63	51.2	deer	12,63
1340	0.2	12.80	8.00	5411	50.5	0.79		Cloudy	12.76
124A	4.0	12.41	7,00	5476	52.5	0.48	41.4	11	12.84
1348	0.7	12.27	747		54.1	0.38	31.9	it	12.87
1352	1.0	12.25	7.96	5425	54.9	0.33	14.35	· La	12.41
1356	1.3	12.28	7.07	5412	55.5	0.30	4.55	. Cr	12.92
		1 2 2		4					
			46 . 10						
	e. Acceptano			Yes	No	N/A			
		ed volume be ed turbidity be							
		meters stabiliz		eu 🛮	ī	Н			
		r N/A - Explair							
		LAPIGII	. Dolow.						
	-								
				1	1.				
SAMPLE C	OLLECTION:		Method:	blue	der				
	.,								
Sample	e ID Con	tainer Type	No. of	Containers	Preservation		Analysis		Time
NSH-04	-ccR	see coc	-			->			1400
45H-04	-COPHE	see coc	-			-			1400
				- 1					
				-		*			
omments									
4. 30.									
		100	/ 11				11		
gnature	-	7	· LA			Date	41012	0	
		/				0.1.0			

		_	
Well/Piezo ID:		400	1
	ASH-OT	CAPHE	CCVZ

Client:								Date: 41.512 a				
Project No:		Daubi	ido				-	Time: Start	Yw.			
Site Location Neather Co		Rawhi		yest	Collector(s)	J. Hurshman, C	Abrondt	Finish				
veather Co	nus. Į	7,		snew	Collector(s)	J. Hurshinan, C	. Amenut					
NATER LE	VEL DATA	: (me	asured fro	m Top of	Casing)		Well /]	Piezomete	er 🔲		
. Total Well	Length	2000	NN	c. Ca	sing Material	puc	3	h of Water Co		(
b. Water Table Depth Zo.41 d. 0					sing Diameter	2	f. Calcul	ated Well Volu	ume (see ba	ack)		
VELL PUR			dbladde	r pump								
			Criteria defi equired Pur			well volumes) _	_Low flow					
	c. Field Te	esting	Equipment	Used:	Make YSI 556	Model		Serial Number	er			
					Hach 2100					-		
	d. Field T	esting	Equipmen	t Calibrati	on Documenta	tion Found in Fi	eld Notebo	ok #	Page #			
2.1	Volum		Total Soci	-00	Spec. Cond	note in	DO	Turbidity	To be	DTW		
Time	Removed	(gal)	T° (C)	pH	(µs/cm)	ORP	mg/L	(NTU)	Color	(ft)		
Stabilization			0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft		
923	inition	-	10.25	6.25	5023	105.8	4.51	18.1	cloves	20.73		
175	0.1		10197	6.301	5025	95.0	2.36	16.4	Clear	20,80		
930	0.5		11.118	6.56	4994	85.8	1.00	16,9	11	20.50		
935	0,9		11 612	4.63	4984	18.0	0.87	15,1	1.1	20,75		
940	1.2		10.57	4.73	4969	71.6	0.38	14,6	II	26.05		
945	116		10.97		4961	65.8	6.33	12.8	11	20.74		
950	1.9		10 82	6.76	4959	67.4	0.71	8.46	11	20.75		
955	2.2		11.10	690	4746	55.00	0.60	7113	11	20.75		
1000	2.5		10.83	694	4969	57.0	0.61	5.53	11	20.76		
1005	2.5		10.78		4948	57.1	0.50	4132	* 1	20.75		
1010	3.)		10,68	6.95	4959	35.7	0.56	4.84	C	20.76		
	e. Accept	ance o	criteria pas	s/fail	Yes	No	N/A					
			volume be turbidity be									
	Have p	arame	eters stabili /A - Explair	zed								
	- 1			146450								
SAMPLE C	OLLECTIO	ON:		Method:	bloods	5						
Sample			ner Type	No. of	Containers	Preservation		Analysis		Time		
ASH-OT-		SLI	c (0) =	-			-			1015		
4514-05	copite		V.				->			1015		
omments												
				,								
ignature	7		T	un			Date	4/13/20	630			
/		-					3 17					

AECOM

Well/Piezo ID: ASH-06	CCVE
	COPHE

Client:	PRF	'A				Date: 470170 Time: Start 030						
Project No: Site Location	n: Raw	hide				_		1030				
Weather Co			227	Collector(s)	J. Hurshman, C	. Ahrendt	T II II SIT					
NATER LE	VEL DATA: (m	easured fro	om Top of	Casing) sing Material sing Diameter	Puc] h of Water Co	Piezomet	- 1 - 1			
		177	- 4 00	oina Diameter	2							
o. Water Ta	ible Depth	BC. 1	d. Ca	sing Diameter		T. Calcul	ated Well Vol	ume (see b	аск)			
WELL PUR	GING DATA a. Purge Meth	odbladde	er pump									
	b. Acceptance - Minimum F				well volumes) _	_ Low flow						
	c. Field Testin	g Equipmen	t Used:	Make YSI 556 Hach 2100	Model		Serial Number	er	-			
	d. Field Testin	ng Equipmer	nt Calibrati	on Documenta	tion Found in Fi	eld Notebo	ok #	Page #				
2000	Volume	2000	371	Spec. Cond	646	DO	Turbidity	4-34	DTW			
Time Stabilization	Removed (gal) T° (C) 0.03	pH +/- 0.1	(µs/cm) +/- 3%	ORP +/- 10 MV	mg/L	(NTU) 5 NTU, 10%	Color	(ft)			
1041	mf ini	12.86	8,35	741	73.6	4.12	23.8	decr	0.3 ft			
lott	0.7	12.71	8.26	686	76.8	3.82	11.7	clear	63.20			
1047	0.4	12.68	8.27	637	76.5	5,81	6.4	dear	63.60			
1050	0.7	12.69	8.78	670	779	5.95	5.43	clear	63.57			
1053	1.0	12.81	8.19	609	79.9	6.10	5,79	clow	64,13			
	-								-			
								-				
		-							+			
							V					
				-								
	e. Acceptance	criteria nas	c/fail	Yes	No	N/A						
		d volume be				TO THE PARTY OF TH						
		d turbidity b										
		neters stabil										
	If no or	N/A - Explai	n below.									
	1											
	1											
SAMPLE C	OLLECTION:		Method:									
Sample		ainer Type	No. of	Containers	Preservation		Analysis		Time			
78H-06-	cere s	eccoe				-			1100			
ASH-06.	COPHE S	ee coc	-			-			1100			
		1		1								
omments	h	1011 W.	ut dy	hun 1	outnes - 11	+ sen	hone to	compl	ite			
		1001	,	1119	10		3- 10	- Comp				
		11					1.1					
ignature 📑	7-	THE		<u></u>		Date	4/20/20					
- 1	/					7.0						

Well/Piezo ID:	ASH-07	CCR
		COPHE

Client:		PRPA							Date: 4	(20
Project No: Site Locatio	n.	Rawhie	do	_			 -			
Weather Co				d	Collector(s)	J. Hurshman, C	Ahrendt	Piezome ength of Water Column cliculated Well Volume (see by flow Serial Number Page #		
	7.7	1	20 10000	7		o. Halolillan, o	. 7 timeriat			
			sured from			DU	Well /		Piezomete	
a. Total Wel	I Length	19	NM	c. Cas	sing Material	FUL	e. Lengt	h of Water Co	lumn	(a
o. Water Ta	ble Depth	1	13.11	d. Cas	sing Diameter		f. Calcul	ated Well Volu	ıme (see ba	ack)
WELL PUR										
	a. Purge	Method	dbladder	pump						-
			criteria defin quired Purg			well volumes) _	_Low flow			
	c. Field	Testing I	Equipment		Make YSI 556	Model		Serial Number	er	_
				2	Hach 2100			-		-
	d. Field	Testing	Equipment	Calibratio	n Documenta	ation Found in Fi	eld Notebo	ok #	Page #	_
	Volu	me			Spec. Cond		DO	Turbidity		DTW
Time	Remove	d (gal)	T° (C)	pH	(µs/cm)	ORP	mg/L	(NTU)	Color	(ft)
Stabilization	Theta	(0.013	7.59	+/- 3% 5872	+/- 10 MV	3.27		clade	0.3 ft
138	0.2		13.00	7,57	5842	608	1,00			13.65
1141	10.4		12.84	7.52	5822	64.5	0.77	8.31	clev	B.62
1144	٠. ١		12.64	7.51	5893	66.7	0.70	8.88		13.61
1148	1.4		12.49	7.48	5961	67.6	0.66			13.65
1176	1.3		10.00	7.45	607.7	- 0.3		Liste	CVEN	13.66
		-	-						-	
	e Accer	otance c	riteria pass	fail	Yes	No	N/A			
	Has re Has re Have	equired equired parame	volume bee turbidity be ters stabiliz A - Explain	n remove en reache ed	d 🗆	🗆				
SAMPLE C	OLLECT	ION:	1	Method: _	blacki	u				
Sample			er Type	No. of C	ontainers	Preservation		Analysis		Time
XH-07			ce cou	_			7			1200
1011 0.7	CDFA		su coc				>			1200
		-								
omments	19									
				11				111		
gnature <u></u>	7.		T	L			Date	41000		

Well/Piezo ID: AS H-OR	cet
7.0.1 - 0	COPHE

Client:	P	RPA				4	Time: Start	ate:4/13	12020
Project No: Site Locatior	n: D	awhide				-	Time: Start_	1200	
Weather Co				Collector(s)	J. Hurshman, C	. Ahrendt	Finish _		
		7							
VATER LE	VEL DATA:	(measured fro	m Top of	Casing)	0.	Well 📐		Piezomete	er 🗆
. Total Well	I Length	NN	c. Ca	sing Material	PVC		h of Water Co	lumn	(
. Water Ta	ble Depth	9.43	d. Ca	sing Diameter	2	f. Calcul	ated Well Volu	ıme (see ba	ick)
		4/6/202	O .	sing Diameter					
VELL PUR	GING DATA								
	a. Purge M	ethodbladde	er pump						
		nce Criteria def			n de la company	Process Maria			
	- Minimur	n Required Pui	ge Volume	(@	well volumes) _	_ Low flow			
	c. Field Tes	sting Equipmen	t Used:	Make	Model		Serial Number	ir	
				YSI 556 Hach 2100					- -1
	d Field To	stina Equipmo	at Calibratio	n Degumente	tion Found in Fi	ald Nataba	ak #	Dogo #	
	u. Field Te	sting Equipmen	ii Calibratii		tion Found in Fi	eid Notebo	OK #	Page #	
Time	Volume Pomoved (nU.	Spec. Cond	OBB	DO ma/l	Turbidity	Calan	DTW
Time Stabilization	Removed (0.03	pH +/- 0.1	(µs/cm) +/- 3%	ORP +/- 10 MV	mg/L +/- 10%	(NTU) 5 NTU, 10%	Color	(ft) 0.3 ft
1603	Instini	7.76	7.10	4499	54.5	4,00		Clear	9.82
1207	0.2	19.41	7.13	4480	53.8	2,10	4.40	11	10.85
1211	0.4	9.17	7.16	4489	53.2	1.04	4.67	11	11.75
1215	0.7	9.23	7.16	4435	53.1	0.76	3.52	11	12.65
1219	1.0	9.17	7.16	4494	52.7	0.56		14	13.45
12.23	1.2	9.26		4486	52.7	0.59	3.37	15	14.21
12.28	1.5	9.11	7.18	4495	52.8	0.56	7.67	11	14.78
	1			1					
	a Assenta	nce criteria pas	o/foil	Vac	No	NI/A			
		ired volume be		Yes	No	N/A			
	Has requ	ired turbidity b	een reache	ed 🗹					
		rameters stabil			5	П			
		or N/A - Explai							
		As cased resident	4.837.444						
	_								
200000		2	24-5, EV.	bladde	-				
SAMPLE C	OLLECTION	V:	Method:	pladak					
Sample	ID ICC	ntainer Type	No. of (Containers	Preservation		Analysis		Time
ASH-08		See coe	110.01	Somaniers	1 1COCI VALIGIT	-	Analysis		1735
54-08.C		(,				- 13			1235
omments									
		>T	11			Date	4/13/202	40	
gnature)-	> 1 ~	~	-		Date	11.3100		-

Well/Piezo ID:	
VVCII/1 ICZU ID.	
ASHOUN	
17.511	

Client: Project No: Site Locatio Weather Co	n: <u>C</u>	latte River Pow DPHE = 60630 awhide Genera	004, CCR	R = 60630103	J. Dobkowski, C		Time: Start	Date: 7/16,	12020	
WATER LE a. Total Wel b. Water Ta	ll Length	(measured fro 53.70 2,93	_ c. Ca	Casing) asing Material	9VC 417		h of Water Co		77_(a] i-b)
	< 500 ml/mir			-						
WELL PUR	a. Purge M	ethodbladde	er pump						-	
	b. Acceptar	nce Criteria def n Required Pur	ined (from ge Volum	workplan) e (@v	well volumes)	_Low flow				
		sting Equipmen		Make YSI HACH	Model 556		Serial Numbe 06M1171AF 17120C0634	51	-	
Time	Volume Removed (gal) T° (C)	рН	Spec. Cond (µs/cm)	ion Found in Fiel	DO mg/L	Turbidity (NTU)	age #	DTW (ft)	
Stabilization	1L 2L 3,8	+/- 3% 13.21 13.21	6:48 6:57 6:81	+/- 3% 40.71 40.85 40.85	+/- 10 MV 74,1 74,1 74,9 (89,0)	+/- 10% 1.90 1.75	5 NTU, 10% 7.09 6.75 9.32	clear Clear Clear	0.3 ft 3,60 4,25	200 mc/ms
08389	5.00	15:02	7.06	4071	64.1	1.39	3.71 9.14 2.38	Clear	5.18 5.25	
	Has requ Has requ Have pa	nce criteria pas lired volume be lired turbidity b rameters stabili or N/A - Explai	en remov een reach zed		No	N/A				
SAMPLE C	OLLECTION	V:	Method:	bladder pump						
Sample ASH-02 ASH-02	-CDPHE -CCR	ontainer Type See COC — See COC —	No. of	Containers	Preservation	,			Time 0900	
Comments		DUP-0)1-(CCR	W45	colle	cteal,	MS/M	ISD Co	ollected
Signature	Myr	NAKA	2hi	<u> </u>		Date	7/16/	2020		E.

b. Ac - M	CDF	te River Pow PHE = 60630 hide Genera	004, CCF	R = 60630103	was a second of the second of		Time: Start J	Oate: 4/1 (5:25)	7/14/20) (7/14/20) (7/15/20)	
Veather Co	nds: St	inny ilui	indy.	_Collector(s)	J. Dobkowski, C	. Ahrendt			7/20/20)	
		easured fro		f Casing) asing Material	PVC	Well [th of Water Co	Piezomet		h)
		62.78	_	asing Diameter			lated Well Volu			<i>-</i> /
		Common Common Maria		daing Diameter		i. Calcu	ated Well Volt	nue (see n		-
			er pump_							
	b. Acceptance - Minimum F	Criteria defi Required Pur	ned (fron ge Volum		well volumes)	Low flow				
	c. Field Testin	g Equipment	Used:	Make YSI HACH	Model 556	OUR SECTION OF THE SE	Serial Numbe 06M1171AF 17120C0634			
	d. Field Testin	ng Equipmen	t Calibrat	tion Documenta	ition Found in Field	d Noteboo	k#P	age #	No. of Contract	
Time tabilization	Volume Removed (gal		pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)	
5:27	0	+/-3%	+/- 0.1 8,25	+/- 3%	+/- 10 MV	6.40	5 NTU, 10%	Clear	62.97	
15:33 15:37	0.5	14,13	7.29	658	50 50		7,24	d	63.60	
5:42	1,0	13.78	7.19	631	53.5 56.3	7,23	2.76	11	64.30	
5:47	1.25	3.67	7.13	618	58.4	7.61	3.82	10	64.90	
5:52	1.50.	13.35	7.13	619	59.9	6.95	2115	ė,	65-30	
5:57	1.75	13.68	7.15	623	59.9	6.49	0.89	11	65.75	
well	Purged		Hing	rechare			13.74		100.42	
01-30	0-25 10-25	17.46	720		- 83°/	7-36	LH	IC	6572	
377.3.3		7	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	7		, , , , , , , , , , , , , , , , , , ,				
127 we	1 went d	19.85	2.61	128 1	42.5	9,50	10.8	Ala-	67.82	
3:40	0.56	17.47	8,20	711	61.8	7.16	7.76	clear	67.90	
3:43	0.75L	16.43	7.75	689	55,3	7.15	4.37	31.	68.15	
3:46	e. Acceptance	criteria pass	/ //	Yes	55.3 No	7.08 N/A	3,87	- 36	68-28	
ell Jent Jry Jurin Juri	Has require Have paran If no or	d volume be d turbidity be neters stabiliz N/A - Explair N/A - Explair	een reach zed n below. gecl	dry (+w.	(e) j Tem	o cha	nge du	e to	weather	V (01
Sample		iner Type	No. of	f Containers	Preservation		Analysis		Time ,	
SH-0G-	-CDPHE S	ee COC —		The discovering of the second			-		0830/	400
14-06	- CCR S	00 GQC							1400	
1-06		e-4-								7/2016
					,		-100			1292
omments										
omments		Wangh			TWO TO THE TOTAL PROPERTY OF THE TOTAL PROPE	no commente			THE PARTY.	

Client: Project No: Site Location Weather Con	cation: Rawhide Generating Station Finish 1345										
	Length ple Depth 500 ml/r SING DAT a. Purge	min): _ TA Method	30.08 14.02 1_bladde	c. Ca	asing Material 1			n of Water Colu		06 (a	
H	- Minim c. Field T	num Rec	quired Pur	ge Volum	Make YSI HACH	Model 556 tion Found in Fiel	191 1111	Serial Numbe 06M1171AF 17120C06345	51	-	
Stabilization 12.25 12.35 12.35 12.43 12.46 12.44 12.52 12.55	6.5 6.5 6.7 7,01	d (gal)	T° (C) +/- 3% (5, 61 13,60 13,01 14,72 14,80 15,06 15,06 14,95	en remove en reach	Spec. Cond (µs/cm) +/-3% 66.7 64.24 64.5 65.84 670.5 67.83 67.99 68.77 69.21	ORP +/- 10 MV - 48.7 - 46.9 - 48.8 - 45.2 - 44.1 - 43.5 - 44.6 - 45.3 - 45.8	DO mg/L +/- 10% 5-65 0-78 0-61 0-55 0-47 0-42 0-40 0-38	Turbidity (NTU) 5 NTU, 10% 21, 6 17, 5 14.0 5.82 5.06 7.73 5.09 4,92 3.88	Color Clear 11 11 11 11		
SAMPLE CO Sample ASH-07- ASH-07 Comments	If r	ON: Containe	A - Explair	n below.	bladder pump Containers	Preservation		Analysis		Time 1315 1315	

Well/Piezo	ID.			_
vveinFlezo	IUA /	11	20	
	415	11/ -	08	

Client: Project No: Site Locatio Weather Co	n: E	awhide Gene	30004, CCF	R = 60630103	J. Dobkowski, C	. Ahrendt	Time: Start Li Finish 1	ate: 7//6 0.40 2.15	6/20	
WATER LE a. Total We b. Water Ta	l Length	(measured 29,0	12 c. c.	f Casing) asing Material _ asing Diameter	3" 2"		h of Water Colu ated Well Volu		<u>.97</u> (a	a-b)
Flow Rate (< 500 ml/mi	n);								
VELL PUR	GING DATA a. Purge M	lethodblac	der pump_	· · · · · · · · · · · · · · · · · · ·	- Andrews	Marin Co.				
	b. Accepta - Minimu	nce Criteria c m Required F	efined (from urge Volum	n workplan) ne (@v	well volumes)	_Low flow				
	c. Field Te	sting Equipm	ent Used:	Make YSI HACH	Model 556		Serial Number 06M1171AF 17120C06345			
	d. Field Te	esting Equipn	ent Calibrat		ion Found in Fiel	d Notebool	oo romaaa	A CONTRACTOR OF THE CONTRACTOR		
Time Stabilization	Volume Removed			Spec. Cond (µs/cm) +/- 3%	ORP +/- 10 MV	DO mg/L	Turbidity (NTU) 5 NTU, 10%	Color	(ft) 0.3 ft	
1044	2	15.4	5 7.55 5 6.77	4437	36.9 47.8	20,68	17.5 15.3	Clear	12.55	220 ml/m
1053	3.5 C GL 7.5	L 12.70	6.18	4420 4418 4425	48.6 47.4 46.0	0,64	6.28 7.04 4.15	/ ₁	14.45 16.39 17.96	144 = V
1108	9.5L	4.50	1 6.60	4421	45,2 41,7 40,7	0.36	8,73 5,84 2,62	t; 2	19.36 19.51 19.45	100 mynin
1121	(1.8		6,93	4451	40.6 41.4	0,31	3.43	- Ti	19.45	
пиотичнений і										
								· · · · · · · · · · · · · · · · · · ·		
		nce criteria p		Yes /	No	N/A				
	Has req Have pa	uired volume uired turbidity rrameters sta or N/A - Exp	been reach							
SAMPLE C	OLLECTIO	N:	Method:	bladder pump						
Sample ASH - 08	-CDPHE	ontainer Type See COC		f Containers	Preservation		Analysis •		Time	
ASH-0	8 -CCR	See COC							1130	
		Rendin				1				I
comments		90		O AME	This common to the					_



Well/Piezo ID: ASH-01

Client: Project No: Site Locatio Weather Co	CDF n: Raw	e River Pov PHE = 60630 hide Gener	0004, CCF ating Stati	R = 60630103	J. Dobkowski, G	G. Dawson	Time: Start Finish	0ate: 10/0 8:55 0:00)5/20	
a. Total Wel b. Water Ta	ble Depth < 500 ml/min):	32.25 13,36	_ c. C.	f Casing) asing Material asing Diameter			h of Water Co ated Well Volu	113334	(a	
	a. Purge Methb. Acceptance	Criteria de	fined (fron	n workplan)				The second second	-	
	c. Field Testin	g Equipmer	t Used:	Make YSI HACH	well volumes) Model 556 tion Found in Fiel		Serial Numbe 11E101016 11120C0148	34		
Time	Volume Removed (gal		рН	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)	
Stabilization		+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%	Color	0.3 ft	15.7
8:58	_	12.12	7.14	3755	32.0	1.95	4.37	clear	13.91	X
9:03	NM	12.15	7.25	3755	30.1	1.70	4.52	clear	13.92	300
9:06	NW	12.35	7.30 7.31	3760 3754	29.8	1.68	4.01	clear	13.90	
	e. Acceptance		- Kail	Yes	No	N/A				The control of
	Has require Has require Have paran	d volume be d turbidity b	een remov een reach ized in below.	/ed □						
Sample	ID Conta	ainer Type	No. o	f Containers	Preservation		Analysis		Time	
ASH-01	-CDPHE S	ee COC —					•		4:15	
ASH-01	-CCR S	ee COC —			100000000000000000000000000000000000000			Juni	9:15	
								~1 mmn 0		
Comments					1550 1550 (1550)	I				
Signature	Af I	6 Mass	K.		e entire en entire en entire en en entire en	Date	10/05/20	20	-	



N 4 - 61 (PS)	175	
Vell/Piez	3 ID:	
	1 (11	- 07
	17.44	- 11 M

Client: Project No: Site Location	CDP	e River Pov HE = 6063 nide Gener	0004, CCF	R = 60630103			Time: Start		1/20	
Weather Co		Sunny		Collector(s)	J. Dobkowski, C	3. Dawson			io n	
WATER LEV	/EL DATA: (me	53.43	c. Ca	asing Material	PVC	Well ⊾ e. Leng	th of Water Co	Piezomet		(a-b)
o. Water Ta	ble Depth	4.42	d. Ca	asing Diameter	4"	f. Calcu	lated Well Volu	ıme (see b	ack)	
Flow Rate (< 500 ml/min):									
VELL PURC	SING DATA a. Purge Metho	odbladd	er pump_	- 1011111111111111111111111111111111111	·	CHOOL MILES				
	b. Acceptance - Minimum R	Criteria de equired Pu	fined (from rge Volum	workplan) le (@	well volumes)	_Low flow				
	c. Field Testing	Equipmer	nt Used:	Make YSI HACH	Model 556	News and	Serial Number 11E101016 11120C01483			
	d. Field Testin	g Equipme	nt Calibrat	ion Documenta	tion Found in Fie	ld Noteboo	ok#F	age#		
Time	Volume Removed (gal)		рН	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)	
tabilization	8	+/- 3%	16.87	+/-3% 4351	+/- 10 MV	+/- 10%	5 NTU, 10%	clear	0.3 ft	Jacomer.
8:05	-	12,76	6,99	4270	4,2.9	12.07	6.23	11	4.95	200my/n;
8°09 8°13		12.59	7,41	4238	42.0	1.50	3.84	fı	5,41	150 ml/
1:16		12,80	741	4240	439.8	1,32	3.66	4	5.75	
:19		12.89	7.45	4236	38.6	1.21	3.41	11	5.93	
4										
								- Commission of the Commission		-
				1					III SHIIAN I - I -	
									-	
			1			1				
					/-					
	ANADIS A P							10-11M-100-10		-
			14 -3 44							
	e. Acceptance Has required Has required Has required Have param If no or N	volume be turbidity b	een remov een reach ized		No					
SAMPLE CO	DLLECTION:	улизноли.	Method:	bladder pump	, , , , , , , , , , , , , , , , , , , ,					
Sample		ner Type	No. of	Containers	Preservation		Analysis		Time	
ASH-02 - ASH-02		e COC — e COC —							8:30	4
4311-04	-00K Se	e 000 —						· · · · · · · · · · · · · · · · · · ·	8:30	
		- Marine								
	Di	10-0	7 /	Mectal F	or CDPH	E DI	10- AU	collect	od Fa	rCCR
omments	11	of O	5 00	mecial t	VI CUITI	11)0	/T () 7	CONTECT	CC1 10	
	IL OXI	Just		11010000		14	Ing las	1-a		-
nature n	MHI //05	MYN	***************************************	_		Date 10	109/202	0		

Client: Project No:	(CDPHE	= 6063	wer Autho	R = 60630103			Time: Start	Date: 10	105/20	
Site Locatio	n: <u>F</u>	Rawhid	e Gener	rating Sta	tion			Finish			
Veather Co	nds: o	lag	132	•	Collector(s)	J. Dobkowski,	G. Dawsor	1			
WATER LE	VEL DATA:	(meas	ured fr	om Top o	of Casing)		Well [1	Piezom	otor 🖂	l
a. Total Wel			0.50		Casing Material	Puc	/	th of Water Co			ı-b)
o. Water Ta	ble Depth	_	37.8		Casing Diameter	_2		lated Well Vol			
Flow Rate (< 500 ml/mi	n): _	200	lm G	_						
VELL PURC	a. Purge M		_bladd	er pump							
	b. Accepta	nce Cri	teria de	fined (fror	m workplan)	well volumes)	Versan				
	c. Field Tes				Make		Low flow				
	1000000	9	dapino	it Odeu.	YSI	Model 556		Serial Number 11E101016	er		
					HACH			11120C0148	34		
	d. Field Te	sting E	quipme	nt Calibra	tion Documenta	tion Found in Fie	eld Noteboo	ok#F	Page #		
201	Volume	L		1	Spec. Cond		I DO	Turbidity		I DTW	
Time tabilization	Removed (T° (C)	pH +/- 0.1	(µs/cm) +/- 3%	ORP	mg/L	(NTU)	Color	(ft)	
6:37	~		1.75	7.01	445 4	+/- 10 MV		5 NTU, 10%		0.3 ft	. 2
8.40	0.1		2.91	7.02	4921	20.4	1.74	100	Cler	38.93	. 2
9	1.3 1943	_	296	7.09	4450	10.1	1.51	11:11	116	39.13	
8:46°	1.9	1	o.uq.	7.06	4967	3.0	1.54	102	CIN	39.41	
7.62	3,4	1	106	707	4971	-03	1.54	9.97	211	39.55	
6.55	3.0	1	187	7.07	4981	-1.	[,0,]	4.16	111	3913	
8:54	4)	1	IN	704	4942	-07	1,91	8.56	141	301.65	
910	4.4	11	.04	7.04	1981	- 915:11	1:34	1.57	114	39,10	
1,04	5.4		11.04	7.00	4944	-11.2	1,42	5.97	1111	39.73	
9:07	6,0	11	.030	7.24	4944	-12 4	1.74	5.50	11	39.75	
4:10	66	- 11	03	7.08	4960	-135	1.10	574	1111	34.76	
9:11	7.7	-	.02	7,04	4961	-14.4	1.79	3-46	101	3048	
a: 10	256		100	726	4981	-15.5	171	274	111	39.78	
4.22	270		100	7.06	4979	7160	177	3.15	11.11	301.71	
1.	VI, U	10	U-W	704	41/1	-16.5	4,174	3.01	1111	39.40	
е	. Acceptan	ce crite	ria pass	/fail	Yes	No	NVA				
	Has requi	red vol	ume bei	en remove	ed 🗆		N/A				
	Has requi	red turk	pidity be	en reach	ed 🔲	d	6				
	Have para	meters	stabiliz	ed				-11			
	11 110 0	IV/A -	Explain	below.			53				
	100										
	Vanada A										
MPLE CO	LLECTION:		1	Method: I	oladder pump	P					
Sample II) Con	tainer 7	Type T	No of	Containers	Proconiction					
		See CC		140. 01	Containers	Preservation		Analysis		Time	
4-03		See CC	oc =							922	
nments		4	efollo	P	vigina at	9',22 mi	1 Stoled	(Whit	Non		
ALCO PARTY	-					- 11	A Gard	Cio wiii			
atura											
ature					-	11	Date				

AECOM

ASH-04

Client: Project No: Site Locatio	n:	CDPH	River Pow IE = 60630 ide Genera	004, CCR	= 60630103			Time: Start _ Finish _		15/20
VVeather Co			,500		Collector(s)	J. Dobkowski, C	G. Dawson	, ,,,,,,,,		
water Le	Length		37.37	c. Ca	sing Material			h of Water Col		(a
b. Water Ta			12.97	d. Ca	ising Diameter		f. Calcul	ated Well Volu	me (see b	ack)
Flow Rate (< 500 ml/	min):			*					
WELL PUR			dbladde	r pump						
	b. Accep	otance (num Re	Criteria defi quired Pur	ned (from ge Volum	workplan) e (@	well volumes)	_Low flow			
	c. Field	Testing	Equipment	Used:	Make YSI HACH	Model 556		Serial Number 11E101016 11120C01483		-
	d. Field	Testing	Equipmen	t Calibrati	on Documenta	tion Found in Fie	ld Noteboo	k#P	age #	
Time Stabilization	Volu Remove	The state of the s	T° (C) +/- 3%	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10 MV	DO mg/L +/- 10%	Turbidity (NTU) 5 NTU, 10%	Color	(ft) 0.3 ft
16:25	-	-	13.31	7.29	5213	0.9	1,90	775	//W	13.50
13:25	0.4	-	1286	7.22	53.00	-54	0.7H	54.1	1 4	13.55
13: 34		5	12.9	7.13	Stug	~ 5.81	0,55	34.7	110	13.60
13:40	2.3	50	12.67	7.17	5293	-6.0	0.43	20,6	1111	13.61
13:43	2.0	6070		7.04	5281	-6.4	0.42	12.1	114	13.67
13:46	3.1		12.9	7.00	5269	-71	0.34	7.44	114	13.66
13:52	415	1	1292	709	5235	-7.3	0,33	6.27	114	13.64
13.55	4.60)	12.98	1,00	5292	-7.4	0.32	9-83-136	r/L	13.70
	Has re Has re Have	equired equired parame	riteria pass volume be turbidity be ters stabili /A - Explair	en remov een reach zed		No	NA O	/		
SAMPLE C	OLL ECT	ON:		Method:	bladder pump					
Sample			ner Type		Containers	Preservation		Analysis		I Time I
ASH-04	-CDPHE	See	COC -	140. 01	Contamers	i i coci vationi	,			Time
ASH-04	-CCR	See	COC —							
									1	
Comments		6tu	w	Smp	ms	13:55			7	
Signature							Date			

Well/Piezo ID: ASH-05

b. Water Table Depth \$\overline{20.75}\$ d. Casing Diameter $2''$ f. Calcul Flow Rate (< 500 ml/min): WELL PURGING DATA a. Purge Methodbladder pump b. Acceptance Criteria defined (from workplan) - Minimum Required Purge Volume (@ well volumes) Low flow c. Field Testing Equipment Used: Make Model	of Water Columited Well Volum Serial Number 11E101016 11120C014834	Piezometer	(a-	
### WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length 37.20 c. Casing Material PVC e. Length	of Water Columited Well Volum Serial Number 11E101016 11120C014834	mn	(a-	
a. Total Well Length 37.22 c. Casing Material VV e. Lengt po. Water Table Depth 20.75 d. Casing Diameter 2" f. Calcul Flow Rate (< 500 ml/min): WELL PURGING DATA a. Purge Methodbladder pump	of Water Columited Well Volum Serial Number 11E101016 11120C014834	mn	(a-	
Description	Serial Number 11E101016 11120C014834	ne (see bad		
NELL PURGING DATA	Serial Number 11E101016 11120C014834 # Pa		ck)	= √
December December	11E101016 11120C014834 :#Pa	<u> </u>		
a. Purge Methodbladder pump	11E101016 11120C014834 :#Pa	<u> </u>		
- Minimum Required Purge Volume (@	11E101016 11120C014834 :#Pa	<u> </u>		
Volume Removed (gal) T° (C) pH Spec. Cond (us/cm) ORP mg/L	11E101016 11120C014834 :#Pa	<u> </u>		
HACH	11120C014834 :#Pa			
Volume		ge #		
Volume		-		
Time Removed (gal) T° (C) pH (µs/cm) ORP mg/L stabilization — +/- 3% +/- 0.1 +/- 3% +/- 10 MV +/- 10% 0 : 122	Turbidity	-	DTW	in a
0:22	(NTU)	Color	(ft)	
10:25	5 NTU, 10%	clear	0.3 ft	225 mg
C:31	17.7	13	21.01	,,,,
10:34	0.8	t1 D	21.04	
0:40	4.54	11/	21.05	
0:43	8.81	1)	21.02	
e. Acceptance criteria pass/fail Has required volume been removed Has required turbidity been reached Have parameters stabilized	18.2 8.56	1,	21.03	
e. Acceptance criteria pass/fail Yes/ No N/A Has required volume been removed Z/	7.64		21.05	
Has required volume been removed Has required turbidity been reached Have parameters stabilized	6.98	11 2	21.03	
Has required volume been removed Has required turbidity been reached Have parameters stabilized				
Has required volume been removed Has required turbidity been reached Have parameters stabilized	- Campa			
Has required volume been removed Has required turbidity been reached Have parameters stabilized				
Has required volume been removed Has required turbidity been reached Have parameters stabilized			-	
Has required volume been removed Has required turbidity been reached Have parameters stabilized				
SAMPLE COLLECTION: Method: bladder pump	- Sarefilling Long C			
Sample ID Container Type No. of Containers Preservation			Time	
51-05-CDPHE See COC	Analysis		1:00	
3.19 35.1	Analysis		11:00	
	Analysis			
	Analysis			
omments	Analysis			
gnature QUL Jolyushi Date	Analysis		100000	

whateo

Client: Project No: Site Location		CDPH	River Pow IE = 60630 ide Genera	004, CCF	R = 60630103		3	Time: Start	Date: 10/ 8:00 1:25	12/20	
Weather Co		_	windy	_	_Collector(s)	J. Dobkowski, O	G. Dawson	rinish _	1.45		
WATER LEVal. Total Wellow. Water Ta	Length		-	c. Ca	f Casing) asing Material asing Diameter	711		f h of Water Co ated Well Volu		(
WELL PUR											
			dbladde		C hiera						
	 b. Accept Minim 	ance (um Re	Criteria defi equired Pur	ned (from ge Volum	workplan) e (@	well volumes)	_Low flow				
	c. Field T	esting	Equipment	Used:	Make YSI HACH	Model 556		Serial Number 11E101016 11120C01483		-	
	d. Field T	Testing	Equipmen	t Calibrat	ion Documenta	tion Found in Fie	ld Noteboo	k#F	Page #		
Time Stabilization	Volum Removed	The state of the s	T° (C) +/- 3%	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10 MV	DO mg/L +/- 10%	Turbidity (NTU) 5 NTU, 10%	Color	(ft) 0.3 ft	
8:13	٥		12.15	6.66	713	36.5	8.90	6.72	clear	6.3.32	100 my.
8:19			12.82	7.18	669	23.7	8.70	3,79	11	63.40	
1,25			12.75	7.22	65.5	19,1	8.71	2.34	li	63.61	
- 4											
				- 24							
			riteria pass volume be		Yes ed	No	N/A				
	Has red	quired	turbidity be	en reach							
			A - Explain								
											0
SAMPLE CO	DLLECTIC	ON:	J	Method:	bladder pump						
Sample		Contain See	er Type	No. of	Containers	Preservation		Analysis		Time 8:30	10/12/2
15H-06 15H-06 -	-CCR	See	COC —		2_	1403	20	CCR, No	e vedan	900	10/11/20
pi 00	CCT					The 3	(12 Rodin		940	10/20/20
omments		10/16	170 Gr	مهد ک	ne of cep	-no pyr). Well	unded:	to ver	olye.	
gnature	Iffe !	200	MGl	1	_		Date _ / (2/12/200	76		
V	U										
1.1/1.2	- 111	W -	d d	of Li	In bother	s, letting	rechar				
10116	~ ~	1	110	1	Distagning	> letting it	reclass	- MA	ai ai	00	

A=COM

Well/Piezo ID: AS/+ - 07

Client: Project No: Site Locatio Weather Co	n: <u>I</u>	Platte River Po CDPHE = 6063 Rawhide Gene	30004, CC	R = 60630103	J. Dobkowski ,	G Dawson	Time: Start_ Finish_	Date: 10/	0.6/20	
	VEL DATA	: (measured f			P.M.	Well [Piezome		-13
b. Water Ta	A A COLUMN	15.4		asing Material	2		th of Water Co			
		20		asing Diameter	0	f. Calcu	lated Well Volu	ıme (see t	oack)	-
Flow Rate (-						
VELL I OIK		Methodbladd	der pump_							
	b. Accepta - Minimu	nce Criteria de m Required Po	efined (fron urge Volum	n workplan) ne (@	well volumes)	Low flow				
		sting Equipme		Make YSI HACH	Model 556		Serial Number 11E101016 11120C01483			
	d. Field Te	esting Equipme	ent Calibra	tion Documenta	tion Found in Fie	eld Noteboo			-0	
Time Stabilization	Volume Removed		pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10 MV	DO mg/L	Turbidity (NTU) 5 NTU, 10%	Color	DTW (ft)	
10.38	0.1	11.43	7.04	6177	-10.4	3305	44.0	flar	0.3 ft	- 300.
10:41	1.2	1153	1 7.03	1240	-10.9	2.57	36,05	114	16.03	
10:50	134	11.76	704	6194	-11.0	2.14	32.6	SIX	16.11	
10:53	3.0	12.16	7.05	1222	-11.7	7.17	215	11:1	16.14	16,10
10:50	U.2	12.21	7.17	6270	-12.4	1.41	924	her	16.11	1000
11102	4.4	12.24	7.09	6340	-13.2	1.13	7.41	/11	16.13	
11:04	504	0 12.40	7.00	9.462	-13.4	1.47	519	1/11	16.11	
	6:6	12.30	710	6512	-12.5	124	5,23	1,1	16:19	
114	13	2 244	715	6524	-11.5	1.74	3.431	IN	16:13	
1,50	8.0	12.6	7.12	6840	-11.14	1.13	3.26	110	16.13	
	e Accenta	nce criteria pas	se/fail	Yes	No	NVA				1
	Has requ Has requ Have pa	uired volume b uired turbidity b rameters stabi or N/A - Expla	een remov een reach lized	red 🗆						130 131
AMPLE CO	DLLECTION	N:	Method:	bladder pump						
Sample	ID Co	ntainer Type See COC —	No. of	Containers	Preservation		Analysis		Time	
A5 H-0	7-CCR	See COC —				*			DZD	
	l l	ri I.	coll : I	N aL II	`20					
omments	-	Storted	collecte	n at 11	40					
gnature						Date			à	

Client: Project No: Site Locatio	CD	tte River Po	0004, CC	R = 60630103	- 100		Time: Start		3/20	
Weather Co		whide Gene UM, bre		Collector(s)	J. Dobkowski,	G. Dawson	Finish	14:15		Y.
	mm Suc	7,	<u>()</u>		1000		7			
WATER LE a. Total We	VEL DATA: (r II Length	neasured fr 29.98	c. C	f Casing) asing Material asing Diameter	Puc	Well [th of Water Co	Piezome	The second secon	(a-b)
o. Water Ta	able Depth	11.06	d. C	asing Diameter	24		lated Welf Volu			to Care
Flow Rate (< 500 ml/min):					10 -4100	idida yyon yon	anic (500 i		mill
	GING DATA a. Purge Met		er pump_							
	b. Acceptanc - Minimum	e Criteria de Required Pu	fined (fron	n workplan) ne (@	well volumes)	_Low flow			minate (
	c. Field Testir	ng Equipmer	nt Used:	Make YSI HACH	Model 556		Serial Numbe			
	d Field Testi	na Causana	-1 O -17				11120C01483		-	
700		ng Equipme	nt Calibrai	lion Documenta	tion Found in Fie	eld Noteboo	k#F	age #		
Time	Volume Removed (ga	I) T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO	Turbidity	6.1	DTW	1
Stabilization		+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	mg/L +/- 10%	(NTU) 5 NTU, 10%	Color	(ft) 0.3 ft	
12:50	0	14,59	6.97	4527	1,73	1.03	13.1	crear	12.25	200 mg
2:53		14,20	6.97	4521	0,4	0.75	7,91	- (1	13.87	
2:57		14.06	6.93	4520	0.1	0.58	5,55 3,88	10	14.76	
413:02	AND THE PARTY OF T	13453	6.96	4526	-0.5	0.55	5.39	· ti	7.06	Loom
3:06		13053	6.96	4518	-0.2	11.06	5.88	11	18.54	Hoom
13:09		14.05	6.96	45 (8	0.1	1.25	5.74	41	18.54	
13:15		15.92	6.96	4499 4516	0.9	0.7.3	3.90 2.51	H	19.67	100my
13:18	THE CONTRACT OF THE CONTRACT O	16,34	6.96	4530	1.0	0.69	3.21	11	19.69	
13:21		16.40	7.01	4534	1.2	0.64	2.50	H	19.67	
					1					
						1 1 1				
	100				con and an analysis of the second					(
	Has require Have param	d volume be d turbidity be	en remov een reach zed	ed 년 년	hmge du	ve to	Weash	of Co.	nlition	S
	DLLECTION:			bladder pump					none.	
Sample ASH-08	THE STATE OF THE S	iner Type ee COC —	No. of	Containers	Preservation		Analysis		Time	
ASH - 108		e COC	-						3:30	
									13-30	
			- 11 A		- Funnes - Gu i					
100-10		1							-	
mments										
		100								
	111	Harsh								

AECOM Environment

Appendix B

Laboratory Analytical and Data Validation Reports

AECOM Environment

January 2020

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60326782

Sampling Event: January 15, 2020
Data Reviewer: Brian Rothmeyer
Peer Reviewer: Steve Szocik
Date Completed: February 18, 2020
Date Completed: February 19, 2020

This report contains the final results of the data validation conducted for the water samples collected January 15, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	C	a	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges. Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.		X ¹	
	Analyte MS/MSD Limits RPD Limits (%) (%) (%) (%) ASH-08-CCR Chromium 58/57 75-125 1 20 % - Percent MS/MSD - Matrix Spike/ Matrix Spike Duplicate RPD - Relative Percent Difference Bold indicates a value that is outside of acceptance limits.			
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:	X		

Review Parameter	Criteria	Criteria Met?			
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA	
	 When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL. 				
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: Parent Sample Field Duplicate ASH-02(MW-2)-CCR DUP-2-CCR				
	• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.	X			
	• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.				
Equipment Blanks	Two equipment blanks were collected with the samples associated with this sampling event. No target analytes reported in the associated equipment blank. Analyte		X ²		
Reporting Limits Met (Non –Radiochemistry)	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X			
Detection Limits Mets (Radiochemistry)	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.			X	
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	- 		X	
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X			

- 1 As the potential bias was considered to be low, the associated chromium result for sample ASH-08-CCR was qualified as estimated (J- m).
- 2 As the TDS results were reported at concentrations>5x the concentration of the blank contamination, qualification was not considered necessary.



January 30, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: PRPA RAWHIDE CCR Pace Project No.: 60326782

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on January 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Diantos m. Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water Arkansas Certification #: 19-016-0

Arkansas Drinking Water Illinois Certification #: 004455 Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-19-12 Utah Certification #: KS000212018-8

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070



SAMPLE SUMMARY

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60326782001	ASH-02(MW-2)-CCR	Water	01/15/20 09:00	01/16/20 08:20
60326782002	DUP-2-CCR	Water	01/15/20 08:00	01/16/20 08:20
60326782003	EB-2-CCR	Water	01/15/20 10:20	01/16/20 08:20
60326782004	ASH-08-CCR	Water	01/15/20 10:45	01/16/20 08:20
60326782005	ASH-07-CCR	Water	01/15/20 12:30	01/16/20 08:20
60326782006	ASH-06-CCR	Water	01/15/20 14:00	01/16/20 08:20



SAMPLE ANALYTE COUNT

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60326782001	ASH-02(MW-2)-CCR	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782002	DUP-2-CCR	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
	EPA 7470	JLH	1	PASI-K	
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782003	EB-2-CCR	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782004	ASH-08-CCR	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782005	ASH-07-CCR	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782006	ASH-06-CCR	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K



Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

Sample: ASH-02(MW-2)-CCR	Lab ID: 6032	26782001	Collected: 01/15/2	20 09:00	Received: 01	/16/20 08:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Meth	nod: EP/	A 3010			
Boron	2010	ug/L	100	1	01/17/20 15:00	01/20/20 14:44	7440-42-8	
Calcium	169000	ug/L	200	1	01/17/20 15:00	01/20/20 14:44	7440-70-2	
Lithium	290	ug/L	10.0	1	01/17/20 15:00	01/20/20 14:44	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Meth	nod: EP/	A 3010			
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-36-0	
Arsenic	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-38-2	
Barium	19.8	ug/L	5.0	5	01/21/20 14:20	01/30/20 14:35	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:31	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:31	7440-43-9	
Chromium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-47-3	
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-48-4	
_ead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7439-92-1	
Molybdenum	8.2	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7439-98-7	
Selenium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7782-49-2	
Γhallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Meth	nod: EP/	A 7470			
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 11:50	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C					
Total Dissolved Solids	4320	mg/L	66.7	1		01/21/20 13:51		
9056 IC Anions	Analytical Meth	od: EPA 90	56					
Chloride	21.4	mg/L	2.0	2		01/21/20 19:36	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 19:34	16984-48-8	
Sulfate	2420	mg/L	200	200		01/21/20 19:52	14808-79-8	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

Sample: DUP-2-CCR	Lab ID: 6032	26782002	Collected: 01/15/2	20 08:00	Received: 01	/16/20 08:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Meth	nod: EP/	A 3010			
Boron	2000	ug/L	100	1	01/17/20 15:00	01/20/20 14:46	7440-42-8	
Calcium	170000	ug/L	200	1	01/17/20 15:00	01/20/20 14:46	7440-70-2	
_ithium	294	ug/L	10.0	1	01/17/20 15:00	01/20/20 14:46	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Meth	nod: EP/	A 3010			
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-36-0	
Arsenic	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-38-2	
Barium	20.5	ug/L	5.0	5	01/21/20 14:20	01/30/20 14:36	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:35	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:35	7440-43-9	
Chromium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-47-3	
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-48-4	
_ead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7439-92-1	
Molybdenum	8.2	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7439-98-7	
Selenium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7782-49-2	
Γhallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Meth	nod: EP/	A 7470			
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 11:53	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C					
Total Dissolved Solids	3490	mg/L	66.7	1		01/21/20 13:51		
9056 IC Anions	Analytical Meth	od: EPA 90	56					
Chloride	21.3	mg/L	2.0	2		01/21/20 20:08	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 20:06		
Sulfate	2440	mg/L	200	200		01/21/20 20:24		



Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

Sample: EB-2-CCR	Lab ID: 6032	26782003	Collected: 01/15/2	0 10:20	Received: 01	/16/20 08:20 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Meth	nod: EP	A 3010			
Boron	ND	ug/L	100	1	01/17/20 15:00	01/20/20 14:53	7440-42-8	
Calcium	ND	ug/L	200	1	01/17/20 15:00	01/20/20 14:53	7440-70-2	
_ithium	ND	ug/L	10.0	1	01/17/20 15:00	01/20/20 14:53	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Meth	nod: EP	A 3010			
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-36-0	
Arsenic	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-38-2	
Barium	ND	ug/L	1.0	1	01/21/20 14:20	01/30/20 14:20	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:51	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:51	7440-43-9	
Chromium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-47-3	
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-48-4	
_ead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7439-92-1	
Molybdenum	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7439-98-7	
Selenium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7782-49-2	
Γhallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Meth	nod: EP	A 7470			
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 11:55	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C					
Total Dissolved Solids	9.0	mg/L	5.0	1		01/21/20 13:51		
9056 IC Anions	Analytical Meth	od: EPA 90	56					
Chloride	ND	mg/L	1.0	1		01/20/20 20:38	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 20:38	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/20/20 20:38	14808-79-8	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

Sample: ASH-08-CCR	Lab ID: 6032	26782004	Collected: 01/15/2	20 10:45	Received: 01	/16/20 08:20 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Met	hod: EP	A 3010			
Boron	960	ug/L	100	1	01/17/20 15:00	01/20/20 14:55	7440-42-8	
Calcium	447000	ug/L	200	1	01/17/20 15:00	01/20/20 14:55	7440-70-2	M1
_ithium	297	ug/L	10.0	1	01/17/20 15:00	01/20/20 14:55	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010			
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-36-0	
Arsenic	1.0	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-38-2	
Barium	19.7	ug/L	10.0	10	01/21/20 14:20	01/30/20 14:37	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:56	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:56	7440-43-9	
Chromium	1.8	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-47-3	M1
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-48-4	
∟ead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7439-92-1	
Molybdenum	1.9	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7439-98-7	
Selenium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7782-49-2	
Γhallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470			
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 11:57	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	IOC					
Total Dissolved Solids	4560	mg/L	100	1		01/21/20 13:51		D6
9056 IC Anions	Analytical Meth	od: EPA 90	56					
Chloride	19.3	mg/L	1.0	1		01/20/20 21:10	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 21:10	16984-48-8	
Sulfate	2800	mg/L	500	500		01/21/20 20:40	14808-79-8	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

Sample: ASH-07-CCR	Lab ID: 6032	26782005	Collected: 01/15/2	20 12:30	Received: 01	/16/20 08:20 M	fatrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Meth	nod: EP	A 3010			
Boron	781	ug/L	100	1	01/17/20 15:00	01/20/20 15:02	7440-42-8	
Calcium	434000	ug/L	200	1	01/17/20 15:00	01/20/20 15:02	7440-70-2	
_ithium	537	ug/L	10.0	1	01/17/20 15:00	01/20/20 15:02	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Meth	nod: EP	A 3010			
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-36-0	
Arsenic	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-38-2	
Barium	19.1	ug/L	5.0	5	01/21/20 14:20	01/30/20 14:41	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 15:21	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 15:21	7440-43-9	
Chromium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-47-3	
Cobalt	1.3	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-48-4	
_ead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7439-92-1	
Molybdenum	1.0	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7439-98-7	
Selenium	51.0	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7782-49-2	
Γhallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Meth	nod: EP	A 7470			
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 12:09	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C					
Total Dissolved Solids	6620	mg/L	125	1		01/21/20 13:51		
9056 IC Anions	Analytical Meth	od: EPA 90	56					
Chloride	74.1	mg/L	10.0	10		01/21/20 21:59	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 23:18	16984-48-8	
Sulfate	3990	mg/L	500	500		01/21/20 22:15	14808-79-8	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

Sample: ASH-06-CCR	Lab ID: 6032	26782006	Collected: 01/15/2	20 14:00	Received: 01	/16/20 08:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Meth	nod: EP/	A 3010			
Boron	304	ug/L	100	1	01/17/20 15:00	01/20/20 15:04	7440-42-8	
Calcium	24300	ug/L	200	1	01/17/20 15:00	01/20/20 15:04	7440-70-2	
Lithium	56.3	ug/L	10.0	1	01/17/20 15:00	01/20/20 15:04	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Meth	nod: EP/	A 3010			
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-36-0	
Arsenic	1.2	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-38-2	
Barium	61.6	ug/L	10.0	10	01/21/20 14:20	01/30/20 14:42	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 15:26	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 15:26	7440-43-9	
Chromium	2.3	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-47-3	
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-48-4	
Lead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7439-92-1	
Molybdenum	17.3	ug/L	1.0	1		01/29/20 15:26		
Selenium	23.5	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7782-49-2	
Thallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Meth	nod: EP/	A 7470			
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 12:11	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C					
Total Dissolved Solids	500	mg/L	10.0	1		01/21/20 13:51		
9056 IC Anions	Analytical Meth	od: EPA 90	56					
Chloride	7.0	mg/L	1.0	1		01/20/20 23:51	16887-00-6	
Fluoride	0.72	mg/L	0.20	1		01/20/20 23:51		
Sulfate	68.3	mg/L	10.0	10		01/21/20 22:31		



QUALITY CONTROL DATA

PRPA RAWHIDE CCR Project:

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

QC Batch: 634822 Analysis Method: EPA 7470 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

2584400 METHOD BLANK: Matrix: Water

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

> Blank Reporting

Parameter Limit Analyzed Qualifiers Units Result Mercury ND 0.20 01/27/20 11:32 ug/L

LABORATORY CONTROL SAMPLE: Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury ug/L 5.5 111 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2584402 2584403

2584401

MS MSD MSD 60326782004 Spike Spike MS MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual ND 5 5 105 75-125 20 Mercury ug/L 5.3 5.4 107

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



QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

QC Batch: 633715 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2580300 Matrix: Water

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Blank Reporting Result Limit Qualifiers Parameter Units Analyzed Boron ND 100 01/20/20 14:30 ug/L Calcium ug/L ND 200 01/20/20 14:30 Lithium ND 10.0 01/20/20 14:30 ug/L

LABORATORY CONTROL SAMPLE: 2580301 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Boron 1000 1000 100 80-120 ug/L Calcium 10000 10200 ug/L 102 80-120 Lithium ug/L 1000 996 100 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2580302 2580303 MS MSD 60326782004 MS MSD MS MSD % Rec Spike Spike Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec **RPD** RPD Qual Limits Boron ug/L 960 1000 1000 1980 1960 102 100 75-125 20 Calcium 447000 10000 10000 453000 452000 58 51 75-125 0 20 M1 ug/L Lithium ug/L 297 1000 1000 1300 1290 100 99 75-125 1 20

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



QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

QC Batch: 634101 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2581912 Matrix: Water

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	01/29/20 13:22	
Arsenic	ug/L	ND	1.0	01/29/20 13:22	
Barium	ug/L	ND	1.0	01/29/20 13:22	
Beryllium	ug/L	ND	0.50	01/29/20 13:22	
Cadmium	ug/L	ND	0.50	01/29/20 13:22	
Chromium	ug/L	ND	1.0	01/29/20 13:22	
Cobalt	ug/L	ND	1.0	01/29/20 13:22	
Lead	ug/L	ND	1.0	01/29/20 13:22	
Molybdenum	ug/L	ND	1.0	01/29/20 13:22	
Selenium	ug/L	ND	1.0	01/29/20 13:22	
Thallium	ug/L	ND	1.0	01/29/20 13:22	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	37.3	93	80-120	
Arsenic	ug/L	40	37.2	93	80-120	
Barium	ug/L	40	36.6	91	80-120	
Beryllium	ug/L	40	39.2	98	80-120	
Cadmium	ug/L	40	37.8	94	80-120	
Chromium	ug/L	40	37.9	95	80-120	
Cobalt	ug/L	40	38.3	96	80-120	
Lead	ug/L	40	37.9	95	80-120	
Molybdenum	ug/L	40	38.4	96	80-120	
Selenium	ug/L	40	35.6	89	80-120	
Thallium	ug/L	40	36.5	91	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 2581			2581916							
Parameter	6 Units	0326782004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	40	40	35.1	35.3	88	88	75-125	1	20	
Arsenic	ug/L	1.0	40	40	38.4	38.5	93	94	75-125	0	20	
Barium	ug/L	19.7	40	40	56.3	57.7	92	95	75-125	3	20	
Beryllium	ug/L	ND	40	40	37.5	37.0	94	92	75-125	1	20	
Cadmium	ug/L	ND	40	40	32.4	32.5	81	81	75-125	0	20	
Chromium	ug/L	1.8	40	40	25.0	24.8	58	57	75-125	1	20	M1
Cobalt	ug/L	ND	40	40	41.3	41.2	101	101	75-125	0	20	

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

(913)599-5665



QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

MATRIX SPIKE & MATRIX S	PIKE DUPLI	CATE: 2581	915		2581916							
Parameter	6 Units	60326782004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	40	40	31.0	31.5	77	78	75-125	2	20	
Molybdenum	ug/L	1.9	40	40	43.6	43.7	104	105	75-125	0	20	
Selenium	ug/L	ND	40	40	36.4	36.5	90	91	75-125	0	20	
Thallium	ug/L	ND	40	40	31.4	31.6	78	79	75-125	1	20	

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



QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

QC Batch: 633990 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2581324 Matrix: Water

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 01/21/20 13:49

LABORATORY CONTROL SAMPLE: 2581325

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Total Dissolved Solids mg/L 1000 969 97 80-120

SAMPLE DUPLICATE: 2581326

60326769011 Dup Max **RPD RPD** Parameter Units Result Result Qualifiers 384 8 **Total Dissolved Solids** 353 10 mg/L

SAMPLE DUPLICATE: 2581327

Date: 01/30/2020 05:25 PM

60326782004 Dup Max RPD RPD Parameter Units Result Result Qualifiers 4560 **Total Dissolved Solids** mg/L 5360 16 10 D6

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

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QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

QC Batch: 633872 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2580991 Matrix: Water

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Davasastas	Llaita	Blank	Reporting	A se a luma al	O 1:5:
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/20/20 09:42	
Fluoride	mg/L	ND	0.20	01/20/20 09:42	
Sulfate	mg/L	ND	1.0	01/20/20 09:42	

METHOD BLANK: 2581483 Matrix: Water

Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/21/20 12:44	
Fluoride	mg/L	ND	0.20	01/21/20 12:44	
Sulfate	mg/L	ND	1.0	01/21/20 12:44	

LABORATORY CONTROL SAMPLE:	2580992	Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		4.7	93	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.2	105	80-120	

LABORATORY CONTROL SAMPLE:	2581484					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		4.7	95	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SP	PIKE DUPLIC	ATE: 2580	994		2580995							
			MS	MSD								
	6	0326629001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	116	50	50	168	167	104	101	80-120	1	15	
Fluoride	mg/L	0.56	2.5	2.5	3.4	3.5	114	118	80-120	3	15	
Sulfate	mg/L	362	250	250	627	618	106	102	80-120	1	15	

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



QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

MATRIX SPIKE & MATRIX SP	PIKE DUPLIC	ATE: 2580	996		2580997							
			MS	MSD								
	6	0326782004	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	19.3	5	5	24.9	24.9	112	114	80-120	0	15	E
Fluoride	mg/L	ND	2.5	2.5	2.7	2.7	106	105	80-120	2	15	
Sulfate	mg/L	2800	2500	2500	5550	5520	110	109	80-120	1	15	

SAMPLE DUPLICATE: 2580993		60326479001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	16.9	16.8	0	15	
Fluoride	mg/L	0.21	0.21	1	15	
Sulfate	mg/L	15.1	15.0	0	15	

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



QUALIFIERS

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

Date: 01/30/2020 05:25 PM

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRPA RAWHIDE CCR

Pace Project No.: 60326782

Date: 01/30/2020 05:25 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60326782001	ASH-02(MW-2)-CCR	EPA 3010	633715	EPA 6010	633760
60326782002	DUP-2-CCR	EPA 3010	633715	EPA 6010	633760
60326782003	EB-2-CCR	EPA 3010	633715	EPA 6010	633760
60326782004	ASH-08-CCR	EPA 3010	633715	EPA 6010	633760
60326782005	ASH-07-CCR	EPA 3010	633715	EPA 6010	633760
60326782006	ASH-06-CCR	EPA 3010	633715	EPA 6010	633760
60326782001	ASH-02(MW-2)-CCR	EPA 3010	634101	EPA 6020	634168
60326782002	DUP-2-CCR	EPA 3010	634101	EPA 6020	634168
60326782003	EB-2-CCR	EPA 3010	634101	EPA 6020	634168
60326782004	ASH-08-CCR	EPA 3010	634101	EPA 6020	634168
60326782005	ASH-07-CCR	EPA 3010	634101	EPA 6020	634168
60326782006	ASH-06-CCR	EPA 3010	634101	EPA 6020	634168
60326782001	ASH-02(MW-2)-CCR	EPA 7470	634822	EPA 7470	634904
60326782002	DUP-2-CCR	EPA 7470	634822	EPA 7470	634904
60326782003	EB-2-CCR	EPA 7470	634822	EPA 7470	634904
60326782004	ASH-08-CCR	EPA 7470	634822	EPA 7470	634904
0326782005	ASH-07-CCR	EPA 7470	634822	EPA 7470	634904
60326782006	ASH-06-CCR	EPA 7470	634822	EPA 7470	634904
60326782001	ASH-02(MW-2)-CCR	SM 2540C	633990		
60326782002	DUP-2-CCR	SM 2540C	633990		
60326782003	EB-2-CCR	SM 2540C	633990		
60326782004	ASH-08-CCR	SM 2540C	633990		
60326782005	ASH-07-CCR	SM 2540C	633990		
60326782006	ASH-06-CCR	SM 2540C	633990		
60326782001	ASH-02(MW-2)-CCR	EPA 9056	633872		
60326782002	DUP-2-CCR	EPA 9056	633872		
60326782003	EB-2-CCR	EPA 9056	633872		
60326782004	ASH-08-CCR	EPA 9056	633872		
60326782005	ASH-07-CCR	EPA 9056	633872		
60326782006	ASH-06-CCR	EPA 9056	633872		



Sample Condition Upon Receipt

WO#:60326782

15000				***
Client Name: HECCON				
Courier: FedEx ☑ UPS □ VIA □ Clay □ P	EX 🗆	EC	I 🗆	Pace ☐ Xroads ☐ Client ☐ Other ☐
Tracking #: 1219 2984 7737 Pace	Shippi	ing Lal	oel Use	d? Yes □ No 🖒
Custody Seal on Cooler/Box Present: Yes /□ No □	Seals	intact	: Yes/L	Ô No □
Packing Material: Bubble Wrap □ Bubble Bags □			am 🗆	None □ Other 22PIC
Thermometer Used: 1298 Type of I	lce: W	e) BI	lue No	• •
Cooler Temperature (°C): As-read 2.4 Corr. Facto	r+0	.0	Correc	ted 2.4 Date and initials of person examining contents: (16) 1/4/20
Temperature should be above freezing to 6°C				11/10/00
Chain of Custody present:	☑Yes	□No	□n/a	
Chain of Custody relinquished:	Yes	□No	□N/A	
Samples arrived within holding time:	, ZYes	□No	□N/A	
Short Hold Time analyses (<72hr):	□Yes	ŹΝο	□N/A	
Rush Turn Around Time requested:	□Yes	ŹΝο	□N/A	
Sufficient volume:	Ves	□No	□n/a	
Correct containers used:	□ Yes	□No	□n/a	
Pace containers used:	□Yes	□No	□n/a	
Containers intact:	/ Ves	□No	□N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes	□No	□KI/A	
Filtered volume received for dissolved tests?	□Yes	□No	ZN/A	
Sample labels match COC: Date / time / ID / analyses	Yes	□No	□N/A	
Samples contain multiple phases? Matrix: W+	□Yes	□‰	□n/a	
Containers requiring pH preservation in compliance?	□xes	□No	□N/A	List sample IDs, volumes, lot #'s of preservative and the
(HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)				date/time added.
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks:				
Lead acetate strip turns dark? (Record only)	□Yes	□No		
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes	□No		
Trip Blank present:	□Yes	□No	□ŊVA	
Headspace in VOA vials (>6mm):	□Yes	□No	DN/A	
Samples from USDA Regulated Area: State:	□Yes	□No	ZN/A	
Additional labels attached to 5035A / TX1005 vials in the field?	□Yes	□No	□N/A	
Client Notification/ Resolution: Copy COC to			N	Field Data Required? Y / N
Person Contacted: Date/Tir	ne:			
Comments/ Resolution:				
Project Manager Review:			Date	Σ



CHAIN-OF-CUSTODY / Analytical Request Document

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

age 21 of 21

				B. Ca. Li	Be, Cr, (12	= =	5 4		9 7	თ	(J)	^	ω	2	_	ITEM#			Request	hone:	Email To:		\ddress:	Company:	Section
					Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	ADDITIONAL COMMENTS					424-010-CCK	-04-CCI	ASH-OB-CCR	-08-CC	R	DUP-2-CCR	ASH -02(MW-2)-CC	SAMPLE ID SAMPLE ID WIPE (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE TISSUE	Section D Valid Matrix Codes Required Client Information MATRIX CODE OPPINISME WATER THE		Requested Due Date/TAT:	(303) 740-2614 Fax:	brian.rothmeyer@aecom.com	Greenwood Village, CO 80111	6200 South Quebec St	AECOM	Section A Required Client Information:
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SIGNATURE of SAMPLER:	PRINT Name of SAMPLER:	AME AND			4	4		15/20	N. N.	=	1.15.20 11		1.15.20 10	1.15.20 10	1. 15.20 10	1.15.20 -	1.15.20 9:00	COMPOSITE END/GRAB	ED								
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Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60327004

Sampling Event: January 15, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Steve Szocik

Date Completed: February 18, 2020

Date Completed: February 19, 2020

This report contains the final results of the data validation conducted for the water samples collected January 15, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	_	riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. Analyte Concentration MB-1845078 Radium-228 0.287 ± 0.246 pCi/L ± - Plus or Minus MB - Method Blank pCi/L - Picocuries Per Liter		X^1	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and the lab duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X

Review Parameter	Criteria	C	riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: Parent Sample Field Duplicate ASH-02(MW-2)-CCR DUP-2-CCR The agreement between parent sample results and the lab duplicate sample results were evaluated. The DER met the criterion of a DER ≤1.	X		
Equipment Blanks	No target analytes reported in the associated equipment blank.		X^2	
Reporting Limits Met (Non –Radiochemistry)	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.			X
Detection Limits Mets (Radiochemistry)	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.	X		
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

- 1 The associated radium-228 sample results reported at concentrations <5x the concentration of the blank contamination were qualified as estimated (J+ bl) to reflect the potential high bias indicated by the blank contamination.
- 2 The associated radium-226, radium-228, and total radium sample results reported at concentrations <5x the concentration of the blank contamination were qualified as estimated (J+ be) to reflect the potential high bias indicated by the blank contamination.

LCSD - Laboratory Control Sample Duplicate

 \leq – Less Than pCi/L - Picocuries Per Liter be - Equipment Blank J – Estimated

MS/MSD - Matrix Spike/Matrix Spike Duplicate

 \leq – Less Than or Equal To

%-Percent

bl - Laboratory Blank Contamination LCS - Laboratory Control Sample

NA – Not Applicable

> - Greater Than

 $[\]sigma-Sigma$

^{± −} Plus or Minus/High or Low Bias DER – Duplicate Error Ration



February 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on January 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

danson Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

Missouri Certification #: 235

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C

Texas/TNI Certification #: T104704188-17-3

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60327004001	ASH-02(MW-2)-CCR	Water	01/15/20 09:00	01/16/20 09:10
60327004002	DUP-2-CCR	Water	01/15/20 08:00	01/16/20 09:10
60327004003	EB-2-CCR	Water	01/15/20 10:20	01/16/20 09:10
60327004004	ASH-08-CCR	Water	01/15/20 10:45	01/16/20 09:10
60327004005	ASH-08-CCR MS	Water	01/15/20 10:45	01/16/20 09:10
60327004006	ASH-08-CCR MSD	Water	01/15/20 10:45	01/16/20 09:10
60327004007	ASH-07-CCR	Water	01/15/20 12:30	01/16/20 09:10
60327004008	ASH-06-CCR	Water	01/15/20 14:00	01/16/20 09:10



SAMPLE ANALYTE COUNT

Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60327004001	ASH-02(MW-2)-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004002	DUP-2-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004003	EB-2-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004004	ASH-08-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004005	ASH-08-CCR MS	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60327004006	ASH-08-CCR MSD	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60327004007	ASH-07-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004008	ASH-06-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA



Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Sample: ASH-02(MW-2)-CCR PWS:	Lab ID: 6032700 Site ID:	4001 Collected: 01/15/20 09:00 Sample Type:	Received:	01/16/20 09:10	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.175 ± 0.575 (1.20) C:NA T:85%	pCi/L	01/28/20 15:00	13982-63-3	
Radium-228	EPA 904.0	0.652 ± 0.365 (0.672) C:88% T:89%	pCi/L	01/28/20 12:52	2 15262-20-1	
Total Radium	Total Radium Calculation	0.652 ± 0.940 (1.87)	pCi/L	01/30/20 12:03	3 7440-14-4	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Sample: DUP-2-CCR PWS:	Lab ID: 6032700 Site ID:	14002 Collected: 01/15/20 08:00 Sample Type:	Received:	01/16/20 09:10	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.194 ± 0.511 (0.913) C:NA T:90%	pCi/L	01/28/20 15:06	13982-63-3	
Radium-228	EPA 904.0	0.546 ± 0.355 (0.682) C:88% T:90%	pCi/L	01/28/20 12:52	2 15262-20-1	
Total Radium	Total Radium Calculation	$0.740 \pm 0.866 (1.60)$	pCi/L	01/30/20 12:03	3 7440-14-4	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Sample: EB-2-CCR PWS:	Lab ID: 603270 Site ID:	04003 Collected: 01/15/20 10:20 Sample Type:	Received:	01/16/20 09:10	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.160 ± 0.555 (0.998) C:NA T:96%	pCi/L	01/28/20 15:00	13982-63-3	
Radium-228	EPA 904.0	0.0508 ± 0.311 (0.710) C:88% T:86%	pCi/L	01/28/20 12:52	2 15262-20-1	
Total Radium	Total Radium Calculation	0.211 ± 0.866 (1.71)	pCi/L	01/30/20 12:03	3 7440-14-4	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Sample: ASH-08-CCR PWS:	Lab ID: 603270 Site ID:	04004 Collected: 01/15/20 10:45 Sample Type:	Received:	01/16/20 09:10	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0379 ± 0.302 (0.626) C:NA T:84%	pCi/L	01/28/20 15:2	1 13982-63-3	
Radium-228	EPA 904.0	0.449 ± 0.316 (0.615) C:87% T:97%	pCi/L	01/28/20 12:52	2 15262-20-1	
Total Radium	Total Radium Calculation	0.487 ± 0.618 (1.24)	pCi/L	01/30/20 12:03	3 7440-14-4	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Sample: ASH-08-CCR MS Lab ID: 60327004005 Collected: 01/15/20 10:45 Received: 01/16/20 09:10 Matrix: Water

PWS: Site ID: Sample Type:

Method Act ± Unc (MDC) Carr Trac Units CAS No. **Parameters** Analyzed Qual EPA 903.1 124.31 %REC ± NA (NA) Radium-226 pCi/L 01/28/20 15:21 13982-63-3 C:NA T:NA EPA 904.0 78.78 %REC ± NA (NA) Radium-228 pCi/L 01/28/20 12:52 15262-20-1 C:NA T:NA



Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Sample: ASH-08-CCR MSD Lab ID: 60327004006 Collected: 01/15/20 10:45 Received: 01/16/20 09:10 Matrix: Water

Site ID: Sample Type:

PWS: Method Act ± Unc (MDC) Carr Trac Units **Parameters** Analyzed CAS No. Qual EPA 903.1 118.43 %REC 4.84 RPD ± Radium-226 pCi/L 01/28/20 15:21 13982-63-3 NA (NA) C:NA T:NA 78.45 %REC 0.43 RPD ± EPA 904.0 pCi/L Radium-228 01/28/20 12:53 15262-20-1 NA (NA) C:NA T:NA



Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Sample: ASH-07-CCR PWS:	Lab ID: 6032700 Site ID:	4007 Collected: 01/15/20 12:30 Sample Type:	Received:	01/16/20 09:10	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.175 ± 0.370 (0.666) C:NA T:93%	pCi/L	01/28/20 15:2	1 13982-63-3	
Radium-228	EPA 904.0	0.136 ± 0.261 (0.574) C:89% T:87%	pCi/L	01/28/20 12:53	3 15262-20-1	
Total Radium	Total Radium Calculation	0.311 ± 0.631 (1.24)	pCi/L	01/30/20 12:03	3 7440-14-4	



Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Sample: ASH-06-CCR PWS:	Lab ID: 603270 Site ID:		ected: 01/15/20 14:00 ple Type:	Received:	01/16/20 09:10	Matrix: Water	
Parameters	Method	Act ± Un	c (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.122 ± 0.39 C:NA T:84%	` '	pCi/L	01/28/20 15:2	1 13982-63-3	
Radium-228	EPA 904.0	0.690 ± 0.34 C:85% T:88	16 (0.593)	pCi/L	01/28/20 12:53	3 15262-20-1	
Total Radium	Total Radium Calculation	0.812 ± 0.73	39 (1.35)	pCi/L	01/30/20 12:03	3 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

QC Batch: 380584 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60327004001, 60327004002, 60327004003, 60327004004, 60327004005, 60327004006, 60327004007,

60327004008

METHOD BLANK: 1845078 Matrix: Water

Associated Lab Samples: 60327004001, 60327004002, 60327004003, 60327004004, 60327004005, 60327004006, 60327004007,

60327004008

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.287 ± 0.246 (0.491) C:89% T:96%
 pCi/L
 01/28/20 12:53

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

QC Batch: 380582 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60327004001, 60327004002, 60327004003, 60327004004, 60327004005, 60327004006, 60327004007,

60327004008

METHOD BLANK: 1845074 Matrix: Water

Associated Lab Samples: 60327004001, 60327004002, 60327004003, 60327004004, 60327004005, 60327004006, 60327004007,

60327004008

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 -0.203 ± 0.273 (0.687) C:NA T:91%
 pCi/L
 01/28/20 14:51

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



QUALIFIERS

Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

Date: 02/06/2020 12:17 PM

PASI-PA Pace Analytical Services - Greensburg



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRPA RAWHIDE CCR

Pace Project No.: 60327004

Date: 02/06/2020 12:17 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60327004001	ASH-02(MW-2)-CCR	EPA 903.1	380582		
60327004002	DUP-2-CCR	EPA 903.1	380582		
60327004003	EB-2-CCR	EPA 903.1	380582		
60327004004	ASH-08-CCR	EPA 903.1	380582		
60327004005	ASH-08-CCR MS	EPA 903.1	380582		
60327004006	ASH-08-CCR MSD	EPA 903.1	380582		
60327004007	ASH-07-CCR	EPA 903.1	380582		
60327004008	ASH-06-CCR	EPA 903.1	380582		
60327004001	ASH-02(MW-2)-CCR	EPA 904.0	380584		
60327004002	DUP-2-CCR	EPA 904.0	380584		
60327004003	EB-2-CCR	EPA 904.0	380584		
60327004004	ASH-08-CCR	EPA 904.0	380584		
60327004005	ASH-08-CCR MS	EPA 904.0	380584		
60327004006	ASH-08-CCR MSD	EPA 904.0	380584		
60327004007	ASH-07-CCR	EPA 904.0	380584		
60327004008	ASH-06-CCR	EPA 904.0	380584		
60327004001	ASH-02(MW-2)-CCR	Total Radium Calculation	381766		
60327004002	DUP-2-CCR	Total Radium Calculation	381766		
60327004003	EB-2-CCR	Total Radium Calculation	381766		
60327004004	ASH-08-CCR	Total Radium Calculation	381766		
60327004007	ASH-07-CCR	Total Radium Calculation	381766		
60327004008	ASH-06-CCR	Total Radium Calculation	381766		

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

DRINKING WATER OTHER Pace Project No./ Lab I.D. Samples intact (Y/V) SAMPLE CONDITIONS /NSD Cooler (Y/N) ₽ Custody Sealed M5/ Received on ice (Y/N) GROUND WATER Page: 23 Residual Chlorine (Y/N) 2 2 2 2 O° ni qmeT REGULATORY AGENCY 8 RCRA Requested Analysis Filtered (Y/N) TIME 20 Site Location STATE _ NPDES S DATE UST DATE Signed O/ ACCEPTED BY / AFFILIATION Total Radium 822-muibeA 3adium-226 thnalysis Test N/A Same as Section A Other Accounts Payable Methanol Heather Wilson Preservatives SOSSEN AECOM HOsN 11033, 3 42700 HCI Invoice Information; HNO³ $\times \times$ XX Company Name: 16.30 ace Profile #: OS^zH 20°5 Pace Quote Reference: Pace Project Section C Jnpreserved 4ttention; Address: Manager: 9 # OF CONTAINERS SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION 1/15/20 DATE . |S.20 | 10:45 <u>2</u> 8 25:01 a.51. 1.15.20 12:30 2 1.15.20 14:00 TIME <u>M</u> COMPOSITE 15.20 . 15.20 COLLECTED DATE AECOM RELINQUISHED BY / AFFILIATION PRPA Rawhide CCR TIME COMPOSITE START DATE Copy To: Brian Rothmeyer Required Project Information کستیالا بدلا Report To: Geoff Webb <u>ح</u> کے 13 T3 ত 5 ত ত (G=GRAB C=COMP) SAMPLE TYPE Purchase Order No. 5 ţ \$ (see valid codes to left) Project Number: **BOOD XIRTAM** Project Name: Valid Matrix Codes WY WY SP. WY TTS として DRINKING WATER WASTE WATER PRODUCT SOIL/SOLID OIL 45H-02 (MW-2) Greenwood Village, CO 80111 brian.rothmeyer@aecom.com 24-08-CC ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE EB-2- CCR 6200 South Quebec St 45H-07-SAMPLE ID ್ರ ೧ Fax 708-2-Section D Required Client Information Phone: (303) 740-2614 Required Client Information; Requested Due Date/TAT: AECOM Section A Page 17 of 20 Address 10 ÷ ITEM #

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

F-ALL-Q-020rev.08, 12-Oct-2007

Pittsburgh Lab Sample Cor	ndition	Upor	n R∈	eceipt
Pace Analytical Client Name:		. 1	HT.	9019 Project #
Courier: Fed Ex UPS USPS USPS Tracking #: 12/9 2989 13	<u> 10 </u>	Domme —	rcial	Pace Other Label LIMS Login
Custody Seal on Cooler/Box Present:		no	_	s intact:
Thermometer Used	~	a .	: (Ve	t Blue None
Cooler Temperature Observed Temp Temp should be above freezing to 6°C	<u> </u>	_ °c _	Corr	pH pages Lof# Date and Initials of person examining
Comments:	Ye	s No	N/A	1///\//20/ contents: ///2 ///////
Chain of Custody Present:				1.
Chain of Custody Filled Out:				2.
Chain of Custody Relinquished:				3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC:	1	'		5.
-Includes date/time/ID Matrix:_		/		7
Samples Arrived within Hold Time:		1		6.
Short Hold Time Analysis (<72hr remaining):		1/		7.
Rush Turn Around Time Requested:		1/		8.
Sufficient Volume:	/	1		9.
Correct Containers Used:		7		10.
-Pace Containers Used:				
Containers Intact:				11.
Orthophosphate field filtered				12.
Hex Cr Aqueous sample field filtered			/	13.
Organic Samples checked for dechlorination	n:		//	14.
Filtered volume received for Dissolved tests			/	15,
All containers have been checked for preservation.		1		16.
exceptions: VOA, coliform, TOC, O&G, Phenol Non-aqueous matrix	ics, Rado	n,	1	p4(2
All containers meet method preservation requirements.				Initial when Completed Date/time of preservation
				Lot # of added Upreservative
-leadspace in VOA Vials (>6mm):		1/		17.
Гrip Blank Present:		/		18.
гір Blank Custody Seals Present				
Rad Samples Screened < 0.5 mrem/hr		1		Initial when completed: Date:
Client Notification/ Resolution:		1	<u> </u>	Indiana. / Nat India.
Person-Gontacted:		***************************************	-Date/	Time: Gontacted By:
Comments/ Resolution:			'	

 $\ \square$ A check in this box indicates that additional information has been stored in ereports.

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

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

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Quality control sample reflorma	Analyst M	Sample Mat			SM						
ontrol Sar	Ra-226	MK1 1/23/2020	51993 DW		1845074	-0.203	0.272	0.687	-1.46	N/A	Pass
Quality C	Test:	Analyst: Date:	Batch ID: Matrix:		MB Sample ID	MB concentration:	M/B Counting Uncertainty:	MB MDC:	MB Numerical Performance Indicator:	MB Status vs Numerical Indicator:	MB Status vs. MDC:
	Pace Analytical			thod Blank Assessment							

	Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
	Sample Collection Date:	1/15/2020	1/20/2020
	Sample I.D.		35525231001
	Sample MS I.D.		35525231001MS
	Sample MSD I.D.	60327004006	
	Spike I.D.:	18-039	18-039
	MS/MSD Decay Corrected Spike Concentration (pCi/mL):	31.435	31.434
	Spike Volume Used in MS (mL):	0.20	0.20
	Spike Volume Used in MSD (mL):	0.20	
	MS Aliquot (L, g, F):	0.653	0.655
	MS Target Conc.(pCl/f_, g, F):	9.623	9.600
	MSD Aliquot (L, g, F):	0.652	
	MSD Target Conc. (pCl/L, g, F):	9.642	
	MS Spike Uncertainty (calculated):	0.452	0.451
	MSD Spike Uncertainty (calculated):	0.453	
3	Sample Result:	0.038	0.044
	Sample Result Counting Uncertainty (pCi/L, g, F):	0.300	0.202
	Sample Matrix Spike Result:	12.000	6.932
	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.716	1.235
	Sample Matrix Spike Duplicate Result:	11.457	
	Matrix Spike Duplicate Result Counting Uncertainty (pCl/L, g, F):		
	MS Numerical Performance Indicator:	2.547	-3.996
	MSD Numerical Performance Indicator:	1.851	
	MS Percent Recovery:	124.31%	71.74%
	MSD Percent Recovery:	118.43%	
	MS Status vs Numerical Indicator:	ΑN	N/A
	MSD Status vs Numerical Indicator:	N/A	
_	MS Status vs Recovery:	Pass	Pass
	MSD Status vs Recovery:	Pass	
-	MS/MSD Upper % Recovery Limits:	136%	136%
	MS/MSD Lower % Recovery Limits:	71%	71%
l			

Matrix Spi Matrix Spi (Basi	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
ě	
Matrix	
	the space below.
	LCS/LCSD in
	other than
	samble IDs if
	Enter Duplicate
Matrix Sp	
Matrix	
	20000

												·*
	60327004004	60327004005	60327004006	12.000	1.716	11,457	1.802	0.428	4.84%	N/A	Pass	35%
Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Sample Matrix Spike Result:	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD:	% RPD Limit:

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:



1 of 1

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

	MS/MSD 2	1/15/2020	60327004004	60327004006	19-057	35.476	0.20	0.20	0.802	8.845	0.805	8.810	0.637	0.634	0.449	0,316	7.418	1.498	7,360	1,479	-2.218	-2.269	78.78%	78.45%	Warning	Warning	Pass	Pass	135%	%09
renow.	MS/MSD 1	1/20/2020	35525228001	20077777	19-057	35.476	0,20		0.802	8.847			0.637		0.362	0.300	7.327	1.471			-2.262		78.73%		Warning		Pass		135%	%09
Alialyst must manually effect All rields highlighted in Tellow.	Sample Matrix Spike Control Assessment	Sample Collection Date:	Sample LD.	Sample MSD LD	Spike I,D.:	MS/MSD Decay Corrected Spike Concentration (pCi/mL):	Spike Volume Used in MS (mL):	Spike Volume Used in MSD (mL):	MS Aliquot (L, g, F):	MS Target Conc.(pCi/L, g, F):	MSD Aliquot (L, g, F):	MSD Target Conc. (pCi/l., g, F):	MS Spike Uncertainty (calculated):	MSD Spike Uncertainty (calculated):	Sample Result.	Sample Result 2 Sigma CSU (pCi/L, g, F):	Sample Matrix Spike Result:	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	MS Numerical Performance Indicator:	MSD Numerical Performance Indicator:	MS Percent Recovery:	MSD Percent Recovery:	MS Status vs Numerical Indicator;	MSD Status vs Numerical Indicator:	MS Status vs Recovery:	MSD Status vs Recovery:	MS/MSD Upper % Recovery Limits:	MS/MSD Lower % Recovery Limits:
														z	LCSD51995															
!	Ra-228 VAL	1/24/2020	51995	2		1845078	0.287	0,246	0.491	2.29	Warning	Pass		SD (Y or N)?	LCS51995	1/28/2020	19-057	35,381	0.10	0.806	4.392	0.316	3.858	0.884	-1.11	87.85%	N/A	Pass	135%	%09

Count Date: Spike I.D.: Decay Corrected Spike Concentration (pCl/mL):

MB Status vs Numerical Indicator; MB Status vs. MDC: MB Numerical Performance Indicator:

Laboratory Control Sample Assessment

MB Sample ID
MB concentration:
M/B 2 Sigma CSU:
MB MDC:

Method Blank Assessment

Test Analyst Date: Worklist Matrix:

Face Analytical"

-/- in in	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	MS Numerical Performance Indicator:	MSD Numerical Performance Indicator:	MS Percent Recovery:	MSD Percent Recovery:	MS Status vs Numerical Indicator:	MSD Status vs Numerical Indicator:	MS Status vs Recovery:	MSD Status vs Recovery:	MS/MSD Upper % Recovery Limits:	MS/MSD Lower % Recovery Limits:	Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Sample Matrix Spike Result:	Matrix Spike Result 2 Sigma CSU (pCI/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD:	% RPD Limit.
														Enter Duplicate	sample IDs if	other than	rcs/rcsp in	the space below.							
	0.10	0.806	4.392	0.316	3.858	0.884	-1.1	87.85%	N/A	Pass	135%	60%								See Below ##					
Coord Course obligation (Local)	Volume Used (mL):	Aliquot Volume (L, g, F):	Target Conc. (pCVL, g, F):	Uncertainty (Calculated):	Result (pCi/L, g, F):	LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	Numerical Performance Indicator:	Percent Recovery:	Status vs Numerical Indicator:	Status vs Recovery:	Upper % Recovery Limits:	Lower % Recovery Limits:	uplicate Sample Assessment	Sample I.D.:	Duplicate Sample I.D.	Sample Result (pCi/L, g, F):	Sample Result 2 Sigma CSU (pCi/L, g, F):	Sample Duplicate Result (pCi/L, g, F):	Sample Duplicate Result 2 Sigma CSU (pC/I/, g, F):	Are sample and/or duplicate results below RL?	Duplicate Numerical Performance Indicator;	Duplicate RPD:	Duplicate Status vs Numerical Indicator:	Duplicate Status vs RPD;	% RPD Limit:

60327004004 60327004005 7.4004006 7.418 1.498 7.360 1.479 0.054 0.054 Pass Pass Pass

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

Ra-228 NELAC DW2 Printed: 1/29/2020 8:14 AM

6 of 10

AECOM Environment

April 2020

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60334143

Sampling Event: April 10th, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: June 22, 2020

Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 10th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	_	riteri Met?	et?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA	
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X			
Holding Times	The samples were analyzed within the method required holding times.	X			
Method Blanks (MB)	No target analytes reported in the associated MB.	X			
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X			
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X	
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an RPD between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X	

		Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%. Where the result for one or both analytes of the field 			X
	duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte Concentration		X ¹	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

The associated chromium results were reported as non-detect and qualification was not considered necessary.

< - Less Than
μg/L - Microgram per Liter
LCSD - Laboratory Control Sample Duplicate
NA - Not Applicable

≤ – Less Than or Equal To% – PercentMB – Method BlankRL – Reporting Limit

^{1 –} The associated total dissolved solids results were reported at concentrations >5x the concentration of the blank contamination and qualification was not considered necessary.

> – Greater Than
mg/L – Milligrams per Liter
LCS – Laboratory Control Sample
MS/MSD – Matrix Spike/Matrix Spike Duplicate
RPD – Relative Percent Difference





May 04, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Charles M. Welson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water Illinois Certification #: 200030 Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070

(913)599-5665



SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
60334143001	ASH-07-CCR	Water	04/10/20 12:00	04/11/20 09:10	
60334143002	ASH-04-CCR	Water	04/10/20 14:00	04/11/20 09:10	

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334143001	ASH-07-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60334143002	ASH-04-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	CNB, LDB	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Date: 05/04/2020 02:54 PM

Sample: ASH-07-CCR	Lab ID: 6033	84143001	Collected: 04/10/2	20 12:00	Received: 04	/11/20 09:10 N	fatrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	110 Preparation Metl	nod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	760	ug/L	100	1	04/23/20 13:50	04/24/20 16:28	7440-42-8	
Calcium	449000	ug/L	200	1	04/23/20 13:50	04/24/20 16:28	7440-70-2	
Lithium	547	ug/L	10.0	1	04/23/20 13:50	04/24/20 16:28	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	nod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-38-2	
Barium	14.8	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 14:45	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 14:45	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-47-3	
Cobalt	1.3	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7439-92-1	
Molybdenum	1.3	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7439-98-7	
Selenium	147	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Metl	nod: EP	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	05/01/20 12:10	05/04/20 12:32	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C					
	Pace Analytical							
Total Dissolved Solids	7160	mg/L	125	1		04/16/20 09:50		
9056 IC Anions	Analytical Meth	od: EPA 90	956					
	Pace Analytical	Services -	Kansas City					
Chloride	146	mg/L	10.0	10		04/14/20 21:10	16887-00-6	
Fluoride	ND	mg/L	0.20	10		04/14/20 20:55		
Sulfate	4000	mg/L	500	500		04/14/20 20:35		



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Date: 05/04/2020 02:54 PM

Sample: ASH-04-CCR	Lab ID: 6033	34143002	Collected: 04/10/2	20 14:00	Received: 04	/11/20 09:10 N	fatrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	639	ug/L	100	1	04/23/20 13:50	04/24/20 16:35	7440-42-8	
Calcium	470000	ug/L	200	1	04/23/20 13:50	04/24/20 16:35	7440-70-2	
_ithium	362	ug/L	10.0	1	04/23/20 13:50	04/24/20 16:35	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-38-2	
Barium	11.4	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 14:49	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 14:49	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-48-4	
_ead	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7439-92-1	
Molybdenum	1.3	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7439-98-7	
Selenium	109	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470			
•	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	05/01/20 12:10	05/04/20 12:34	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C					
	Pace Analytical							
Total Dissolved Solids	6100	mg/L	100	1		04/16/20 09:50		
9056 IC Anions	Analytical Meth	od: EPA 90	56					
	Pace Analytical	Services -	Kansas City					
Chloride	197	mg/L	50.0	50		04/14/20 21:58	16887-00-6	
Fluoride	ND	mg/L	0.20	1		04/14/20 21:42		
Sulfate	3330	mg/L	500	500		04/15/20 15:45		



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Date: 05/04/2020 02:54 PM

QC Batch: 652448 Analysis Method: EPA 7470

QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2646897 Matrix: Water

Associated Lab Samples: 60334143001, 60334143002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 05/04/20 12:23

LABORATORY CONTROL SAMPLE: 2646898

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury ug/L 4.4 89 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2646899 2646900

MS MSD

60334152001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Conc. Result Result % Rec % Rec **RPD** RPD Qual Result Limits ND 5 4.3 20 Mercury ug/L 5 3.9 86 79 75-125 9

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



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Date: 05/04/2020 02:54 PM

QC Batch: 650929 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2641332 Matrix: Water

Associated Lab Samples: 60334143001, 60334143002

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Boron	ug/L	ND ND	100	04/24/20 16:10	
Calcium	ug/L	ND	200	04/24/20 16:10	
Lithium	ug/L	ND	10.0	04/24/20 16:10	

LABORATORY CONTROL SAMPLE: 2641333 LCS Spike LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Boron 1000 1000 100 80-120 ug/L Calcium 10000 10200 102 80-120 ug/L Lithium 1000 ug/L 950 95 80-120

MATRIX SPIKE & MATRIX SP	IKE DUPL	JICATE: 2641		2641335								
			MS	MSD								
		60334063002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	192	1000	1000	1220	1220	103	103	75-125	0	20	
Calcium	ug/L	173000	10000	10000	181000	181000	82	81	75-125	0	20	
Lithium	ug/L	81.3	1000	1000	1040	1040	95	96	75-125	1	20	

MATRIX SPIKE & MATRIX SF	PIKE DUPLIC	CATE: 2641	336		2641337							
			MS	MSD								
	6	0334152001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	889	1000	1000	1860	1880	97	99	75-125	1	20	
Calcium	ug/L	359000	10000	10000	361000	365000	20	64	75-125	1	20	M1
Lithium	ug/L	343	1000	1000	1320	1330	98	98	75-125	0	20	

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



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Date: 05/04/2020 02:54 PM

QC Batch: 651308 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2642960 Matrix: Water

Associated Lab Samples: 60334143001, 60334143002

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	04/30/20 14:40	
Arsenic	ug/L	ND	1.0	04/30/20 14:40	
Barium	ug/L	ND	1.0	04/30/20 14:40	
Beryllium	ug/L	ND	0.50	04/30/20 14:40	
Cadmium	ug/L	ND	0.50	04/30/20 14:40	
Chromium	ug/L	ND	1.0	04/30/20 14:40	
Cobalt	ug/L	ND	1.0	04/30/20 14:40	
Lead	ug/L	ND	1.0	04/30/20 14:40	
Molybdenum	ug/L	ND	1.0	04/30/20 14:40	
Selenium	ug/L	ND	1.0	04/30/20 14:40	
Thallium	ug/L	ND	1.0	04/30/20 14:40	

LABORATORY CONTROL SAMPLE:	2642961					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	40.4	101	80-120	
Arsenic	ug/L	40	41.4	104	80-120	
Barium	ug/L	40	38.4	96	80-120	
Beryllium	ug/L	40	40.6	102	80-120	
Cadmium	ug/L	40	40.1	100	80-120	
Chromium	ug/L	40	39.2	98	80-120	
Cobalt	ug/L	40	39.1	98	80-120	
Lead	ug/L	40	38.8	97	80-120	
Molybdenum	ug/L	40	40.4	101	80-120	
Selenium	ug/L	40	41.7	104	80-120	
Thallium	ug/L	40	37.3	93	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 2642	962 MS	MSD	2642963							
	6	0334152001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	37.5	37.5	94	94	75-125	0	20	
Arsenic	ug/L	ND	40	40	39.2	39.3	98	98	75-125	0	20	
Barium	ug/L	5.1	40	40	43.8	43.7	97	97	75-125	0	20	
Beryllium	ug/L	ND	40	40	30.0	29.3	75	73	75-125	2	20	M1
Cadmium	ug/L	ND	40	40	32.9	32.8	82	82	75-125	0	20	
Chromium	ug/L	ND	40	40	39.0	39.1	97	97	75-125	0	20	

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

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Date: 05/04/2020 02:54 PM

MATRIX SPIKE & MATRIX S	SPIKE DUPLI	CATE: 2642	962		2642963							
		60334152001	MS Spiles	MSD	MS	MSD	MS	MSD	0/ Doo		Mov	
Doromotor			Spike	Spike	_	_	_	_	% Rec	DDD	Max	Ougl
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cobalt	ug/L	ND	40	40	38.4	38.4	95	95	75-125	0	20	
Lead	ug/L	ND	40	40	32.0	31.8	80	79	75-125	1	20	
Molybdenum	ug/L	1.2	40	40	41.8	41.7	102	101	75-125	0	20	
Selenium	ug/L	ND	40	40	41.4	41.4	103	103	75-125	0	20	
Thallium	ug/L	ND	40	40	31.9	31.8	80	80	75-125	0	20	

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



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

QC Batch: 649499 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2635895 Matrix: Water

Associated Lab Samples: 60334143001, 60334143002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 04/16/20 09:48

LABORATORY CONTROL SAMPLE: 2635896

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units **Total Dissolved Solids** mg/L 1000 940 94 80-120

SAMPLE DUPLICATE: 2635897

60334170006 Dup Max Parameter Units Result Result **RPD RPD** Qualifiers 1690 **Total Dissolved Solids** mg/L 1780 5 10

SAMPLE DUPLICATE: 2635898

Date: 05/04/2020 02:54 PM

60334152001 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 4710 10 mg/L 4640 1

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



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

QC Batch: 649144 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2634592 Matrix: Water

Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/14/20 13:47	
Fluoride	mg/L	ND	0.20	04/14/20 13:47	
Sulfate	mg/L	ND	1.0	04/14/20 13:47	

METHOD BLANK: 2635675 Matrix: Water

Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/16/20 09:10	
Fluoride	mg/L	ND	0.20	04/16/20 09:10	
Sulfate	mg/L	ND	1.0	04/16/20 09:10	

METHOD BLANK: 2637180 Matrix: Water

Associated Lab Samples: 60334143001, 60334143002

Date: 05/04/2020 02:54 PM

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/17/20 08:41	
Fluoride	mg/L	ND	0.20	04/17/20 08:41	
Sulfate	mg/L	ND	1.0	04/17/20 08:41	

LABORATORY CONTROL SAMPLE:	2634593					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	4.6	92	80-120	
Fluoride	mg/L	2.5	2.4	98	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

LABORATORY CONTROL SAMPLE:	2635676					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		4.7	93	80-120	
Fluoride	mg/L	2.5	2.4	96	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

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



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Date: 05/04/2020 02:54 PM

LABORATORY CONTROL SAMPLE: 2637181 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride 5 mg/L 4.8 95 80-120 95 Fluoride mg/L 2.5 2.4 80-120 Sulfate mg/L 5 5.0 99 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2634594					2634595							
			MS	MSD								
		20149952005	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	97900	50000	50000	150000	150000	105	105	80-120	0	15	
Fluoride	mg/L	ND	250	250	265	299	106	119	80-120	12	15	
Sulfate	mg/L	608	500	500	1150	1360	108	149	80-120	17	15	M1,R1

SAMPLE DUPLICATE: 2634596						
		20149952010	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	87600	87300	0	15	
Fluoride	mg/L	ND	ND		15	
Sulfate	mg/L	510	466	9	15	

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

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QUALIFIERS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 05/04/2020 02:54 PM

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334143

Date: 05/04/2020 02:54 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch	
60334143001	ASH-07-CCR	EPA 3010	650929	EPA 6010	651000	
60334143002	ASH-04-CCR	EPA 3010	650929	EPA 6010	651000	
60334143001	ASH-07-CCR	EPA 3010	651308	EPA 6020	651454	
60334143002	ASH-04-CCR	EPA 3010	651308	EPA 6020	651454	
60334143001	ASH-07-CCR	EPA 7470	652448	EPA 7470	652532	
60334143002	ASH-04-CCR	EPA 7470	652448	EPA 7470	652532	
60334143001	ASH-07-CCR	SM 2540C	649499			
60334143002	ASH-04-CCR	SM 2540C	649499			
60334143001	ASH-07-CCR	EPA 9056	649144			
60334143002	ASH-04-CCR	EPA 9056	649144			



Sample Condition Upon Receipt

WO#:	60334143	3
60334143		

Client Name: Accom				
Courier: FedEx ☑ UPS □ VIA □ Clay □ P	EX 🗆	EC		Pace ☐ Xroads ☐ Client ☐ Other ☐
Tracking #: 1505 8763 7051 Pace	Shippir	ig Lat	el Use	d? Yes-ET No⊡
Custody Seal on Cooler/Box Present: Yes ☑ No □	Seals i	intact:	Yes 2	
Packing Material: Bubble Wrap □ Bubble Bags □		Fo	am 🗆	None Other ZPIC
Thermometer Used: T-296 Type of	lce: W∌	⊮ BI	ue No	ne HS
Cooler Temperature (°C): As-read 0.3 Corr. Facto	r_+6.	1	Correct	ted 0.4 examining contents: 4.11.20
Temperature should be above freezing to 6°C				
Chain of Custody present:	₽Yes	□No	□N/A	
Chain of Custody relinquished:	ØYes	□No	□N/A	
Samples arrived within holding time:	2 Yes	□No	□N/A	
Short Hold Time analyses (<72hr):	□Yes	ØN₀	□N/A	
Rush Turn Around Time requested:	□Yes	ØN₀	□n/a	
Sufficient volume:	₽Yes	□No	□N/A	
Correct containers used:	✓Yes	□No	□n/A	
Pace containers used:	ØYes	□No	□n/A	
Containers intact:	₫Yes	□No	□n/a	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes	□No	☑N/A	
Filtered volume received for dissolved tests?	□Yes	□No	ØN/A	
Sample labels match COC: Date / time / ID / analyses	☐Yes	□No	□N/A	
Samples contain multiple phases? Matrix: WT	□Yes	Ľ No	□N/A	
Containers requiring pH preservation in compliance?	ØYes	□No	□N/A	List sample IDs, volumes, lot #'s of preservative and the
(HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot #603	3173			date/time added.
Cyanide water sample checks:		-		
Lead acetate strip turns dark? (Record only)	□Yes	□No		
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes	□No		
Trip Blank present:	□Yes	ØN₀	□N/A	
Headspace in VOA vials (>6mm):	□Yes	□No	⊠ N/A	
Samples from USDA Regulated Area: State	□Yes	□No	⊟ N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	□Yes	□No	⊒ ⁄N/A	
Client Notification/ Resolution: Copy COC to	Cllent?	Υ /	N	Field Data Required? Y / N
Person Contacted: Date/Tir	me:			
Comments/ Resolution:				
Project Manager Review:			Date	e'

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

(10334143 Pace Project No./ Lab I.D. **DRINKING WATER** SAMPLE CONDITIONS OTHER ō > GROUND WATER Page: Residual Chlorine (Y/N) 9.4 REGULATORY AGENCY 8 RCRA Requested Analysis Filtered (Y/N) TIME 0910 Site Location STATE 4-11.20 NPDES DATE UST **5240C LDS** × 7470 Total Mercury ACCEPTED BY / AFFILIATION 6010 Total Metals** K 6020 Total Metals* 9056 CI, F, SO4 **↓** test sisylsnA N/A Same as Section A Other Accounts Payable Methanol Heather Wilson Preservatives $Na_2S_2O_3$ AECOIV NaOH 11033, 3 42700 НСІ Invoice Information: HNO3 Company Name: Pace Project Manager. Pace Profile #: POS2H Section C 1630 Pace Quote Attention: Unpreserved HME Address: # OF CONTAINERS SAMPLE TEMP AT COLLECTION DATE CLIMITS TIME COMPOSITE END/GRAB HELOW DATE COLLECTED RELINQUISHED BY / AFFILIATION 4/10/20 1400 PRPA Rawhide CCR TIME 2007 COMPOSITE START 2201F DATE Copy To: Brian Rothmeyer Report To: Vasanta Kalluri Required Project Information (G=GRAB C=COMP) SAMPLE TYPE 5 urchase Order No. 3 (see valid codes to left) MATRIX CODE roject Number: roject Name: Section B Valid Matrix Codes DW WT WW OLL OLL OLL OTT ST DRINKING WATER
WASTE WASTE WASTE PRODUCT
SOUCOULD
OIL
WIDE
AIR
OTHER
TISSUE Greenwood Village, CO 80111 454-67-CCR brian.rothmeyer@aecom.com ASH-OH- COR ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St Be, Cr. Co, As, Se. Mo, Cd, Sb, Ba, Tt, Pb SAMPLE ID tequired Client Information Phone: (303) 740-2614 Required Client Information: Requested Due Date/TAT: AECOM Section D ..B. Ca. 13 Сотрапу: Email To: Address: 9 7 12 62 4 2 9 7 60 6 ITEM #

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

F-ALL-Q-020rev.08, 12-Oct-2007

(N/Y)

Samples Intact

Cooler (Y/N)

Custody Sealer

Ice (Y/V)

Received on

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Page 17 of 17

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER:

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60334301

Sampling Event: April 13th, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: June 22, 2020

Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 13th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria				
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA	
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X			
Holding Times	The samples were analyzed within the method required holding times.	X			
Method Blanks (MB)	No target analytes reported in the associated MB.	X			
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X			
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X	
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an RPD between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X	

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below:			
	• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.			X
	• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			
Equipment Blanks	No target analytes reported in the associated equipment blank.			
	Analyte Concentration		X ¹	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		
	Comments			

Comments

The associated chromium results were reported as non-detect and qualification was not considered necessary.

 $\begin{array}{l} < - \, Less \, Than \\ \mu g/L - Microgram \, per \, Liter \\ LCSD - Laboratory \, Control \, Sample \, Duplicate \\ NA - Not \, Applicable \end{array}$

≤ – Less Than or Equal To % – Percent MB – Method Blank RL – Reporting Limit

^{1 –} The associated total dissolved solids results were reported at concentrations >5x the concentration of the blank contamination and qualification was not considered necessary.

> - Greater Than
mg/L - Milligrams per Liter
LCS - Laboratory Control Sample
MS/MSD - Matrix Spike/Matrix Spike Duplicate
RPD - Relative Percent Difference





May 05, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 14, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407

Dianton m. Wilson

Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070



SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
60334301001	ASH-05-CCR	Water	04/13/20 10:15	04/14/20 09:30	
60334301002	ASH-08-CCR	Water	04/13/20 12:35	04/14/20 09:30	



SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334301001	ASH-05-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	JWR, LDB	3	PASI-K
60334301002	ASH-08-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	JWR, LDB	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Date: 05/05/2020 04:09 PM

Sample: ASH-05-CCR	Lab ID: 6033	34301001	Lab ID: 60334301001 Collected: 04/13/20 10:15 Received: 04/14/20 09:30 M								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua			
6010 MET ICP	Analytical Meth	Analytical Method: EPA 6010 Preparation Method: EPA 3010									
	Pace Analytical	Services -	Kansas City								
Boron	817	ug/L	100	1	04/23/20 13:50	04/24/20 16:56	7440-42-8				
Calcium	517000	ug/L	200	1	04/23/20 13:50	04/24/20 16:56	7440-70-2				
Lithium	288	ug/L	10.0	1	04/23/20 13:50	04/24/20 16:56	7439-93-2				
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010						
	Pace Analytical	Services -	Kansas City								
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-36-0				
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-38-2				
3arium	16.9	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-39-3				
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 16:19	7440-41-7				
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 16:19	7440-43-9				
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-47-3				
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-48-4				
₋ead	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7439-92-1				
Molybdenum	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7439-98-7				
Selenium	62.5	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7782-49-2				
Γhallium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-28-0				
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470						
	Pace Analytical	Services -	Kansas City								
Mercury	ND	ug/L	0.20	1	05/04/20 13:00	05/05/20 11:04	7439-97-6				
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C								
	Pace Analytical										
Total Dissolved Solids	4570	mg/L	100	1		04/16/20 09:51					
9056 IC Anions	Analytical Meth	od: EPA 90	56								
	Pace Analytical	Services -	Kansas City								
Chloride	241	mg/L	50.0	50		04/28/20 11:42	16887-00-6				
Fluoride	ND	mg/L	0.20	1		04/27/20 22:00					
Sulfate	2950	mg/L	500	500		04/27/20 22:16					



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Date: 05/05/2020 04:09 PM

Complex ACU 00 CCD	Lab ID. COO	1201000	Callested: 04/40/	00 40.00	Dogobrodi 04	/4.4/20.00.20	Antrice Motor					
Sample: ASH-08-CCR	Lab ID: 6033	34301002	Collected: 04/13/2	20 12:35	Received: 04	1/14/20 09:30 IV	latrix: Water					
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua				
6010 MET ICP	Analytical Meth	Analytical Method: EPA 6010 Preparation Method: EPA 3010										
	Pace Analytical	Services -	Kansas City									
Boron	956	ug/L	100	1	04/23/20 13:50	04/24/20 17:07	7440-42-8					
Calcium	455000	ug/L	200	1	04/23/20 13:50	04/24/20 17:07	7440-70-2					
Lithium	291	ug/L	10.0	1	04/23/20 13:50	04/24/20 17:07	7439-93-2					
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010							
	Pace Analytical	Services -	Kansas City									
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-36-0					
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-38-2					
Barium	15.7	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-39-3					
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 16:24	7440-41-7					
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 16:24	7440-43-9					
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-47-3					
Cobalt	1.4	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-48-4					
_ead	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7439-92-1					
Molybdenum	1.0	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7439-98-7					
Selenium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7782-49-2					
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-28-0					
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470							
	Pace Analytical	Services -	Kansas City									
Mercury	ND	ug/L	0.20	1	05/04/20 13:00	05/05/20 11:06	7439-97-6					
2540C Total Dissolved Solids	Analytical Meth	od: SM 25	40C									
	Pace Analytical	Services -	Kansas City									
Total Dissolved Solids	3130	mg/L	66.7	1		04/16/20 09:51						
9056 IC Anions	Analytical Meth	od: EPA 90	056									
	Pace Analytical	Services -	Kansas City									
Chloride	21.2	mg/L	2.0	2		04/28/20 11:58	16887-00-6					
Fluoride	ND	mg/L	0.20	1		04/27/20 23:04						
Sulfate	3070	mg/L	500	500		04/27/20 23:20						



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Date: 05/05/2020 04:09 PM

QC Batch: 652570 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2647504 Matrix: Water

Associated Lab Samples: 60334301001, 60334301002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 05/05/20 10:48

LABORATORY CONTROL SAMPLE: 2647505

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury ug/L 4.4 89 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2647506 2647507

MS MSD

60334284001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Conc. Result Result % Rec % Rec **RPD** RPD Qual Result Limits ND 5 20 Mercury ug/L 5 4.8 4.7 96 95 75-125

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



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Date: 05/05/2020 04:09 PM

QC Batch: 650929 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2641332 Matrix: Water

Associated Lab Samples: 60334301001, 60334301002

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	04/24/20 16:10	
Calcium	ug/L	ND	200	04/24/20 16:10	
Lithium	ug/l	ND	10.0	04/24/20 16:10	

LABORATORY CONTROL SAMPLE: 2641333 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 1000 Boron 1000 100 80-120 ug/L Calcium 10000 10200 102 80-120 ug/L Lithium 1000 ug/L 950 95 80-120

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 2641		2641335								
			MS	MSD								
		60334063002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	192	1000	1000	1220	1220	103	103	75-125	0	20	
Calcium	ug/L	173000	10000	10000	181000	181000	82	81	75-125	0	20	
Lithium	ug/L	81.3	1000	1000	1040	1040	95	96	75-125	1	20	

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 2641	336		2641337							
			MS	MSD								
		60334152001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	889	1000	1000	1860	1880	97	99	75-125	1	20	
Calcium	ug/L	359000	10000	10000	361000	365000	20	64	75-125	1	20	M1
Lithium	ug/L	343	1000	1000	1320	1330	98	98	75-125	0	20	

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Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Date: 05/05/2020 04:09 PM

QC Batch: 651308 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2642960 Matrix: Water

Associated Lab Samples: 60334301001, 60334301002

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	04/30/20 14:40	
Arsenic	ug/L	ND	1.0	04/30/20 14:40	
Barium	ug/L	ND	1.0	04/30/20 14:40	
Beryllium	ug/L	ND	0.50	04/30/20 14:40	
Cadmium	ug/L	ND	0.50	04/30/20 14:40	
Chromium	ug/L	ND	1.0	04/30/20 14:40	
Cobalt	ug/L	ND	1.0	04/30/20 14:40	
Lead	ug/L	ND	1.0	04/30/20 14:40	
Molybdenum	ug/L	ND	1.0	04/30/20 14:40	
Selenium	ug/L	ND	1.0	04/30/20 14:40	
Thallium	ug/L	ND	1.0	04/30/20 14:40	

LABORATORY CONTROL SAMPLE:	2642961					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	40.4	101	80-120	
Arsenic	ug/L	40	41.4	104	80-120	
Barium	ug/L	40	38.4	96	80-120	
Beryllium	ug/L	40	40.6	102	80-120	
Cadmium	ug/L	40	40.1	100	80-120	
Chromium	ug/L	40	39.2	98	80-120	
Cobalt	ug/L	40	39.1	98	80-120	
Lead	ug/L	40	38.8	97	80-120	
Molybdenum	ug/L	40	40.4	101	80-120	
Selenium	ug/L	40	41.7	104	80-120	
Thallium	ug/L	40	37.3	93	80-120	

MATRIX SPIKE & MATRIX SI	PIKE DUPL	LICATE: 2642	962 MS	MSD	2642963							
		60334152001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	37.5	37.5	94	94	75-125	0	20	
Arsenic	ug/L	ND	40	40	39.2	39.3	98	98	75-125	0	20	
Barium	ug/L	5.1	40	40	43.8	43.7	97	97	75-125	0	20	
Beryllium	ug/L	ND	40	40	30.0	29.3	75	73	75-125	2	20 I	M1
Cadmium	ug/L	ND	40	40	32.9	32.8	82	82	75-125	0	20	
Chromium	ug/L	ND	40	40	39.0	39.1	97	97	75-125	0	20	

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Date: 05/05/2020 04:09 PM

MATRIX SPIKE & MATRIX S	PIKE DUPLIC	ATE: 2642	962 MS	MSD	2642963							
	6	0334152001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cobalt	ug/L	ND	40	40	38.4	38.4	95	95	75-125	0	20	
Lead	ug/L	ND	40	40	32.0	31.8	80	79	75-125	1	20	
Molybdenum	ug/L	1.2	40	40	41.8	41.7	102	101	75-125	0	20	
Selenium	ug/L	ND	40	40	41.4	41.4	103	103	75-125	0	20	
Thallium	ug/L	ND	40	40	31.9	31.8	80	80	75-125	0	20	

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



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

QC Batch: 649499 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2635895 Matrix: Water

Associated Lab Samples: 60334301001, 60334301002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 04/16/20 09:48

LABORATORY CONTROL SAMPLE: 2635896

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units **Total Dissolved Solids** mg/L 1000 940 94 80-120

SAMPLE DUPLICATE: 2635897

60334170006 Dup Max Parameter Units Result Result **RPD RPD** Qualifiers 1690 **Total Dissolved Solids** mg/L 1780 5 10

SAMPLE DUPLICATE: 2635898

Date: 05/05/2020 04:09 PM

60334152001 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 4710 10 mg/L 4640 1

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 603

60334301

QC Batch: 651331 QC Batch Method: EPA 9056 Analysis Method:

EPA 9056

Analysis Description:

9056 IC Anions

Laboratory:

Pace Analytical Services - Kansas City

Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2643017

Chloride Fluoride Sulfate

Sulfate

Date: 05/05/2020 04:09 PM

Matrix: Water

Associated Lab Samples: 60334301001, 60334301002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
	mg/L	ND	1.0	04/27/20 07:39	
	mg/L	ND	0.20	04/27/20 07:39	
	mg/L	ND	1.0	04/27/20 07:39	

METHOD BLANK: 2643623 Matrix: Water

Associated Lab Samples: 60334301001, 60334301002

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/28/20 07:11	
Fluoride	mg/L	ND	0.20	04/28/20 07:11	
Sulfate	mg/L	ND	1.0	04/28/20 07:11	

mg/L

LABORATORY CONTROL SAMPLE:	2643018					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		4.4	87	80-120	
Fluoride	mg/L	2.5	2.2	87	80-120	

5

4.6

92

80-120

LABORATORY CONTROL SAMPLE:	2643624					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	4.7	94	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	
Sulfate	mg/L	5	5.2	103	80-120	

MATRIX SPIKE & MATRIX SP	PIKE DUPLIC	CATE: 2643	019		2643020							
Parameter	6 Units	60334530002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	99.2	50	50	174	159	150	120	80-120	9	15	M1
Fluoride	mg/L	0.24	2.5	2.5	2.6	2.6	94	96	80-120	2	15	
Sulfate	mg/L	54.6	50	50	128	113	148	117	80-120	13	15	M1

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



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Date: 05/05/2020 04:09 PM

SAMPLE DUPLICATE: 2643021

Parameter	Units	60334530002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	99.2	113	13	15	
Fluoride	mg/L	0.24	0.24	1	15	
Sulfate	mg/L	54.6	61.5	12	15	

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



QUALIFIERS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 05/05/2020 04:09 PM

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

(913)599-5665



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334301

Date: 05/05/2020 04:09 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch	
60334301001	ASH-05-CCR	EPA 3010	650929	EPA 6010	651000	
60334301002	ASH-08-CCR	EPA 3010	650929	EPA 6010	651000	
60334301001	ASH-05-CCR	EPA 3010	651308	EPA 6020	651454	
60334301002	ASH-08-CCR	EPA 3010	651308	EPA 6020	651454	
60334301001	ASH-05-CCR	EPA 7470	652570	EPA 7470	652687	
60334301002	ASH-08-CCR	EPA 7470	652570	EPA 7470	652687	
60334301001	ASH-05-CCR	SM 2540C	649499			
60334301002	ASH-08-CCR	SM 2540C	649499			
60334301001	ASH-05-CCR	EPA 9056	651331			
60334301002	ASH-08-CCR	EPA 9056	651331			



Sample Condition Upon Receipt



Client Name: AE COM				
Courier: FedEx ☐ UPS □ VIA □ Clay □ P	EX 🗆	EC	1 🗆	Pace □ Xroads □ Client □ Other □
Tracking #: 1505 87(13 1114 Pace	shippi	ng Lal	bel Use	d? Yes ☑ No □
Custody Seal on Cooler/Box Present: Yes Mo □	Seals	intact	: Yes 🗜	→ No □
Packing Material: Bubble Wrap □ Bubble Bags □] .	_ Fo	am 🗆	None Other & CLC
Thermometer Used: Tage of	lce: W	et) B	lue No	
Cooler Temperature (°C): As-read O. Corr. Factor	or to	1.1	Correc	ted 0.8 Date and initials of person examining contents: D4142 MU
Temperature should be above freezing to 6°C				
Chain of Custody present:	Ves	□No	□N/A	
Chain of Custody relinquished:	Pes	□No	□N/A	
Samples arrived within holding time:	deves	□No	□N/A	
Short Hold Time analyses (<72hr):	□Yes	dNo	□N/A	
Rush Turn Around Time requested:	□Yes	iΖNο	□n/a	
Sufficient volume:	Ø√es	□No	□N/A	
Correct containers used:	Yes	□No	□N/A	
Pace containers used:	(a) Yes	□No	□N/A	
Containers intact:	ĹŢÝYes	□No	□N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes	□No	C)PN/A	
Filtered volume received for dissolved tests?	□Yes	□No	DHV/A	
Sample labels match COC: Date / time / ID / analyses	Yes	□No	□N/A	
Samples contain multiple phases? Matrix: 1	□Yes	(A)No	□N/A	
Containers requiring pH preservation in compliance?	Yes	□No	□n/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(HNO₃, H ₂ SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot ♯ V	1031	73		date/line added.
Cyanide water sample checks:	□Yes			
Lead acetate strip tums dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	□Yes			
			-d	
Trip Blank present:	□Yes			
Headspace in VOA vials (>6mm):	□Yes	∐No		
Samples from USDA Regulated Area: State:	□Yes	□No	Ø₹N/A	
Additional labels attached to 5035A / TX1005 vials in the field?			ØN/A	
Client Notification/ Resolution: Copy COC to		Y	/ N	Field Data Required? Y / N
Person Contacted: Date/Til	me:			
Comments/ Resolution;				
Inffman Channan				
Project Manager Review: Jeffrey Shopper			Date	3



CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

HCO HCO House	Section A Required C	Section A Required Client Information:	Section B Required Project Information:	Section C			Page:) of	-
Common Video Comm	Company	AECOM	Report To: Vasanta Kalluri	l				-	-
Page	Address:	6200 South Quebec St			REGUL	ATORY AGENC	\ \		
SAMPLE		Greenwood Village, CO 80111			L.	L	IND WATER	-	DRINKING WATER
Sample Fig. Sample Fig	Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		.Sn L	L		L	
Particular Par				ı	Site Lo				
SAMPLE ID Whether come the form of the strong of the stro	Requested	Due Date/TAT:	Project Number:	1	8				
SAMPLE ID	-				Requested Analysis	: Filtered (Y/N)			
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Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60334388

Sampling Event: April 14th, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: June 23, 2020

Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 14th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Criteria Parameter			riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			
	Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:	X		
	• When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical			

Review Parameter	Criteria	Crite Met		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
	precision is indicated by an RPD between the results of ≤20%.			
	• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below:			
	Parent Sample Field Duplicate ASH-02-CCR DUP-3-CCR ■ When both the sample and duplicate values are >5xRL			
	 acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%. Where the result for one or both analytes of the field 	X		
	duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte Concentration		X ¹	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

The associated chromium results were reported as non-detect and qualification was not considered necessary.

< - Less Than
μg/L - Microgram per Liter
LCSD - Laboratory Control Sample Duplicate
NA - Not Applicable

≤ – Less Than or Equal To % – Percent MB – Method Blank RL – Reporting Limit

^{1 –} The associated total dissolved solids results were reported at concentrations >5x the concentration of the blank contamination and qualification was not considered necessary.

> – Greater Than
mg/L – Milligrams per Liter
LCS – Laboratory Control Sample
MS/MSD – Matrix Spike/Matrix Spike Duplicate
RPD – Relative Percent Difference





May 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 15, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Charles M. Welson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070



SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
60334388001	ASH-01-CCR	Water	04/14/20 10:20	04/15/20 08:30	
60334388002	ASH-02-CCR	Water	04/14/20 13:30	04/15/20 08:30	
60334388003	DUP-3-CCR	Water	04/14/20 08:00	04/15/20 08:30	



SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334388001	ASH-01-CCR	EPA 6010	HKC, JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60334388002	ASH-02-CCR	EPA 6010	HKC, JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60334388003	DUP-3-CCR	EPA 6010	HKC, JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

Sample: ASH-01-CCR	Lab ID: 6033	4388001	Collected: 04/14/2	20 10:20	Received: 04	/15/20 08:30 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	486	ug/L	100	1	04/25/20 09:38	04/27/20 15:25	7440-42-8	
Calcium	381000	ug/L	200	1	04/25/20 09:38	04/29/20 14:55	7440-70-2	
Lithium	439	ug/L	10.0	1	04/25/20 09:38	04/29/20 14:55	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	020 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-38-2	
Barium	9.6	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 14:38	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 14:38	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7439-92-1	
Molybdenum	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7439-98-7	
Selenium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	170 Preparation Met	hod: EP	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	05/06/20 10:15	05/06/20 13:53	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 25	40C					
	Pace Analytical	Services -	Kansas City					
Total Dissolved Solids	3250	mg/L	66.7	1		04/20/20 13:57		
9056 IC Anions	Analytical Meth	od: EPA 90	056					
	Pace Analytical							
Chloride	23.1	mg/L	2.0	2		05/05/20 16:14	16887-00-6	
Fluoride	0.24	mg/L	0.20	1		05/04/20 09:59		
Sulfate	2000	mg/L	200	200		05/05/20 14:35		



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

Sample: ASH-02-CCR	Lab ID: 6033	34388002	Collected: 04/14	20 13:30	Received: 04	/15/20 08:30 N	/latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Me	thod: EF	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	1990	ug/L	100	1	04/25/20 09:38	04/27/20 15:37	7440-42-8	
Calcium	173000	ug/L	200	1	04/25/20 09:38	04/29/20 15:07	7440-70-2	
Lithium	320	ug/L	10.0	1	04/25/20 09:38	04/29/20 15:07	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Me	thod: EF	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-38-2	
Barium	23.9	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 14:59	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 14:59	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-48-4	
₋ead	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7439-92-1	
Molybdenum	8.4	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7439-98-7	
Selenium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7782-49-2	
Γhallium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Me	thod: EF	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	05/06/20 10:15	05/06/20 14:05	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C					
	Pace Analytical	Services -	Kansas City					
Total Dissolved Solids	3430	mg/L	66.7	1		04/20/20 13:57		
9056 IC Anions	Analytical Meth	od: EPA 90	956					
	Pace Analytical	Services -	Kansas City					
Chloride	20.4	mg/L	5.0	5		05/05/20 01:25	16887-00-6	
Fluoride	ND	mg/L	0.20	1		05/01/20 16:25		
Sulfate	2090	mg/L	200	200		05/05/20 01:42		



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

Sample: DUP-3-CCR	Lab ID: 6033	4388003	Collected: 04/14/2	20 08:00	Received: 04	/15/20 08:30 N	/latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	1980	ug/L	100	1	04/25/20 09:38	04/27/20 15:39	7440-42-8	
Calcium	172000	ug/L	200	1	04/25/20 09:38	04/29/20 15:09	7440-70-2	
_ithium	316	ug/L	10.0	1	04/25/20 09:38	04/29/20 15:09	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	020 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-38-2	
Barium	22.0	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 15:04	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 15:04	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-48-4	
₋ead	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7439-92-1	
Molybdenum	8.4	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7439-98-7	
Selenium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7782-49-2	
Γhallium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	170 Preparation Met	hod: EP	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	05/06/20 10:15	05/06/20 14:07	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 25	40C					
	Pace Analytical	Services -	Kansas City					
Total Dissolved Solids	2910	mg/L	66.7	1		04/20/20 13:58		
9056 IC Anions	Analytical Meth	od: EPA 90	056					
	Pace Analytical							
Chloride	21.2	mg/L	2.0	2		05/05/20 02:32	16887-00-6	
Fluoride	ND	mg/L	0.20	1		05/01/20 17:13		
Sulfate	2150	mg/L	200	200		05/05/20 02:48		

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

QC Batch: 652982 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334388001, 60334388002, 60334388003

METHOD BLANK: 2648960 Matrix: Water

Associated Lab Samples: 60334388001, 60334388002, 60334388003

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 05/06/20 13:37

LABORATORY CONTROL SAMPLE: 2648961

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury ug/L 5.0 99 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2648962 2648963

MS MSD

60334388001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Conc. Result Result % Rec % Rec **RPD** RPD Qual Result Limits ND 5 20 Mercury ug/L 5 5.0 4.9 100 99 75-125 2

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



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

LABORATORY CONTROL SAMPLE: 2642626

Date: 05/06/2020 04:52 PM

Pace Project No.: 60334388

QC Batch: 651247 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334388001, 60334388002, 60334388003

METHOD BLANK: 2642624 Matrix: Water

Associated Lab Samples: 60334388001, 60334388002, 60334388003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Boron	ug/L	ND ND	100	04/27/20 15:14	
Calcium	ug/L	ND	200	04/29/20 14:40	
Lithium	ug/L	ND	10.0	04/29/20 14:40	

LABORATORT CONTROL SAMPLE.	2042023					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Boron	ug/L	1000	949	95	80-120	
Calcium	ug/L	10000	10800	108	80-120	
Lithium	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 2642	626		2642627							
		60334388001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
		00334300001	Spike	Spike	IVIO	MOD	IVIO	IVISD	70 Kec		IVIAX	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	486	1000	1000	1480	1460	99	97	75-125	1	20	
Calcium	ug/L	381000	10000	10000	389000	386000	72	41	75-125	1	20	M1
Lithium	ug/L	439	1000	1000	1480	1480	104	104	75-125	0	20	

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 2642	628 MS	MSD	2642629							
		60334610001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	253	1000	1000	1240	1240	99	98	75-125	0	20	
Calcium	ug/L	86800	10000	10000	97400	98000	106	112	75-125	1	20	
Lithium	ug/L	79.4	1000	1000	1080	1100	100	102	75-125	1	20	

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



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

QC Batch: 651309 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334388001, 60334388002, 60334388003

METHOD BLANK: 2642964 Matrix: Water

Associated Lab Samples: 60334388001, 60334388002, 60334388003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND ND	1.0	05/05/20 14:31	
Arsenic	ug/L	ND	1.0	05/05/20 14:31	
Barium	ug/L	ND	1.0	05/05/20 14:31	
Beryllium	ug/L	ND	0.50	05/05/20 14:31	
Cadmium	ug/L	ND	0.50	05/05/20 14:31	
Chromium	ug/L	ND	1.0	05/05/20 14:31	
Cobalt	ug/L	ND	1.0	05/05/20 14:31	
Lead	ug/L	ND	1.0	05/05/20 14:31	
Molybdenum	ug/L	ND	1.0	05/05/20 14:31	
Selenium	ug/L	ND	1.0	05/05/20 14:31	
Thallium	ug/L	ND	1.0	05/05/20 14:31	

LABORATORY CONTROL SAMPLE:	2642965					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	40.3	101	80-120	
Arsenic	ug/L	40	40.8	102	80-120	
Barium	ug/L	40	38.8	97	80-120	
Beryllium	ug/L	40	41.8	105	80-120	
Cadmium	ug/L	40	39.8	100	80-120	
Chromium	ug/L	40	38.4	96	80-120	
Cobalt	ug/L	40	37.5	94	80-120	
Lead	ug/L	40	38.5	96	80-120	
Molybdenum	ug/L	40	39.3	98	80-120	
Selenium	ug/L	40	41.8	104	80-120	
Thallium	ug/L	40	37.1	93	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 2642		MOD	2642967							
	6	0334388001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	38.2	39.1	95	98	75-125	2	20	
Arsenic	ug/L	ND	40	40	40.8	41.6	102	104	75-125	2	20	
Barium	ug/L	9.6	40	40	48.3	49.0	97	99	75-125	2	20	
Beryllium	ug/L	ND	40	40	36.6	37.7	91	94	75-125	3	20	
Cadmium	ug/L	ND	40	40	34.0	34.9	85	87	75-125	3	20	
Chromium	ug/L	ND	40	40	38.8	39.7	96	99	75-125	2	20	

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

MATRIX SPIKE & MATRIX S	SPIKE DUPLI	CATE: 2642	966		2642967							
	(60334388001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cobalt	ug/L	ND	40	40	36.4	37.4	91	93	75-125	3	20	
Lead	ug/L	ND	40	40	31.7	32.7	79	82	75-125	3	20	
Molybdenum	ug/L	ND	40	40	43.5	45.2	108	112	75-125	4	20	
Selenium	ug/L	ND	40	40	41.8	42.3	104	105	75-125	1	20	
Thallium	ug/L	ND	40	40	31.7	32.5	79	81	75-125	2	20	

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



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

QC Batch: 650182 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334388001, 60334388002, 60334388003

METHOD BLANK: 2638424 Matrix: Water

Associated Lab Samples: 60334388001, 60334388002, 60334388003

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 04/20/20 13:57

LABORATORY CONTROL SAMPLE: 2638425

Spike LCS LCS % Rec
Parameter Units Conc. Result % Rec Limits Qualifiers

Total Dissolved Solids mg/L 1000 973 97 80-120

SAMPLE DUPLICATE: 2638426

60334388001 Dup Max Parameter Units Result Result **RPD RPD** Qualifiers 3250 **Total Dissolved Solids** mg/L 3590 10 10

SAMPLE DUPLICATE: 2638427

Date: 05/06/2020 04:52 PM

60334689003 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 689 mg/L 651 6 10

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

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

QC Batch: 652356 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334388002, 60334388003

METHOD BLANK: 2646477 Matrix: Water

Associated Lab Samples: 60334388002, 60334388003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/01/20 13:30	
Fluoride	mg/L	ND	0.20	05/01/20 13:30	
Sulfate	mg/L	ND	1.0	05/01/20 13:30	

METHOD BLANK: 2647533 Matrix: Water

Associated Lab Samples: 60334388002, 60334388003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/04/20 09:24	
Fluoride	mg/L	ND	0.20	05/04/20 09:24	
Sulfate	mg/L	ND	1.0	05/04/20 09:24	

LABORATORY CONTROL SAMPLE:	2646478					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		4.7	94	80-120	
Fluoride	mg/L	2.5	2.3	93	80-120	
Sulfate	mg/L	5	4.8	96	80-120	

LABORATORY CONTROL SAMPLE:	2647534					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	4.6	92	80-120	
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	4.9	97	80-120	

MATRIX SPIKE & MATRIX SP	IATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2646533											
			MS	MSD								
		40206545002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	17.4	25	25	48.1	40.8	123	93	80-120	16	15	M1,R1
Fluoride	mg/L	<1.0	12.5	12.5	15.8	12.4	119	92	80-120	24	15	R1
Sulfate	mg/L	31.7	25	25	65.5	55.7	135	96	80-120	16	15	M1,R1

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



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

MATRIX SPIKE SAMPLE:	2646538						
		40206609001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	6.5	5	11.4	97	80-120	
Fluoride	mg/L	0.53	2.5	2.8	91	80-120	
Sulfate	mg/L	162	50	214	105	80-120 E	

SAMPLE DUPLICATE: 2646537						
		40206545003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	7.3	7.3	0	15	
Fluoride	mg/L	0.81	0.81	0	15	
Sulfate	mg/L	138	132	4	15	

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

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

QC Batch: 652553 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334388001

METHOD BLANK: 2647456 Matrix: Water

Associated Lab Samples: 60334388001

Blank Reporting Limit Qualifiers Parameter Units Result Analyzed Chloride mg/L ND 1.0 05/04/20 09:21 Fluoride mg/L ND 0.20 05/04/20 09:21 Sulfate mg/L ND 05/04/20 09:21 1.0

METHOD BLANK: 2648101 Matrix: Water

Associated Lab Samples: 60334388001

Date: 05/06/2020 04:52 PM

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND ND	1.0	05/05/20 09:36	
Fluoride	mg/L	ND	0.20	05/05/20 09:36	
Sulfate	mg/L	ND	1.0	05/05/20 09:36	

LABORATORY CONTROL SAMPLE:	2647457					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		4.7	93	80-120	
Fluoride	mg/L	2.5	2.3	94	80-120	
Sulfate	mg/L	5	5.0	99	80-120	

LABORATORY CONTROL SAMPLE:	2648102					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	4.7	93	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUPI	ICATE: 2647	459		2647460							
			MS	MSD								
		60334388001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	23.1	10	10	34.2	33.6	111	104	80-120	2	15	
Fluoride	mg/L	0.24	2.5	2.5	2.4	2.5	86	89	80-120	3	15	
Sulfate	mg/L	2000	1000	1000	3060	3090	107	110	80-120	1	15	

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



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Parameter

Date: 05/06/2020 04:52 PM

Chloride

Fluoride

Sulfate

Units

mg/L

mg/L

mg/L

MATRIX SPIKE & MATRIX S	PIKE DUPI	LICATE: 2647	461 MS	MSD	2647462							
		60334610001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Chloride	mg/L	116	50	50	169	166	107	101	80-120	2	15	
Fluoride	mg/L	0.57	2.5	2.5	2.8	2.9	91	93	80-120	2	15	
Sulfate	mg/L	320	250	250	569	562	99	97	80-120	1	15	
SAMPLE DUPLICATE: 264	7458		603343	88001	Dup			Max				
Parameter		Units	Res		Result	RPI)	RPD	Qualif	iers		
Chloride		mg/L	-	23.1	23.5	5	1	15				
Fluoride		mg/L		0.24	.16	J		15	;			
Sulfate		mg/L		2000	2010)	1	15	i			
SAMPLE DUPLICATE: 264	7463											
			603346	10001	Dup			Max				

Result

109

0.57

305

Result

116

0.57

320

RPD

6

0

5

RPD

15

15

15

Qualifiers

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



QUALIFIERS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 05/06/2020 04:52 PM

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334388

Date: 05/06/2020 04:52 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica Batch
60334388001	ASH-01-CCR	EPA 3010	651247	EPA 6010	651262
60334388002	ASH-02-CCR	EPA 3010	651247	EPA 6010	651262
60334388003	DUP-3-CCR	EPA 3010	651247	EPA 6010	651262
60334388001	ASH-01-CCR	EPA 3010	651309	EPA 6020	651456
60334388002	ASH-02-CCR	EPA 3010	651309	EPA 6020	651456
60334388003	DUP-3-CCR	EPA 3010	651309	EPA 6020	651456
60334388001	ASH-01-CCR	EPA 7470	652982	EPA 7470	653083
60334388002	ASH-02-CCR	EPA 7470	652982	EPA 7470	653083
60334388003	DUP-3-CCR	EPA 7470	652982	EPA 7470	653083
60334388001	ASH-01-CCR	SM 2540C	650182		
60334388002	ASH-02-CCR	SM 2540C	650182		
60334388003	DUP-3-CCR	SM 2540C	650182		
60334388001	ASH-01-CCR	EPA 9056	652553		
60334388002	ASH-02-CCR	EPA 9056	652356		
60334388003	DUP-3-CCR	EPA 9056	652356		



Sample Condition Upon Receipt



Client Name: HECOM		
Courier: FedEx UPS UPS VIA Clay	PEX □ ECI □	Pace ☐ Xroads ☐ Client ☐ Other ☐
Tracking #: 150587636(25 P	ace Shipping Label Use	d? Yes □ No.
Custody Seal on Cooler/Box Present: Yes ▼ No □	Seals intact: Yes	
Packing Material: Bubble Wrap □ Bubble Bags		None □ Other ☑ C//C
	of Ice We Blue No	, ,
Cooler Temperature (°C): As-read 4.2 Corr. Fa	ctor 70 - 1 Correc	ted 4.3 Date and initials of person examining contents: 1-/5-2020
Temperature should be above freezing to 6°C		175 5000
Chain of Custody present:	Xyes □No □N/A	
Chain of Custody relinquished:	Xes DNo DN/A	
Samples arrived within holding time:	Yes DNo DN/A	
Short Hold Time analyses (<72hr):	□Yes Do □N/A	
Rush Turn Around Time requested:	□Yes No □N/A	
Sufficient volume:	Yes DNo DN/A	
Correct containers used:	OVes ONO ON/A	
Pace containers used:	Yes Ono On/A	
Containers intact:	Yes DNo DN/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No DNIA	
Filtered volume received for dissolved tests?	□Yes □No NA	
Sample labels match COC: Date / time / ID / analyses	Yes DNo DN/A	
Samples contain multiple phases? Matrix: (A)	□Yes No □N/A	
Containers requiring pH preservation in compliance?	Yes No N/A	List sample IDs, volumes, lot #'s of preservative and the
(HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot ☆C		date/time added.
Cyanide water sample checks:	00,7175	
Lead acetate strip tums dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Trip Blank present:	□Yes □No VINVA	
Headspace in VOA vials (>6mm):	□Yes □No NN/A	
Samples from USDA Regulated Area: State:	□Yes □No DWA	
Additional labels attached to 5035A / TX1005 vials in the field	? DYes DNo MINIA	
Client Notification/ Resolution: Copy COC	1/1	Field Data Required? Y / N
Person Contacted: Date/	Time:	
Comments/ Resolution:		
Project Manager Review:	Date	
-		*



CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

	nation;	Required Project Information:	Project	MOTHE	ation:				_	in epiove	Invoice Information:	-								<u> </u>	Page:	7	of	
Company AECOM	OM	Report To: Vasanta Kalluri	. Vasa	ınta K	alluri				-	Attention:		Accounts Payable	Payab	Φ			Г					1		
Address: 6200	6200 South Quebec St	Сору То:	1	ר Roth	Brian Rothmeyer				Ĭ	Company Name.	Name:	AECOM	M				100	TA III	VOLTO A VOCTA ILIDAG					
	Greenwood Village, CO 80111									Address	Sa	Same as Section A	Section	Αſ			L	NEDER		SENCT COOLINE MANAGETER		١.		
0	brian.rothmeyer@aecom.com	Purchase Order No.	Order N	:O					ľ	Pace Quote		42700					T	5 5	. L	A CINION A	A EX		DRINKING WATER	ATER
Phone: (303) 740-2614	-2614 Fax:	Project Name:		PRPA	PRPA Rawhide CCR	te CCR				Reference: Pace Project		Heather Wilson	Vilson				- 8	150	- L	KCKA		OTHER	ER.	
Requested Due Date/TAT:	тат:	Project Number.	.mber.							Pace Profile #	11 N	11033, 3					5	STATE:	11:	8				
O selfred				-										H		queste	d Anal	ysis Filt	Requested Analysis Filtered (Y/N)	9				
Required Client Information		Codes	(fiel of s	(GMO:		COLLECTED	СТЕР				Pre	Preservatives	ves	¶N/A										
	WATER WASTE WATER PRODUCT SOILSOI ID	* * * * * * * * * * * * * * * * * * *	valid code:	SAB C=C	COMPOSITE	SITE	COMPOSITE END/GRAB	ite AB	естіои.												(N			
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	ASH-UI- CCR		1		DATE	TIME	DATE	TIME	√S	ın >	H	PH (W	_	06	09		1				ace Proje	Pace Project No./ Lab I.D.	Lab I.D.
2	ASH-02-CCP					(2,23)				4 %	4 =				< >	۲ ·	× 1				4			
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nt Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60334455

Sampling Event: April 10th, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: June 23, 2020

Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 10th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria		riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤1. 			X
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		

Review Parameter	Criteria	_	Criteri Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Detection Limits Mets (Radiochemistry)	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.		X ¹	
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

1 – For the radium-226 result for sample ASH-07-CCR, the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported MDC and was qualified as estimated (J v) indicating the detection limit criteria was not met.

> - Greater Than

 $[\]sigma$ – Sigma (Uncertainty)

^{6 –} Signia (Uncertainty)
± – Plus or Minus/High or Low Bias
LCS – Laboratory Control Sample
MS/MSD – Matrix Spike/Matrix Spike Duplicate
RPD – Relative Percent Difference

< – Less Than pCi/L – Picocuries Per Liter DER – Duplicate Error Ratio

LCSD - Laboratory Control Sample Duplicate

NA – Not Applicable v – Compound Identification Issue

^{≤ –} Less Than or Equal To % – Percent

J-Estimated

MDC – Minimum Detectable Concentration Ra – Radium





May 05, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

Revision 1 - This report replaces the May 4, 2020 report. This project was revised on May 4, 2020 to reflect revised Client Sample ID's. (Greensburg, PA)

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407

Matter m. Wilson

Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L

(913)599-5665



SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334455001	ASH-07-CCR	Water	04/10/20 12:00	04/11/20 10:30
60334455002	ASH-04-CCR	Water	04/10/20 14:00	04/11/20 10:30

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334455001	ASH-07-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334455002	ASH-04-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

Sample: ASH-07-CCR PWS:	Lab ID: 6033 Site ID:	4455001 Collected: 04/10/20 12:00 Sample Type:	Received:	04/11/20 10:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg				
Radium-226	EPA 903.1	0.166 ± 0.253 (0.407) C:NA T:94%	pCi/L	05/01/20 12:07	7 13982-63-3	
	Pace Analytical	Services - Greensburg				
Radium-228	EPA 904.0	1.15 ± 0.609 (1.10) C:61% T:80%	pCi/L	04/29/20 14:14	4 15262-20-1	
	Pace Analytical	Services - Greensburg				
Total Radium	Total Radium Calculation	1.32 ± 0.862 (1.51)	pCi/L	05/01/20 14:23	3 7440-14-4	



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

Sample: ASH-04-CCR PWS:	Lab ID: 6033445 5 Site ID:	5002 Collected: 04/10/20 14:00 Sample Type:	Received:	04/11/20 10:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	vices - Greensburg				
Radium-226	EPA 903.1	0.516 ± 0.383 (0.479) C:NA T:101%	pCi/L	05/01/20 12:07	7 13982-63-3	
	Pace Analytical Ser	vices - Greensburg				
Radium-228	EPA 904.0	0.696 ± 0.494 (0.961) C:71% T:77%	pCi/L	04/29/20 14:14	1 15262-20-1	
	Pace Analytical Serv	vices - Greensburg				
Total Radium	Total Radium Calculation	1.21 ± 0.877 (1.44)	pCi/L	05/01/20 14:23	3 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

QC Batch: 392409 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60334455001, 60334455002

METHOD BLANK: 1900036 Matrix: Water

Associated Lab Samples: 60334455001, 60334455002

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.713 ± 0.406 (0.750) C:77% T:86%
 pCi/L
 04/29/20 10:57

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

QC Batch: 392407 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60334455001, 60334455002

METHOD BLANK: 1900035 Matrix: Water

Associated Lab Samples: 60334455001, 60334455002

ParameterAct \pm Unc (MDC) Carr TracUnitsAnalyzedQualifiersRadium-226-0.102 \pm 0.375 (0.811) C:NA T:87%pCi/L05/01/20 11:30

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

(913)599-5665



QUALIFIERS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 05/05/2020 10:47 AM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334455

Date: 05/05/2020 10:47 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334455001	ASH-07-CCR	EPA 903.1	392407		
60334455002	ASH-04-CCR	EPA 903.1	392407		
60334455001	ASH-07-CCR	EPA 904.0	392409		
60334455002	ASH-04-CCR	EPA 904.0	392409		
60334455001	ASH-07-CCR	Total Radium Calculation	394616		
60334455002	ASH-04-CCR	Total Radium Calculation	394616		

CHAIN-OF-CUSTODY / Analytical Request Document

Face Analytical

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

Pace Project No./ Lab I.D. Samples Intact (Y/N) DRINKING WATER SAMPLE CONDITIONS F-ALL-Q-020rev.08, 12-Oct-2007 Cooler (Y/N) OTHER ğ (N/Y) epi Received on I GROUND WATER Page: Residual Chlorine (Y/N) 2 O° ni qmeT REGULATORY AGENCY ္ပ RCRA £ 35. Requested Analysis Filtered (Y/N) TIME 02 02)01/4 12-11-5 Site Location STATE NPDES DATE UST DATE Signed (MM/DD/YY): ACCEPTED BY / AFFILIATION Total Radium 822-muibs7 822-muibs? N/A taseT eisylsnA1 Other Same as Section A MANNY WINNER Accounts Payable Methanol Heather Wilson Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any involces not paid within 30 days. Na₂S₂O₃ Preservatives Company Name: AECOM HOgN ace Profile #: 11033, 3 42700 IOH nvoice information: HNO3 300 Unpreserved H₂SO₄ Reference: Pace Project Section C 202 TIME Pace Quote Address: N # OF CONTAINERS SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION 4/10/170 DATE TIME COMPOSITE END/GRAB DATE COLLECTED AEIOW RELINQUISHED BY / AFFILIATION TIME 3 <u>3</u> PRPA Rawhide CCR COMPOSITE 35 02/04/5 DATE Copy To: Brian Rothmeyer Required Project Information: Report To: Geoff Webb SAMPLE TYPE (G=GRAB C=COMP) <u>ာ</u> Surchase Order No.: 15 Project Name: (see valid codes to left) **BUOD XIBITAM** Project Number: Section B Valid Matrix Codes MATRIX
DRINKING WATER C
WATER V
WASTE WATER V
PRODUCT
SOIL/SOLID OIL WIPE AIR OTHER TISSUE Greenwood Village, CO 80111 brian.rothmeyer@aecom.com 457-50-ESA B4-07-CE ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St SAMPLE ID Fax: Section D Required Client Information Phone: (303) 740-2614 Required Client Information: Requested Due Date/TAT: AECOM Page 11 of 14 Section A Company: Email To: Address: ဌ 9 ۲, ø o, 2 Ξ 7 N TEM # 67

Pittsburgh Lab Sample Condition Upon Receipt Client Name: Project # Courier: Fed Ex UPS USPS Client Commercial Pace Other Label 1505 8763 6239 .IMS Login Custody Seal on Cooler/Box Present: Seals intact: no 4.0 Thermometer Used Type of Ice: Blue None Correction Factor: 03 **Cooler Temperature** Temp should be above freezing to 6°C Date and Initials of person examining contents: 100 4-13-20 pH paper Lot# 1000391 Yes. No Comments: _____ Chain of Custody Present: Chain of Custody Filled Out: Chain of Custody Relinquished: Sampler Name & Signature on COC: Sample Labels match COC: -Includes date/time/ID Matrix: Samples Arrived within Hold Time: Short Hold Time Analysis (<72hr remaining): Rush Turn Around Time Requested: Sufficient Volume: 9. Correct Containers Used: 10. -Pace Containers Used: Containers Intact: Orthophosphate field filtered 12 Hex Cr Aqueous sample field filtered 13. Organic Samples checked for dechlorination: Filtered volume received for Dissolved tests 15. All containers have been checked for preservation. 16. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix All containers meet method preservation initial when Date/time of requirements. completed preservation Lot # of added preservative Headspace in VOA Vials (>6mm): 17. Trip Blank Present: 18. Trip Blank Custody Seals Present

Client Notification/ Resolution: -Person-Contacted: Comments/ Resolution:

Initial when completed:

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

Rad Samples Screened < 0.5 mrem/hr

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

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

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Sample Matrix Spike Control Assessment

Ra-226	MK7	4/18/2020	53500
Test	Analyst	Date:	Batch ID:

Pace Analytical

MS/MSD 2 4/9/2020

4/9/2020 MS/MSD

> Sample I.D. Sample MS I.D. Sample MSD I.D. Sample Collection Date:

≷ Matrix:

	1900035	-0.102	0.375	0.811	-0.53	N/A	Pass
Method Blank Assessment	MB Sample ID	MB concentration:	WB Counting Uncertainty:	MB MDC:	MB Numerical Performance Indicator:	MB Status vs Numerical Indicator:	MB Status vs. MDC:

•																													_
1	60334185002	80000145500	60334185010	18-039	31.431	0.20	0.20	0.662	9.500	0.647	9.722	0.447	0.457	-0.051	0.262	10.769	1.540	9.793	1.467	1.591	0.152	113.89%	101.25%	N/A	N/A	Pass	Pass	136%	71%
	Sample I.D.	Cample INO 1.D.	Sample MSD I.U.	Spike I.D.:	MS/MSD Decay Corrected Spike Concentration (pCi/mL):	Spike Volume Used in MS (mL.):	Spike Volume Used in MSD (mL):	MS Aliquot (L, g, F):	MS Target Conc.(pCi/L, g, F);	MSD Aliquot (L, g, F);	MSD Target Conc. (pCi/L, g, F);	MS Spike Uncertainty (calculated):	MSD Spike Uncertainty (calculated):	Sample Result:	Sample Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Result:	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	MS Numerical Performance Indicator:	MSD Numerical Performance Indicator:	MS Percent Recovery:	MSD Percent Recovery:	MS Status vs Numerical Indicator.	MSD Status vs Numerical Indicator:	MS Status vs Recovery:	MSD Status vs Recovery:	MS/MSD Upper % Recovery Limits:	MS/MSD Lower % Recovery Limits:
			_										N	LCSD53500															
	53500 DIW	:			1900035	-0.102	0.375	0.811	533	N/A	Pass		3D (Y or N)?	LCS53500	5/1/2020	18-039	31.431	0.10	0.659	4.772	0.224	4.439	1.032	0.62	93.03%	Y/Z	Pass	135%	73%

Spike I.D.:
Spike Concentration (pCi/mL):
Volume Used (mL):
Aliquot Volume (1, 9, F):
Target Conc. (pCi/L, 9, F):

Count Date:

Laboratory Control Sample Assessment

Uncertainty (Calculated):
Result (pC/IL, g, F):
LCS/LCSD Counting Uncertainty (pC/IL, g, F):

Numerical Performance Indicator:

Status vs Recovery: Upper % Recovery Limits: Lower % Recovery Limits:

Status vs Numerical Indicator:

Percent Recovery

N/A N/A Pass Pass 136%

60334185006 60334185011 18-039 31 431 0.20 0.20 0.664 9.467 0.465 0.445 0.445 0.445 0.464 0.333 11.838 1.1838 1.1635 9.220 -1.563 12.20 -1.563

***************************************		Matrix Spike/Matrix Spike Duplicate Sample Assessment		1
	Enter Duplicate	Sample I.D.	60334185002	
	sample IDs if	Sample MS I.D.	60334185009	
	other than	Sample MSD I.D.	60334185010	
	LCS/LCSD in	Sample Matrix Spike Result:	10.769	
	the space below.	Matrix Spike Result Counting Uncertainty (pCI/L, g, F):	1.540	
		Sample Matrix Spike Duplicate Result:	9.793	
See Below 排		Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.467	
		Duplicate Numerical Performance Indicator:	0.900	
		(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	11.75%	
		MS/ MSD Duplicate Status vs Numerical Indicator:	A/A	
		MS/ MSD Duplicate Status vs RPD:	Pass	
		% RPD Limit:	32%	

Sample I.D.:
Duplicate Sample i.D.
Sample Result (pCirl., g. F):
Sample Result Counting Uncartainty (pCirl., g. F):
Sample Duplicate Result (pCirl., g. F):
Sample Duplicate Result (pCirl., g. F):

Duplicate Sample Assessment

Are sample and/or duplicate results below RL?

Duplicate Numerical Performance Indicator

60334185006 60334185011 60334185012 11.838 1.1838 1.417 2.537 31.93% N/A Pass 32%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Duplicate Status vs RPD: % RPD Limit:

Duplicate RPD:

Duplicate Status vs Numerical Indicator:

Comments:

Ml 9-1-20

Ra-226_53500_W.xls Ra-226 (R0§5-8 0,1Apr2019).xls

Ra-226 NELAC QC Printed: 5/1/2020 12:56 PM

Pace Analytical

Quality Control Sample Performance Assessment

Ra-228

VAL 4/21/2020

53501 WT Test Analyst Date: Worklist Matrix:

1900036 0.713 0.406 0.750

MB concentration: M/B 2 Sigma CSU: MB MDC:

MB Numerical Performance Indicator: MB Status vs Numerical Indicator: MB Status vs. MDC:

MB Sample ID

Method Blank Assessment

3.44 Fail* Pass

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	4/9/2020	4/9/2020
Sample I.D. Sample MS I.D.	60334185002 60334185009	60334185006
Sample MSD I.D.	60334185010	60334185012
Spike I.D.:	19-057	19-057
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	34.551	34.551
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	0.20
MS Aliquot (L, g, F):	0.810	0.811
MS Target Conc.(pCi/L, g, F):	8.535	8.516
MSD Aliquot (L, g, F):	0.811	0.806
MSD Target Conc. (pCi/L, g, F):	8.524	8.573
MS Spike Uncertainty (calculated):	0.615	0.613
MSD Spike Uncertainty (calculated):	0.614	0.617
Sample Result:	0.701	0,746
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.425	0,432
Sample Matrix Spike Result:	8.391	8,563
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.788	1.802
Sample Matrix Spike Duplicate Result:	8.770	9.611
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	1.877	1.965
MS Numerical Performance Indicator:	-0.855	-0.702
MSD Numerical Performance Indicator:	-0.441	0.272
MS Percent Recovery:	%60.08	91.78%
MSD Percent Recovery:	94.67%	103.41%
MS Status vs Numerical Indicator:	Pass	Pass
MSD Status vs Numerical Indicator:	Pass	Pass
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	%09	%09

LCS53501 4/29/2020 19-057 34.323

Count Date: Spike I.D.:

Laboratory Control Sample Assessment

Decay Corrected Spike Concentration (pCi/mL):

Volume Used (mL):

1.096 1.04 114.13%

Percent Recovery: Status vs Numerical Indicator: Status vs Recovery: Upper % Recovery Limits: Lower % Recovery Limits:

Result (pC/I/L, g, F): LCS/LCSD 2 Sigma CSU (pC/I/L, g, F): Numerical Performance Indicator:

Ϋ́

0.10 0.802 4.280 0.308 4.885

Aliquot Volume (L, g, F): Target Conc. (pCl/L, g, F): Uncertainty (Calculated):

ļ												
	60334185002	60334185009	60334185010	8.391	1.788	8.770	1.877	-0.287	4.96%	Pass	Pass	36%
Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Sample Matrix Spike Result:	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD;	% RPD Limit
	Enter Duplicate	sample IDs if	other than	LCS/LCSD in	the space below.							

60334185006 60334185011 60334185012 8.653 1.802, 9.611 1.905 0..771 11.91% Pass Pass

	elow the MDC.
Duplicate Status vs RPD: % RPD Limit:	valuation of duplicate precision is not applicable if either the sample or duplicate results are bel

See Below 排

Duplicate Numerical Performance Indicator: Duplicate RPD: Duplicate Status vs Numerical Indicator:

Sample 1.D.:

Sample Result (pCi/L, g, F):

Sample Result Sigma CSU (pCi/L, g, F):

Sample Duplicate Result (pCi/L, g, F):

Sample Duplicate Result Sigma CSU (pCi/L, g, F):

Are sample and/or duplicate results below RL?

Duplicate Sample Assessment

排 E/%

If the lowest activity sample in this batch is greater than ten times the blank value, the blank is acceptable; otherwise this batch must be re-prepped.

Comments:

6 of 10

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60334456

Sampling Event: April 13th, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: June 23, 2020

Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 13th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria		Criteria Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.			NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤1. 			X
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Detection Limits Mets (Radiochemistry)	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.		X ¹	
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

1 – For the radium-226 result for sample ASH-08-CCR, the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported MDC and was qualified as estimated (J v) indicating the detection limit criteria was not met.

> - Greater Than

 $[\]sigma$ – Sigma (Uncertainty)

^{6 –} Signia (Uncertainty)
± – Plus or Minus/High or Low Bias
LCS – Laboratory Control Sample
MS/MSD – Matrix Spike/Matrix Spike Duplicate
RPD – Relative Percent Difference

< – Less Than pCi/L – Picocuries Per Liter DER – Duplicate Error Ratio

LCSD - Laboratory Control Sample Duplicate

NA – Not Applicable v – Compound Identification Issue

^{≤ –} Less Than or Equal To % – Percent

J-Estimated

MDC – Minimum Detectable Concentration Ra – Radium





May 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 14, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Hoothor Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Dianton m. Wilson

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1

Missouri Certification #: 235

New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706

Ohio EPA Rad Approval: #41249 Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282

North Dakota Certification #: R-190

Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L

(913)599-5665



SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334456001	ASH-05-CCR	Water	04/13/20 10:15	04/14/20 09:30
60334456002	ASH-08-CCR	Water	04/13/20 12:35	04/14/20 09:30

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334456001	ASH-05-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334456002	ASH-08-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

Sample: ASH-05-CCR PWS:	Lab ID: 6033445 Site ID:	6001 Collected: 04/13/20 10:15 Sample Type:	Received:	04/14/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	vices - Greensburg				
Radium-226	EPA 903.1	0.404 ± 0.378 (0.536) C:NA T:96%	pCi/L	05/05/20 15:40	13982-63-3	
	Pace Analytical Ser	vices - Greensburg				
Radium-228	EPA 904.0	1.03 ± 0.478 (0.811) C:74% T:84%	pCi/L	05/01/20 14:02	2 15262-20-1	
	Pace Analytical Ser	vices - Greensburg				
Total Radium	Total Radium Calculation	1.43 ± 0.856 (1.35)	pCi/L	05/05/20 17:27	7440-14-4	



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

Sample: ASH-08-CCR PWS:	Lab ID: 6033445 Site ID:	Geod2 Collected: 04/13/20 12:35 Sample Type:	Received:	04/14/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	rvices - Greensburg				
Radium-226	EPA 903.1	0.351 ± 0.431 (0.703) C:NA T:91%	pCi/L	05/05/20 15:40	13982-63-3	
	Pace Analytical Ser	rvices - Greensburg				
Radium-228	EPA 904.0	3.69 ± 0.923 (0.877) C:76% T:80%	pCi/L	05/01/20 14:02	2 15262-20-1	
	Pace Analytical Ser	rvices - Greensburg				
Total Radium	Total Radium Calculation	4.04 ± 1.35 (1.58)	pCi/L	05/05/20 17:27	7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

QC Batch: 392594 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60334456001, 60334456002

METHOD BLANK: 1901256 Matrix: Water

Associated Lab Samples: 60334456001, 60334456002

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.119 ± 0.382 (0.859) C:77% T:80%
 pCi/L
 05/01/20 14:03

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

QC Batch: 392952 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60334456001, 60334456002

METHOD BLANK: 1903552 Matrix: Water

Associated Lab Samples: 60334456001, 60334456002

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 0.000 ± 0.383 (0.775) C:NA T:82%
 pCi/L
 05/05/20 15:40

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

(913)599-5665



QUALIFIERS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 05/06/2020 09:18 AM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

(913)599-5665



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334456

Date: 05/06/2020 09:18 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334456001	ASH-05-CCR	EPA 903.1	392952		
60334456002	ASH-08-CCR	EPA 903.1	392952		
60334456001	ASH-05-CCR	EPA 904.0	392594		
60334456002	ASH-08-CCR	EPA 904.0	392594		
60334456001	ASH-05-CCR	Total Radium Calculation	394990		
60334456002	ASH-08-CCR	Total Radium Calculation	394990		

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Face Analytical www.pacetess.com

Section A Required C	Section A Required Client Information:	Section B Required Project Information	Section C	Page: of
Company:	AECOM	Report To: Geoff Webb	Attention: Accounts Payable	
Address.	6200 South Quebec St	Copy To: Brian Rothmeyer	Company Name: AECOM	REGULATORY AGENCY
	Greenwood Village, CO 80111	**Control Control Cont	Address: Same as Section A	NPDES L' GROUND WATER L' DRINKING WATER
1.2	brian.rothmeye	Purchase Order No.:	Pace Quote 42700 Reference.	F UST F RCRA F OTHER
Phone;	(303) 740-2614 Fax:	Project Name: PRPA Rawhide CCR	Pace Project Heather Wilson Manager.	Site Location
Request	Requested Due Date/TAT:	Project Number:	Pace Profile #: 11033, 3	STATE: CO
				Requested Analysis Filtered (Y/N)
	Section D Valid Matrix Codes Required Client information MATRIX COL	des e	Preservatives × ×	
	DRINKING WATER WASTE WATER PRODUCT SOL/SOLID OIL	Dow wy		(N/A) :
	SAMPLE ID WPE (A-Z, 0-9 /) OTHER Sample IDs MUST BE UNIQUE TISSUE	CODE (s	bevr hed h	Chlorine
# W∃II		AMPLE TIME DATE TIME	sAMPLE 1 # OF CO! Unprese H2SO ₄ HKI Na ₂ S ₂ O ₉ HCI Na ₂ OH Other	전 Pace Project No./ Lab I.D.
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1 of		SIGNATURE of SAI	ļ'	Receipt Coolo
14		"Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per	5% per month for any invoices not paid within 30 days.	F-ALL-Q-020rev.08, '

Pittsburgh Lab Sample Co	ondition	Upoı	n Re	ceipt		
Pacs Analytical Client Name	e: <u> </u>	AI	<u>=c</u>	OM	Project#	_
Courier: Fed Ex UPS USPS Tracking #: 1505876415		Comme	ercial	Pace Other	Label]
	,				LIMS Login	_
Custody Seal on Cooler/Box Present:	-			1	no	
Thermometer Used	·····			Blue None	6	
Cooler Temperature Observed Temp	4.6	- °C	Corr	ection Factor: 0.4	F °C Final Temp: +.2 °C	
Temp should be above freezing to 6°C				pH paper Lot#	Date and Initials of person examining	7
Comments:	Yes	No	N/A	1004281	Date and Initials of person examining contents: リルルーリバスクルシー	
Chain of Custody Present:				1.		
Chain of Custody Filled Out:		1		2.		_
Chain of Custody Relinquished:		'		3.		
Sampler Name & Signature on COC:		<u> </u>		4.		
Sample Labels match COC:				5.		
-Includes date/time/ID Matri	x. WT					
Samples Arrived within Hold Time:				6.		
Short Hold Time Analysis (<72hr remainin	g):			7.		
Rush Turn Around Time Requested:				8.		
Sufficient Volume:				9.]
Correct Containers Used:	/			10.		
-Pace Containers Used:						
Containers Intact:				11.		7
Orthophosphate field filtered				12.		
Hex Cr Aqueous sample field filtered				13.		7
Organic Samples checked for dechlorina	ation:			14.		7
Filtered volume received for Dissolved tests			/	15,		
All containers have been checked for preservation	. /	-		16. DH47	•	1
exceptions: VOA, coliform, TOC, O&G, Phen Non-aqueous matrix	nolics, Radon	١,	.1	PII	•	
All containers meet method preservation requirements.				Initial when M 2	Date/time of preservation	
				Lot # of added preservative		
Headspace in VOA Vials (>6mm):				17.		1
Trip Blank Present:				18.		†
Trip Blank Custody Seals Present	-			10.	** **	1 . ,
Rad Samples Screened < 0.5 mrem/hr		+		Initial when NMP	- Date: 4/15/1010	·
		,		completed:	Date:	_
Client Notification/ Resolution:			_			
Person Contacted:			-Date/	Time:	Gontacted By:	
Comments/ Resolution:						-
						-
						-
						-

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

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

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

Face Analytical"

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

MS/MSD 2

MS/MSD

Sample Collection Date:

Sample Matrix Spike Control Assessment

30358880001MS 30358880001 4/7/2020

Sample I.D. Sample MS I.D.

Spike I.D.:

18-039 31.431 0.20

MS/MSD Decay Corrected Spike Concentration (pCl/mL): Spike Volume Used in MS (mL): Spike Volume Used in MSD (mL):

0.651

MS Aliquot (L, g, F): MS Target Conc.(pCi/L, g, F): 1.939 0.624 9.630

-2.537 79.60% Pass 136%

ΧŽ

0.454

MSD Target Conc. (pCi/L, g, F):

Ra-226 Test:

MK1 4/23/2020	53569	ΜO		1903552	0.000	0.383	0.775	0.00	N/A	Pass
Analyst: Date:	Batch ID:	Matrix:	Method Blank Assessment	Ol Sample ID	MB concentration:	M/B Counting Uncertainty:	MB MDC:	MB Numerical Performance Indicator:	MB Status vs Numerical Indicator:	MB Status vs. MDC:

Laboratory Control Sample Assessi

	LCSD (Y or N)? N NSD Spike Uncertainty (calculated):	LCS53569 LCSD53569	vate: 5/5/2020 Sample Result Counting Uncertainty (pCi/L, g, F):	I.D.: 18-039	ml.); 31.430 Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	mL); Sample Matrix Spike Duplicate Result.	(F): 0.652 Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	(F); 4.819 MS Numerical Performance Indicator:	ed); 0.226 MSD Numerical Performance Indicator:	, F); 4.354	. F): 1.010	etor: -0.88 MS Status vs Numerical Indicator:	N 60:36%	YZ	ery: Pass	nits: 135% MS/MSD Upper % Recovery Limits:	7902
	ol Sample Assessment		Count Date:	Spike I.D.:	Spike Concentration (pCi/mL):	Volume Used (mL):	Aliquot Volume (L, g, F):	Target Conc. (pCi/L, g, F):	Uncertainty (Calculated):	Result (pCi/L, g, F):	LCS/LCSD Counting Uncertainty (pCi/L, g, F):	Numerical Performance Indicator	Percent Recovery:	Status vs Numerical Indicator	Status vs Recovery:	Upper % Recovery Limits:	Lower % Recovery Limits:

Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Sample Matrix Spike Result.	Matrix Spike Result Counting Uncertainty (pCl/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD:	% RPD Limit:
	Enter Duplicate	P sample IDs if	other than	rcs/rcsb in	the space below.			30359163001	30359163001DUP			

0.400 0.299 0.415

Sample I.D.:

Duplicate Sample I.D.:

Sample Result (DCML, g, F):

Sample Result Counting Uncertainty (DCML, g, F):

Sample Duplicate Result (DCML, g, F):

Sample Duplicate Result (DCML, g, F):

Are sample and/or duplicate results below RL?

Are sample and/or duplicate results below RL?

Duplicate Sample Assessment

See Below ##

0.584

44.57% N/A Fail***

Duplicate Status vs Numerical indicator: Duplicate Status vs RPD:

Duplicate RPD:

Duplicate Numerical Performance Indicator:

30359163001DUP 30359163001

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

regulty a Su mo

- Baith must be re-predictive to unacceptable precision. Let $\mathcal C$ A Coceptable

1 of 1

Ra-226_53569_DW_W.xls Ra-226 (R085-8 01Apr2019).xls

Scher Sage 13 of 14

Ra-226 NELAC QC Printed: 5/5/2020 5:19 PM

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Matrix Spike LD: A152020 A1520	Test: Analysis	Ra-228		Samia Matrix Saile Control Bessement	MS/MSD 1	WS/MSD 2
Morklist: 53539 Sample ID	Atalyst. Date:	4/23/2020		Sample matrix spike control Assessment Sample Collection Date:	4/15/2020	MO/MOD A
MS Sample ID	Worklist: Matrix:	53539 WT			30359026001 30359026001MS	
MB Sample ID 1901266 MS/MSD Decay Corrected Spike Concentration (D(I/mL): Spike Volume Used in MS (mL): MB Status vs Numerical Performance Indicator: Pass MS/MSD Decay Corrected Spike Concentration (D(I/L, g. F): MS Spike Volume Used in MS (mL): Spike Volume Used in MS (mL): MS Status vs Numerical Performance Indicator: Pass MS/MSD Decay Corrected Spike Concentration (D(I/L, g. F): MS Spike Volume Used in MS (mL): MS Spike Uncertainty (calculated): MSD Aliquot (L, g. F): MS Spike Uncertainty (calculated): MSD MSD Spike Result: Signa CSU (pCi/L, g. F): MSD MSD Spike Duplicate Result: MSD Numerical Performance Indicator: MSD Status vs Numerical Indicator: MSD				Sample MSD I.D.		
MB Sample ID 1901256 MS/MSD Decay Corrected Spike Concentration (pCi/mL): MB concentration: 0.119 MS/MSD Decay Corrected Spike Concentration (pCi/mL): MB ADC: 0.859 MS/MSD Decay Corrected Spike Volume Used in MS (mL): MB MDC: 0.859 MS Janget Conc. (pCi/L. g. F): MB MDC: Pass MS Janget Conc. (pCi/L. g. F): MB Status vs. MDC: Pass MS Janget Conc. (pCi/L. g. F): MB Status vs. MDC: Pass MS Dalquot (L. g. F): MB Spike Uncertainty (calculated): LCSD53539 LCSD53539 Count Date: 5/1/2020 Sample Result Sigma CSU (pCi/L. g. F): Spike LD: 14-047 Sample Result Sigma CSU (pCi/L. g. F): Spike LD: 14-047 Sample Matrix Spike Duplicate Result Sigma CSU (pCi/L. g. F): Aliquot Volume Used (mL): 0.10 Matrix Spike Duplicate Result Sigma CSU (pCi/L. g. F): Aliquot Volume Used (mL): 0.10 Matrix Spike Duplicate Result Sigma CSU (pCi/L. g. F): Aliquot Volume Used (mL): 0.10 Matrix Spike Duplicate Result Sigma CSU (pCi/L. g. F): Aliguot Volume Used (mL): 0.10 Matrix Spike Duplicate Result Sigma CSU (pCi/L. g. F):	sessment			Spike I.D.:	19-057	
0.119 Spike Volume Used in MS (mL); 0.832 Spike Volume Used in MS (mL); 0.61 Pass 0.61 MS Aliquot (L. g. F); NSD Target Conc. (pCi/L. g. F); MSD Target Conc. (pCi/L. g. F); MSD Target Conc. (pCi/L. g. F); MSD MSD Target Conc. (pCi/L. g. F); MSD Spike Uncertainty (calculated); MSD Spike Uncertainty (calculated); 1.6253539 Sample Result 2 Sigma CSU (pCi/L. g. F); 1.6254539 Sample Result 2 Sigma CSU (pCi/L. g. F); 1.6254539 Sample Result 2 Sigma CSU (pCi/L. g. F); 1.6254539 Sample Matrix Spike Duplicate Result (adculated); 1.625467 Sample Matrix Spike Duplicate Result (adculated); 1.62547 Matrix Spike Result 2 Sigma CSU (pCi/L. g. F); 1.62647 Sample Matrix Spike Duplicate Result (adculated); 1.62648 Sample Matrix Spike Duplicate Result (adculated); 1.62649 Sample Matrix Spike Duplicate Result; 1.62	CI Sample ID	1901256		MS/MSD Decay Corrected Spike Concentration (pCi/mL):	34.483	
MMB 2 Sigma CSU: 0.382 Spike Volume Used in MSD (mL); MB MDC: 0.659 MSD MSD (mL); MB MDC: 0.61 MS Aliquot (L, g, F); MB Status vs. MDC: Pass MSD Aliquot (L, g, F); MB Status vs. MDC: Pass MSD Aliquot (L, g, F); MB Status vs. MDC: Pass MSD Aliquot (L, g, F); MSD Aliquot (L, g, F); MSD Aliquot (L, g, F); Count Date: 51/2020 Spike Uncertainty (calculated); Concentration polimin; 34.299 Sample Result Z Sigma CSU (pClL, g, F); Volume Used (mL); 0.10 Matrix Spike Result Z Sigma CSU (pClL, g, F); Aliquot Volume (L, g, F); 0.811 Matrix Spike Duplicate Result Z Sigma CSU (pClL, g, F); Aliquot Volume (L, g, F); 0.304 MSD Numerical Performance Indicator: Result (pCi/L, g, F); 0.348 MSD Numerical Performance Indicator: Result (pCi/L, g, F); 0.348 MSD Sigma vs Numerical Indicator: Percent Recovery: Percent Recovery: Percent Recovery: Percent Recovery: Percent Recovery: Percent Recovery: Percent Recove	MB concentration:	0.119		Spike Volume Used in MS (mL):	0.20	
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MS Target Conc. (pCl/L, g, F): MB Status vs. MDC: Pass MS Spike Uncertainty (calculated): MSD Spike Uncertainty (calculated): MATIX Spike Result 2 Sigma CSU (pCl/L, g, F): MSD Numerical Performance Indicator: MSD Status vs Numerical Indi	MB MDC:	0.859		MS Aliquot (L, g, F):	0,815	
Sus Numerical Indicator: Pass MSD Tagettor (L. g. F): MB Status vs. MDC: Pass MSD Taget Cone, (pCl/L, g. F): LCSD (Y or N)? N MSD Spike Uncertainty (calculated): LCSS3539 LCSD63639 LCSD63639 Spike I.D: Sample Result 2 Sigma CSU (pCl/L, g. F): Spike I.D: 34.299 Amount Date: Sample Matrix Spike Result 2 Sigma CSU (pCl/L, g. F): Aliquot Volume Used (mL): 34.299 Amount Date: Sample Matrix Spike Duplicate Result 2 Sigma CSU (pCl/L, g. F): Aliquot Volume Used (mL): 37.29 Matrix Spike Duplicate Result 2 Sigma CSU (pCl/L, g. F): Sample Matrix Spike Duplicate Result. Result (pCi/L, g. F): 37.29 Matrix Spike Duplicate Result 2 Sigma CSU (pCl/L, g. F): Amount CSU (pCl/L, g. F): Sigma CSU (pCl/L, g. F): 37.29 MSD Numerical Performance Indicator: Approvent Recovery: Result (pCi/L, g. F): 37.29 MSD Status vs Numerical Indicator: MSD Status vs Numerical Indicator: Percent Recovery: Percent Recovery: MSD Status vs Numerical Indicator: MSD Status vs Recovery: Percent Recovery: Percent Recovery: MSSMSD Lower % Recovery:	MB Numerical Performance Indicator:	0.61		MS Target Conc.(pCi/L, g, F):	8,466	
MB Status vs. MDC; Pass MSS Target Conc. (pCt/L, g, F): MS Spike Uncertainty (calculated): MSD Spike Uncertainty (calculated): Sample Result Z Sigma CSU (pCt/L, g, F): Spike Uncertainty (calculated): Spike Uncertainty	MB Status vs Numerical Indicator:	Pass		MSD Aliquot (L, g, F):		
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LCSD (Y or N)?				MS Spike Uncertainty (calculated):	0.610	
CS53539 CCSD53539 Sample Result Sigma CSU (PCL, g, F): 19-057 Sample Result Sigma CSU (PCL, g, F): 19-057 Sample Matrix Spike Result: Sample Matrix Spike Result: Sigma CSU (PCL, g, F): 23-229 Sample Matrix Spike Duplicate Result: Matrix Spike Pesult: Sigma CSU (PCL, g, F): 37-24 Sample Matrix Spike Duplicate Result: Sigma CSU (PCL, g, F): MS Numerical Performance Indicator: 0.334 MSD Numerical Performance Indicator: MSD Numerical Performance Indicator: MSD Numerical Performance Indicator: MSD Status vs Numerical Indicator: MSD Status vs Recovery: MSSMSD Lower % Recovery Limits: 60%	rol Sample Assessment	LCSD (Y or N)?	z	MSD Spike Uncertainty (calculated):		
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19-057 Sample Matrix Spike Result Sigma CSU (DCML, 9, F): 0.10	Count Date:	5/1/2020		Sample Result 2 Sigma CSU (pCi/L, g, F):	0.415	
34.239 Matrix Spike Result 2 Sigma CSU (pCiff., g, F): 0.10 Sample Matrix Spike Duplicate Result: 0.811 Matrix Spike Duplicate Result 2 Sigma CSU (pCiff., g, F): 4.227 MS Numerical Performance Indicator: 0.304 MS Dumerical Performance Indicator: 0.948 MSD Percent Recovery: 0.98 MSD Percent Recovery: N/A MS Status vs Numerical Indicator: M/A MSD Status vs Numerical Indicator: MSD Status vs Numerical Indicator: MSS Status vs Recovery: MSD Status vs Recovery: MS/MSD Lower % Recovery: MS/MSD Lower % Recovery Limits: MS/MSD Lower % Recovery Limits:	Spike I.D.:	19-057		Sample Matrix Spike Result:	7.874	
0.10 Sample Matrix Spike Duplicate Result.	Decay Corrected Spike Concentration (pCi/mL):	34.299		Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.622	
0.811 Matrix Spike Duplicate Result 2 Sigma CSU (PCiff., g. F): 4.227 M.S. Numerical Performance Indicator: 0.304 MSD Numerical Performance Indicator: 3.729 MS Percent Recovery: 0.948 MSD Percent Recovery: -0.98 MSD Percent Recovery: NIA MSD Status vs Numerical Indicator: Pass MSD Status vs Recovery: Pass MSD Status vs Recovery: 135% MSJMSD Upper % Recovery: 60% MSIMIS:	Volume Used (mL):	0.10		Sample Matrix Spike Duplicate Result:		
4.227 MS Numerical Performance Indicator: 0.394 MSD Numerical Performance Indicator: 3.729 MS Percent Recovery: 0.948 MSD Percent Recovery: -0.98 MSD Percent Recovery: MSD Status vs Numerical Indicator: MSD Status vs Recovery: N/A MS Status vs Recovery: Pass MSD Status vs Recovery: 135% MS/MSD Upper % Recovery: 60% MS/MSD Lower % Recovery Limits: 60% MS/MSD Lower % Recovery Limits:	Aliquot Volume (L, g, F):	0.811		Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
0.304 MSD Numerical Performance Indicator. 3.729 MS Percent Recovery. 0.948 MSD Percent Recovery. -0.98 MSD Percent Recovery. -0.98 MSD Percent Recovery. NA MSD Status vs Numerical Indicator. NA MSS Status vs Recovery. Pass MSS Status vs Recovery. 135% MS/MSD Lopper % Recovery Limits: 60% MS/MSD Lower % Recovery Limits:	Target Conc. (pCi/L, g, F):	4.227		MS Numerical Performance Indicator:	-0.992	
3.729 MS Percent Recovery. 0.948 MSD Percent Recovery. -0.98 MS Status vs Numerical Indicator. 82.20% MSD Status vs Numerical Indicator. NA MSD Status vs Recovery. Pass MSS Status vs Recovery. 135% MS/MSD Upper % Recovery Limits: 60% MS/MSD Lower % Recovery Limits:	Uncertainty (Catculated):	0.304		MSD Numerical Performance Indicator:		
0.948 MSD Percent Recovery. -0.98 MS Status vs Numerical indicator: 88.20% MSD Status vs Numerical indicator: NIA MSD Status vs Recovery: Pass MSD Status vs Recovery: 135% MSIMSD Upper % Recovery Limits: 60% MSIMSD Lower % Recovery Limits:	Result (pCi/L, g, F):	3.729		MS Percent Recovery:	89.35%	
-0.98 MS Status vs Numerical Indicator: 88.20% MSD Status vs Numerical Indicator: N/A MSD Status vs Recovery: Pass MS/MSD Upper % Recovery: 135% MS/MSD Lower % Recovery Limits: 60%	LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	0.948		MSD Percent Recovery:		
Name	Numerical Performance Indicator:	-0.98		MS Status vs Numerical Indicator:	Pass	
Numerical Indicator: N/A MS Status vs Recovery. Status vs Recovery: Pass MSD Status vs Recovery. Status vs Recovery: MSD Status vs Recovery. **Recovery Limits: 153% MS/MSD Upper **Recovery Limits: **Recovery Limits: 60% MS/MSD Lower **Recovery Limits:	Percent Recovery:	88.20%		MSD Status vs Numerical Indicator:		
Status vs Recovery: % Recovery Limits: 135% MS/MSD Upper % Recovery Limits: % Recovery Limits: 60% MS/MSD Lower % Recovery Limits:		Y/V		MS Status vs Recovery:	Pass	
% Recovery Limits: 135% MS/MSD Upper % Recovery Limits: % Recovery Limits: 60% MS/MSD Lower % Recovery Limits:	Status vs Recovery:	Pass		MSD Status vs Recovery:		
% Recovery Limits: 60% Recovery Limits:		135%		MS/MSD Upper % Recovery Limits:	135%	
	Lower % Recovery Limits:	60%		MS/MSD Lower % Recovery Limits:	%09	

Laboratory Control Sample Assessment

Method Blank Assessment

Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Sample Matrix Spike Result:	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD:	% RPD Limit:
	Enter Duplicate	sample IDs if	other than	LCS/LCSD in	the space below.			30358879001	B0358879001DUP			
	Sample I.D.: 30358879001 Enter Duplicate	30358879001DUP	0.068	0.325	0.441	0.355	See Below #	-1.518	146.43%	Pass	Failt	36%
Duplicate Sample Assessment	Sample I.D.:	Duplicate Sample I.D. 30358879001DUP sample IDs if	Sample Result (pCi/L, g, F):	Sample Result 2 Sigma CSU (pCi/L, g, F):	Sample Duplicate Result (pCi/L, g, F):	Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	Are sample and/or duplicate results below RL?	Duplicate Numerical Performance Indicator:	Duplicate RPD:	Duplicate Status vs Numerical Indicator:	Duplicate Status vs RPD:	% RPD Limit.

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Comments:



6 of 10

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60334603

Sampling Event: April 14th, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: June 23, 2020

Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 14th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	_	riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. Analyte Concentration MB 1903526 Ra-228 0.607 ± 0.492 pCi/L ± - Plus or Minus pCi/L - Picocuries Per Liter MB - Method Blank Ra - Radium		X^1	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below:	X		

Review Parameter	Criteria	_	riteri Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
	Parent Sample Field Duplicate ASH-02-CCR DUP-3-CCR • The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤1.			
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		
Detection Limits Mets (Radiochemistry)	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.		X ²	
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		
	Comments			

- 1 As the associated radium-226 sample results were reported at concentrations less than the MDC, qualification was not considered necessary.
- 2 For the radium-226 result for sample ASH-01-CCR, the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported MDC and was qualified as estimated (J v) indicating the detection limit criteria was not met.

> - Greater Than

 $[\]sigma-Sigma\;(Uncertainty)$

 $[\]pm$ – Plus or Minus/High or Low Bias LCS - Laboratory Control Sample

MS/MSD - Matrix Spike/Matrix Spike Duplicate

RPD - Relative Percent Difference

< - Less Than

pCi/L – Picocuries Per Liter DER – Duplicate Error Ratio LCSD – Laboratory Control Sample Duplicate

NA - Not Applicable

v - Compound Identification Issue

^{≤ –} Less Than or Equal To

^{% –} Percent J – Estimated

MDC - Minimum Detectable Concentration

Ra-Radium





May 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 15, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Dianton m. Wilson

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14

Missouri Certification #: 235

Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
60334603001	ASH-01-CCR	Water	04/14/20 10:20	04/15/20 09:30	
60334603002	ASH-02-CCR	Water	04/14/20 13:30	04/15/20 09:30	
60334603003	DUP-3-CCR	Water	04/14/20 08:00	04/15/20 09:30	
60334603004	ASH-01-CCR MS	Water	04/14/20 10:20	04/15/20 09:30	
60334603005	ASH-01-CCR MSD	Water	04/14/20 10:20	04/15/20 09:30	



SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334603001	ASH-01-CCR	EPA 903.1	 MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334603002	ASH-02-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334603003	DUP-3-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334603004	ASH-01-CCR MS	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60334603005	ASH-01-CCR MSD	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

Sample: ASH-01-CCR PWS:	Lab ID: 6033460 3 Site ID:	Collected: 04/14/20 10:20 Sample Type:	Received:	04/15/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Serv	rices - Greensburg				
Radium-226	EPA 903.1	0.238 ± 0.248 (0.350) C:NA T:92%	pCi/L	05/06/20 14:03	3 13982-63-3	
	Pace Analytical Serv	rices - Greensburg				
Radium-228	EPA 904.0	0.743 ± 0.403 (0.735) C:81% T:86%	pCi/L	05/04/20 11:06	15262-20-1	
	Pace Analytical Serv	rices - Greensburg				
Total Radium	Total Radium Calculation	0.981 ± 0.651 (1.09)	pCi/L	05/06/20 15:18	3 7440-14-4	



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

Sample: ASH-02-CCR PWS:	Lab ID: 6033460 Site ID:	3002 Collected: 04/14/20 13:30 Sample Type:	Received:	04/15/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	vices - Greensburg				
Radium-226	EPA 903.1	-0.115 ± 0.318 (0.752) C:NA T:96%	pCi/L	05/06/20 14:03	3 13982-63-3	
	Pace Analytical Ser	vices - Greensburg				
Radium-228	EPA 904.0	0.321 ± 0.431 (0.923) C:77% T:80%	pCi/L	05/04/20 11:06	5 15262-20-1	
	Pace Analytical Ser	vices - Greensburg				
Total Radium	Total Radium Calculation	0.321 ± 0.749 (1.68)	pCi/L	05/06/20 15:18	3 7440-14-4	



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

Sample: DUP-3-CCR PWS:	Lab ID: 6033 Site ID:	4603003 Collected: 04/14/20 08:00 Sample Type:	Received:	04/15/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg				
Radium-226	EPA 903.1	0.201 ± 0.348 (0.621) C:NA T:83%	pCi/L	05/06/20 14:03	3 13982-63-3	
	Pace Analytical	Services - Greensburg				
Radium-228	EPA 904.0	0.600 ± 0.478 (0.961) C:77% T:78%	pCi/L	05/04/20 11:23	3 15262-20-1	
	Pace Analytical	Services - Greensburg				
Total Radium	Total Radium Calculation	0.801 ± 0.826 (1.58)	pCi/L	05/06/20 15:18	8 7440-14-4	



Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

 Sample: ASH-01-CCR MS
 Lab ID: 60334603004
 Collected: 04/14/20 10:20
 Received: 04/15/20 09:30
 Matrix: Water

 PWS:
 Site ID:
 Sample Type:

 Parameters
 Method
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 CAS No.
 Qual

Pace Analytical Services - Greensburg

Radium-226 EPA 903.1 **80.65 %REC ± NA (NA)** pCi/L 05/06/20 14:03 13982-63-3

C:NA T:NA%
Pace Analytical Services - Greensburg

Radium-228 EPA 904.0 **86.79 %REC ± NA (NA)** pCi/L 05/04/20 11:06 15262-20-1

C:NA T:NA

(913)599-5665



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

 Sample: ASH-01-CCR MSD
 Lab ID: 60334603005
 Collected: 04/14/20 10:20
 Received: 04/15/20 09:30
 Matrix: Water

 PWS:
 Site ID:
 Sample Type:

 Parameters
 Method
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 CAS No.
 Qual

Pace Analytical Services - Greensburg

Radium-226 EPA 903.1 **100.47 %REC 21.89 RPD ±** pCi/L 05/06/20 14:03 13982-63-3

NA (NA) C:NA T:NA%

Pace Analytical Services - Greensburg

Radium-228 EPA 904.0 **67.37 %REC 25.19 RPD ±** pCi/L 05/04/20 11:06 15262-20-1

NA (NA) C:NA T:NA

(913)599-5665



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

QC Batch: 392941 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60334603001, 60334603002, 60334603003, 60334603004, 60334603005

METHOD BLANK: 1903525 Matrix: Water

Associated Lab Samples: 60334603001, 60334603002, 60334603003, 60334603004, 60334603005

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 0.000 ± 0.376 (0.760) C:NA T:89%
 pCi/L
 05/06/20 14:03

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

QC Batch: 392942 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60334603001, 60334603002, 60334603003, 60334603004, 60334603005

METHOD BLANK: 1903526 Matrix: Water

Associated Lab Samples: 60334603001, 60334603002, 60334603003, 60334603004, 60334603005

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.607 ± 0.298 (0.492) C:82% T:89%
 pCi/L
 05/04/20 11:05

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



QUALIFIERS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 05/06/2020 03:14 PM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334603

Date: 05/06/2020 03:14 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334603001	ASH-01-CCR	EPA 903.1	392941		
60334603002	ASH-02-CCR	EPA 903.1	392941		
60334603003	DUP-3-CCR	EPA 903.1	392941		
60334603004	ASH-01-CCR MS	EPA 903.1	392941		
60334603005	ASH-01-CCR MSD	EPA 903.1	392941		
60334603001	ASH-01-CCR	EPA 904.0	392942		
60334603002	ASH-02-CCR	EPA 904.0	392942		
60334603003	DUP-3-CCR	EPA 904.0	392942		
60334603004	ASH-01-CCR MS	EPA 904.0	392942		
60334603005	ASH-01-CCR MSD	EPA 904.0	392942		
60334603001	ASH-01-CCR	Total Radium Calculation	395185		
60334603002	ASH-02-CCR	Total Radium Calculation	395185		
60334603003	DUP-3-CCR	Total Radium Calculation	395185		

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical

Pace Project No./ Lab I.D. (N/A) DRINKING WATER Samples Intact SAMPLE CONDITIONS F-ALL-Q-020rev.08, 12-Oct-2007 OTHER Custody Sealed Cooler (Y/V) ŏ (M/Y) eo! Received on GROUND WATER Page: Residual Chiorine (Y/N) 2 Cemp in °C ၀ REGULATORY AGENCY RCRA Requested Analysis Filtered (Y/N) TME 2 STATE Site Location 2-51-1 NPDES DATE T UST DATE Signed (MM/DD/YY): ACCEPTED BY / AFFILIATION muibsA lato1 × 822-muibs7 922-muibe? t Analysis Test N A Howalower Ofper Same as Section A Accounts Payable Methanol Heather Wilson Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days. Preservatives $Na_2S_2O_3$ Sompany Name: AECOM HOBN 11033, 3 42700 HCI Jeary Invoice Information: ^EONH \times Manager: Pace Profile #: OS^zH Pace Quote Reference: Pace Project Section C 1630 TIME Unpreserved Attention: 4ddress: # OF CONTAINERS SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION 14/14/20 DATE HME COMPOSITE END/GRAB 14000 DATE COLLECTED RELINQUISHED BY / AFFILIATION TIME 414110 1333 PRPA Rawhide CCR 2012/11/15 COMPOSITE 1/14/1/2 DATE Copy To: Brian Rothmeyer Required Project Information: Report To: Geoff Webb (G=GRAB C=COMP) SAMPLE TYPE Ó <u>ک</u> کے Purchase Order No.: 1 Project Number: (see valid codes to left) **MATRIX CODE** Project Name: Section B Valid Matrix Codes

MATRIX
CODE
DRINKING WATER
WATER
WASTE WW
PRODUCT
SCILSOLID
SCILSOLID TS A X Y P E T @ ASH-CI AIR OTHER TISSUE 3. CCP Greenwood Village, CO 80111 45 H-02 - CCR brian.rothmeyer@aecom.com とウーブ・エグ ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St DV0. SAMPLE ID Section D Required Client Information 05-2/5-31 (303) 740-2614 Section A Required Client Information: Requested Due Date/TAT: AECOM Company: Email To: Address; Phone: Page 14 of 17 9 ÷ 7 80 က 9 ۲. Φ # W31)

Pittsburgh Lab Sample Condition Upon Receipt Face Analytical ALCOM Client Name: Project # Courier: Fed Ex UPS USPS Client Commercial Pace Other Label Tracking #: 1505 8764 1411 LIMS Login Custody Seal on Cooler/Box Present: Ves Seals intact: no Type of Ice: Wet Blue None Thermometer Used Correction Factor: 03 °C Final Temp: 3.0 Observed Temp **Cooler Temperature** Temp should be above freezing to 6°C pH paper Lot# Date and Initials of person examining contents: 04 4-16-20 1074281 .No N/A Comments: Yes Chain of Custody Present: Chain of Custody Filled Out: Chain of Custody Relinquished: Sampler Name & Signature on COC: Sample Labels match COC: 5. 11/ -Includes date/time/ID Matrix: Samples Arrived within Hold Time: Short Hold Time Analysis (<72hr remaining): Rush Turn Around Time Requested: 8. Sufficient Volume: 9. Correct Containers Used: 10. -Pace Containers Used: Containers Intact: 11. Orthophosphate field filtered 12. Hex Cr Aqueous sample field filtered 13. Organic Samples checked for dechlorination: 14. Filtered volume received for Dissolved tests 15. All containers have been checked for preservation, 16. pHIZ exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix All containers meet method preservation Initial when Date/time of requirements. completed preservation Lot # of added preservative Headspace in VOA Vials (>6mm): 17. Trip Blank Present: 18. Trip Blank Custody Seals Present Rad Samples Screened < 0.5 mrem/hr Initial when M Client Notification/ Resolution: Person-Contacted: -Date/Fime:--Contacted-By: Comments/ Resolution:

 \square A check in this box indicates that additional information has been stored in ereports. Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR

of the Workorder Edit Screen.

Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers) *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section

Face Analytical

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

MK1 Ra-226 Test: Analyst:

4/23/2020 53564 DW	90	K/Z
Date: Batch ID: Matrix:	MB Sample ID MB concentration: M/B Counting Uncertainty: MB MDC: MB MDC:	Status vs intimerical indicator;

Method Blank Assessment

	•	Z	LCSD53564															****
N/A Pass		LCSD (Y or N)?	LCS53564	5/6/2020	18-039	31.430	0.10	0.661	4.754	0.223	4.163	0.897	-1.25	87.58%	N/A	Pass	135%	73%
MB Status vs Numerical Indicator: MB Status vs. MDC:		Laboratory Control Sample Assessment		Count Date:	Spike I.D.:	Spike Concentration (pCl/mL):	Volume Used (mL):	Aliquot Volume (L, g, F):	Target Conc. (pCi/L, g, F):	Uncertainty (Calculated):	Result (pCi/L, g, F):	LCS/LCSD Counting Uncertainty (pCl/L, g, F):	Numerical Performance Indicator:	Percent Recovery:	Status vs Numerical Indicator:	Status vs Recovery:	Upper % Recovery Limits:	Lower % Recovery Limits:

MB Numerical Performance Indicator:

Upper % Recovery Limits: Lower % Recovery Limits:

Duplicate Sample Assessment

	Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
	Sample Collection Date:	4/13/2020	4/14/2020
	Sample I.D.	35543759002	60334603001
	Sample MS I.D.	35543759002MS	60334603004
	Sample MSD I.D.		60334603005
	Spike I.D.:	18-039	18-039
	MS/MSD Decay Corrected Spike Concentration (pCl/mL):	31.431	31.431
	Spike Volume Used in MS (mL);	0.20	0.20
	Spike Volume Used in MSD (mL):		0.20
	MS Aliquot (L, g, F):	0.655	0.648
	MS Target Conc.(pCi/L, g, F):	9.597	9.698
	MSD Aliquot (L, g, F):		0.651
	MSD Target Conc. (pCi/L, g, F):		9.658
1	MS Spike Uncertainty (calculated):	0,451	0.456
	MSD Spike Uncertainty (calculated):		0.454
	Sample Result:	0.323	0.238
	Sample Result Counting Uncertainty (pCi/L, g, F):	0.271	0.247
	Sample Matrix Spike Result:	7.387	8.059
	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.123	1.228
.37	Sample Matrix Spike Duplicate Result:		9.942
	Matrix Spike Duplicate Result Counting Uncertainty (pCI/L, g, F):		1.347
_	MS Numerical Performance Indicator:	4.003	-2.759
	MSD Numerical Performance Indicator:		0.062
	MS Percent Recovery:	73.61%	80.65%
	MSD Percent Recovery:		100.47%
	MS Status vs Numerical Indicator:	A/N	N/A
	MSD Status vs Numerical Indicator:		N/A
-	MS Status vs Recovery:	Pass	Pass
	MSD Status vs Recovery:		Pass
	MS/MSD Upper % Recovery Limits:	136%	136%
-	MS/MSD Lower % Recovery Limits:	71%	71%

	Matrix Spike/Matrix Spike Duplicate Sample Assessment	
Enter Duplicate	Sample I.D.	
sample IDs if	Sample MS I.D.	
other than	Sample MSD I.D.	
LCS/LCSD in	Sample Matrix Spike Result:	
the space below.	Matrix Spike Result Counting Uncertainty (pCl/L, g, F):	
	Sample Matrix Spike Duplicate Result:	
	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	
	Duplicate Numerical Performance Indicator:	

60334603001 60334603005 60334603005 8.059 1.228 9.942 1.347 -2.025 21.89% NA NA PASS 32%

Sample I.D.: Bample Sample I.D. Sample Result (pCi/L, g, F): Sample Duplicate Sample I.D. Sample Duplicate Result (pCi/L, g, F): Are sample and/or duplicate Result (pCi/L, g, F): Are sample and/or duplicate results below RI.? Duplicate Numerical Performance indicator: Duplicate Status vs Numerical indicator:

(Based on the Percent Recoveries) MS/ MSD Ouplicate RPD:
MS/ MSD Duplicate Status vs Numerical Indicator:
MS/ MSD Duplicate Status vs RPD:
% RPD Limit:

cample or dunis	oil or and some support the state of a state
	% RPD Limit:
	Duplicate Status vs RPD:
	Duplicate Status vs Numerical Indicator:
	Duplicate RPD:
	Duplicate Numerical Performance Indicator:

			ib so olumes
Duplicate Status vs Numerical Indicator:	Duplicate Status vs RPD:	% RPD Limit:	ate precision is not applicable if either the sample or d

		sample or duplik	
Duplicate Status vs RPD:	% RPD Limit:	precision is not applicable if either the sample or duplic	

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Comments:

Ra-226 NELAC QC Printed: 5/6/2020 3:01 PM 5-6-202

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow. Ra-228

Test

_	**************************************
VAL 4/27/2020 53565 WT	1903526 0.607 0.298 0.492 3.49 Fali* See Comment*
Analyst: Date: Worklist: Matrix:	MB Sample ID MB concentration: MR 2 Sigma CSU: MB MDC: MB MDC: MB Status vs Numerical Indicator: MB Status vs. MDC: MB Status vs. MDC:

Method Blank Assessment

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	4/13/2020	4/14/2020
	35543759004	60334603001
	35543759004MS	60334603004
Sample MSD I.D.	•	60334603005
Spike I.D.:	19-057	19-057
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	34.505	34,505
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):		0.20
MS Aliquot (L, g, F):	608.0	0.807
MS Target Conc.(pCi/L, g, F):	8.535	8.554
MSD Aliquot (L, g, F):		0.816
MSD Target Conc. (pCi/L, g, F):		8.453
MS Spike Uncertainty (calculated):	0,615	0.616
MSD Spike Uncertainty (calculated):		0.609
Sample Result:	0.120	0.743
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.295	0.403
Sample Matrix Spike Result:	7,316	8.167
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.509	1.654
Sample Matrix Spike Duplicate Result:		6.438
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.343
MS Numerical Performance Indicator:	-1.585	-1.223
MSD Numerical Performance Indicator:		-3.537
MS Percent Recovery:	84.31%	86.79 %
MSD Percent Recovery:		67.37%
MS Status vs Numerical Indicator:	Pass	Pass
MSD Status vs Numerical Indicator;		Failmen
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:		Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	60%	%O9
MS/MSD Lower % Recovery Limits:	60%	- 1

54/2020 19-057 34.267 0.10 0.819 4.184 0.301 3.106 0.772 -2.55 74.23% N/A Pass 135% 60%

Uncertainty (Calculated):
Result (pCi/L, g, F):
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):
Numerical Performance Indicator:

Aliquot Volume (L, g, F): Target Conc. (pCI/L, g, F):

Volume Used (mL):

Status vs Recovery: Upper % Recovery Limits: Lower % Recovery Limits:

Duplicate Sample Assessment

Percent Recovery:

Status vs Numerical Indicator

Count Date: Spike I.D.:

Laboratory Control Sample Assessment

Decay Corrected Spike Concentration (pCi/mL):

Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D. Sample I.D. Sample MS I.D. Other fran LCSLLCSD in The space below. Sample Matrix Spike Result 2 Sigma CSU (DCI/L. g. F): Sample Matrix Spike Result 2 Sigma CSU (DCI/L. g. F): Sample Matrix Spike Didicate Result Matrix Spike Duplicate Result 2 Sigma CSU (DCI/L. g. F): Duplicate Numerical Performance Indicate Result MS/ MSD Duplicate Sigma CSU (DCI/L. g. F): Duplicate Numerical Performance Indicator: (Based on the Percent Recoveries) MS/ MSD Duplicate RPD: MS/ MSD Duplicate Status vs Numerical Indicator: % RPD: % RPD: % RPD Limit.
	See Below ##
Imple Assessment	Sample I.D.: Sample Result (pClt., g, F): Sample Result 2 Sigma CSU (pCit., g, F): Sample Duplicate Result (pClt., g, F): Sample Duplicate Result (pClt., g, F): Are sample and/or duplicate results below RL? Duplicate Numerical Performance Indicator: Duplicate RPD: Duplicate RPD: Sample Status vs RPD: Duplicate RPD: Duplicate RPD: SRPD: Duplicate RPD: SRPD: SRPD: Duplicate RPD: Duplicate RPD: Duplicate RPD: SRPD: Duplicate RPD: Duplicate RPD: Duplicate RPD: Duplicate RPD: SRPD: Duplicate RPD: Dup

60334603001 60334603004 60334603005

8.167 1.654 6.438 1.343 1.591 25.19% Pass Pass 36%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

"The method blank result is below the reporting limit for this analysis and is acceptable.

6 of 10

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60334926

Sampling Event: April 20th, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: June 23, 2020

Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 20th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria		riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤1. 	X		
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		

Review Parameter	Criteria	_	riteri Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Detection Limits Mets (Radiochemistry)	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.	X		
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

> - Greater Than
σ - Sigma (Uncertainty)
DER - Duplicate Error Ratio
MS/MSD - Matrix Spike/Matrix Spike Duplicate

< - Less Than pCi/L - Picocuries Per Liter LCS - Laboratory Control Sample NA - Not Applicable

^{≤ –} Less Than or Equal To % – Percent LCSD – Laboratory Control Sample Duplicate RPD – Relative Percent Difference





May 13, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Dianton m. Wilson

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334926001	ASH-06-CCR	Water	04/20/20 11:00	04/21/20 09:30
60334926002	ASH-03-CCR	Water	04/20/20 13:25	04/21/20 09:30

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334926001	ASH-06-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334926002	ASH-03-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

Sample: ASH-06-CCR PWS:	Lab ID: 6033492 0 Site ID:	6001 Collected: 04/20/20 11:00 Sample Type:	Received:	04/21/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	vices - Greensburg				
Radium-226	EPA 903.1	0.0661 ± 0.302 (0.613) C:NA T:82%	pCi/L	05/12/20 11:23	3 13982-63-3	
	Pace Analytical Ser	vices - Greensburg				
Radium-228	EPA 904.0	0.415 ± 0.356 (0.715) C:79% T:85%	pCi/L	05/08/20 11:42	2 15262-20-1	
	Pace Analytical Ser	vices - Greensburg				
Total Radium	Total Radium Calculation	0.481 ± 0.658 (1.33)	pCi/L	05/12/20 12:10	6 7440-14-4	



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

Sample: ASH-03-CCR PWS:	Lab ID: 60334926 Site ID:	6002 Collected: 04/20/20 13:25 Sample Type:	Received:	04/21/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Serv	vices - Greensburg				
Radium-226	EPA 903.1	0.337 ± 0.440 (0.726) C:NA T:82%	pCi/L	05/12/20 11:36	13982-63-3	
	Pace Analytical Serv	vices - Greensburg				
Radium-228	EPA 904.0	0.753 ± 0.376 (0.651) C:80% T:90%	pCi/L	05/08/20 11:42	2 15262-20-1	
	Pace Analytical Serv	vices - Greensburg				
Total Radium	Total Radium Calculation	1.09 ± 0.816 (1.38)	pCi/L	05/12/20 12:16	6 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

QC Batch: 393311 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60334926001, 60334926002

METHOD BLANK: 1905212 Matrix: Water

Associated Lab Samples: 60334926001, 60334926002

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 -0.0341 ± 0.306 (0.729) C:81% T:77%
 pCi/L
 05/08/20 11:43

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

QC Batch: 393310 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60334926001, 60334926002

METHOD BLANK: 1905211 Matrix: Water

Associated Lab Samples: 60334926001, 60334926002

ParameterAct \pm Unc (MDC) Carr TracUnitsAnalyzedQualifiersRadium-226 0.0500 ± 0.325 (0.656) C:NA T:85%pCi/L05/12/20 11:23

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



QUALIFIERS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 05/13/2020 10:52 AM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334926

Date: 05/13/2020 10:52 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334926001	ASH-06-CCR	EPA 903.1	393310		
60334926002	ASH-03-CCR	EPA 903.1	393310		
60334926001	ASH-06-CCR	EPA 904.0	393311		
60334926002	ASH-03-CCR	EPA 904.0	393311		
60334926001	ASH-06-CCR	Total Radium Calculation	395929		
60334926002	ASH-03-CCR	Total Radium Calculation	395929		

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Face Analytical

Section A Required C	Section A Required Client Information:	Section B Required Project Information:	t Informs	ation:				Section C	Section C	ž O										Page:	-	of į	
Company:	AECOM	Report To: Geoff Webb	ĭff We	qq				Attention:	ion:	Acco	Accounts Payable	ayable							J		-	-	
Address:	6200 South Quebec St	Copy To: Brian	ın Rof	Brian Rothmeyer				Comp	Company Name:		AECOM		-			REGU	ATOR	REGULATORY AGENCY	5				
	Greenwood Village, CO 80111							Address	SS:	Same	Same as Section A	ection,	4			Ż L	NPDES	L GR	GROUND WATER	/ATER	L DRI	DRINKING WATER	ATER
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Phone: (;	(303) 740-2614 Fax:	Project Name:	PRP	'A Rawh	PRPA Rawhide CCR			Pace F Manage	roject er.	Heat	Heather Wilson	lson				Site	Site Location						
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Pittsburgh Lab	Sample Condit	ion L	Jpon	Re	ceipt		
Pace Analytical'	Client Name:		A	EC	M	_ Project#	
Courier: Fed Ex U	IPS DUSPS DClient	44	ommei	rcial	Pace Other		Label_ LIMS Login
Custody Seal on Cooler/E	lox Present: yes	_ n	0	Seals	intact: yes	ол 🔲 .	
Thermometer Used	#10 ,	Туре	of Ice:	Wet	Blue None	, 0	110
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Temp should be above freezing	g to 6°C						
					pH paper Lot#	Date and content	Initials of derson examining
Comments:		Yes	No	N/A	1009111		
Chain of Custody Present:		1/		ļ	1.		
Chain of Custody Filled Ou	t			ļ	2.		
Chain of Custody Relinquis	hed:				3.		
Sampler Name & Signature	on COC:				4.		
Sample Labels match COC	:	/			5.		
-Includes date/time/ID	Matrix:	W					
Samples Arrived within Hol	d Time:				6.		
Short Hold Time Analysis	(<72hr remaining):	7	1		7.		
Rush Turn Around Time F					8.		
Sufficient Volume:	-	1			9.		
Correct Containers Used:		1/			10.		
-Pace Containers Used:		1					
Containers Intact:		//			11.		
Orthophosphate field filtere	d	1			12.		
Hex Cr Aqueous sample fie				/	13.		
Organic Samples checke			,	//	14.		
Filtered volume received fo				/	15.		
All containers have been checi					16. <i>OH</i> (<u> </u>	
exceptions: VOA, coliform Non-aqueous matrix	, TOC, O&G, Phenolics,	Radon,		1	10.		
All containers meet method	preservation				Initial when	Date/time of	
requirements.	,	<u> </u>		<u> </u>	completed	preservation	
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Headspace in VOA Vials (>6mm):		1		17.		
Trip Blank Present:			/		18.		
Trip Blank Custody Seals P	resent				22	/	. /
Rad Samples Screened <	0.5 mrem/hr	7			Initial when completed:	Date: 4/	2/120
Client Notification/ Resolu	ution:	اا		L	//	1	4./41
Person Contacted:				-Date/	Time:	Cont	acted By:
Comments/ Resolution:				•			
							

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

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

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

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.	
Ra-226	

Test

Fáce Analytical

MS/MSD 2

MS/MSD 1

MSD Aiquot (L. g. F):
MSD Target Conc. (pCi/L. g. F):
MS Spike Uncertainty (calculated):
MSD Spike Uncertainty (calculated):

Sample Matrix Spike Control Assessment	Sample Collection Date:	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Spike I.D.:	MS/MSD Decay Corrected Spike Concentration (pCi/mL):	Spike Volume Used in MS (mL):	Spike Volume Used in MSD (ml.):	MS Aljouot (L. a. F):	MS Target Conc.(pC)(L. g. F);	MSD Alignor (I or E)	MSD Target Conc. (p.C.)
MK1	4/29/2020	53646	ρW			1905211	0.050	0.325	0.656	0:30	Ϋ́Z	Pass
	Date: 4	Batch ID:	Matrix:		Metrica brank Assessment	MB Sample ID	MB concentration:	M/B Counting Uncertainty:	MB MDC:	MB Numerical Performance Indicator:	MB Status vs Numerical Indicator:	MB Status vs. MDC:
					Method bran							

MS Spike Uncertainty (calculated):	MSD Spike Uncertainty (calculated):	LCSD53646	5/12/2020 Sample Result Counting Uncertainty (pC)/i. a. F):	18-039 Sample Matrix Spike Result:	31.430 Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	O.10 Sample Matrix Spike Duplicate Result:	0.654 Matrix Spike Duplicate Result Counting Uncertainty (pCi/L a. F):	4.809 MS Numerical Performance Indicator:	0.226 MSD Numerical Performance Indicator:	4.072 MS Percent Recovery	0.894 MSD Percent Recovery	-1.56 MS Status vs Numerical Indicator:	84.69% MSD Status vs Numerical Indicator:	N/A MS Status vs Recovery:	Pass MSD Status vs Recovery:	135% MS/MSD Upper % Recovery Limits:	73% MS/MSD Lower % Recovery Limits:
	LCSD (Y or N)?	LCS53646	5/12/2020	18-039	31.430	0.10	0.655	4.800	0.226	4.144	0.891	-1.40	86.33%	A/A	Pass	135%	73%
	Laboratory Control Sample Assessment		Count Date:	Spike I.D.:	Spike Concentration (pCi/mL):	Volume Used (mL):	Aliquot Volume (L, g, F):	Target Conc. (pCi/l., g, F):	Uncertainty (Calculated):	Result (pCi/L, g, F):	LCS/LCSD Counting Uncertainty (pCi/L, g, F):	Numerical Performance Indicator:	Percent Recovery:	Status vs Numerical Indicator:	Status vs Recovery:	Upper % Recovery Limits:	Lower % Recovery Limits:

	ó	.0	<u></u>		-		-:-	ij.		¥	Ö	<u></u>
Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Sample Matrix Spike Result:	Matrix Spike Result Counting Uncertainty (pCi/L, q, F);	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator;	MS/ MSD Duplicate Status vs RPD;	% RPD Limit
	Enter Duplicate	samble IDs if	other than	LCS/LCSD in	the space below.							
	LCS53646	LCSD53646	4.144	0.891	4.072	0.894	2	0.111	1.91%	N/N	Pass	32%

Sample I.D..

Buplicate Sample I.D.

Sample Result (DG/L, g, F):

Sample Result Counting Uncertainty (DG/L, g, F):

Sample Duplicate Result (DG/L, g, F):

Sample and/or duplicate results (bG/L, g, F):

Are sample and/or duplicate results below RL?

Duplicate Sample Assessment

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Duplicate Status vs Numerical Indicator:
Duplicate Status vs RPD:
% RPD Limit

Duplicate Numerical Performance Indicator:

(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:

Comments:

Ra-226 NELAC QC Printed: 5/12/2020 12:08 PM

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Ra-228

Test:

Method Blank Assessment

MS/MSD 2

MS/MSD Sample I.D. Sample MS I.D. Sample MSD I.D. MSD Target Conc. (PCI/L, g, F): MS Spike Uncertainty (calculated): MSD Spike Uncertainty (calculated): Sample Result 2 Sigma CSU (pCi/L, g, F): Sample Matrix Spike Result: Matrix Spike Result 2 Sigma CSU (pCi/L, g, F): Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F): MS Numerical Performance Indicator: MS Aliquot (L, g, F): MS Target Conc.(pCi/L, g, F): Sample Result: Sample Matrix Spike Duplicate Result: MSD Percent Recovery: Sample Collection Date: Spike I.D. MS/MSD Decay Corrected Spike Concentration (pCl/mL): Spike Volume Used in MS (mL) Spike Volume Used in MSD (mL): MSD Numerical Performance Indicator MS Percent Recovery MS Status vs Numerical Indicator MSD Status vs Numerical Indicator. MS Status vs Recovery Sample Matrix Spike Control Assessment 5/4/2020 53647 WT -0.034 0.306 0.729 -0.22 Analyst: Date: Worklist: Matrix: MB Sample ID MB MDC: MB Numerical Performance Indicator: M/B 2 Sigma CSU: MB Status vs Numerical Indicator. MB Status vs. MDC: MB concentration:

Count Date 5/8/2020 5/8/2020 Spike I,D.: 19-057 19-057 Decay Corrected Spike Concentration (pCi/L); 34.221 34.221 Volume Used (mt.): 0.10 0.10 Aliquot Volume (I, g. F): 0.815 0.811 Tagget Conc. (pCi/L, g. F): 4.197 4.222 Uncertainy (Calculated): 0.302 0.304 Result (pCi/L, g. F): 0.676 0.705 Numerical Forcant Recovery: 61.76% 64.69% Status vs Numerical Indicator: Pass Pass Upper % Recovery Imits: 60% 60%
19-057 34.221 0.10 0.815 4.197 0.302 2.592 0.676 4.25 NIA NIA Pass 135%
34.221 0.10 0.815 4.197 0.302 2.592 0.676 4.25 61.76% N/A Pass 135% 60%
0.10 0.815 4.197 0.302 2.592 0.676 61.76% NJA Pass 135% 60%
0.815 4.197 0.302 2.592 0.676 4.25 61.76% N/A Pass 135% 60%
4.197 0.302 2.592 0.676 4.25 61.76% N/A N/A Pass 135% 60%
0.302 2.5592 0.676 4.25 61.76% N/A N/A Pass 135% 60%
2.592 0.676 4.25 61.76% NJA Pass 135% 60%
0.676 4.25 61.76% N.A Pass 135% 60%
4.25 61.76% N/A Pass 135% 60%
61.76% N/A Pass 135% 60%
N/A Pass 135% 60%
Pass 135% 60%
135% 60%
%09

Matrix Spike/Matrix Spike Duplicate Sample Assessment	ate Sample I.D.	if Sample MS I.D.	Sample MSD I.D.	in Sample Matrix Spike Result.	ow. Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	Sample Matrix Spike Duplicate Result.	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/l., g. F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD:	% RPD Limit
	Enter Duplicate	sample IDs i	other than	LCS/LCSD in	the space below.							-
	LCS53647	LCSD53647	2.592	0.676	2.731	0.705	<u>0</u>	-0.280	4.64%	Pass	Pass	36%
plicate Sample Assessment	Sample I.D.:	Duplicate Sample I.D.	Sample Result (pCi/L, g, F):	Sample Result 2 Sigma CSU (pCi/L, g, F):	Sample Duplicate Result (pCl/L, g, F):	Sample Duplicate Result 2 Sigma CSU (pCVL, g, F):	Are sample and/or duplicate results below RL?	Duplicate Numerical Performance Indicator:	(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	Duplicate Status vs Numerical Indicator:	Duplicate Status vs RPD;	% RPD Limit:

MS/MSD Upper % Recovery Limits: MS/MSD Lower % Recovery Limits:

MSD Status vs Recovery

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Comments:



Ra-228 NELAC DW2 Printed: 5/11/2020 8:21 AM

6 of 10

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60334957

Sampling Event: April 20th, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: June 23, 2020

Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 20th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review	Criteria	_	riteri	a
Parameter Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	Met? No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			
	Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the			X
	reporting limit (RL), acceptable sampling and analytical			

Review Parameter	Criteria	C		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
	precision is indicated by an RPD between the results of ≤20%.			
	• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below:			
	• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.			X
	• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte		X ¹	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

1 – The associated chromium result for sample ASH-06-CCR was reported at a concentration <5x the concentration of the blank contamination and was qualified as non-detect (U be).

≤ – Less Than or Equal To

NA – Not Applicable

LCSD - Laboratory Control Sample Duplicate

— % – Percent

U – Non-detect

The associated total dissolved solids results were reported at concentrations >5x the concentration of the blank contamination and qualification was not considered necessary.

> – Greater Than
mg/L – Milligrams per Liter
be – Equipment Blank Contamination
MB – Method Blank
RL – Reporting Limit

< - Less Than
µg/L - Microgram per Liter
LCS - Laboratory Control Sample
MS/MSD - Matrix Spike/Matrix Spike Duplicate
RPD - Relative Percent Difference





May 12, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Dianos m. Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070



SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
60334957001	ASH-06-CCR	Water	04/20/20 11:00	04/21/20 08:25	
60334957002	ASH-03-CCR	Water	04/20/20 13:25	04/21/20 08:25	



SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334957001	ASH-06-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60334957002	ASH-03-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Date: 05/12/2020 01:34 PM

Sample: ASH-06-CCR	Lab ID: 6033	4957001	Collected: 04/20/2	20 11:00	Received: 04	/21/20 08:25 N	fatrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	308	ug/L	100	1	04/30/20 14:20	05/01/20 15:03	7440-42-8	
Calcium	24100	ug/L	200	1	04/30/20 14:20	05/01/20 15:03	7440-70-2	
Lithium	60.2	ug/L	10.0	1	04/30/20 14:20	05/01/20 15:03	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-36-0	
Arsenic	1.2	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-38-2	
3arium	58.8	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-39-3	
Beryllium	ND	ug/L	0.50	1	05/05/20 13:15	05/08/20 11:48	7440-41-7	
Cadmium	ND	ug/L	0.50	1	05/05/20 13:15	05/08/20 11:48	7440-43-9	
Chromium	2.6	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-47-3	
Cobalt	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-48-4	
₋ead	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7439-92-1	
Molybdenum	15.4	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7439-98-7	
Selenium	24.5	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7782-49-2	
Γhallium	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	05/11/20 12:10	05/12/20 09:42	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C					
	Pace Analytical	Services -	Kansas City					
Total Dissolved Solids	443	mg/L	10.0	1		04/23/20 15:38		
9056 IC Anions	Analytical Meth							
	Pace Analytical	Services -	Kansas City					
Chloride	7.0	mg/L	1.0	1		05/02/20 01:40	16887-00-6	
Fluoride	0.69	mg/L	0.20	1		05/02/20 01:40	16984-48-8	
Sulfate	63.6	mg/L	10.0	10		05/02/20 01:56	14808-79-8	



ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Date: 05/12/2020 01:34 PM

Sample: ASH-03-CCR	Lab ID: 6033	34957002	Collected: 04/	/20/20	0 13:25	Received: 04	/21/20 08:25 M	latrix: Water	
Parameters	Results	Units	Report Lim	nit _	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation	Meth	od: EPA	A 3010			
	Pace Analytical	Services -	Kansas City						
Boron	807	ug/L	1	100	1	04/30/20 14:20	05/01/20 15:05	7440-42-8	
Calcium	467000	ug/L	2	200	1	04/30/20 14:20	05/01/20 15:05	7440-70-2	
Lithium	428	ug/L	10	0.0	1	04/30/20 14:20	05/01/20 15:05	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation	Meth	od: EPA	A 3010			
	Pace Analytical	Services -	Kansas City						
Antimony	ND	ug/L		1.0	1	05/05/20 13:15	05/08/20 11:52	7440-36-0	
Arsenic	ND	ug/L		1.0	1	05/05/20 13:15	05/08/20 11:52	7440-38-2	
Barium	8.8	ug/L		1.0	1	05/05/20 13:15	05/08/20 11:52	7440-39-3	
Beryllium	ND	ug/L	0.	.50	1	05/05/20 13:15	05/08/20 11:52	7440-41-7	
Cadmium	ND	ug/L	0.	.50	1	05/05/20 13:15	05/08/20 11:52	7440-43-9	
Chromium	ND	ug/L	•	1.0	1	05/05/20 13:15	05/08/20 11:52	7440-47-3	
Cobalt	ND	ug/L	•	1.0	1	05/05/20 13:15	05/08/20 11:52	7440-48-4	
_ead	ND	ug/L		1.0	1	05/05/20 13:15	05/08/20 11:52	7439-92-1	
Molybdenum	ND	ug/L		1.0	1	05/05/20 13:15	05/08/20 11:52	7439-98-7	
Selenium	121	ug/L		1.0	1	05/05/20 13:15	05/08/20 11:52	7782-49-2	
Thallium	ND	ug/L		1.0	1	05/05/20 13:15	05/08/20 11:52	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation	Meth	od: EPA	A 7470			
	Pace Analytical	Services -	Kansas City						
Mercury	ND	ug/L	0.	.20	1	05/11/20 12:10	05/12/20 09:44	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C						
	Pace Analytical								
Total Dissolved Solids	5760	mg/L	1	125	1		04/23/20 15:38		
9056 IC Anions	Analytical Meth	od: EPA 90	56						
	Pace Analytical	Services -	Kansas City						
Chloride	76.8	mg/L	10	0.0	10		05/02/20 02:43	16887-00-6	
Fluoride	ND	mg/L		.20	1		05/02/20 02:48		
Sulfate	3190	mg/L	_	500	500		05/05/20 04:11		

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

653803

QC Batch: QC Batch Method: EPA 7470 Analysis Method:

EPA 7470

Analysis Description:

7470 Mercury

Laboratory:

Pace Analytical Services - Kansas City

Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: Associated Lab Samples: Matrix: Water

60334957001, 60334957002

Blank Result

Reporting

Limit Analyzed Qualifiers

Mercury

Mercury

Units ug/L

Units

ND

0.20 05/12/20 09:26

LABORATORY CONTROL SAMPLE:

Parameter

Parameter

2652700

Spike Conc.

LCS Result

LCS % Rec % Rec Limits

Qualifiers

ug/L

ND

4.8

96 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:

2652701

60334857001 Parameter Units Result

MS Spike

MSD Spike Conc.

MSD Result

MS % Rec

87

MSD

% Rec

Max RPD

Mercury

Date: 05/12/2020 01:34 PM

ug/L

Conc.

5 5

MS Result 4.4

2652702

4.5

% Rec 90 Limits **RPD**

Qual 20 75-125 2

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Date: 05/12/2020 01:34 PM

QC Batch: 652154
QC Batch Method: EPA 3010

Analysis Method: EPA 6010 Analysis Description: 6010 MET

Laboratory:

Pace Analytical Services - Kansas City

Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2645793

Matrix: Water

Associated Lab Samples: 60334957001, 60334957002

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Boron	ug/L	ND ND	100	05/01/20 14:49	
Calcium	ug/L	ND	200	05/01/20 14:49	
Lithium	ug/L	ND	10.0	05/01/20 14:49	

LABORATORY CONTROL SAMPLE: 2645794

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	995	100	80-120	
Calcium	ug/L	10000	10500	105	80-120	
Lithium	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUPLI	ICATE: 2645	795		2645796							
			MS	MSD								
		60334760001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	770	1000	1000	1700	1700	93	93	75-125	0	20	
Calcium	ug/L	507000	10000	10000	499000	499000	-76	-72	75-125	0	20	M1
Lithium	ug/L	179	1000	1000	1210	1220	104	104	75-125	0	20	

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



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Date: 05/12/2020 01:34 PM

QC Batch: 652835 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2648379 Matrix: Water

Associated Lab Samples: 60334957001, 60334957002

Units ug/L	Blank Result	Reporting Limit	Analyzed	Qualifiers
		Limit	Analyzed	Qualifiers
ug/L	ND -			
	ND	1.0	05/08/20 11:18	
ug/L	ND	1.0	05/08/20 11:18	
ug/L	ND	1.0	05/08/20 11:18	
ug/L	ND	0.50	05/08/20 11:18	
ug/L	ND	0.50	05/08/20 11:18	
ug/L	ND	1.0	05/08/20 11:18	
ug/L	ND	1.0	05/08/20 11:18	
ug/L	ND	1.0	05/08/20 11:18	
ug/L	ND	1.0	05/08/20 11:18	
ug/L	ND	1.0	05/08/20 11:18	
ua/l	ND	1.0	05/08/20 11:18	
	ug/L ug/L ug/L ug/L ug/L ug/L	ug/L ND	ug/L ND 0.50 ug/L ND 0.50 ug/L ND 1.0	ug/L ND 0.50 05/08/20 11:18 ug/L ND 0.50 05/08/20 11:18 ug/L ND 1.0 05/08/20 11:18

LABORATORY CONTROL SAMPLE:	2648380					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	38.4	96	80-120	
Arsenic	ug/L	40	39.5	99	80-120	
Barium	ug/L	40	37.6	94	80-120	
Beryllium	ug/L	40	38.6	97	80-120	
Cadmium	ug/L	40	38.1	95	80-120	
Chromium	ug/L	40	38.5	96	80-120	
Cobalt	ug/L	40	38.4	96	80-120	
Lead	ug/L	40	37.5	94	80-120	
Molybdenum	ug/L	40	39.9	100	80-120	
Selenium	ug/L	40	38.3	96	80-120	
Thallium	ug/L	40	36.3	91	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLI	CATE: 2648	381		2648382							
	é	60334857001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	38.0	38.0	95	95	75-125	0	20	
Arsenic	ug/L	ND	40	40	38.7	39.1	96	97	75-125	1	20	
Barium	ug/L	13.1	40	40	50.7	50.6	94	94	75-125	0	20	
Beryllium	ug/L	ND	40	40	32.9	32.4	82	81	75-125	2	20	
Cadmium	ug/L	ND	40	40	34.8	35.2	87	88	75-125	1	20	
Chromium	ug/L	ND	40	40	37.9	37.9	94	94	75-125	0	20	

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Date: 05/12/2020 01:34 PM

MATRIX SPIKE & MATRIX	SPIKE DUPLI	CATE: 2648	381		2648382							
Parameter	Units	60334857001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec	RPD	Max RPD	Qual
Cobalt	ug/L		40	40	37.1	37.5	90	91	75-125		20	
Lead	ug/L	ND	40	40	34.0	34.2	85	85	75-125	1	20	
Molybdenum	ug/L	1.8	40	40	41.8	41.9	100	100	75-125	0	20	
Selenium	ug/L	143	40	40	181	180	94	94	75-125	0	20	
Thallium	ug/L	ND	40	40	33.4	33.7	83	84	75-125	1	20	

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



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

QC Batch: 650766 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2640735 Matrix: Water

Associated Lab Samples: 60334957001, 60334957002

Blank Reporting
Parameter Units Result Limit Analyzed

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 04/23/20 15:36

LABORATORY CONTROL SAMPLE: 2640736

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units **Total Dissolved Solids** mg/L 1000 1000 100 80-120

SAMPLE DUPLICATE: 2640737

Farameter Units Result Result RPD RPD Qualifiers

Total Dissolved Solids mg/L 754 740 2 10

SAMPLE DUPLICATE: 2640738

Date: 05/12/2020 01:34 PM

60334857003 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 5230 mg/L 5740 9 10

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Date: 05/12/2020 01:34 PM

QC Batch: 652356 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2646477 Matrix: Water

Associated Lab Samples: 60334957001, 60334957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND ND	1.0	05/01/20 13:30	
Fluoride	mg/L	ND	0.20	05/01/20 13:30	
Sulfate	mg/L	ND	1.0	05/01/20 13:30	

METHOD BLANK: 2647533 Matrix: Water

Associated Lab Samples: 60334957001, 60334957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/04/20 09:24	
Fluoride	mg/L	ND	0.20	05/04/20 09:24	
Sulfate	mg/L	ND	1.0	05/04/20 09:24	

LABORATORY CONTROL SAMPLE:	2646478					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		4.7	94	80-120	
Fluoride	mg/L	2.5	2.3	93	80-120	
Sulfate	mg/L	5	4.8	96	80-120	

LABORATORY CONTROL SAMPLE:	2647534					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	4.6	92	80-120	_
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	4.9	97	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 2646	533		2646534							
			MS	MSD								
		40206545002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	17.4	25	25	48.1	40.8	123	93	80-120	16	15	M1,R1
Fluoride	mg/L	<1.0	12.5	12.5	15.8	12.4	119	92	80-120	24	15	R1
Sulfate	mg/L	31.7	25	25	65.5	55.7	135	96	80-120	16	15	M1,R1

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



QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Date: 05/12/2020 01:34 PM

MATRIX SPIKE SAMPLE:	2646538						
		40206609001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	6.5	5	11.4	97	80-120	
Fluoride	mg/L	0.53	2.5	2.8	91	80-120	
Sulfate	mg/L	162	50	214	105	80-120 E	

SAMPLE DUPLICATE: 2646537						
		40206545003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	7.3	7.3	0	15	
Fluoride	mg/L	0.81	0.81	0	15	
Sulfate	mg/L	138	132	4	15	

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



QUALIFIERS

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 05/12/2020 01:34 PM

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR

Pace Project No.: 60334957

Date: 05/12/2020 01:34 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334957001	ASH-06-CCR	EPA 3010	652154	EPA 6010	652231
60334957002	ASH-03-CCR	EPA 3010	652154	EPA 6010	652231
60334957001	ASH-06-CCR	EPA 3010	652835	EPA 6020	652871
60334957002	ASH-03-CCR	EPA 3010	652835	EPA 6020	652871
60334957001	ASH-06-CCR	EPA 7470	653803	EPA 7470	653941
60334957002	ASH-03-CCR	EPA 7470	653803	EPA 7470	653941
60334957001	ASH-06-CCR	SM 2540C	650766		
60334957002	ASH-03-CCR	SM 2540C	650766		
60334957001	ASH-06-CCR	EPA 9056	652356		
60334957002	ASH-03-CCR	EPA 9056	652356		



Sample Condition Upon Receipt



Client Name: AECOM		
Courier: FedEx UPS UPS VIA Clay DP	PEX 🗆 ECI 🗆	Pace ☐ Xroads ☐ Client ☐ Other ☐
1665 04, 1661	e Shipping Label Used	d? Yes □ No □
Custody Seal on Cooler/Box Present: Yes Ø No □	Seals intact: Yes	
Packing Material: Bubble Wrap [] Bubble Bags []		None [] Other 27/
/10-	Ice: We Blue No	
Cooler Temperature (°C): As-read 0.2 Corr. Factor		Date and fulfials of person
Temperature should be above freezing to 6°C		5.5
Chain of Custody present;	□xres □No □N/A	
Chain of Custody relinquished	Ches Ono Onia	
Samples arrived within holding time:	ZYes ONO ON/A	
Short Hold Time analyses (<72hr):	□Yes ØNo □N/A	
Rush Turn Around Time requested:	☐Yes ØNo ☐N/A	
Sufficient volume:	ØYes □No □N/A	
Correct containers used:	DYes ONO ONA	
Pace containers used:	ØYes □No □N/A	
Containers intact:	✓Yes □No □N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	√ □Yes □No □N/A	
Filtered volume received for dissolved tests?	□Yes □No □N/A	
Sample labels match COC: Date / time / ID / analyses	ØYes □No □N/A	
Samples contain multiple phases? Matrix: W-	□Yes (No □N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)	ZYes □No □N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot #6(3173	
Cyanide water sample checks:		
Lead acetate strip tums dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Potassium lodice test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	□Yes □No □N/A	
Headspace in VOA vials (>6mm):	□Yes □No □N/A	
Samples from USDA Regulated Area: State	□Yes □No □N/A	
Additional labels attached to 5035A / TX1005 vials in the field?		
Client Notification/ Resolution: Copy COC to		Field Data Required? Y / N
Person Contacted: Date/Ti	me:	
Comments/ Resolution:		
Project Manager Review:	Date	

CHAIN-OF-CUSTODY / Analytical Request Document Pace Analytical

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

Pace Project No./ Lab I.D. Samples Intact (V/V) **DRINKING WATER** SAMPLE CONDITIONS OTHER Cooler (Y/N) ŏ Custody Sealed Ice (Y/N) 7 Received on GROUND WATER Page: Residual Chlorine (Y/N) M O° ni qmeT ó REGULATORY AGENCY 8 2835 RCRA Requested Analysis Filtered (Y/N) TIME 02/12/1/20 12/20 Site Location STATE: NPDES DATE UST **5240C LDS** 7470 Total Mercury DATE Signed (MM/DD/YY): ACCEPTED BY / AFFILIATION **alateM latoT 0108 *slateM latoT 0208 9 9026 CI, F, SO4 N/A Analysis Test Same as Section A Other Brita Hochenas Accounts Payable Methanol Heather Wilson Preservatives Na₂S₂O₃ Company Name: AECOM NaOH 11033, 3 42700 HCI (I) Invoice Information: HNO3 × Jovens Reference:
Pace Project
Manager:
Pace Profile #: ⁷OS⁷H Section C 6091 Pace Quote Unpreserved TIME Attention: Address: # OF CONTAINERS M SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION 4/2 dze DATE TIME COMPOSITE END/GRAB HEOM. COLLECTED DATE RELINQUISHED BY / AFFILIATION PRPA Rawhide CCR TIME 1100 470izo 1325 COMPOSITE START astrally DATE Brian Rothmeyer Report To: Vasanta Kalluri Required Project Information: (G=GRAB C=COMP) **SAMPLE TYPE** MT 6 S urchase Order No.: 3 Project Number. (see valid codes to left) MATRIX CODE project Name: Section B Copy To: Valid Matrix Codes MATRIX CODE DRINKING WATER DW
WATER WT
WASTE WATER WW
PRODUCT P
SOIL/SOLID SL P WP P ST AIR OTHER TISSUE Greenwood Village, CO 80111 brian.rothmeyer@aecom.com ADDITIONAL COMMENTS (A-Z, 0-91,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St 454-03-CCR 'Be. Cr. Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb 454-06-CC SAMPLE ID Required Client Information (303) 740-2614 Required Client Information: Requested Due Date/TAT: AECOM Section D Section A **B, Ca, Li Email To: Address: Phone: Page 17 of 17 10 F 12 2 ιΩ 9 1 m

F-ALL-Q-020rev.08, 12-Oct-2007

Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 15% per month for any invoices not paid within 30 days.

AECOM Environment

July 2020

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Date Completed: October 5, 2020

Date Completed: October 12, 2020

Data Package: 60342902Sampling Event: July 15, 2020
Data Reviewer: Brian Rothmeyer
Peer Reviewer: Katie Abbott

This report contains the final results of the data validation conducted for the water samples collected July 15th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017) and USEPA National Functional Guidelines for Organic Data Review, EPA-

General Overall Assessment:

540-R-2017-002 (January 2017).

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	_	riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. Analyte Concentration MB 1963995 Total Ra-228 0.856 ± 0.394 pCi/L ± - Plus or Minus pCi/L - Picocuries Per Liter MB - Method Blank Ra - Radium		X^1	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X

Review Parameter	Criteria		riteri Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Total vs. Partial Analyses	 Comparison of total sample results with the associated partial sample results satisfied the following criteria. In instances where the sample result is greater than the minimum detectable concentration (MDC) and the value for partial analysis exceed that for a total analysis, the agreement between total sample results and dissolved sample results were evaluated. The DER met the criterion of a DER ≤2. 	X		
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2. 			X
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		
Detection Limits Mets	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit. Sample Analyte Result (pCi/L) 2 Sigma (σ) MDC (pCi/L) BAT-05-CDPHE Total Ra-226 0.466 \pm 0.541 0.873 \pm - Plus or Minus pCi/L - Picocuries Per Liter MDC - Minimum Detectable Concentration Ra - Radium		X ²	
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

- 1 The associated total radium-228 sample results reported at concentrations greater than the MDC and reported at concentrations less than 5x the concentration of the blank contamination were qualified as estimated (J+ bl) to reflect the potential high bias indicated by the blank contamination.
- 2-For the total radium-226 result for sample BAT-05-CDPHE, the 2 sigma (σ) uncertainty multiplied by 1.65 were greater than the reported MDC, and the associated total radium-226 result was qualified as estimated (J v) indicating the detection limit criteria was not met.

> - Greater Than

^{± −} Plus or Minus/High or Low Bias

^{% -} Percent

J-Estimated

MB - Method Blank

NA – Not Applicable v – Compound Identification Issue

< - Less Than

σ – Sigma (Uncertainty)

bl - Laboratory blank Contamination LCS - Laboratory Control Sample

MDC - Minimum Detectable Concentration

Ra-Radium

^{≤ –} Less Than or Equal To pCi/L - Picocuries Per Liter

DER – Duplicate Error Ratio

LCSD - Laboratory Control Sample Duplicate MS/MSD - Matrix Spike/Matrix Spike Duplicate RPD - Relative Percent Difference





August 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Dianton m. Wilson

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



CERTIFICATIONS

Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60342902001	ASH-06-CDPHE	Water	07/15/20 08:20	07/16/20 09:30
60342902002	BAT-05-CDPHE	Water	07/15/20 10:30	07/16/20 09:30
60342902003	BAT-09-CDPHE	Water	07/15/20 12:45	07/16/20 09:30
60342902004	BAT-08-CDPHE	Water	07/15/20 15:15	07/16/20 09:30
60342902005	ASH-06-CDPHE DISSOLVED	Water	07/15/20 08:20	07/16/20 09:30
60342902006	BAT-05-CDPHE DISSOLVED	Water	07/15/20 10:30	07/16/20 09:30
60342902007	BAT-09-CDPHE DISSOLVED	Water	07/15/20 12:45	07/16/20 09:30
60342902008	BAT-08-CDPHE DISSOLVED	Water	07/15/20 15:15	07/16/20 09:30

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60342902001	ASH-06-CDPHE	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

Sample: ASH-06-CDPHE PWS:	Lab ID: 6034290 Site ID:	2001 Collected: 07/15/20 08:20 Sample Type:	Received:	07/16/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	vices - Greensburg				
Radium-226	EPA 903.1	0.0586 ± 0.445 (0.880) C:NA T:88%	pCi/L	07/30/20 12:5	5 13982-63-3	
	Pace Analytical Ser	vices - Greensburg				
Radium-228	EPA 904.0	0.939 ± 0.521 (0.948) C:67% T:79%	pCi/L	07/29/20 14:39	9 15262-20-1	
	Pace Analytical Ser	vices - Greensburg				
Total Radium	Total Radium Calculation	0.998 ± 0.966 (1.83)	pCi/L	07/31/20 10:0	1 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

QC Batch: 405819 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60342902001, 60342902002, 60342902003, 60342902004

METHOD BLANK: 1963995 Matrix: Water

Associated Lab Samples: 60342902001, 60342902002, 60342902003, 60342902004

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.856 ± 0.394 (0.628) C:69% T:88%
 pCi/L
 07/29/20 14:36

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

QC Batch: 405818 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60342902001, 60342902002, 60342902003, 60342902004

METHOD BLANK: 1963994 Matrix: Water
Associated Lab Samples: 60342902001, 60342902002, 60342902003, 60342902004

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.000 ± 0.313 (0.641) C:NA T:96% pCi/L 07/30/20 12:36

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



QUALIFIERS

Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 08/06/2020 03:53 PM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CDPHE

Pace Project No.: 60342902

Date: 08/06/2020 03:53 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60342902001	ASH-06-CDPHE	EPA 903.1	405818		
60342902001	ASH-06-CDPHE	EPA 904.0	405819		
60342902001	ASH-06-CDPHE	Total Radium Calculation	407489		

DRINKING WATER OTHER ö GROUND WATER Page: 90000 REGULATORY AGENCY RCRA Shipping : Special : Handling : Total : Site Location NPDES UST 0.00 0.00 Dept: 6003 Date : 01Jul20 0.00 C Custommer : 665926 Weight : 50 LBS 0.00 Phone : (317)875-5894 CDD : 0.00 is Dept: client services DV : Suna: STANDARD MVFRNIGHT Master 1908 6730 3055 TRCK: 1908 6730 3066 Same as Section A Accounts Payable Pace Quote 73141
Reference:
Pace Project Heather Wilson Company Name: AECOM Invoice Information: Attention: Section C Address: Shipping : Special : Handling : Total : Project Name: PRPA Rawhide CDPHE Copy To: Brian Rothmeyer 0.00 Report To: Vasanta Kalluri Required Project Information; Date: 01Jul20 Customer: 685928 Weight: 50 LBS Customer: (317)875-5894 COD: care. Dept: client services DV: SUM STANDARD OUFRNIGHT MASTER 1908 6730 3055 TROK: 1908 6730 3055 Section B Purchase Order No.: brian,rothmeyer@aecom.com Greenwood Village, CO 80111 6200 South Quebec St Phone: (303) 740-2614 | Fax: Required Client Information: AECOM Company: Email To: Address:

7 10 E	(202) (40+2014		2	O STANDARD	- 1	J		Manager						5		_	S					
Request	Requested Due Date/TAT: 15 Day TAT	Project Number:	mber					Pace Profile #:	# 11033,	3,8					STATE	ůi.	}					
											_	Re	Requested Analysis Filtered (Y/N)	d Anal	ysis Fil	ered ((/N/					
	Section D Valid Matrix Codes Recuired Client Information MATRIX COL	Codes	<u> </u>	1 100	COLLE	COLLECTED			Prese	Preservatives	‡N/A	A										
			ee valid codes l		COMPOSITE	COMPOSITE	ОГГЕСТІОИ	S			1	97	. 82	.6 & 228 1m-228				. (N/V) э				
	SAMPLE ID WRE (A-Z, 0-9 /) OTHER Sample IDS MUST BE UNIQUE TISSUE	AR TO ST		-e) 3.11.			TEMP AT C	SATAINER: bevred			101 resT eisy	S2-muibs	uibaЯ be	od Radiu SS-muibs				al Chlorin				
# WBL			XIRTAM 3J9MAS	DATE	E E	DATE TI	TIME SAMPLE	Unpres	HCI HNO ³ H ⁵ 20 ⁴	NaOH Na ₂ S ₂ C	Other	A latoT	R IstoT					Residu	Pa	Pace Project No./ Lab I.D	ct No./ I	ab I.D.
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7 6	PART OF COOKE			, ,		7/15/2018	377	+	•			3	3	2								
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12							- PATE	TIME	_			N/AFF	ACCEPTED BY / AFFILIATION		DATE	╀	TIME	1	78	SAMPLE CONDITIONS	SNOILIGN	
	ADDITIONAL COMMENTS		KELIN	KELINGUISHED BT / AFFILIATION	AFFILIA	<u> </u>	מאוני	7,611	4			1	4		+	1				-		
*One co	One combined result for the total radium and another for the dissolved radium		公出	25t Ble on the	3	7	115/20	17:75	15	3	~	2	2	12	1911	<u>'</u>	32 33	3	>	<u>ア</u>		_
	Ω				SAMPL	SAMPLER NAME AND SIGNATURE	SIGNATUF	- F	-									Э.			(N/	
ye I	ge 1					PRINT Name of	of SAMPLER:	3332		J. Swales) ,							ui dm	bavie:	S ybc	Y) 19k	(N/X) seld
J UI	9 of :					SIGNATURE of	of SAMPLER:	J. M.	Ä.	大学的		35	DATE Signed (MM/DD/YY):	10 pa	1/165/	80%	0	θΙ			000	ms2
∠ 4	24							MA										Д	0.000	E ALL O 020res/ 08 12_Oct_2007	7002-MO	

F-ALL-Q-020rev.08, 12-Oct-2007

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

Pittsburgh Lab Sample Condi					
Face Analytical Client Name:	1	91	E(OM 1	Project#
Courier: Fed Ex UPS USPS Clien			ercial	Pace Other	Label
Tracking #: 190867303006	, a	191	086	7303055	LIMS Login
Custody Seal on Cooler/Box Present: yes	n	10	Seals	intact: 🗹 yes 🔲	no ·
Thermometer Used	Туре	of Ice	: (Wet) Blue None	•
Cooler Temperature Observed Temp	2, O	. C	Corre	ection Factor: O 3	°c Final Temp: 5.7 °c
Temp should be above freezing to 6°C					· · · · · · · · · · · · · · · · · · ·
				pH paper Lot# 1005191	Date and Initials of person examining contents: MMK 7/16/120
Comments:	Yes	No	N/A	10001911	
Chain of Custody Present:	+	ļ	-	1.	
Chain of Custody Filled Out:	\vdash		ļ	2.	
Chain of Custody Relinquished:	<u> </u>		<u> </u>	3.	
Sampler Name & Signature on COC:				4.	
Sample Labels match COC:	4			5.	
-includes date/time/ID Matrix: V	<u> </u>	и	-		
Samples Arrived within Hold Time:		ļ		6.	
Short Hold Time Analysis (<72hr remaining):				7.	
Rush Turn Around Time Requested:				8.	
Sufficient Volume:				9.	
Correct Containers Used:	/			10,	
-Pace Containers Used:					
Containers Intact:				11.	
Orthophosphate field filtered				12.	
Hex Cr Aqueous sample field filtered				13.	, , , , , , , , , , , , , , , , , , , ,
Organic Samples checked for dechlorination:				14.	
Filtered volume received for Dissolved tests				15.	
All containers have been checked for preservation.				16,	
exceptions: VOA, coliform, TOC, O&G, Phenolics, I Non-aqueous matrix	Radon,			10.	
All containers meet method preservation					Date/time of
requirements.					preservation
				Lot # of added preservative	
leadspace in VOA Vials (>6mm):				17.	
rip Blank Present:				18.	-
rip Blank Custody Seals Present					
Rad Samples Screened < 0.5 mrem/hr				Initial when IMR	Date: 7/16/2020
Client Notification/ Resolution:				completed.	Date.
Person Contacted:			Date/T	imo:	Contacted By
Comments/ Resolution:			αι C /-i-	HIIG.	Gontacted By:
- Control (Cooldol)					
					

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

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

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

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Ra-226

Test: Analyst: Date: Batch ID: Matrix:

Pace Analytical

MB Sample ID

Method Blank Assessment

MB concentration:

M/B Counting Uncertainty: MB MDC: MB Numerical Performance Indicator:

MB Status vs Numerical Indicator; MB Status vs. MDC:

Laboratory Control Sample Assessment

MS/MSD 2 MS/MSD . MS Aliquot (L, 9, F):
MS Target Conc. (pCi/L, 9, F):
MSD Aliquot (L, 9, F):
MSD Target Conc. (pCi/L, 9, F): Sample I.D. Sample MS I.D. Sample MSD I.D. MS/MSD Decay Corrected Spike Concentration (pCl/mt.): Spike Volume Used in MS (mL): Spike Volume Used in MSD (mL): Sample Collection Date: Spike I.D.: Sample Matrix Spike Control Assessment LCSD (Y or N)?
LCS56143
730/2020
730/2020
31.427
0.10
0.661
4.754
0.223
4.953
0.917
0.41 7/22/2020 55143 DW 0.000 0.313 0.641 0.00 N/A Pass 폿

MS Spike Uncertainty (calculated):	MSD Spike Uncertainty (calculated):	Sample Result:	Sample Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Result:	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F);	MS Numerical Performance Indicator:	MSD Numerical Performance Indicator:	MS Percent Recovery:	MSD Percent Recovery:	MS Status vs Numerical Indicator;	MSD Status vs Numerical Indicator;	MS Status vs Recovery:	MSD Status vs Recovery:	MS/MSD Upper % Recovery Limits:	MS/MSD Lower % Recovery Limits:	
	ΥΥ	LCSD55143	7/30/2020	18-039	31.427	0.10	_		0.228	4.842	0.958	-0.02	99.82%	ΑÑ	Pass	135%	73%	

Aliquot Volume (L, g, F): Target Conc. (pCi/L, g, F):

Uncertainty (Calculated): Result (pCi/L, g, F):

LCS/LCSD Counting Uncertainty (pCi/L, g, F):

Numerical Performance Indicator

Percent Recovery Status vs Numerical Indicator:

Spike Concentration (pCi/mL): Volume Used (mL):

Count Date Spike I.D. Status vs Recovery: Upper % Recovery Limits: Lower % Recovery Limits:

Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I D	Sample MSD D	Sample Matrix Snike Result:	Matrix Solke Result Counting Uncertainty (PC)/ (PC)/	Sample Matrix Soike Dublicate Result:	Matrix Soike Dublicate Result Counting Uncertainty (p.C// p. E)	Duplicate Numerical Performance Indicator	(Based on the Percent Recoveries) MS/ MSD Dunitoate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator	MS/ MSD Direlicate Status vs RPD	% RPD Limit:
2	Enter Duplicate	sample IDs if	other than	LCS/LCSD in	the space below.							
	LCS55143	LCSD55143	4.953	0.917	4.842	0.958	<u>Q</u>	0.164	4.27%	N/A	Pass	32%
Duplicate Sample Assessment	Sample I.D.:	Duplicate Sample I.D.	Sample Result (pCi/L, g, F):	Sample Result Counting Uncertainty (pCi/l., g, F):	Sample Duplicate Result (pCi/L, g, F):	Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	Are sample and/or duplicate results below RL?	Duplicate Numerical Performance Indicator:	(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	Duplicate Status vs Numerical Indicator:	Duplicate Status vs RPD:	% RPD Limit:

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

Ra-226 NELAC QC Printed: 7/30/2020 2:04 PM

of 1

Quality Control Sample Performance Assessment

Ra-228 Test **Analyst**:

723/2020 55144 WT Worklist: Matrix: Date:

Analyst Must Manually Enter All Fields Highlighted in Yellow. Χ¥

1963995 0.856 0.394 0.628 4.25 Fail* MB concentration: M/B 2 Sigma CSU: MB Sample ID MB MDC: MB Numerical Performance Indicator. MB Status vs Numerical Indicator; MB Status vs. MDC;

Method Blank Assessment

MS/MSD 2 MS/MSD 1 Sample I.D. Sample MS I.D. MS/MSD Decay Corrected Spike Concentration (pCi/mL): Spike Volume Used in MS (mL): MSD Target Conc. (pCi/L, g, F): Sample Collection Date: Sample MSD I.D. Spike I.D.: MS Aliquot (L, g, F): MS Target Conc.(pCi/L, g, F): MSD Aliquot (£, g, F): Sample Result 2 Sigma CSU (pCi/L, g, F): Sample Matrix Spike Result: Matrix Spike Result 2 Sigma CSU (pCi/L, g, F): Spike Volume Used in MSD (mL) MS Spike Uncertainty (calculated) rix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F) MS Percent Recovery. MSD Percent Recovery. MS Status vs Numerical Indicator. MSD Status vs Numerical Indicator. MSD Spike Uncertainty (calculated) Sample Result Sample Matrix Spike Duplicate Result MS Numerical Performance Indicator MSD Numerical Performance Indicator Sample Matrix Spike Control Assessment

le Assessment	LCSD (Y or N)?	X	
	LCS55144	LCSD55144	
Count Date:	7/29/2020	7/29/2020	
Spike I.D.:	20-030	20-030	
Corrected Spike Concentration (pCi/mL):	39.008	39.008	
Volume Used (mL):	0.10	0.10	
Aliquot Volume (L, g, F):	0.817	0.810	Matri
Target Conc. (pCi/L, g, F):	4.774	4.816	
Uncertainty (Calculated):	0.234	0.236	
Result (pCi/L, g, F):	5.087	6.025	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.157	1.363	
Numerical Performance Indicator:	0.52	1.71	
Percent Recovery:	106.55%	125.09%	
Status vs Numerical Indicator:	N/N	N/A	
Status vs Recovery:	Pass	Pass	
Upper % Recovery Limits:	135%	135%	
Lower % Recovery Limits:	%09	%09	

Decay Corrected Spike Concentration (pCi/m

Laboratory Control Sample Assessment

	% RPD Limit:
	MS/ MSD Duplicate Status vs RPD;
	MS/ MSD Duplicate Status vs Numerical Indicator.
	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:
	Duplicate Numerical Performance Indicator:
	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):
	Sample Matrix Spike Duplicate Result:
	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):
	Sample Matrix Spike Result:
	Sample MSD I.D.
	Sample MS I.D.
	Sample I.D.
	Matrix Spike/Matrix Spike Duplicate Sample Assessment

LCS/LCSD in the space below.

1.157 6.025 1.363 NO -1.028 16.00%

Are sample and/or duplicate results below RL? Duplicate Numerical Performance Indicator:

(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:

Duplicate Status vs Numerical Indicator:

Enter Duplicate sample IDs if other than

LCS55144

Sample I.D.: Duplicate Sample I.D. Sample Result (pCVL, g, F):

Duplicate Sample Assessment

LCSD55144 5.087

Sample Result 2 Sigma CSU (pCi/L, g, F): Sample Duplicate Result (pCi/L, g, F): Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):

MS/MSD Upper % Recovery Limits: MS/MSD Lower % Recovery Limits:

MS Status vs Recovery: MSD Status vs Recovery:

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Pass Pass 36%

Duplicate Status vs RPD: % RPD Limit:

*The method blank result is below the reporting limit for this analysis and is acceptable. Comments:

6 of 10

Ra-228 NELAC DW2 Printed: 7/30/2020 8:51 AM

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60343029 Sampling Event: July 16th

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: September 24, 2020

Date Completed: October 12, 2020

This report contains the final results of the data validation conducted for the water samples collected July 16th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review	Criteria	Criteria		
Parameter		Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges. Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.		X ¹	
	Analyte MS/MSD Limits RPD Limits (%) (%) (%) (%) ASH-02-CCR Beryllium 132/131 75-125 1 20 % - Percent MS/MSD - Matrix Spike/ Matrix Spike Duplicate RPD - Relative Percent Difference Bold indicates a value that is outside of acceptance limits.			
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:	X		

Review Parameter	Criteria	Criteria Met?			
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA	
	 When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL. 				
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: Parent Sample Field Duplicate				
	ASH-02-CCR DUP-01-CCR • When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%. • Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.	X			
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte Concentration		X ²		
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.		X^3		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X			
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X			

Comments

- $1-\mathrm{As}$ the potential bias was considered to be high for beryllium, and the associated sample result was reported as non-detect, qualification was not considered necessary.
- 2 As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.
- 3 The beryllium result for sample ASH-07-CCR was reported as non-detect at an elevated reporting limit. This non-detect result will need to be evaluated by the end user of the data with respect to project objectives.

TDS – Total Dissolved Solids

< - Less Than</p>
% - Percent
MB - Method Blank
RL - Reporting Limit

≤ – Less Than or Equal To LCS – Laboratory Control Sample MS/MSD – Matrix Spike/Matrix Spike Duplicate RPD – Relative Percent Difference





August 04, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 17, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Dianos m. Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water Arkansas Certification #: 20-020-0

Arkansas Drinking Water Illinois Certification #: 200030

lowa Certification #: 118

Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070



SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60343029001	ASH-02-CCR	Water	07/16/20 09:00	07/17/20 08:40
60343029002	DUP-01-CCR	Water	07/16/20 08:00	07/17/20 08:40
60343029003	ASH-08-CCR	Water	07/16/20 11:30	07/17/20 08:40
60343029004	ASH-07-CCR	Water	07/16/20 13:15	07/17/20 08:40



SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60343029001	ASH-02-CCR	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60343029002	DUP-01-CCR	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60343029003	ASH-08-CCR	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60343029004	ASH-07-CCR	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Date: 08/04/2020 04:17 PM

Sample: ASH-02-CCR	Lab ID: 6034	13029001	Collected: 07/16/2	0 09:00	Received: 07	//17/20 08:40 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation Meth	nod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	2040	ug/L	100	1	07/23/20 11:43	08/03/20 18:02	7440-42-8	
Calcium	164000	ug/L	200	1	07/23/20 11:43	08/03/20 18:02	7440-70-2	
Lithium	314	ug/L	10.0	1	07/23/20 11:43	08/03/20 18:02	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	020 Preparation Meth	nod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-36-0	
Arsenic	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-38-2	
Barium	20.0	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-39-3	
Beryllium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:05	7440-41-7	M1
Cadmium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:05	7440-43-9	
Chromium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-47-3	
Cobalt	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-48-4	
_ead	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7439-92-1	
Molybdenum	8.2	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7439-98-7	
Selenium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7782-49-2	
Thallium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	170 Preparation Meth	nod: EP	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	07/23/20 08:52	07/23/20 13:37	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 25	40C					
	Pace Analytical	Services -	Kansas City					
Total Dissolved Solids	3270	mg/L	66.7	1		07/22/20 08:41		
9056 IC Anions	Analytical Meth	od: EPA 90	056					
	Pace Analytical	Services -	Kansas City					
Chloride	21.0	mg/L	5.0	5		07/24/20 16:00	16887-00-6	
Fluoride	0.24	mg/L	0.20	1		07/24/20 10:00		
Sulfate	2090	mg/L	200	200		07/24/20 17:03		



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Date: 08/04/2020 04:17 PM

Sample: DUP-01-CCR	Lab ID: 6034	3029002	Collected: 07/16	/20 08:0	0 Received: 07	7/17/20 08:40 N	/latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Me	thod: EF	PA 3010			
	Pace Analytical	Services -	Kansas City					
Boron	2040	ug/L	100	1	07/23/20 11:43	08/03/20 18:10	7440-42-8	
Calcium	165000	ug/L	200	1	07/23/20 11:43	08/03/20 18:10	7440-70-2	
_ithium	317	ug/L	10.0	1	07/23/20 11:43	08/03/20 18:10	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Me	thod: EF	PA 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-36-0	
Arsenic	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-38-2	
Barium	19.8	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-39-3	
Beryllium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:24	7440-41-7	
Cadmium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:24	7440-43-9	
Chromium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-47-3	
Cobalt	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-48-4	
₋ead	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7439-92-1	
Molybdenum	8.1	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7439-98-7	
Selenium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7782-49-2	
Γhallium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Me	thod: EF	PA 7470			
•	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	07/23/20 08:52	07/23/20 13:43	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C					
	Pace Analytical							
Total Dissolved Solids	3110	mg/L	66.7	1		07/22/20 08:42		
9056 IC Anions	Analytical Meth	od: EPA 90	56					
	Pace Analytical	Services -	Kansas City					
Chloride	20.6	mg/L	5.0	5		07/24/20 18:54	16887-00-6	
Fluoride	0.24	mg/L	0.20	-		07/24/20 19:10		
Sulfate	2080	mg/L	200	-		07/24/20 18:06		



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Date: 08/04/2020 04:17 PM

Sample: ASH-08-CCR	Lab ID: 6034	13029003	Collected: 07/16/	20 11:30	Received: 07	7/17/20 08:40 N	/latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	942	ug/L	100	1	07/23/20 11:43	08/03/20 18:12	7440-42-8	
Calcium	432000	ug/L	200	1	07/23/20 11:43	08/03/20 18:12	7440-70-2	
_ithium	311	ug/L	10.0	1	07/23/20 11:43	08/03/20 18:12	7439-93-2	
020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-36-0	
Arsenic	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-38-2	
Barium	14.3	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-39-3	
Beryllium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:29	7440-41-7	
Cadmium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:29	7440-43-9	
Chromium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-47-3	
Cobalt	1.5	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-48-4	
₋ead	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7439-92-1	
Molybdenum	1.0	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7439-98-7	
Selenium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7782-49-2	
Γhallium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470			
•	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	07/23/20 08:52	07/23/20 13:46	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	10C					
	Pace Analytical							
Total Dissolved Solids	4520	mg/L	100	1		07/22/20 08:42		
9056 IC Anions	Analytical Meth	od: EPA 90	56					
	Pace Analytical	Services -	Kansas City					
Chloride	20.5	mg/L	2.0	2		07/28/20 19:36	16887-00-6	
Fluoride	ND	mg/L	0.20	1		07/24/20 19:25		
Sulfate	2880	mg/L	500	500		07/24/20 19:41		



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Date: 08/04/2020 04:17 PM

Sample: ASH-07-CCR	Lab ID: 6034	3029004	Collected: 07/16/2	0 13:15	Received: 07	7/17/20 08:40	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation Meth	nod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	742	ug/L	100	1	07/23/20 11:43	08/03/20 18:15	7440-42-8	
Calcium	431000	ug/L	200	1	07/23/20 11:43	08/03/20 18:15	7440-70-2	
Lithium	589	ug/L	10.0	1	07/23/20 11:43	08/03/20 18:15	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Meth	nod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-36-0	
Arsenic	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-38-2	
Barium	11.7	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-39-3	
Beryllium	ND	ug/L	1.0	2	07/23/20 09:15	07/30/20 12:56	7440-41-7	1e
Cadmium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:34	7440-43-9	
Chromium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-47-3	
Cobalt	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-48-4	
∟ead	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7439-92-1	
Molybdenum	1.6	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7439-98-7	
Selenium	220	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7782-49-2	
Thallium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-28-0	
470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Meth	nod: EP	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	07/23/20 08:52	07/23/20 13:48	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C					
	Pace Analytical							
Total Dissolved Solids	6890	mg/L	143	1		07/22/20 08:42		
9056 IC Anions	Analytical Meth	od: EPA 90	056					
	Pace Analytical	Services -	Kansas City					
Chloride	180	mg/L	10.0	10		07/24/20 20:13	16887-00-6	
Fluoride	ND	mg/L	0.20	1		07/24/20 19:57		
Sulfate	4200	mg/L	500	500		07/24/20 20:29		

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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Mercury

Date: 08/04/2020 04:17 PM

QC Batch: 667087 Analysis Method: EPA 7470

QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2701599 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 07/23/20 12:55

LABORATORY CONTROL SAMPLE: 2701600

 Parameter
 Units
 Spike Conc.
 LCS Result
 LCS % Rec Limits
 Qualifiers

 ug/L
 5
 5.1
 102
 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2701601 2701602

MS MSD

60343029001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Conc. Result Result % Rec % Rec **RPD** RPD Qual Result Limits ND 5 20 Mercury ug/L 5 5.1 5.2 99 100 75-125 2

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Boron

Calcium

Lithium

Date: 08/04/2020 04:17 PM

QC Batch: 667142 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2701787 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Blank Reporting Qualifiers Parameter Units Result Limit Analyzed ug/L ND 100 08/03/20 17:41 ug/L ND 200 08/03/20 17:41 ug/L ND 08/03/20 17:41 10.0

LABORATORY CONTROL SAMPLE: 2701788

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Boron	ug/L	1000	1010	101	80-120	_
Calcium	ug/L	10000	9790	98	80-120	
Lithium	ug/L	1000	974	97	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 2701	789		2701790							
			MS	MSD								
		60343029001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	2040	1000	1000	3020	3080	98	104	75-125	2	20	
Calcium	ug/L	164000	10000	10000	174000	176000	104	125	75-125	1	20	
Lithium	ug/L	314	1000	1000	1350	1360	103	104	75-125	0	20	

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



QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Date: 08/04/2020 04:17 PM

QC Batch: 667072 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2701556 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	07/30/20 10:54	
Arsenic	ug/L	ND	1.0	07/30/20 10:54	
Barium	ug/L	ND	1.0	07/30/20 10:54	
Beryllium	ug/L	ND	0.50	07/30/20 10:54	
Cadmium	ug/L	ND	0.50	07/30/20 10:54	
Chromium	ug/L	ND	1.0	07/30/20 10:54	
Cobalt	ug/L	ND	1.0	07/30/20 10:54	
Lead	ug/L	ND	1.0	07/30/20 10:54	
Molybdenum	ug/L	ND	1.0	07/30/20 10:54	
Selenium	ug/L	ND	1.0	07/30/20 10:54	
Thallium	ug/L	ND	1.0	07/30/20 10:54	

LABORATORY CONTROL SAMPLE:	2701557					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	40.0	100	80-120	
Arsenic	ug/L	40	39.9	100	80-120	
Barium	ug/L	40	37.5	94	80-120	
Beryllium	ug/L	40	39.0	98	80-120	
Cadmium	ug/L	40	38.9	97	80-120	
Chromium	ug/L	40	40.9	102	80-120	
Cobalt	ug/L	40	39.6	99	80-120	
Lead	ug/L	40	38.8	97	80-120	
Molybdenum	ug/L	40	40.1	100	80-120	
Selenium	ug/L	40	38.7	97	80-120	
Thallium	ug/L	40	37.2	93	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 2701	558 MS	MSD	2701559							
	6	0343029001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	39.8	39.7	99	99	75-125	0	20	
Arsenic	ug/L	ND	40	40	42.6	42.3	106	105	75-125	1	20	
Barium	ug/L	20.0	40	40	58.9	58.5	97	96	75-125	1	20	
Beryllium	ug/L	ND	40	40	52.9	52.4	132	131	75-125	1	20	M1
Cadmium	ug/L	ND	40	40	35.4	35.2	88	88	75-125	1	20	
Chromium	ug/L	ND	40	40	31.1	31.2	77	77	75-125	0	20	

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

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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Date: 08/04/2020 04:17 PM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 2701	558 MS	MSD	2701559							
	6	0343029001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cobalt	ug/L	ND	40	40	40.8	40.2	102	100	75-125	2	20	
Lead	ug/L	ND	40	40	32.1	32.3	80	81	75-125	1	20	
Molybdenum	ug/L	8.2	40	40	52.7	52.1	111	110	75-125	1	20	
Selenium	ug/L	ND	40	40	43.5	43.4	108	108	75-125	0	20	
Thallium	ug/L	ND	40	40	32.2	32.4	80	81	75-125	1	20	

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

Qualifiers



QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

QC Batch: 666681 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2700487 Matrix: Water

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 07/22/20 08:38

LABORATORY CONTROL SAMPLE: 2700488

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits

Total Dissolved Solids mg/L 1000 999 100 80-120

SAMPLE DUPLICATE: 2700489

Farameter Units Result Result RPD RPD Qualifiers

Total Dissolved Solids mg/L 2060 2180 5 10

SAMPLE DUPLICATE: 2700490

Date: 08/04/2020 04:17 PM

60343029001 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 3270 mg/L 3250 0 10

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



QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

QC Batch: 667260 Analysis Method: EPA 9056 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

> Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2702207 Matrix: Water

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

		Diank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/24/20 09:51	
Fluoride	mg/L	ND	0.20	07/24/20 09:51	
Sulfate	mg/L	ND	1.0	07/24/20 09:51	

METHOD BLANK: 2704372 Matrix: Water

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/28/20 17:26	
Fluoride	mg/L	ND	0.20	07/28/20 17:26	
Sulfate	mg/L	ND	1.0	07/28/20 17:26	

METHOD BLANK: 2705816 Matrix: Water

Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
mg/L	ND	1.0	07/29/20 09:09	
mg/L	ND	0.20	07/29/20 09:09	
mg/L	ND	1.0	07/29/20 09:09	
	mg/L mg/L	Units Result mg/L ND mg/L ND	Units Result Limit mg/L ND 1.0 mg/L ND 0.20	Units Result Limit Analyzed mg/L ND 1.0 07/29/20 09:09 mg/L ND 0.20 07/29/20 09:09

LABORATORY CONTROL SAMPLE: 2702208

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L		4.8	95	80-120	
Fluoride	mg/L	2.5	2.5	98	80-120	
Sulfate	mg/L	5	5.1	103	80-120	

LABORATORY CONTROL SAMPLE:

Date: 08/04/2020 04:17 PM

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L		4.8	95	80-120	
Fluoride	mg/L	2.5	2.7	108	80-120	
Sulfate	mg/L	5	5.1	101	80-120	

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



QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Sulfate

Date: 08/04/2020 04:17 PM

LABORATORY CONTROL SAMPLE: 2705817 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 5 4.9 98 80-120 Fluoride mg/L 2.5 2.5 100 80-120 Sulfate mg/L 5 5.0 100 80-120 MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2702209 2702210 MSD MS 60343029001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Chloride mg/L 21.0 25 25 46.0 45.9 100 100 80-120 0 15 Fluoride mg/L 0.24 2.5 2.5 2.5 2.4 89 88 80-120 1 15 Sulfate mg/L 2090 1000 1000 3140 3100 105 101 80-120 15 MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2702212 2702213 MS MSD 60343210001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Chloride 50 115 50 171 171 0 15 mg/L 111 111 80-120 Fluoride 0.51 2.5 2.5 2.7 2.7 89 89 0 mg/L 80-120 15 Sulfate mg/L 315 250 250 561 558 98 97 80-120 1 15 SAMPLE DUPLICATE: 2702211 60343029001 Dup Max Units Result RPD RPD Qualifiers Parameter Result Chloride mg/L 21.0 20.6 2 15 0.24 Fluoride 0.24 1 15 mg/L 2090 2080 Sulfate mg/L 1 15 SAMPLE DUPLICATE: 2702214 60343210001 Dup Max Result RPD RPD Qualifiers Parameter Units Result Chloride mg/L 115 116 0 15 0.51 0.50 2 Fluoride mg/L 15

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

315

mg/L

310

2

15



QUALIFIERS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 08/04/2020 04:17 PM

1e Dilution was required to get Internal Standard recoveries within Method specifications

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343029

Date: 08/04/2020 04:17 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica Batch
60343029001	ASH-02-CCR	EPA 3010	667142	EPA 6010	667237
60343029002	DUP-01-CCR	EPA 3010	667142	EPA 6010	667237
60343029003	ASH-08-CCR	EPA 3010	667142	EPA 6010	667237
60343029004	ASH-07-CCR	EPA 3010	667142	EPA 6010	667237
60343029001	ASH-02-CCR	EPA 3010	667072	EPA 6020	667154
60343029002	DUP-01-CCR	EPA 3010	667072	EPA 6020	667154
60343029003	ASH-08-CCR	EPA 3010	667072	EPA 6020	667154
60343029004	ASH-07-CCR	EPA 3010	667072	EPA 6020	667154
60343029001	ASH-02-CCR	EPA 7470	667087	EPA 7470	667145
60343029002	DUP-01-CCR	EPA 7470	667087	EPA 7470	667145
60343029003	ASH-08-CCR	EPA 7470	667087	EPA 7470	667145
60343029004	ASH-07-CCR	EPA 7470	667087	EPA 7470	667145
60343029001	ASH-02-CCR	SM 2540C	666681		
60343029002	DUP-01-CCR	SM 2540C	666681		
60343029003	ASH-08-CCR	SM 2540C	666681		
60343029004	ASH-07-CCR	SM 2540C	666681		
60343029001	ASH-02-CCR	EPA 9056	667260		
60343029002	DUP-01-CCR	EPA 9056	667260		
60343029003	ASH-08-CCR	EPA 9056	667260		
60343029004	ASH-07-CCR	EPA 9056	667260		



Sample Condition Upon Receipt



Client Name: Accom		
Courier: FedEx ✓ UPS □ VIA □ Clay □	PEX 🗆 ECI 🗆	Pace ☐ Xroads ☐ Client ☐ Other ☐
Tracking #: 1408 6330 6606 659 Page	ce Shipping Label Use	d? Yes □ No 🗹
Custody Seal on Cooler/Box Present: Yes. ✓ No □	Seals intact: Yes 4	No □
Packing Material: Bubble Wrap □ Bubble Bags	□ Foam □	None □ Other ☑ 같이 C
Thermometer Used: 1-299 4.6 Type o	fice: Web Blue No	Date and initials of passen
	tor +O.1 Correc	ted 0.3 Date and initials of person examining contents: 7.17.20
Temperature should be above freezing to 6°C		<u> </u>
Chain of Custody present:	✓Yes □No □N/A	
Chain of Custody relinquished:	ØYes □No □N/A	
Samples arrived within holding time:	ØYes □No □N/A	
Short Hold Time analyses (<72hr):	□Yes ZNo □N/A	
Rush Turn Around Time requested:	□Yes ØNo □N/A	
Sufficient volume:	ZaYes □No □N/A	
Correct containers used:	ØYes □No □N/A	
Pace containers used:	ØYes □No □N/A	
Containers intact:	ØYes □No □N/A	-
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No ☑N/A	
Filtered volume received for dissolved tests?	□Yes □No ØN/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☑No □N/A	Did not receive volume for ASH-06-CCR
Samples contain multiple phases? Matrix: WT	□Yes ZNo □N/A	
Containers requiring pH preservation in compliance?	Øyes □No □N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# (603173	dato/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Trip Blank present:	□Yes 🗖No □N/A	
Headspace in VOA vials (>6mm):	□Yes □No ØN/A	
Samples from USDA Regulated Area: State:	□Yes □No ØN/A	
Additional labels attached to 5035A / TX1005 vials in the field	? □Yes □No ☑N/A	
Client Notification/ Resolution: Copy COC to	o Client? Y / N	Field Data Required? Y / N
Person Contacted: Date/1	Гіте:	
Comments/ Resolution:		
	431	es min
Project Manager Review:	Date	e:

FaceAnalytical

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

MS/MSO @ KNH-OG Pace Project No./ Lab I.D. (V/V) DRINKING WATER SAMPLE CONDITIONS F-ALL-Q-020rev 68, 12-Oct-2007 OTHER Cooler (Y/N) of Custody Sealed Ice (Y/N) Received on GROUND WATER Page: 0.3 Residual Chlorine (Y/N) 57 O° ni qmeT REGULATORY AGENCY 00 RCRA 1720 0840 Requested Analysis Filtered (Y/N) TIME Site Location STATE: NPDES DATE UST \$240C LDS 470 Total Mercury > DATE Signed (MM/DD/YY): ACCEPTED BY / AFFILIATION 2 **slateM latoT 0108 - Mu - Musu | MS *slateM Netals* 8028 CI' E' 204 Analysis Test ↑N/A Swar o Other Same as Section A Accounts Payable Methanol Heather Wilson 300 ces not paid within 30 days. Preservatives Na₂S₂O₃ ompany Name: AECOM NgOH 11033, 3 42700 HCI €ОИН ŧIJ 899 [⊅]OS[₹]H ace Project Section C 20 00 Pace Quote Reference; Unpreserved 45 Ct TIME c ttention: Address: Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any inyon PRINT Name of SAMPLER: No 3 # OF CONTAINERS SAMPLER NAME AND SIGNATURE 06/97/ SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION DATE 0830 1315 16/30 CB 00 8 TIME 16/20 1/15/20 DATE COLLECTED No blewski RELINQUISHED BY / AFFILIATION PRPA Rawhide CCR TIME Į 1 COMPOSITE Brian Rothmeyer DATE 1 j Report To: Vasanta Kalluri į Į Required Project Information W7 6 350 NT S ٥ ی 7/16/30 MT 6 (G=GRAB C=COMP) SAMPLE TYPE Purchase Order No. 3 (see valid codes to left) **BUOD XINTAM** Project Number Project Name: Section B Copy To: DW WY PWW PWP OL O O O O Valid Matrix Codes DRINKING WATER DEWATER WATER WASTE WATER WENDUCT BROUCT Or AIR OTHER TISSUE OIL Greenwood Village, CO 80111 brian.rothmeyer@aecom.com ADDITIONAL COMMENTS - CCF (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St . Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb SAMPLE ID 2H-03-C Section D Required Client Information 90 - HS (303) 740-2614 Required Client Information: Requested Due Date/TAT: AECOM Section A B Ca L Company -mail To: ddress ione: 9 œ 6 우 Ħ 12 # MƏTI Page 19 of 19

Date Completed: September 25, 2020

Date Completed: October 12, 2020

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60343165Sampling Event: July 16th, 2020
Data Reviewer: Brian Rothmeyer
Peer Reviewer: Katie Abbott

This report contains the final results of the data validation conducted for the water samples collected July 16th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

		\sim		A	
Cenera	1 (lvera	ш.	Assessment	•

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Criteria Parameter			riteri	a
Sample-specific	For each "No" response, list qualified data and bias direction in	Yes	Met? No	NA
Parameters	Table 1 or explain no qualification in comments.			
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: ■ The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: Parent Sample Field Duplicate ASH-02-CCR DUP-01-CCR	X		

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
	• The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.			
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		
Detection Limits Mets (Radiochemistry)	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit. Sample Analyte Result (pCi/L) 2 Sigma (σ) MDC (pCi/L) DUP-01-CCR Ra-226 0.377 \pm 0.392 0.584 \pm - Plus or Minus pCi/L - Picocuries Per Liter MDC - Minimum Detectable Concentration Ra - Radium		X ¹	
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

< – Less Than pCi/L – Picocuries Per Liter

J – Estimated

MDC - Minimum Detectable Concentration

Ra-Radium

 \leq – Less Than or Equal To \pm – Plus or Minus/High or Low Bias LCS - Laboratory Control Sample

MS/MSD – Matrix Spike/Matrix Spike Duplicate

v - Compound Identification Issue

σ – Sigma (Uncertainty) DER – Duplicate Error Ratio

LCSD - Laboratory Control Sample Duplicate

NA – Not Applicable

¹⁻ The associated detected result where the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported minimum detectable concentration (MDC) was qualified as estimated (J v) indicating the detection limit criteria was not met.





August 07, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 17, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Dianton m. Wilson

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60343165001	ASH-02-CCR	Water	07/16/20 09:00	07/17/20 10:40
60343165002	DUP-01-CCR	Water	07/16/20 08:00	07/17/20 10:40
60343165003	ASH-08-CCR	Water	07/16/20 11:30	07/17/20 10:40
60343165004	ASH-07-CCR	Water	07/16/20 13:15	07/17/20 10:40
60343165005	ASH-02-CCR MS	Water	07/16/20 09:00	07/17/20 10:40
60343165006	ASH-02-CCR MSD	Water	07/16/20 09:00	07/17/20 10:40



SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60343165001	ASH-02-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60343165002	DUP-01-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60343165003	ASH-08-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60343165004	ASH-07-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60343165005	ASH-02-CCR MS	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60343165006	ASH-02-CCR MSD	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Sample: ASH-02-CCR PWS:	Lab ID: 6034316 9 Site ID:	Collected: 07/16/20 09:00 Sample Type:	Received:	07/17/20 10:40	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Serv	vices - Greensburg				
Radium-226	EPA 903.1	0.0466 ± 0.330 (0.658) C:NA T:86%	pCi/L	08/04/20 11:54	13982-63-3	
	Pace Analytical Serv	vices - Greensburg				
Radium-228	EPA 904.0	0.803 ± 0.484 (0.914) C:72% T:87%	pCi/L	07/31/20 14:10	15262-20-1	
	Pace Analytical Serv	vices - Greensburg				
Total Radium	Total Radium Calculation	0.850 ± 0.814 (1.57)	pCi/L	08/04/20 14:26	7440-14-4	



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Sample: DUP-01-CCR PWS:	Lab ID: 6034 Site ID:	3165002 Collected: 07/16/20 08:00 Sample Type:	Received:	07/17/20 10:40	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg				
Radium-226	EPA 903.1	0.377 ± 0.392 (0.584) C:NA T:85%	pCi/L	08/04/20 11:54	13982-63-3	
	Pace Analytical	Services - Greensburg				
Radium-228	EPA 904.0	1.42 ± 0.574 (0.921) C:72% T:81%	pCi/L	07/31/20 14:10	15262-20-1	
	Pace Analytical	Services - Greensburg				
Total Radium	Total Radium Calculation	1.80 ± 0.966 (1.51)	pCi/L	08/04/20 14:26	7440-14-4	



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Sample: ASH-08-CCR PWS:	Lab ID: 60343 Site ID:	3165003 Collected: 07/16/20 11:30 Sample Type:	Received:	07/17/20 10:40	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical S	Services - Greensburg				
Radium-226	EPA 903.1	0.253 ± 0.359 (0.608) C:NA T:94%	pCi/L	08/04/20 11:54	13982-63-3	
	Pace Analytical S	Services - Greensburg				
Radium-228	EPA 904.0	0.228 ± 0.526 (1.16) C:70% T:77%	pCi/L	07/31/20 14:11	15262-20-1	
	Pace Analytical S	Services - Greensburg				
Total Radium	Total Radium Calculation	0.481 ± 0.885 (1.77)	pCi/L	08/04/20 14:26	7440-14-4	



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Sample: ASH-07-CCR PWS:	Lab ID: 6034316 Site ID:	S5004 Collected: 07/16/20 13:15 Sample Type:	Received:	07/17/20 10:40	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	rvices - Greensburg				
Radium-226	EPA 903.1	0.256 ± 0.461 (0.813) C:NA T:97%	pCi/L	08/04/20 11:54	13982-63-3	
	Pace Analytical Ser	rvices - Greensburg				
Radium-228	EPA 904.0	0.0718 ± 0.458 (1.04) C:69% T:81%	pCi/L	07/31/20 14:10	15262-20-1	
	Pace Analytical Ser	rvices - Greensburg				
Total Radium	Total Radium Calculation	0.328 ± 0.919 (1.85)	pCi/L	08/04/20 14:26	7440-14-4	



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Sample: ASH-02-CCR MS Lab ID: 60343165005 Collected: 07/16/20 09:00 Received: 07/17/20 10:40 Matrix: Water PWS: Site ID: Sample Type: Method Act ± Unc (MDC) Carr Trac Units CAS No. **Parameters** Analyzed Qual Pace Analytical Services - Greensburg EPA 903.1 84.89 %REC ± NA (NA) Radium-226 pCi/L 08/04/20 12:08 13982-63-3 C:NA T:NA Pace Analytical Services - Greensburg 94.67 %REC ± NA (NA) EPA 904.0 07/31/20 14:11 15262-20-1 Radium-228 pCi/L

C:NA T:NA



Project: 60630004.200.2 PRPA CCR

EPA 904.0

Pace Project No.: 60343165

Radium-228

Sample: ASH-02-CCR MSD Lab ID: 60343165006 Collected: 07/16/20 09:00 Received: 07/17/20 10:40 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac CAS No. **Parameters** Method Units Analyzed Qual Pace Analytical Services - Greensburg 101.69 %REC 18.01 RPD ± Radium-226 EPA 903.1 pCi/L 08/04/20 12:08 13982-63-3 NA (NA) C:NA T:ŃA Pace Analytical Services - Greensburg

75.81 %REC 22.13 RPD ±

NA (NA) C:NA T:NA pCi/L

07/31/20 14:11 15262-20-1



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

QC Batch: 406077 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60343165001, 60343165002, 60343165003, 60343165004, 60343165005, 60343165006

METHOD BLANK: 1965046 Matrix: Water

Associated Lab Samples: 60343165001, 60343165002, 60343165003, 60343165004, 60343165005, 60343165006

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 -0.101 ± 0.342 (0.757) C:NA T:83%
 pCi/L
 08/04/20 11:40

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

QC Batch: 406078 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60343165001, 60343165002, 60343165003, 60343165004, 60343165005, 60343165006

METHOD BLANK: 1965048 Matrix: Water

Associated Lab Samples: 60343165001, 60343165002, 60343165003, 60343165004, 60343165005, 60343165006

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.372 ± 0.371 (0.767) C:74% T:90%
 pCi/L
 07/31/20 14:10

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



QUALIFIERS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 08/07/2020 03:13 PM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343165

Date: 08/07/2020 03:13 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica Batch
60343165001	ASH-02-CCR	EPA 903.1	406077	_	
60343165002	DUP-01-CCR	EPA 903.1	406077		
60343165003	ASH-08-CCR	EPA 903.1	406077		
60343165004	ASH-07-CCR	EPA 903.1	406077		
60343165005	ASH-02-CCR MS	EPA 903.1	406077		
60343165006	ASH-02-CCR MSD	EPA 903.1	406077		
60343165001	ASH-02-CCR	EPA 904.0	406078		
60343165002	DUP-01-CCR	EPA 904.0	406078		
60343165003	ASH-08-CCR	EPA 904.0	406078		
60343165004	ASH-07-CCR	EPA 904.0	406078		
60343165005	ASH-02-CCR MS	EPA 904.0	406078		
60343165006	ASH-02-CCR MSD	EPA 904.0	406078		
60343165001	ASH-02-CCR	Total Radium Calculation	407927		
60343165002	DUP-01-CCR	Total Radium Calculation	407927		
60343165003	ASH-08-CCR	Total Radium Calculation	407927		
60343165004	ASH-07-CCR	Total Radium Calculation	407927		

CHAIN-OF-CUSTODY / Analytical Request Document

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

Face Analytical

SAMPLE CANDIFFER 7-17-1 @ ASH-02 Pace Project No./ Lab I.D. (N/Y) DRINKING WATER Samples intact MS/MSD OTHER Cooler (Y/N) ₽ Custody Sealer (N/Y) sol no bevieceR GROUND WATER Page: Residual Chlorine (Y/N) O' ni qmaT ၀ REGULATORY AGENCY RCRA さ Requested Analysis Filtered (Y/N) TIME Site Location STATE NPDES DATE UST DATE Signed (MM/DD/YY); ACCEPTED BY / AFFILIATION Total Radium 2 822-muibe? > 822-muibes Analysis Test N/A Thursday to Same as Section A 19thC MART Poly Care Accounts Payable Methanol Heather Wilson _EO_SS_SeN Preservatives AECON HOBN 11033, 3 42700 HCI Invoice Information. 3000 BOOK HNO3 Company Name: Reference:
Pace Project
Manager:
Pace Profile #: ⁷OS⁷H Section C TIME Unpreserved Pace Quote vttention; Address: 47 CF CP CP PRINT Name of SAMPLER: C. # OF CONTAINERS SAMPLER NAME AND SIGNATURE SIGNATURE of SAMPLER: 7(6/30 SAMPLE TEMP AT COLLECTION DATE 0000 02/9/// 1315 0880 of A1/L 7/16/20 1/30 TIME COMPOSITE END/GRAB 1470 OG/////// DATE COLLECTED 2000 1 D RELINQUISHED BY / AFFILIATION ΪŽ ļ) COMPOSITE DATE Brian Rothmeyer) Report To: Vasanta Kalluri Į į Required Project Information: TO M SAMPLE TYPE D B ロアス ē (G=GRAB C=COMP) Purchase Order No.: (see valid codes to left) MATRIX CODE Project Number: roject Name: Section B Copy To: C7/16/30 Valid Matrix Codes 9 × 9 F × 9 ~ 9 9 ¥ 8 P E DRINKING WATER WATER WASTE WASTE WATER PRODUCT SOIL/SOLID 2 OIL WIPE AIR OTHER TISSUE Greenwood Village, CO 80111 brian.rothmeyer@aecom.com ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 54 -03 -CCR SH-08-(CR SH-67-CCR 6200 South Quebec St 4P-01-CCR SAMPLE ID Required Client Information 90 Phone: (303) 740-2614 Required Client Information; Requested Due Date/TAT: AECOM ASH Section D Page 15 of 20 Company: Email To: Address: 2 Ξ 7 8 6 # M3TI

Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.6% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

Pittsburgh Lab Sample Condi	tion U	pon	Re	ceipt	
Pace Analytical* Client Name:	<u> </u>	E(0	MProject#	
Courier: Ped Ex UPS USPS Oclien Tracking #: 19 68 6 7 30	47	40)	Pace Other Labsi	
Custody Seal on Cooler/Box Present: yes Thermometer Used	no Type o			s intact: yes no Blue None	•
Cooler Temperature Observed Temp		. C	Com	ection Factor: C Final Temp: C	
Temp should be above freezing to 6°C					-
Comments:	Yes	No	N/A	pH paper Lot# Date and initials of person examining contents: 46 7-17	20
Chain of Custody Present:			•	1,	<u> </u>
Chain of Custody Filled Out:				2.	
Chain of Custody Relinquished:				3.	•
Sampler Name & Signature on COC;				4.	
Sample Labels match COC:				5.	1
-Includes date/time/ID Matrix:	/	VI			<u>.</u>
Samples Arrived within Hold Time:				6.	
Short Hold Time Analysis (<72hr remaining):				7.	· · :
Rush Turn Around Time Requested:		<u> </u>		B.	
Sufficient Volume:				9.	
Correct Containers Used:				10.	
-Pace Containers Used;				.,,	
Containers Intact		'		11.	
Orthophosphate field filtered				12.	
Hex Cr Aqueous sample field filtered			_	13.	<u>.</u>
Organic Samples checked for dechlorination:	<u> </u>			14.	· .
Filtered volume received for Dissolved tests			_	15.	
All containers have been checked for preservation.			١	16.	
exceptions: VOA, coliform, TOC, O&G, Phenolics, I Non-aqueous matrix	Radon,			٠.	
All containers meet method preservation		T		Initial when Date/time of	
requirements.				completed preservation	-
-		·		preservative	
Headspace in VOA Vials (≻6mm):				17.	
Trip Blank Present:				18.	;
Trip Blank Custody Seals Present					·. · ·
Rad Samples Screened < 0.5 mrem/hr				Initial when Completed: 7-17-20	
Client Notification/ Resolution:				7	
Person-Contacted:			ate/F		.
Comments/ Resolution: Missing San	nfle	<u> </u>	DH.	-06-CCR	-
					•
					•
					•
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 \square A check in this box indicates that additional information has been stored in ereports.

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

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

Face Analytical

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Ra-226 Test:

7/16/2020

35564004001 35564004001MS 7/13/2020 MS/MSD

Sample I.D. Sample MS I.D. Sample MSD I.D.

Spike I.D.:

Sample Collection Date:

Sample Matrix Spike Control Assessment

20-032 32.186 0.20

MS/MSD Decay Corrected Spike Concentration (pCi/mL): Spike Volume Used in MS (mL);

Spike Volume Used in MSD (mL):

	244
Analyst:	MK1
Date:	7/25/2020
Batch ID:	55193
Matrix:	DW
Method Blank Assessment	
MB Sample ID	1965046
MB concentration;	-0.101
M/B Counting Uncertainty:	0.342
MB MDC:	0.757
MB Numerical Performance Indicator;	-0.58
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

	LCSD (Y or N)?	z
	LCS55193	LCSD55193
Count Date:	8/4/2020	
Spike I.D.:	20-032	
Spike Concentration (pCi/mL):	32.186	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.652	
Target Conc. (pCi/L, g, F):	4.935	
Uncertainty (Calculated):	0.232	
Result (pCi/L, g, F):	5.110	
Counting Uncertainty (pCi/L, g, F):	0.899	
Numerical Performance Indicator:	0.37	
Percent Recovery:	103.56%	
Status vs Numerical Indicator:	A/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Laboratory Control Sample As

60343165001 60343165005 60343165005 20-032 32.186 0.20 0.541 10.042 0.472 0.472 0.473 0.463 0.463 0.472 0.473 0.473 0.473 0.473 0.473 0.483 0.263 0.273 8.571 1.238 10.070 1.362 2.179 0.222 84.89% 10.169%

	Spine Volume Used III MOD (IIII)	
	MS Aliquot (L, g, F):	0.642
	MS Target Conc.(pCl/L, g, F):	10.033
	MSD Aliquot (L, g, F):	
	MSD Target Conc. (pCl/L, g, F):	
	MS Spike Uncertainty (calculated):	0.472
z	MSD Spike Uncertainty (calculated):	
D55193	Sample Result:	0.226
	Sample Result Counting Uncertainty (pCi/L, g, F):	0.266
	Sample Matrix Spike Result:	10.304
	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.239
	Sample Matrix Spike Duplicate Result:	
	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	
	MS Numerical Performance Indicator:	0.065
	MSD Numerical Performance Indicator:	
	MS Percent Recovery:	100.45%
	MSD Percent Recovery:	
	MS Status vs Numerical Indicator:	A/Z
	MSD Status vs Numerical Indicator:	
	MS Status vs Recovery:	Pass
	MSD Status vs Recovery:	
	MS/MSD Upper % Recovery Limits:	136%
	MS/MSD Lower % Recovery Limits:	71%

Uncertainty (Calculated):
Result (pC/I/L, g, F);
LCS/LCSD Counting Uncertainty (pC/I/L, g, F);

Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.: Enter Duplicate	mpte I.D. sample IDs if	i/L, g, F):	M, g, F):	III. 9. F): the space below.		See Below ## Matrix Spike Duplicate Re		Duplicate RPD: (Based on the Percent Recoveries) MS/ MSD Duplicate RPD:			% RECORD
Duplicate Sample Assessment	Sam	Duplicate Sample I.D.	Sample Result (pCi/L, g, F):	Sample Result Counting Uncertainty (pCi/L, g, F):	Sample Duplicate Result (pCI/L, g, F):	Sample Duplicate Result Counting Uncertainty (pCI/L, g, F):	Are sample and/or duplicate results below RL?	Duplicate Numerical Performance Indicator:	Duplical	Duplicate Status vs Numerical Indicator;	Duplicate Status vs RPD:	9X %

60343165001 60343165005 60343165006

N/A N/A Pass Pass 136%

8.571 1.238 10.070 1.352 -1.603 18.01% N/A Pass 32%

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Comments:

1 of 1

M/ 24 20 Ra-226 NELAC QC Printed: 8/4/2020 12:43 PM

Quality Control Sample Performance Assessment

Ra-228 VAL 7/28/2020 55194 WT Test Analyst Date: Worklist Matrix:

1965048

MB Sample ID

Method Blank Assessment

0.372

MB concentration: M/B 2 Sigma CSU: MB MDC:

0.371 0.767 1.96 Pass Pass

MB Numerical Performance Indicator: MB Status vs Numerical Indicator: MB Status vs. MDC:

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		7 007 9 07 4	C 0018074
	Sample matrix spike Control Assessment	MS/MSD 1	MS/MSD Z
	Sample Collection Date:	7/13/2020	7/15/2020
	Sample I.D.	35564007001	60343165001
	Sample MS I.D.	ñ	60343165005
	Sample MSD I.D.		60343165006
	Spike I.D.:	20-030	20-030
	MS/MSD Decay Corrected Spike Concentration (pCl/mL):	39.216	39.216
	Spike Volume Used in MS (mL):	0.20	0.20
	Spike Volume Used in MSD (mL):		0.20
	MS Aliquot (L, g, F):	0.801	0.814
	MS Target Conc.(pCl/L, g, F):	9.791	9.634
	MSD Aliquot (L, g, F):		0.820
	MSD Target Conc. (pCi/L, g, F):		9.562
	MS Spike Uncertainty (calculated):	0.480	0.472
Γ	MSD Spike Uncertainty (calculated):		0.469
Ţ	Sample Result:	0.562	0.803
Г	Sample Result 2 Sigma CSU (pCirl., g, F):	0.463	0.484
	Sample Matrix Spike Result:	8.203	9.924
	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.682	2.038
	Sample Matrix Spike Duplicate Result:		8.052
	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.672
	MS Numerical Performance Indicator:	-2.329	-0.468
	MSD Numerical Performance Indicator:		-2.516
_	MS Percent Recovery:	78.04%	94.67%
	MSD Percent Recovery:		75.81%
	MS Status vs Numerical Indicator:	Warning	Pass
	MSD Status vs Numerical Indicator:		Warning
_	MS Status vs Recovery:	Pass	Pass
	MSD Status vs Recovery:		Pass
	MS/MSD Upper % Recovery Limits:		135%
	MS/MSD Lower % Recovery Limits:	%09	%09

Laboratory Control Sample Assessment LCSD (Y or N)?	Z	
LCS25194	LCSD55194	
Count Date: 7/31/2020		
Spike I.D.: 20-030		
Decay Corrected Spike Concentration (pCi/mL): 38.982		Matri
Volume Used (mL): 0.10		
Aliquot Volume (L, g, F): 0.811		Matrix Spike D
	•	
Percent Recovery: 93.85%	•	
Status vs Numerical Indicator, N/A		
Status vs Recovery: Pass		
Upper % Recovery Limits; 135%		
Duplicate Sample Assessment		Matrix Spike/Matrix Spil
Samole I.D.:	Enter Duplicate	
Duplicate Sample I.D.	sample IDs if	
Sample Result (pCi/L, g, F):	other than	
Sample Result 2 Sigma CSU (pCi/L, g, F):	rcs/rcsp in	
Sample Duplicate Result (pCi/L, g, F):	the space below.	Matri
Sample Duplicate Result 2 Sigma CSU (pCl/L, g, F):		
Are sample and/or duplicate results below RL? See Below ##	**	Matrix Spike D
Duplicate Numerical Performance Indicator:		
Duplicate RPD;		(Based on the Perc

	Matrix Spike/Matrix Spike Duplicate Sample Assessment	
ds	Sample I.D.	60343165001
	Sample MS I.D.	60343165005
	Sample MSD I.D.	60343165006
	Sample Matrix Spike Result:	9.924
<u> </u>	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	2,038
	Sample Matrix Spike Duplicate Result:	8,052
	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	1.672
_	Duplicate Numerical Performance indicator:	1.392
	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	22.13%
1	MS/ MSD Duplicate Status vs Numerical Indicator:	Pass
	MS/ MSD Duplicate Status vs RPD:	Pass
	% RPD Limit	36%

Comments:

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Duplicate Status vs Numerical Indicator: Duplicate Status vs RPD: % RPD Limit:

Seople to Mo

1 of 1

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Ra-226

Face Analytical

ĭ ¥ Test Analyst

Date: Batch ID: Matrix:	7/27/2020 55223 DW
Method Blank Assessment	
MB Sample ID	1966408
MB concentration:	0.280
M/B Counting Uncertainty:	0.388
MB MDC:	0.658
MB Numerical Performance Indicator:	1.4.
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC;	Pass

	Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
	Sample Collection Date:	7/17/2020	
	Sample I.D.	60343289008	
	Sample MS I.D.	60343289009	
	Sample MSD I.D.	60343289010	
	Spike I.D.:	20-032	
	MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32,186	
	Spike Volume Used in MS (mL):	0.20	
	Spike Volume Used in MSD (mL):	:	
	MS Aliquot (L. g. F):	0.658	
	MS Target Conc.(pCi/L, g, F):	9.787	
	MSD Aliquot (L, g, F):		
	MSD Target Conc. (pCi/L, g, F):	9.854	
١	MS Spike Uncertainty (calculated):	0.460	
	MSD Spike Uncertainty (calculated):	0.463	
	Sample Result:	0.493	
	Sample Result Counting Uncertainty (pCi/L, g, F):		
	Sample Matrix Spike Result:		
	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.279	
	Sample Matrix Spike Duplicate Result:		
	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
_	MS Numerical Performance Indicator:	-1.517	
_	MSD Numerical Performance Indicator:	-1.796	
_	MS Percent Recovery:	88.87%	
_	MSD Percent Recovery:	87.51%	
_	MS Status vs Numerical Indicator;	N/A	
_	MSD Status vs Numerical Indicator:	A/N	
_	MS Status vs Recovery:	Pass	
_	MSD Status vs Recovery:	Pass	
-	MS/MSD Upper % Recovery Limits:	_	
╗	MS/MSD Lower % Recovery Limits:	71%	

6/3/2020 20-032 32.186 0.10 0.553 4.928 0.232 5.195 1.015 0.50 1.015 1.015 1.035 1.35%

Aliquot Volume (L. g. F):
Target Conc., (pC/L, g. F):
Uncertainty (Calculated):
Result (pC/L, g. F):
LCS/LCSD Counting Uncertainty (pC/L, g. F):
Numerical Performance Indicator:

Percent Recovery: Status vs Recovery:

Status vs Numerical Indicator:

Count Date: Spike I.D.:

Laboratory Control Sample Assessmen

Spike Concentration (pCi/mL): Volume Used (mL):

60343289008 60343289009 60343289010 9.191 1.279 9.117 1.207 0.082 1.54% N/A N/A R/A 8.28s 32%

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Comments:



Pace Analytical"

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Ra-228	VAL 7/28/2020	55226 WT
Test	Analyst: Date:	Worklist: Matrix:

MS/MSD 2

7/17/2020

Sample Collection Date:

Sample Matrix Spike Control Assessment

Sample I.D. Sample MS I.D. Sample MSD I.D.

Spike I.D.:

MS/MSD Decay Corrected Spike Concentration (pCi/mL):

60343289008 60343289000 60343289010 20-030 39.165 0.20 0.20 0.814 9.662 0.814 9.662 0.814 9.619 0.473 0.473 0.471 1.111 1.111 1.534 2.105 0.123 -0.174 10.534 2.105 0.174 10.174 10.174 10.178

MSD Target Conc. (pCi/L, g, F):

Spike Volume Used in MSD (mL): MS Aliquot (L., g, F):

MS Target Conc.(pCi/L, g, F):

Spike Volume Used in MS (ml.):

Ra-228	VAL 7/28/2020	55226 WT
Test	Analyst: Date:	Worklist: Matrix:

MB Sample ID 1966413 MB concentration: 0.364 M/B 2 Sigma CSU: 0.347 MB Numerical Performance Indicator: 2.06 MB Status via Numerical Indicator: 2.06 MB Status via Numerical Indicator: Manning

			,
			MS Spike Uncertainty (calculated):
Laboratory Control Sample Assessment	LCSD (Y or N)?	z	MSD Spike Uncertainty (calculated):
•	LCS55226	LCSD55226	Sample Result:
Count Date:	7/30/2020		Sample Result 2 Sigma CSU (pCl/L, g, F):
Spike I.D.:	20-030		Sample Matrix Spike Result:
Decay Corrected Spike Concentration (pCi/mL):	38.996		Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):
Volume Used (mL):	0.10		Sample Matrix Spike Duplicate Result:
Aliquot Volume (L., g, F):	0.812		Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):
Target Conc. (pCi/L, g, F):	4.805		MS Numerical Performance Indicator:
Uncertainty (Calculated):	0.235		MSD Numerical Performance Indicator:
Result (pCi/L, g, F):	3.733		MS Percent Recovery:
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	0.965		MSD Percent Recovery:
Numerical Performance Indicator:	-2.12		MS Status vs Numerical Indicator:
Percent Recovery:	77.69%		MSD Status vs Numerical Indicator:
Status vs Numerical Indicator:	N/A		MS Status vs Recovery:
Status vs Recovery:	Pass		MSD Status vs Recovery:
Upper % Recovery Limits:	135%		MS/MSD Upper % Recovery Limits:
Lower % Recovery Limits:	%09		MS/MSD Lower % Recovery Limits:

Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D. Sample MS I.D. Sample MSD I.D. Sample Matrix Splike Result 2 Sigma CSU (pCift, g, F): Sample Matrix Splike Duplicate Result 2 Sigma CSU (pCift, g, F): MS/ MSD Duplicate Status vs Numerical Indicator: MS/ MSD Duplicate Status vs Numerical Indicator: MS/ MSD Duplicate Status vs Numerical Indicator: MS/ MSD Duplicate Status vs RPD. MS/ MSD Duplicate Status vs RPD. MS/ MSD Duplicate Status vs RPD.	
	Enter Duplicate sample IDs if other than I LCS/LCSD in the space below.	results are below
	See Below##	ampie or ouplicate
Duplicate Sample Assessment	Sample I.D.: Duplicate Sample I.D.: Sample Result (pCi/L. g, F): Sample Duplicate Result (pCi/L. g, F): Sample Duplicate Result (pCi/L. g, F): Are sample and/or duplicate results below RL? Augument of Sigma CSU (pCi/L. g, F): Augument Sigma CSU (pCi/L. g, F): Augument Sigma CSU (pCi/L. g, F): Duplicate RPD: Duplicate RPD: Duplicate RPD: Duplicate RPD: Duplicate RPD: Sample Augument Sigma Sigma RPD: Sample Augument Sigma	## Evaluation of duplicate precision is not applicable if either the sarriple of duplicate results are below the MDC.

60343289009 60343289010 60343289008

10.914

2.161 10.534 2.105 0.247 3.52% Pass Pass 36%

8, aL)	۱
	13

Comments:

Ra-228_55226_W.xls Ra-228 (R086-8 04Sep2019).xls

Date Completed: September 25, 2020

Date Completed: October 12, 2020

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60343460Sampling Event: July 22nd, 2020
Data Reviewer: Brian Rothmeyer
Peer Reviewer: Katie Abbott

This report contains the final results of the data validation conducted for the water samples collected July 22nd, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General	Overall	Assessment:
---------	---------	--------------------

X	Data are usable without qualification.		
Data are usable with qualification (noted below).			
	Some or all data are unusable for any purpose (detailed below).		

Data Review Checklist

Review Parameter	Criteria		Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA	
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X			
Holding Times	The samples were analyzed within the method required holding times.	X			
Method Blanks (MB)	No target analytes reported in the associated MB.	X			
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X			
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X	
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.	X			

Review Parameter	Criteria		Criteria Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below:			
	• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.			X
	• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte		X ¹	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		
	Comments			

1 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

NA – Not Applicable TDS – Total Dissolved Solids

< - Less Than % - Percent MB - Method Blank $RL-Reporting\ Limit$ ≤ – Less Than or Equal To LCS – Laboratory Control Sample MS/MSD – Matrix Spike/Matrix Spike Duplicate RPD - Relative Percent Difference

> - Greater Than mg/L - Milligrams per Liter LCSD - Laboratory Control Sample Duplicate





July 30, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 23, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Dianos m. Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water Arkansas Certification #: 20-020-0 Arkansas Drinking Water

Illinois Certification #: 200030 lowa Certification #: 118

Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070

(913)599-5665



SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60343460001	ASH-06-CCR	Water	07/22/20 08:30	07/23/20 08:50

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60343460001	ASH-06-CCR	SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

Date: 07/30/2020 04:28 PM

Sample: ASH-06-CCR	Lab ID: 603	43460001	Collected: 07/22/2	20 08:30	Received: 0	7/23/20 08:50 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Meth Pace Analytica							
Total Dissolved Solids	472	mg/L	10.0	1		07/28/20 08:58		
9056 IC Anions	Analytical Meth Pace Analytica							
Chloride	7.9	mg/L	1.0	1		07/28/20 18:00	16887-00-6	
Fluoride	0.77	mg/L	0.20	1		07/28/20 18:00	16984-48-8	
Sulfate	101	mg/L	10.0	10		07/28/20 18:15	14808-79-8	



QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

QC Batch: 667823

QC Batch Method: SM 2540C

Analysis Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343460001

METHOD BLANK: 2704489 Matrix: Water

Associated Lab Samples: 60343460001

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 07/28/20 08:57

LABORATORY CONTROL SAMPLE: 2704490

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units **Total Dissolved Solids** mg/L 1000 1000 100 80-120

SAMPLE DUPLICATE: 2704491

60343458003 Dup Max Parameter Units Result Result **RPD RPD** Qualifiers 1350 **Total Dissolved Solids** mg/L 5 1420 10

SAMPLE DUPLICATE: 2704492

Date: 07/30/2020 04:28 PM

60343460001 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 472 2 10 mg/L 481

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

(913)599-5665



QUALITY CONTROL DATA

Analysis Method:

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

QC Batch: 668101
QC Batch Method: EPA 9056

Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

EPA 9056

Associated Lab Samples: 60343460001

METHOD BLANK: 2705230 Matrix: Water

Associated Lab Samples: 60343460001

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Chloride	mg/L	ND ND	1.0	07/28/20 11:14	
Fluoride	mg/L	ND	0.20	07/28/20 11:14	
Sulfate	mg/L	ND	1.0	07/28/20 11:14	

METHOD BLANK: 2705823 Matrix: Water

Associated Lab Samples: 60343460001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND ND	1.0	07/29/20 09:09	
Fluoride	mg/L	ND	0.20	07/29/20 09:09	
Sulfate	mg/L	ND	1.0	07/29/20 09:09	

LABORATORY CONTROL SAMPLE:	2705231					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	(

Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.5	98	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

LABORATORY CONTROL SAMPLE: 2705824

Date: 07/30/2020 04:28 PM

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	_
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705232 2705233

Parameter	Units	20163521001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	88.6	25	25	112	113	95	96	80-120	0	15	E
Fluoride	mg/L	<0.20	2.5	2.5	1.7	1.7	64	63	80-120	2	15	M1
Sulfate	mg/L	2710	25	25	2650	2640	-259	-280	80-120	0	15	E,M1

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



QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

Date: 07/30/2020 04:28 PM

SAMPLE DUPLICATE: 2705234

Parameter	Units	20163521002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	<2.0	ND		15	
Fluoride	mg/L	< 0.40	ND		15	
Sulfate	mg/L	21.6	21.3	2	15	

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



QUALIFIERS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 07/30/2020 04:28 PM

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

(913)599-5665



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343460

Date: 07/30/2020 04:28 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60343460001	ASH-06-CCR	SM 2540C	667823		
60343460001	ASH-06-CCR	EPA 9056	668101		



Sample Condition Upon Receipt



Client Name: Accom		
Courier: FedEx Ø UPS □ VIA □ Clay □ F	PEX 🗆 ECI [☐ Pace ☐ Xroads ☐ Client ☐ Other ☐
Tracking #: 1908 6730 6710 Pace	e Shipping Labe	Used? Yes □ No.Æ
Custody Seal on Cooler/Box Present: Yes ✓ No □	Seals intact:	
Packing Material: Bubble Wrap □ Bubble Bags □	Foar	n □ None □ Other 🗗 🕏 Plc
Thermometer Used:	Ice: (Wet) Blue	e None
Cooler Temperature (°C): As-read Corr. Factor	or_ +0.1 C	orrected 1.3 Date and initials of person examining contents: 7.23.20
Temperature should be above freezing to 6°C		
Chain of Custody present:	ØYes □No [□N/A
Chain of Custody relinquished	ØŶes □No 〔	JN/A
Samples arrived within holding time:	ØYes □No [⊒n/a
Short Hold Time analyses (<72hr):	□Yes ØNo [□N/A
Rush Turn Around Time requested:	□Yes ØNo [AND
Sufficient volume:	☑Yes □No [A/N/A
Correct containers used:	ØYes □No 〔	A/NC
Pace containers used:	☑Yes □No [□N/A
Containers intact:	✓Yes □No [□N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No {	Ín/a
Filtered volume received for dissolved tests?	□Yes □No [ØN/A
Sample labels match COC: Date / time / ID / analyses	ØYes □No [DN/A
Samples contain multiple phases? Matrix: WT	□Yes Ø No [□N/A
Containers requiring pH preservation in compliance? (HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	□Yes □No ↓	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Potassium louide test simp turns blue/purple? (Preserve)	□Yes □No	
Trip Blank present:	□Yes ☑No [□N/A
Headspace in VOA vials (>6mm):	☐Yes ☐No [ZN/A
Samples from USDA Regulated Area: State	□Yes □No !	BN/A
Additional labels attached to 5035A / TX1005 vials in the field?		Śn/a
Client Notification/ Resolution: Copy COC to	Client? Y /	N Field Data Required? Y / N
Person Contacted: Date/T Comments/ Resolution	ime:	
Project Manager Review:		Date



CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT, All relevant fields must be completed accurately.

School County C	ection A equired Client Information		Section B Required Project Information	ect Info	ormation					Section C Invoice Information:	C formatio	Ë									Page:	_	of	/
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Important Note. By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any involces not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60343729 Sampling Event: July 24th

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: September 25, 2020

Date Completed: October 12, 2020

This report contains the final results of the data validation conducted for the water samples collected July 24th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?			
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA	
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X			
Holding Times	The samples were analyzed within the method required holding times.	X			
Method Blanks (MB)	No target analytes reported in the associated MB.	X			
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X			
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X	
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X	

Review Parameter	Criteria	C	a	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%. Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL. 			X
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte		X ¹	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.		X^2	
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		
	Comments			

- 1 As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.
- 2 Several analytes were reported as non-detect at elevated reporting limits. These non-detect results will need to be evaluated by the end user of the data with respect to project objectives.

< - Less Than % - Percent MB - Method Blank RL - Reporting Limit Less Than or Equal To
 LCS – Laboratory Control Sample
 MS/MSD – Matrix Spike/Matrix Spike Duplicate
 RPD – Relative Percent Difference

> – Greater Than mg/L – Milligrams per Liter LCSD – Laboratory Control Sample Duplicate NA – Not Applicable TDS – Total Dissolved Solids





August 14, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 25, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Charles M. Welson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070





SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60343729001	ASH-06-CCR	Water	07/24/20 11:20	07/25/20 08:40

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60343729001	ASH-06-CCR	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

Date: 08/14/2020 04:47 PM

Sample: ASH-06-CCR	Lab ID: 6034	13729001	Collected: 07/24/2	20 11:20	Received: 07	7/25/20 08:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua			
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparation Met	hod: EP	A 3010						
	Pace Analytica	Services -	Kansas City								
Boron	334	ug/L	100	1	07/29/20 16:10	08/07/20 13:49	7440-42-8				
Calcium	37600	ug/L	200	1	07/29/20 16:10	08/07/20 13:49	7440-70-2				
Lithium	57.5	ug/L	10.0	1	07/29/20 16:10	08/07/20 13:49	7439-93-2				
6020 MET ICPMS	Analytical Meth	Analytical Method: EPA 6020 Preparation Method: EPA 3010									
	Pace Analytica	Services -	Kansas City								
Antimony	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-36-0	D3			
Arsenic	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-38-2	D3			
Barium	64.7	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-39-3				
Beryllium	ND	ug/L	2.5	5	07/29/20 10:40	08/14/20 13:17	7440-41-7	D3			
Cadmium	ND	ug/L	2.5	5	07/29/20 10:40	08/14/20 13:17	7440-43-9	D3			
Chromium	12.6	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-47-3				
Cobalt	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-48-4	D3			
_ead	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7439-92-1	D3			
Molybdenum	22.4	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7439-98-7				
Selenium	25.9	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7782-49-2				
Thallium	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-28-0	D3			
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470						
	Pace Analytica	Services -	Kansas City								
Mercury	ND	ug/L	0.20	1	07/27/20 14:16	07/28/20 09:34	7439-97-6				



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

Date: 08/14/2020 04:47 PM

QC Batch: 667803 QC Batch Method: EPA 7470 Analysis Method: EPA 7470
Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343729001

METHOD BLANK: 2704434 Matrix: Water

Associated Lab Samples: 60343729001

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 07/28/20 09:00

LABORATORY CONTROL SAMPLE: 2704435

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury ug/L 5.0 99 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2704436 2704437

MS MSD

60343718001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Result ND 5 4.9 20 Mercury ug/L 5 5.0 98 99 75-125 0

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



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

QC Batch: 668354 QC Batch Method: EPA 3010 Analysis Method: EPA 6010
Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343729001

METHOD BLANK: 2705939 Matrix: Water

Associated Lab Samples: 60343729001

LABORATORY CONTROL SAMPLE:

Date: 08/14/2020 04:47 PM

Blank Reporting Qualifiers Parameter Units Result Limit Analyzed Boron ND 100 08/07/20 13:11 ug/L Calcium ND 200 08/07/20 13:11 ug/L ND 08/07/20 13:11 Lithium ug/L 10.0

Spike LCS LCS % Rec
Parameter Units Conc. Result % Rec Limits Qualifiers

Boron 1000 1020 102 80-120 ug/L 10000 10000 Calcium ug/L 100 80-120 Lithium ug/L 1000 1040 104 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705941 2705942

2705940

MS MSD 60343919001 MSD Spike Spike MS MS MSD % Rec Max Limits Qual Parameter Conc. Result % Rec % Rec **RPD** RPD Units Result Conc. Result ug/L 103 20 Boron 127 1000 1000 1160 1160 103 75-125 0 Calcium 10000 106000 105000 ug/L 95.8 mg/L 10000 99 91 75-125 1 20 Lithium ug/L 33.1 1000 1000 1040 1040 101 100 75-125 0 20

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



Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

QC Batch: 668255 QC Batch Method: EPA 3010 Analysis Method: EPA 6020 Analysis Description: 6020 MET

Analysis Description: Laboratory:

Pace Analytical Services - Kansas City

Associated Lab Samples: 60343729001

METHOD BLANK: 2705603

Date: 08/14/2020 04:47 PM

Matrix: Water

Associated Lab Samples: 60343729001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	 ND	1.0	08/14/20 12:45	
Arsenic	ug/L	ND	1.0	08/14/20 12:45	
Barium	ug/L	ND	1.0	08/14/20 12:45	
Beryllium	ug/L	ND	0.50	08/14/20 12:45	
Cadmium	ug/L	ND	0.50	08/14/20 12:45	
Chromium	ug/L	ND	1.0	08/14/20 12:45	
Cobalt	ug/L	ND	1.0	08/14/20 12:45	
Lead	ug/L	ND	1.0	08/14/20 12:45	
Molybdenum	ug/L	ND	1.0	08/14/20 12:45	
Selenium	ug/L	ND	1.0	08/14/20 12:45	
Thallium	ug/L	ND	1.0	08/14/20 12:45	

LABORATORY CONTROL SAMPLE:	2705604					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	39.4	98	80-120	
Arsenic	ug/L	40	39.9	100	80-120	
Barium	ug/L	40	38.6	97	80-120	
Beryllium	ug/L	40	38.8	97	80-120	
Cadmium	ug/L	40	38.7	97	80-120	
Chromium	ug/L	40	41.4	103	80-120	
Cobalt	ug/L	40	40.5	101	80-120	
Lead	ug/L	40	39.0	98	80-120	
Molybdenum	ug/L	40	39.9	100	80-120	
Selenium	ug/L	40	38.2	96	80-120	
Thallium	ug/L	40	37.7	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705605 2705606												
		60343718001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	% Rec	RPD	RPD	Qual
Antimony	ug/L		40	40	40.4	41.1	100	102	75-125	2	20	
Arsenic	ug/L	ND	40	40	42.4	43.0	105	107	75-125	1	20	
Barium	ug/L	19.0	40	40	57.5	58.6	96	99	75-125	2	20	
Beryllium	ug/L	ND	40	40	38.3	38.7	95	97	75-125	1	20	
Cadmium	ug/L	ND	40	40	39.0	39.5	97	99	75-125	1	20	
Chromium	ug/L	ND	40	40	44.1	45.1	109	112	75-125	2	20	

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

Date: 08/14/2020 04:47 PM

MATRIX SPIKE & MATRIX S	PIKE DUPLIC	ATE: 2705	605 MS	MSD	2705606							
	6	0343718001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cobalt	ug/L	ND	40	40	42.1	42.9	104	106	75-125	2	20	
Lead	ug/L	ND	40	40	35.4	36.0	88	90	75-125	2	20	
Molybdenum	ug/L	ND	40	40	45.7	47.1	105	108	75-125	3	20	
Selenium	ug/L	ND	40	40	39.4	40.1	97	99	75-125	2	20	
Thallium	ug/L	ND	40	40	35.0	35.9	87	89	75-125	2	20	

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



QUALIFIERS

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 08/14/2020 04:47 PM

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

(913)599-5665



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CCR

Pace Project No.: 60343729

Date: 08/14/2020 04:47 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60343729001	ASH-06-CCR	EPA 3010	668354	EPA 6010	668488
60343729001	ASH-06-CCR	EPA 3010	668255	EPA 6020	668322
60343729001	ASH-06-CCR	EPA 7470	667803	EPA 7470	667891



Sample Condition Upon Receipt ESI Tech Spec Client



Client Name: AFOM					
Courier: FedEx D UPS UPS UPS UPS P	EX 🗆	EC		Pace Xroads	s □ Client □ Other □
Tracking #: 1908 1031 2597 Pace	Shippii	ng Lab	el Use	d? Yes □ No □	
Custody Seal on Cooler/Box Present: Yes ☑ No □	Seals	intact:	Yes 1	No 🗆	
Packing Material: Bubble Wrap □ Bubble Bags □		Fo	am 🗆	None 🗷	Other □
Thermometer Used: Type	e of Ice	: Wet	> Blue	None	
Cooler Temperature (°C): As-read 3.5 Corr. Factor)r - 1)	5	Correc	ted 3 D	Date and initials of person examining contents: 57252044
Temperature should be above freezing to 6°C					oxerming contents 1252 CAX
Chain of Custody present:	Ves	□No	□n/a		
Chain of Custody relinquished:	Yes	□No	□N/A		
Samples arrived within holding time:	Yes	_	□N/A		
Short Hold Time analyses (<72hr):	□Yes	/	□N/A		
Rush Turn Around Time requested:	□Yes	No	□N/A		
Sufficient volume:	₩Ves	□No	□N/A		
Correct containers used:	Yes	□No	□N/A		
Pace containers used:	Yes	□No	□n/a		
Containers intact:	Yes	□No	□N/A		
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes	□No	MN/A		
Filtered volume received for dissolved tests?	□Yes	□No	DIN/A		
Sample labels match COC: Date / time / ID / analyses	½ Yes	□No	□N/A		
Samples contain multiple phases? Matrix.	□Yes	ØN₀	□N/A		
Containers requiring pH preservation in compliance?	Yes	□No	□N/A	List sample IDs, vo	lumes, lot #'s of preservative and the
(HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO))317	7		date/time added.	
Cyanide water sample checks:) 2. 1	_			
Lead acetate strip turns dark? (Record only)	□Yes	□No			
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes	□No			
Trip Blank present:	□Yes	□No	120V/A		
Headspace in VOA vials (>6mm):	□Yes	□No	DINIA		
Samples from USDA Regulated Area: State:	□Yes	□No	M/A		
Additional labels attached to 5035A / TX1005 vials in the field?	□Yes	□No	M/A		
Client Notification/ Resolution: Copy COC to C	Client?	Y /	N	Field Data Requi	ired? Y / N
Person Contacted: Date/Tir	me:				Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck
Comments/ Resolution:					sample temps.
	411				Start: 114 Start:
					End: 1145 End:
Project Manager Review:			Date):	Temp: 3 · O Temp:



CHAIN-OF-CUSTODY / Analytical Request Document

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

Middle CCR Methods Same as Series Accounts Payable Reculatory Agency Middle CCR Middle CR Middle CCR Middle	Section A Required Client Information:	nformation:	Section B Required Project Information.	Section C	Page: of	L
September Sept		ECOM	Report To: Vasanta Kalluri		+	_
Checknood Village CO 20111 Checknood Village CO 20114 Checknood Vill		200 South Quebec St		Company Name: AECOM		
Section Offine recold Section Control Contro	J.	breenwood Village, CO 80111				
Section Proper Name PRPA Rawhide COR		rian.rothmeyer@aecom.com	Purchase Order No.:		SHOOND WATER	NG WATER
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SAMPLE ID	Rednested Due	Date/TAT:	Project Number:	e #:		
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	B Ca Li			-		

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

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER:

Page 13 of 13

F-ALL-Q-020rev 08, 12-Oct-2007

Samples Intact (Y/N)

Custody Seale Cooler (Y/N)

Received on Ice (Y/N)

O° ni qmeT

(MM/DD/YYD 2/2 Y/20

AECOM Environment

October 2020

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60350434

Sampling Event: October 5, 2020
Data Reviewer: Brian Rothmeyer
Peer Reviewer: Katie Abbott
Date Completed: December 20, 2020
Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 5th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	_	riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:			
	• When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%.			X
	• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			

Review Parameter	Criteria		riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%. Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL. 			X
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte Concentration		X^1	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

1 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

< - Less Than % - Percent MB – Method Blank RL - Reporting Limit ≤ – Less Than or Equal To LCS – Laboratory Control Sample MS/MSD – Matrix Spike/Matrix Spike Duplicate RPD – Relative Percent Difference

> – Greater Than mg/L – Milligram per Liter LCSD – Laboratory Control Sample Duplicate NA – Not Applicable TDS – Total Dissolved Solids





October 29, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 06, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Charles M. Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070





SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60350434001	ASH-01-CCR	Water	10/05/20 09:15	10/06/20 08:45

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60350434001	ASH-01-CCR	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Date: 10/29/2020 03:44 PM

Sample: ASH-01-CCR	Lab ID: 6035	0434001	Collected:	10/05/2	0 09:15	Received: 10	/06/20 08:45 N	fatrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparati	on Meth	od: EPA	A 3010			
	Pace Analytical	Services -	Kansas City						
Boron	487	ug/L		100	1	10/20/20 16:50	10/23/20 15:49	7440-42-8	
Calcium	329000	ug/L		200	1	10/20/20 16:50	10/23/20 15:49	7440-70-2	
Lithium	413	ug/L		10.0	1	10/20/20 16:50	10/23/20 15:49	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparati	on Meth	od: EPA	A 3010			
	Pace Analytical	Services -	Kansas City						
Antimony	ND	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7440-36-0	
Arsenic	ND	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7440-38-2	
Barium	9.3	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7440-39-3	
Beryllium	ND	ug/L		0.50	1	10/27/20 10:35	10/29/20 10:03	7440-41-7	
Cadmium	ND	ug/L		0.50	1	10/27/20 10:35	10/29/20 10:03	7440-43-9	
Chromium	ND	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7440-47-3	
Cobalt	ND	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7440-48-4	
_ead	ND	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7439-92-1	
Molybdenum	ND	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7439-98-7	
Selenium	ND	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7782-49-2	
Γhallium	ND	ug/L		1.0	1	10/27/20 10:35	10/29/20 10:03	7440-28-0	
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparati	on Meth	od: EPA	A 7470			
	Pace Analytical	Services -	Kansas City						
Mercury	ND	ug/L		0.20	1	10/13/20 16:51	10/14/20 13:22	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C						
	Pace Analytical	Services -	Kansas City						
Total Dissolved Solids	3330	mg/L		66.7	1		10/07/20 13:40		
9056 IC Anions	Analytical Meth	od: EPA 90	56						
	Pace Analytical	Services -	Kansas City						
Chloride	23.0	mg/L		2.0	2		10/26/20 11:52	16887-00-6	
Fluoride	0.24	mg/L		0.20	1		10/26/20 11:36		
Sulfate	2100	mg/L		200	200		10/26/20 12:08		

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Date: 10/29/2020 03:44 PM

QC Batch: 682487 Analysis Method: EPA 7470 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

> Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350434001

METHOD BLANK: 2758831 Matrix: Water

Associated Lab Samples: 60350434001

> Blank Reporting Qualifiers Parameter Units Result Limit Analyzed

Mercury ND 0.20 10/14/20 13:15 ug/L

LABORATORY CONTROL SAMPLE: 2758832

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury ug/L 5.0 100 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2758833 2758834

> MSD MS

60350840001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Result ND 5 20 Mercury ug/L 5 5.0 5.0 99 99 75-125 0

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

QC Batch: 684016 Analysis Method: QC Batch Method: EPA 3010 Analysis Descript

Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

EPA 6010

Associated Lab Samples: 60350434001

METHOD BLANK: 2765272 Matrix: Water

Associated Lab Samples: 60350434001

LABORATORY CONTROL SAMPLE:

Date: 10/29/2020 03:44 PM

Blank Reporting Limit Qualifiers Parameter Units Result Analyzed Boron ND 100 10/23/20 15:33 ug/L Calcium ND 200 10/23/20 15:33 ug/L Lithium ug/L ND 10/23/20 15:33 10.0

Spike LCS LCS % Rec
Parameter Units Conc. Result % Rec Limits Qualifiers

95 Boron 500 473 80-120 ug/L Calcium 5000 4560 ug/L 91 80-120 Lithium 498 ug/L 500 100 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2765274 2765275

2765273

Parameter	Units	60350205001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	564	500	500	1020	1040	92	95	75-125	1	20	
Calcium	ug/L	98200	5000	5000	96600	98700	-32	10	75-125	2	20	M1
Lithium	ua/l	41.6	500	500	536	548	99	101	75-125	2	20	

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Date: 10/29/2020 03:44 PM

QC Batch: 685294 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350434001

METHOD BLANK: 2770426 Matrix: Water

Associated Lab Samples: 60350434001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	10/29/20 09:44	
Arsenic	ug/L	ND	1.0	10/29/20 09:44	
Barium	ug/L	ND	1.0	10/29/20 09:44	
Beryllium	ug/L	ND	0.50	10/29/20 09:44	
Cadmium	ug/L	ND	0.50	10/29/20 09:44	
Chromium	ug/L	ND	1.0	10/29/20 09:44	
Cobalt	ug/L	ND	1.0	10/29/20 09:44	
Lead	ug/L	ND	1.0	10/29/20 09:44	
Molybdenum	ug/L	ND	1.0	10/29/20 09:44	
Selenium	ug/L	ND	1.0	10/29/20 09:44	
Thallium	ug/L	ND	1.0	10/29/20 09:44	

LABORATORY CONTROL SAMPLE:	2770427					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	38.8	97	80-120	
Arsenic	ug/L	40	39.9	100	80-120	
Barium	ug/L	40	37.0	93	80-120	
Beryllium	ug/L	40	40.7	102	80-120	
Cadmium	ug/L	40	39.0	98	80-120	
Chromium	ug/L	40	40.4	101	80-120	
Cobalt	ug/L	40	39.1	98	80-120	
Lead	ug/L	40	39.3	98	80-120	
Molybdenum	ug/L	40	39.1	98	80-120	
Selenium	ug/L	40	38.7	97	80-120	
Thallium	ug/L	40	37.7	94	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLI	CATE: 2770		MCD	2770429							
	f	60350369001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND ND	40	40	37.7	37.3	94	93	75-125	1	20	
Arsenic	ug/L	ND	40	40	42.4	41.6	106	104	75-125	2	20	
Barium	ug/L	9.3	40	40	49.3	48.4	100	98	75-125	2	20	
Beryllium	ug/L	ND	40	40	38.4	38.1	96	95	75-125	1	20	
Cadmium	ug/L	ND	40	40	35.4	34.9	88	87	75-125	1	20	
Chromium	ug/L	ND	40	40	46.5	45.8	115	114	75-125	2	20	

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Date: 10/29/2020 03:44 PM

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 2770	428 MS	MSD	2770429							
	6	0350369001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cobalt	ug/L	ND	40	40	40.5	39.9	101	100	75-125	1	20	
Lead	ug/L	ND	40	40	31.6	30.7	79	77	75-125	3	20	
Molybdenum	ug/L	ND	40	40	50.6	49.9	126	124	75-125	2	20	M1
Selenium	ug/L	ND	40	40	42.2	41.5	105	103	75-125	2	20	
Thallium	ug/L	ND	40	40	32.3	31.6	81	79	75-125	2	20	

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

QC Batch: 681356 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350434001

METHOD BLANK: 2753988 Matrix: Water

Associated Lab Samples: 60350434001

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 10/07/20 13:38

LABORATORY CONTROL SAMPLE: 2753989

Parameter Units Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers

Total Dissolved Solids mg/L 1000 989 99 80-120

SAMPLE DUPLICATE: 2753990

60350088001 Dup Max Parameter Units Result Result **RPD RPD** Qualifiers 1650 **Total Dissolved Solids** mg/L 1590 4 10

SAMPLE DUPLICATE: 2753991

Date: 10/29/2020 03:44 PM

60350395001 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 9280 mg/L 8920 4 10

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

QC Batch: 685060 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350434001

METHOD BLANK: 2769666 Matrix: Water

Associated Lab Samples: 60350434001

Blank Reporting Qualifiers Parameter Units Result Limit Analyzed Chloride mg/L ND 1.0 10/26/20 09:13 Fluoride mg/L ND 0.20 10/26/20 09:13 Sulfate mg/L ND 1.0 10/26/20 09:13

METHOD BLANK: 2770399 Matrix: Water

Associated Lab Samples: 60350434001

Blank Reporting Parameter Units Result Limit Analyzed Qualifiers Chloride ND 1.0 10/27/20 09:06 mg/L Fluoride mg/L ND 0.20 10/27/20 09:06 Sulfate mg/L ND 1.0 10/27/20 09:06

METHOD BLANK: 2771511 Matrix: Water

Associated Lab Samples: 60350434001

Date: 10/29/2020 03:44 PM

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/28/20 09:04	
Fluoride	mg/L	ND	0.20	10/28/20 09:04	
Sulfate	mg/L	ND	1.0	10/28/20 09:04	

LABORATORY CONTROL SAMPLE: 2769667 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 5 5.0 99 80-120 Fluoride mg/L 2.5 2.5 100 80-120 Sulfate mg/L 5 5.2 104 80-120

LABORATORY CONTROL SAMPLE: 2770400

Spike LCS LCS % Rec

Qualifiers Parameter Units Conc. Result % Rec Limits Chloride mg/L 5 4.9 98 80-120 Fluoride 2.5 2.6 103 80-120 mg/L Sulfate mg/L 5.1 80-120 5 102

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Sulfate

Date: 10/29/2020 03:44 PM

LABORATORY CONTROL S	SAMPLE:	2771512										
Daramatar		Llaita	Spike	LC		LCS % Rec	% Re		Qualifiers			
Parameter		Units	Conc.	Res			Limit		Qualifiers	_		
Chloride		mg/L		5	4.9	97		80-120				
Fluoride		mg/L	2.		2.6	102		80-120				
Sulfate		mg/L		5	5.1	102	2 8	80-120				
MATRIX SPIKE & MATRIX S	SPIKE DUPI		668		2769669							
			MS	MSD								
		60350879002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Chloride	mg/L	126	50	50	180	179	107	105	80-120	0	15	
Fluoride	mg/L	0.64	2.5	2.5	2.9	3.0	92	95	80-120	3	15	
Sulfate	mg/L	323	250	250	570	565	99	97	80-120	1	15	
MATRIX SPIKE & MATRIX S	SPIKE DUPI	LICATE: 2769	671 MS	MSD	2769672							
		60350879003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	•				שטואו			ivian	
			Ouric.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Chloride	mg/L	21.0	10	10	Result 31.9	Result 32.7	% Rec	_	Limits	RPD 2	RPD	Qua
Chloride Fluoride	mg/L mg/L							% Rec	Limits 80-120		RPD 15	Qua M1
	_	21.0	10	10	31.9	32.7	109	% Rec	Limits 80-120 80-120	2	RPD 15	
Fluoride	mg/L mg/L	21.0	10 2.5	10 2.5	31.9 2.1	32.7 2.1	109 77	% Rec 117 75	Limits 80-120 80-120	 2 2	RPD 15	M1
Fluoride Sulfate	mg/L mg/L	21.0	10 2.5	10 2.5 2500	31.9 2.1	32.7 2.1	109 77	% Rec 117 75	Limits 80-120 80-120	 2 2	RPD 15	M1
Fluoride Sulfate	mg/L mg/L	21.0	10 2.5 2500	10 2.5 2500 79002	31.9 2.1 5210	32.7 2.1	109 77 104	% Rec 117 75 106	Limits 80-120 80-120	2 2 1	RPD 15	M1
Fluoride Sulfate SAMPLE DUPLICATE: 27	mg/L mg/L	21.0 0.22 2610	10 2.5 2500 603508	10 2.5 2500 79002	31.9 2.1 5210	32.7 2.1 5260	109 77 104	% Rec 117 75 106 Max	Limits 80-120 80-120 80-120	2 2 1	RPD 15	M1
Fluoride Sulfate SAMPLE DUPLICATE: 27 Parameter	mg/L mg/L	21.0 0.22 2610 Units	10 2.5 2500 603508	10 2.5 2500 79002 ult	31.9 2.1 5210 Dup Result	32.7 2.1 5260	109 77 104	% Rec 117 75 106 Max RPD	Limits 80-120 80-120 80-120 Qualif	2 2 1	RPD 15	M1

SAMPLE DUPLICATE: 2769673						
5, <u>-</u> 2 2 5, <u>-</u> 15, <u>-</u> 1, 5, 5, 5		60350879003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	21.0	21.0	0	15	
Fluoride	mg/L	0.22	ND		15	
Sulfate	ma/L	2610	2740	5	15	

323

310

15

mg/L

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



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 10/29/2020 03:44 PM

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

(913)599-5665



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350434

Date: 10/29/2020 03:44 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60350434001	ASH-01-CCR	EPA 3010	684016	EPA 6010	684144
60350434001	ASH-01-CCR	EPA 3010	685294	EPA 6020	685326
60350434001	ASH-01-CCR	EPA 7470	682487	EPA 7470	682636
60350434001	ASH-01-CCR	SM 2540C	681356		
60350434001	ASH-01-CCR	EPA 9056	685060		



Sample Condition Upon Receipt



Client Name: AECom		
Courier: FedEx ✓ UPS □ VIA □ Clay □	PEX □ ECI □	Pace ☐ Xroads ☐ Client ☐ Other ☐
Tracking #: 1908 6736 0923 Pag	ce Shipping Label Used	? Yes □ No Ø
Custody Seal on Cooler/Box Present: Yes 🖊 No 🗆	Seals intact: Yes	No □
Packing Material: Bubble Wrap □ Bubble Bags	□ Foam □	None ☐ Other □
Thermometer Used: T-299 Type o	fice: Web Blue Nor	
Cooler Temperature (°C): As-read 0.4 Corr. Fac	tor +0.2 Correct	ed 0.6 Date and initials of person examining contents:
Temperature should be above freezing to 6°C		P10/6/20
Chain of Custody present:	Źyes □No □N/A	
Chain of Custody relinguished:	Yes □No □N/A	
Samples arrived within holding time:	✓Yes □No □N/A	
Short Hold Time analyses (<72hr):	□Yes ☑No □N/A	
Rush Turn Around Time requested:	□Yes ☑No □N/A	
Sufficient volume:	Yes ONO ON/A	
Correct containers used:	yes □No □N/A	
Pace containers used:	Yes □No □N/A	
Containers intact:	ZYes □No □N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No ☑N/A	
Filtered volume received for dissolved tests?	□Yes □No □N/A	
Sample labels match COC: Date / time / ID / analyses	Yes No N/A	
Samples contain multiple phases? Matrix: WT	□Yes ☑No □N/A	
Containers requiring pH preservation in compliance?	ZYes □No □N/A	List sample IDs, volumes, lot #'s of preservative and the
(HNO ₃ , H₂SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)		date/time added.
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Trip Blank present:	□Yes □No □N/A	
Headspace in VOA vials (>6mm):	□Yes □No ☑N/A	
Samples from USDA Regulated Area: State:	□Yes □No □N/A	
Additional labels attached to 5035A / TX1005 vials in the field	d? □Yes □No ØN/A	
Client Notification/ Resolution: Copy COC		Field Data Required? Y / N
Person Contacted: Date	/Time:	
Comments/ Resolution:		
Project Manager Review:	Dat	e.
Toject Manager Neview.	Dat	·

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical

00 60350434 Pace Project No./ Lab I.D. (NY)DRINKING WATER Samples Intact SAMPLE CONDITIONS OTHER COOIEC (Y/N) of Custody Sealed (M/Y) eal Received on GROUND WATER Page: Residual Chlorine (Y/N) J. ui dwaT C8280 REGULATORY AGENCY 00 RCRA TIME Requested Analysis Filtered (Y/N) DATE Signed (0/65/2 020 (MM/DD/YY): 10/65/2 10.630 Site Location STATE: NPDES DATE UST 5240C LDS 470 Total Mercury ACCEPTED BY / AFFILIATION 5010 Total Metals** *SISTO Total Metals* 9029 CI' E' 204 Lanalysis Test N/A Same as Section A Other Accounts Payable - Johnson Bolkowsh Methanol Heather Wilson Preservatives _EO_SS_SbN ompany Name AECON NaOH 11033, 42700 HCI HNO³ °OS^zH ace Profile # 1 15:50 Section C まる Unpreserved TIME ace Quote ddress # OF CONTAINERS SAMPLER NAME AND SIGNATURE 10/2/30gm PRINT Name of SAMPLER: SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION DATE TIME DATE COLLECTED RELINQUISHED BY / AFFILIATION John Stone 9:35 PRPA Rawhide CCR TIME COMPOSITE 0/2/30 DATE Sopy To Brian Rothmeyer Report To Vasanta Kalluri Required Project Information (G=GRAB C=COMP) **39YT 3J9MA**8 urchase Order No (see valid codes to left) MATRIX CODE roject Number roject Name Section B Valid Matrix Codes SL OL WP AR OT TS WATER WASTE WATER PRODUCT SOIL/SOLID DRINKING WATER OIL WIPE AIR OTHER TISSUE Greenwood Village, CO 80111 brian.rothmeyer@aecom.com ADDITIONAL COMMENTS (A-Z, 0-9 / .-) Sample IDs MUST BE UNIQUE 6200 South Quebec St Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb SAMPLE ID equired Client Information (-10-(303) 740-2614 Section A Required Client Information Requested Due Date/TAT: AECOM HSH B, Ca, LI Company Page 16 of 16 mail To: ddress auou 9 ÷ 7 es rO. 9 80 6 # MHTI N 4

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

F-ALL-Q-020rev 08, 12-Oct-2007

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60350963

Sampling Event: October 9, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 20, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 9th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria			a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.		No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X

Review Parameter	Criteria	C	a	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: Parent Sample Field Duplicate ASH-02-CCR DUP-04 When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%. Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.	X		
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte Concentration 60350963 ERB-04-CCR TDS 12.0 mg/L mg/L - Milligrams per Liter TDS - Total Dissolved Solids		X^1	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		
	Comments			

Comments

1 - As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

< - Less Than % - Percent MB - Method Blank RL - Reporting Limit Less Than or Equal To
 LCS – Laboratory Control Sample
 MS/MSD – Matrix Spike/Matrix Spike Duplicate
 RPD – Relative Percent Difference

> - Greater Than mg/L - Milligram per Liter LCSD - Laboratory Control Sample Duplicate NA - Not Applicable TDS - Total Dissolved Solids





November 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407

Dianton M. Wilson

Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water

Illinois Certification #: 200030

Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070



SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
60350963001	ASH-02-CCR	Water	10/09/20 08:30	10/10/20 08:50	
60350963002	DUP-04	Water	10/09/20 00:00	10/10/20 08:50	
60350963003	ASH-05-CCR	Water	10/09/20 11:00	10/10/20 08:50	
60350963005	ERB-04	Water	10/09/20 12:45	10/10/20 08:50	



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60350963001	ASH-02-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60350963002	DUP-04	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60350963003	ASH-05-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60350963005	ERB-04	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

Sample: ASH-02-CCR	Lab ID: 6035	0963001	Collected: 1	0/09/2	0 08:30	Received: 10	/10/20 08:50 I	Matrix: Water	
Parameters	Results	Units	Report L	imit _	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Metho	od: EPA 60	010 Preparation	n Meth	nod: EPA	3010			
	Pace Analytical	Services -	Kansas City						
Boron	2140	ug/L		100	1	11/01/20 18:06	11/02/20 12:11	7440-42-8	
Calcium	176000	ug/L		200	1	11/01/20 18:06	11/02/20 12:11	7440-70-2	
Lithium	303	ug/L		10.0	1	11/01/20 18:06	11/02/20 12:11	7439-93-2	
6020 MET ICPMS	Analytical Metho	od: EPA 60	20 Preparation	n Meth	nod: EPA	3010			
	Pace Analytical	Services -	Kansas City						
Antimony	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7440-36-0	D3
Arsenic	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7440-38-2	D3
Barium	19.0	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7440-39-3	
Beryllium	ND	ug/L		1.5	3	11/01/20 18:06	11/04/20 14:15	7440-41-7	D3
Cadmium	ND	ug/L		1.5	3	11/01/20 18:06	11/04/20 14:15	7440-43-9	D3
Chromium	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7440-47-3	D3
Cobalt	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7440-48-4	D3
_ead	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7439-92-1	D3
Molybdenum	8.5	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7439-98-7	
Selenium	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7782-49-2	D3
Γhallium	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:15	7440-28-0	D3
7470 Mercury	Analytical Metho	od: EPA 74	70 Preparation	n Meth	nod: EPA	7470			
	Pace Analytical	Services -	Kansas City						
Mercury	ND	ug/L		0.20	1	10/14/20 13:29	10/15/20 12:30	7439-97-6	
2540C Total Dissolved Solids	Analytical Metho	od: SM 25	40C						
	Pace Analytical	Services -	Kansas City						
Total Dissolved Solids	3350	mg/L		66.7	1		10/14/20 15:29)	
9056 IC Anions	Analytical Metho	od: EPA 90)56						
	Pace Analytical	Services -	Kansas City						
Chloride	20.4	mg/L		5.0	5		10/27/20 12:33	16887-00-6	
Fluoride	0.23	mg/L		0.20	1		10/27/20 12:18		
Sulfate	1050	mg/L		200	200		10/27/20 12:47		



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

Sample: DUP-04	Lab ID: 6035	0963002	Collected:	10/09/2	00:00	Received: 10	/10/20 08:50 N	Matrix: Water	
Parameters	Results	Units	Report	t Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	10 Preparat	ion Meth	nod: EP/	A 3010			
	Pace Analytical	Services -	Kansas City						
Boron	2100	ug/L		100	1	11/01/20 18:06	11/02/20 12:14	7440-42-8	
Calcium	172000	ug/L		200	1	11/01/20 18:06	11/02/20 12:14	7440-70-2	
ithium	302	ug/L		10.0	1	11/01/20 18:06	11/02/20 12:14	7439-93-2	
020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparat	ion Meth	nod: EP/	A 3010			
	Pace Analytical	Services -	Kansas City						
Antimony	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7440-36-0	D3
Arsenic	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7440-38-2	D3
Barium	17.2	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7440-39-3	
Beryllium	ND	ug/L		1.5	3	11/01/20 18:06	11/04/20 14:20	7440-41-7	D3
Cadmium	ND	ug/L		1.5	3	11/01/20 18:06	11/04/20 14:20	7440-43-9	D3
Chromium	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7440-47-3	D3
Cobalt	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7440-48-4	D3
ead	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7439-92-1	D3
/lolybdenum	8.4	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7439-98-7	
Selenium	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7782-49-2	D3
hallium	ND	ug/L		3.0	3	11/01/20 18:06	11/04/20 14:20	7440-28-0	D3
470 Mercury	Analytical Meth	od: EPA 74	70 Preparat	ion Meth	nod: EP/	A 7470			
	Pace Analytical	Services -	Kansas City						
Mercury	ND	ug/L		0.20	1	10/14/20 13:29	10/15/20 12:33	7439-97-6	
540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C						
	Pace Analytical	Services -	Kansas City						
Total Dissolved Solids	3270	mg/L		66.7	1		10/14/20 15:29	1	
0056 IC Anions	Analytical Meth	od: EPA 90	56						
	Pace Analytical	Services -	Kansas City						
Chloride	21.4	mg/L		2.0	2		10/27/20 13:17	16887-00-6	
luoride	0.23	mg/L		0.20	1		10/27/20 13:02		
Sulfate	1090	mg/L		200	200		10/27/20 13:32	1/18/08-70-8	



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

Sample: ASH-05-CCR	Lab ID: 6035	50963003	Collected: 10/0	9/20	11:00	Received: 10)/10/20 08:50 N	/latrix: Water	
Parameters	Results	Units	Report Lim	it	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation N	/letho	od: EPA	A 3010			
	Pace Analytical	Services -	Kansas City						
Boron	884	ug/L	10	00	1	11/01/20 18:06	11/02/20 12:17	7440-42-8	
Calcium	557000	ug/L	20	00	1	11/01/20 18:06	11/02/20 12:17	7440-70-2	
Lithium	313	ug/L	10	.0	1	11/01/20 18:06	11/02/20 12:17	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation N	1etho	od: EPA	A 3010			
	Pace Analytical	Services -	Kansas City						
Antimony	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7440-36-0	D3
Arsenic	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7440-38-2	D3
Barium	15.4	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7440-39-3	
Beryllium	ND	ug/L	1	.5	3	11/01/20 18:06	11/04/20 14:24	7440-41-7	D3
Cadmium	ND	ug/L	1	.5	3	11/01/20 18:06	11/04/20 14:24	7440-43-9	D3
Chromium	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7440-47-3	D3
Cobalt	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7440-48-4	D3
_ead	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7439-92-1	D3
Molybdenum	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7439-98-7	D3
Selenium	57.8	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7782-49-2	
Γhallium	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:24	7440-28-0	D3
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation N	/letho	d: EPA	A 7470			
	Pace Analytical	Services -	Kansas City						
Mercury	ND	ug/L	0.2	20	1	10/14/20 13:29	10/15/20 12:35	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C						
	Pace Analytical								
Total Dissolved Solids	4810	mg/L	10	00	1		10/14/20 15:29		
9056 IC Anions	Analytical Meth	od: EPA 90	056						
	Pace Analytical	Services -	Kansas City						
Chloride	242	mg/L	50	.0	50		10/27/20 14:31	16887-00-6	
Fluoride	ND	mg/L	0.2		1		10/27/20 13:47		
Sulfate	2710	mg/L	5.	-	500		10/27/20 14:46		



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

Sample: ERB-04	Lab ID: 6035	50963005	Collected: 10/0	9/20 1	12:45	Received: 10	/10/20 08:50 I	Matrix: Water	
Parameters	Results	Units	Report Lim	it C)F	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation N	/lethod	I: EPA	3010			
	Pace Analytical	Services -	Kansas City						
Boron	ND	ug/L	10	00	1	11/01/20 18:06	11/02/20 12:22	7440-42-8	
Calcium	ND	ug/L	2	00	1	11/01/20 18:06	11/02/20 12:22	7440-70-2	
Lithium	ND	ug/L	10	.0	1	11/01/20 18:06	11/02/20 12:22	7439-93-2	
020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation N	/lethod	I: EPA	3010			
	Pace Analytical	Services -	Kansas City						
Antimony	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7440-36-0	D3
Arsenic	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7440-38-2	D3
Barium	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7440-39-3	D3
Beryllium	ND	ug/L	1	.5	3	11/01/20 18:06	11/04/20 14:33	7440-41-7	D3
Cadmium	ND	ug/L	1	.5	3	11/01/20 18:06	11/04/20 14:33	7440-43-9	D3
Chromium	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7440-47-3	D3
Cobalt	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7440-48-4	D3
ead	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7439-92-1	D3
Nolybdenum	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7439-98-7	D3
Selenium	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7782-49-2	D3
-hallium	ND	ug/L	3	.0	3	11/01/20 18:06	11/04/20 14:33	7440-28-0	D3
470 Mercury	Analytical Meth	od: EPA 74	170 Preparation N	/lethod	I: EPA	7470			
	Pace Analytical	Services -	Kansas City						
Mercury	ND	ug/L	0.3	20	1	10/14/20 13:29	10/15/20 12:39	7439-97-6	
540C Total Dissolved Solids	Analytical Meth	od: SM 25	40C						
	Pace Analytical								
Total Dissolved Solids	12.0	mg/L	5	.0	1		10/14/20 15:30)	
056 IC Anions	Analytical Meth	od: EPA 90	056						
	Pace Analytical	Services -	Kansas City						
Chloride	ND	mg/L	1	.0	1		10/27/20 15:31	16887-00-6	
Fluoride	ND	mg/L	0.:	-	1		10/27/20 15:31		
Sulfate	ND	mg/L			1		10/27/20 15:31		

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

QC Batch: 682721 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2759679 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 10/15/20 12:01

LABORATORY CONTROL SAMPLE: 2759680

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury ug/L 4.6 93 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2759681 2759682

MS MSD

60350879003 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Conc. Result Result % Rec % Rec **RPD** RPD Qual Result Limits ND 5 20 Mercury ug/L 5 4.9 4.6 96 92 75-125 5

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

QC Batch: 686333 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2774094 Matrix: Water
Associated Lab Samples: 60350963001 60350963002 60350963003 60350963005

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

		Dialik	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	11/02/20 11:41	
Calcium	ug/L	ND	200	11/02/20 11:41	
Lithium	ug/L	ND	10.0	11/02/20 11:41	

LABORATORY CONTROL SAMPLE: 2774095

Date: 11/06/2020 05:05 PM

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1010	101	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Lithium	ug/L	1000	1040	104	80-120	

MATRIX SPIKE & MATRIX SI	PIKE DUPLIC	CATE: 2774	096		2774097							
			MS	MSD								
	6	0350962001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	1990	1000	1000	3090	3080	110	110	75-125	0	20	
Calcium	ug/L	164000	10000	10000	182000	180000	184	163	75-125	1	20	M1
Lithium	ug/L	279	1000	1000	1230	1240	95	96	75-125	1	20	

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

QC Batch: 686335 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2774102 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	11/04/20 13:25	
Arsenic	ug/L	ND	1.0	11/04/20 13:25	
Barium	ug/L	ND	1.0	11/04/20 13:25	
Beryllium	ug/L	ND	0.50	11/04/20 13:25	
Cadmium	ug/L	ND	0.50	11/04/20 13:25	
Chromium	ug/L	ND	1.0	11/04/20 13:25	
Cobalt	ug/L	ND	1.0	11/04/20 13:25	
Lead	ug/L	ND	1.0	11/04/20 13:25	
Molybdenum	ug/L	ND	1.0	11/04/20 13:25	
Selenium	ug/L	ND	1.0	11/04/20 13:25	
Thallium	ug/L	ND	1.0	11/04/20 13:25	

LABORATORY CONTROL SAMPLE:	2774103					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	38.0	95	80-120	
Arsenic	ug/L	40	38.5	96	80-120	
Barium	ug/L	40	36.9	92	80-120	
Beryllium	ug/L	40	38.5	96	80-120	
Cadmium	ug/L	40	37.6	94	80-120	
Chromium	ug/L	40	38.3	96	80-120	
Cobalt	ug/L	40	38.8	97	80-120	
Lead	ug/L	40	38.0	95	80-120	
Molybdenum	ug/L	40	38.6	97	80-120	
Selenium	ug/L	40	37.6	94	80-120	
Thallium	ug/L	40	36.3	91	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 2774	. • .	MOD	2774105							
	6	0350962001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	37.6	37.2	94	93	75-125	1	20	
Arsenic	ug/L	ND	40	40	39.3	38.8	97	96	75-125	1	20	
Barium	ug/L	16.0	40	40	54.1	52.8	95	92	75-125	2	20	
Beryllium	ug/L	ND	40	40	34.4	34.2	86	85	75-125	1	20	
Cadmium	ug/L	ND	40	40	35.4	34.8	88	87	75-125	2	20	
Chromium	ug/L	ND	40	40	32.3	31.9	80	79	75-125	1	20	

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

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

MATRIX SPIKE & MATRIX	SPIKE DUPLI	CATE: 2774	104		2774105							
Parameter	Units	60350962001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec	RPD	Max RPD	Qual
												— Quai
Cobalt	ug/L	ND	40	40	39.6	39.3	99	98	75-125	1	20	
Lead	ug/L	ND	40	40	33.8	33.8	84	84	75-125	0	20	
Molybdenum	ug/L	7.6	40	40	51.1	50.5	109	107	75-125	1	20	
Selenium	ug/L	ND	40	40	36.4	35.5	91	88	75-125	3	20	
Thallium	ug/L	ND	40	40	33.5	33.2	83	83	75-125	1	20	

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

Qualifiers



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

QC Batch: 682830 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2760011 Matrix: Water

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 10/14/20 15:28

LABORATORY CONTROL SAMPLE: 2760012

Spike LCS LCS % Rec
Parameter Units Conc. Result % Rec Limits

Total Dissolved Solids mg/L 1000 1030 103 80-120

SAMPLE DUPLICATE: 2760013

Date: 11/06/2020 05:05 PM

60350990003 Dup Max **RPD** Parameter Units Result Result **RPD** Qualifiers 5780 **Total Dissolved Solids** mg/L 6170 7 10

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Chloride Fluoride Sulfate

QC Batch: 685060 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2769666 Matrix: Water

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Result	Limit	Analyzed	Qualifiers
•	mg/L	ND	1.0	10/26/20 09:13	
	mg/L	ND	0.20	10/26/20 09:13	
	mg/L	ND	1.0	10/26/20 09:13	

METHOD BLANK: 2770399 Matrix: Water

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND ND	1.0	10/27/20 09:06	
Fluoride	mg/L	ND	0.20	10/27/20 09:06	
Sulfate	mg/L	ND	1.0	10/27/20 09:06	

METHOD BLANK: 2771511 Matrix: Water

Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/28/20 09:04	
Fluoride	mg/L	ND	0.20	10/28/20 09:04	
Sulfate	mg/L	ND	1.0	10/28/20 09:04	

LABORATORY CONTROL SAMPLE: 2769667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L		5.0	99	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.2	104	80-120	

LABORATORY CONTROL SAMPLE: 2770400

Date: 11/06/2020 05:05 PM

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L		4.9	98	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

LABORATORY CONTROL S	AIVIPLE:	2771512	Spike	LC	:S	LCS	% Re	ec.				
Parameter		Units	Conc.	Res		% Rec	Limi		Qualifiers			
Chloride		mg/L		5	4.9	9	7 8	30-120		_		
Fluoride		mg/L	2	.5	2.6	10	2 8	30-120				
Sulfate		mg/L		5	5.1	10.	2 8	30-120				
MATRIX SPIKE & MATRIX S	PIKE DUPL	ICATE: 2769	668		2769669)						
			MS	MSD								
		60350879002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Chloride	mg/L	126	50	50	180	179	107	105	80-120	0	15	
Fluoride	mg/L	0.64	2.5	2.5	2.9	3.0	92	95	80-120	3	15	
Sulfate	mg/L	323	250	250	570	565	99	97	80-120	1	15	
MATRIX SPIKE & MATRIX S	PIKE DUPL	.ICATE: 2769	671		2769672	2						
			MS	MSD								
		60350879003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Chloride	mg/L	21.0	10	10	31.9	32.7	109	117	80-120	2	15	
Fluoride	mg/L	0.22	2.5	2.5	2.1	2.1	77	75	80-120	2	15	M1
Sulfate	mg/L	2610	2500	2500	5210	5260	104	106	80-120	1	15	M1
SAMPLE DUPLICATE: 276	9670											
			603508	79002	Dup			Max				

		60350879002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	126	122	4	15	
Fluoride Fluoride	mg/L	0.64	0.64	1	15	
Sulfate	mg/L	323	310	4	15	

SAMPLE DUPLICATE: 2769673						
		60350879003	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	21.0	21.0	0	15	
Fluoride	mg/L	0.22	ND		15	
Sulfate	mg/L	2610	2740	5	15	

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



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 11/06/2020 05:05 PM

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60350963

Date: 11/06/2020 05:05 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60350963001	ASH-02-CCR	EPA 3010	686333	EPA 6010	686502
60350963002	DUP-04	EPA 3010	686333	EPA 6010	686502
60350963003	ASH-05-CCR	EPA 3010	686333	EPA 6010	686502
60350963005	ERB-04	EPA 3010	686333	EPA 6010	686502
60350963001	ASH-02-CCR	EPA 3010	686335	EPA 6020	686504
60350963002	DUP-04	EPA 3010	686335	EPA 6020	686504
60350963003	ASH-05-CCR	EPA 3010	686335	EPA 6020	686504
60350963005	ERB-04	EPA 3010	686335	EPA 6020	686504
60350963001	ASH-02-CCR	EPA 7470	682721	EPA 7470	682799
60350963002	DUP-04	EPA 7470	682721	EPA 7470	682799
60350963003	ASH-05-CCR	EPA 7470	682721	EPA 7470	682799
60350963005	ERB-04	EPA 7470	682721	EPA 7470	682799
60350963001	ASH-02-CCR	SM 2540C	682830		
60350963002	DUP-04	SM 2540C	682830		
60350963003	ASH-05-CCR	SM 2540C	682830		
60350963005	ERB-04	SM 2540C	682830		
60350963001	ASH-02-CCR	EPA 9056	685060		
60350963002	DUP-04	EPA 9056	685060		
60350963003	ASH-05-CCR	EPA 9056	685060		
60350963005	ERB-04	EPA 9056	685060		



Sample Condition Upon Receipt ESI Tech Spec Client



Client Name: AF, COM			
Courier: FedEx D UPS UPS Clay Clay	PEX 🗆 ECI 🗆	Pace □ Xroads	s □ Client □ Other □
Tracking #: 1903 0730 0485 Pa	ce Shipping Label Use	ed? Yes □ No □	
Custody Seal on Cooler/Box Present: Yes No	Seals intact: Yes		
Packing Material: Bubble Wrap □ Bubble Bags	□ Foam □	None □	Other MOU
Thermometer Used: 7198	ype of Ice: Ver Blue	None	
Cooler Temperature (°C): As-read U-5 Corr. Fac	ctor - b. 4 Correc	ted 4. \	Date and initials of person examining contents: 100 02000
Temperature should be above freezing to 6°C			
Chain of Custody present:	Yes ONO ON/A		
Chain of Custody relinquished:	Yes ONO ON/A		
Samples arrived within holding time:	Yes ONO ON/A		
Short Hold Time analyses (<72hr):	□Yes MNo □N/A		
Rush Turn Around Time requested:	□Yes □No □N/A		
Sufficient volume:	MYes □No □N/A		
Correct containers used:	MYes □No □N/A		
Pace containers used:	ØÍYes □No □N/A		
Containers intact:	ŬYes □No □N/A		
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No 🗖N/A		
Filtered volume received for dissolved tests?	□Yes □No MIN/A		
Sample labels match COC: Date / time / ID / analyses	Yes □No □N/A		
Samples contain multiple phases? Matrix: UT	□Yes Ino □N/A		
Containers requiring pH preservation in compliance?	Yes No N/A		lumes, lot #'s of preservative and the
(HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	#603173	date/time added.	
Cyanide water sample checks:			
Lead acetate strip turns dark? (Record only)	□Yes □No		
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No		
Trip Blank present:	□Yes □No ► N/A		
Headspace in VOA vials (>6mm):	□Yes □No ☐N/A		
Samples from USDA Regulated Area: State:	□Yes □No □N/A		
Additional labels attached to 5035A / TX1005 vials in the field	i? □Yes □No □N/A		
Client Notification/ Resolution: Copy COC to	o Client? Y / N	Field Data Requir	red? Y / N
Person Contacted: Date/	Time:		Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck
Comments/ Resolution:			sample temps.
			Start: 0920 Start:
			End: 0923 End:
Project Manager Review:	Date	a:	Temp: U. Temp:



CHAIN-OF-CUSTODY / Analytical Request Document

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

DRINKING WATER OTHER of GROUND WATER Page: REGULATORY AGENCY 00 RCRA STATE: Site Location NPDES UST Same as Section A Accounts Payable Heather Wilson Company Name: AECOM Pace Project Heather VVI Manager Pece Profile #: 11033, 3 42700 Invoice Information Section C Pace Quole Address: Attention Project Name: PRPA Rawhide CCR Copy To Brian Rothmeyer Report To: Vasanta Kalluri Required Project Information: Surchase Order No. roject Number Section B Greenwood Village, CO 80111 brian.rothmeyer@aecom.com 6200 South Quebec St Phone (303) 740-2614 Required Client Information. Requested Due Date/TAT: AECOM Section A Email To: опрапу Address

								-				1							
											١	Requested Analysis Filtered (Y/N)	nalysis I	Filtered	(X/N)				
	Required Client Information MATRIX COLE DERINKING WATER DW	cope	_	(AMU)	COLL	COLLECTED			Preser	Preservatives	↑ N / A								
		WW SL	see valid codes	=6RAB C=C	COMPOSITE START	COMPOSITE						**8				(N/J.)			
#	WINE AM OTHER IQUE TISSUE	AR AR		E TYPE (G=			D TA 9MET E	ONTAINERS			ysis Test :I, F, SO4	otal Metals otal Metals otal Mercu	TDS			al Chlorine (2035	40350963	
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f 20						SIGNATURE	SIGNATURE of SAMPLER:	R: \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	あれし	HOL.	DAT (MM)	DATE Signed (MM/DD/YY):	12/09	12020	0,		90		
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Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any Modes not paid within 30 days.

F-ALL-Q-020rev 08, 12-Oct-2007



CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

Section Require	n A d Client Information:	Section B Required Pro	oiect Inf	formation:	Section C Invoice Information:																F	Page:		of							
Compan		Report To: \							Atten				unts	Pay	able					T						_					
Address	6200 South Quebec St	Сору То:	Brian F	Rothmeyer					Com	pany N	Name	: A	ECO	М						R	EGI	JLAT	ORY	AGI	ENC'	Υ					
	Greenwood Village, CO 80111	+							Addre	ess:	,	Sam	e as	Sect	ion A	λ				-		NPDES			GROL		WAT	FR \square	DRINKIN	G WATER	2
Email To	brian.rothmeyer@aecom.com	Purchase Ore	der No.	:						Quote		4270	0							_		JST			RCRA				OTHER	,	•
Phone:	(303) 740-2614 Fax:	Project Name	e: Pl	RPA Rawhi	de					Project	t	Heat	ner V	Vilso	n							Locati							777	7777	777
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	Required Client Information MATRIX	CODE	o left)		COLL	ECTED					F	rese	rvati	ves		↑N/A													<u>////</u>	<u>///</u>	<u>///</u>
	DRINKING WATER WATER WASTE WASTE WASTE WASTE PRODUCT SOIL/SOLID OIL SAMPLE ID AIR	P SL OL WP	(see valid codes to left)	COMP STA	OSITE RT	COMPO END/GF	SITE RAB	COLLECTION	RS							→ ts	4	als*	als**	ercury							ле (Y/N)				
ITEM #	(A-Z, 0-9 /,-) OTHER Sample IDs MUST BE UNIQUE	AR OT TS	MATRIX CODE		TIME	DATE	TIME	SAMPLE TEMP AT	# OF CONTAINERS	Unpreserved	H ₂ SO ₄	HNO ₃	NaOH	Na ₂ S ₂ O ₃	Methanol	Analysis Test	9056 CI, F, SO4	6020 Total Metals*	Total M	otal M	234UC 1 D3						Residual Chlorine (Y/N)	Pace	Project I	No./ Lab	I.D.
1	ASH-02-CCR	1	WT C	3 10/9/20	8:30				3	2		1					Х	Х	Х	X Z	X										
2	DUP-04	١	WT (3 10/9/20					3	2		1					Х	х	Х	x :	х										
3	ASH-05-CCR	١	WT C	3 10/9/20	11:00				3	2		1				_	Х	Х	Х	X 2	X										
4	ERB-04	,	WT (3 10/9/20	12:45				3	2		1				_	Х	Х	Х	X 2	х					_					
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Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60351403

Sampling Event: October 9, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 21, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 9th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria		riteri Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: Parent Sample Field Duplicate	X		
	BAT-04R-CCR DUP-02-CCR			

σ – Sigma (Uncertainty)
DER – Duplicate Error Ratio \
MB – Method Blank
NA – Not Applicable

Review Parameter	Criteria	_	ia	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	Met? No	NA
	• The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.			
Equipment Blanks	No target analytes reported in the associated equipment blank.		X ¹	
Detection Limits Mets	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.	X		
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		
	Comments			

Comments

^{1 –} As the associated radium-228 and total radium sample results were reported at concentrations less than the minimum detectable concentration (MDC), qualification was not considered necessary.

< - Less Than pCi/L - Picocuries Per Liter LCS - Laboratory Control Sample MDC - Minimum Detectable Concentration

^{≤ –} Less Than or Equal To ± – Plus or Minus/High or Low Bias LCSD – Laboratory Control Sample Duplicate MS/MSD – Matrix Spike/Matrix Spike Duplicate





November 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407

Dianton M. Wilson

Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351403001	ASH-02-CCR	Water	10/09/20 08:30	10/10/20 10:00
60351403002	DUP-04	Water	10/09/20 00:00	10/10/20 10:00
60351403003	ASH-05-CCR	Water	10/09/20 11:00	10/10/20 10:00
60351403005	ERB-04	Water	10/09/20 12:45	10/10/20 10:00



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351403001	ASH-02-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351403002	DUP-04	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351403003	ASH-05-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351403005	ERB-04	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Sample: ASH-02-CCR PWS:	Lab ID: 6035 Site ID:	1403001 Collected: 10/09/20 08:30 Sample Type:	Received:	10/10/20 10:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg				
Radium-226	EPA 903.1	-0.0655 ± 0.426 (0.924) C:NA T:98%	pCi/L	10/27/20 12:19	9 13982-63-3	
	Pace Analytical	Services - Greensburg				
Radium-228	EPA 904.0	0.355 ± 0.363 (0.753) C:71% T:101%	pCi/L	10/26/20 14:18	8 15262-20-1	
	Pace Analytical	Services - Greensburg				
Total Radium	Total Radium Calculation	0.355 ± 0.789 (1.68)	pCi/L	10/28/20 15:2	1 7440-14-4	



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Sample: DUP-04 PWS:	Lab ID: 6035140 Site ID:	O3002 Collected: 10/09/20 00:00 Sample Type:	Received:	10/10/20 10:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	rvices - Greensburg				
Radium-226	EPA 903.1	0.000 ± 0.508 (1.04) C:NA T:92%	pCi/L	10/27/20 12:19	9 13982-63-3	
	Pace Analytical Ser	rvices - Greensburg				
Radium-228	EPA 904.0	0.339 ± 0.423 (0.897) C:75% T:82%	pCi/L	10/26/20 14:18	8 15262-20-1	
	Pace Analytical Ser	rvices - Greensburg				
Total Radium	Total Radium Calculation	0.339 ± 0.931 (1.94)	pCi/L	10/28/20 15:2	1 7440-14-4	



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Sample: ASH-05-CCR PWS:	Lab ID: 603514 Site ID:	03003 Collected: 10/09/20 11:00 Sample Type:	Received:	10/10/20 10:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Se	rvices - Greensburg				
Radium-226	EPA 903.1	0.687 ± 0.545 (0.740) C:NA T:97%	pCi/L	10/27/20 12:32	2 13982-63-3	
	Pace Analytical Se	rvices - Greensburg				
Radium-228	EPA 904.0	0.619 ± 0.425 (0.815) C:73% T:86%	pCi/L	10/26/20 14:18	3 15262-20-1	
	Pace Analytical Se	rvices - Greensburg				
Total Radium	Total Radium Calculation	1.31 ± 0.970 (1.56)	pCi/L	10/28/20 15:2	1 7440-14-4	



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Sample: ERB-04 PWS:	Lab ID: 6035140 3 Site ID:	3005 Collected: 10/09/20 12:45 Sample Type:	Received:	10/10/20 10:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Serv	rices - Greensburg				
Radium-226	EPA 903.1	0.118 ± 0.283 (0.546) C:NA T:108%	pCi/L	10/27/20 12:32	2 13982-63-3	
	Pace Analytical Serv	rices - Greensburg				
Radium-228	EPA 904.0	1.41 ± 0.584 (0.938) C:73% T:80%	pCi/L	10/26/20 14:18	3 15262-20-1	
	Pace Analytical Serv	rices - Greensburg				
Total Radium	Total Radium Calculation	1.53 ± 0.867 (1.48)	pCi/L	10/28/20 15:21	7440-14-4	

(913)599-5665



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

QC Batch: 419066 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60351403001, 60351403002, 60351403003, 60351403005

METHOD BLANK: 2026020 Matrix: Water
Associated Lab Samples: 60351403001, 60351403002, 60351403003, 60351403005

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 -0.0621 ± 0.322 (0.746) C:NA T:88% pCi/L 10/27/20 12:04

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

(913)599-5665



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

QC Batch: 419067 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60351403001, 60351403002, 60351403003, 60351403005

METHOD BLANK: 2026021 Matrix: Water
Associated Lab Samples: 60351403001, 60351403002, 60351403003, 60351403005

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-228 0.425 ± 0.426 (0.874) C:71% T:72% pCi/L 10/26/20 14:18

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



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 11/06/2020 05:25 PM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351403

Date: 11/06/2020 05:25 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351403001	ASH-02-CCR	EPA 903.1	419066		
60351403002	DUP-04	EPA 903.1	419066		
60351403003	ASH-05-CCR	EPA 903.1	419066		
60351403005	ERB-04	EPA 903.1	419066		
60351403001	ASH-02-CCR	EPA 904.0	419067		
60351403002	DUP-04	EPA 904.0	419067		
60351403003	ASH-05-CCR	EPA 904.0	419067		
60351403005	ERB-04	EPA 904.0	419067		
60351403001	ASH-02-CCR	Total Radium Calculation	420680		
60351403002	DUP-04	Total Radium Calculation	420680		
60351403003	ASH-05-CCR	Total Radium Calculation	420680		
60351403005	ERB-04	Total Radium Calculation	420680		

CHAIN-OF-CUSTODY / Analytical Request Document

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

Face Analytical

DRINKING WATER OTHER ğ NPDES | GROUND WATER | Page: 8 REGULATORY AGENCY RCRA STATE Site Location UST Same as Section A Accounts Payable Heather Wilson Company Name. AECOM Pace Oudle 42700
Reference:
Pace Project Heather W
Manager:
Pace Profile #: 11033, 3 Invoice information; Section C Attention: Address Copy To: Brian Rothmeyer Report To: Vasanta Kalluri Section B Required Project Information; <u>6</u> Jurchase Order No. Project Number: project Name: Greenwood Village, CO 80111 brian.rothmeyer@aecom.com 6200 South Quebec St Fax Phone: (303) 740-2614 Section A Required Client Information. Requested Due Date/TAT: AECOM Company: Address: Email To:

					Pace Project No./ Lab I.D.			***************************************				The state of the s		- Andrewson and the second sec			SNOLLIONS				_		olomes
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		COLL	COMPOSITE START	U N	8:30	1	11:00		1375								RELINQUISHED BY / AFFILIATION	ALK USH			SAMPL		
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F-ALL-Q-020rev.08, 12-Oct-2007

Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1,5% per month for any Musces not paid within 30 days.

Pittsburgh Lab Sa	ample Conditi	ion U	pon	Rec	eipt			
Pace Analytical Clie	ent Name:	1) 2.	20	k	15	Project :	#	
/Pace Analytical Clie	ent Name:	va	<u>ce</u>	\sim		Fiojecti	T	
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Fracking #: 1908 6	7 36 106	≱ ``	we le	0[10]2	ne		LIMS Login	
Custody Seal on Cooler/Box I		N no)	Seals i	ntact: yes	no		-
Thermometer Used	1000111 (\$50)00 1	Type o				_		
	erved Temp	.,,p			ction Factor:	°C Fin	al Temp: C	
Cooler Temperature Observations to Cooler Temperature	-						-	1
•					pH paper Lot#	Date an	nd Initials of person examining ents:	
Comments:		Yes	No	N/A	1000 401			
Chain of Custody Present:					1.			
Chain of Custody Filled Out:					2.			
Chain of Custody Relinquished					3.			1
Sampler Name & Signature on	COC:				4.			_
Sample Labels match COC:	_			L	5.			
-Includes date/time/ID	Matrix:	W_						1
Samples Arrived within Hold Ti	me:	\blacksquare		<u> </u>	6.			-
Short Hold Time Analysis (<7	'2hr remaining):				7.			
Rush Turn Around Time Req	uested:				8.			-
Sufficient Volume:					9.			-
Correct Containers Used:				<u> </u>	10.			
-Pace Containers Used:				ļ			,	-
Containers Intact:					11.			_
Orthophosphate field filtered					12.			-
Hex Cr Aqueous sample field f	iltered				13.			_
Organic Samples checked t	for dechlorination:		<u> </u>		14.			_
Filtered volume received for D	issolved tests				15.			_
All containers have been checked			<u> </u>	<u> </u>	16. He	2		1
exceptions: VOA, coliform, To Non-aqueous matrix	OC, O&G, Phenolics	, Radon	,			1		
All containers meet method preservation			_	T	Initial when			
requirements.			<u> </u>	<u> </u>	Lot # of added	preservati	on	_
					preservative			4
Headspace in VOA Vials (>6r	nm):				17.			_
Trip Blank Present:					18.			
Trip Blank Custody Seals Pres	sent							4
Rad Samples Screened < 0.5	5 mrem/hr		† _		Initial when completed:	Date: [[2/10/2000	
Client Notification/ Resolution	on:							
Person-Gontacted:				_Date/	Fime:	c	ontacted By:	
Comments/ Resolution:								
								-
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		<u></u>						_
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Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

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



CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

Section Require	A d Client Information:	Section B Required Pr	roject	Inforn	mation:						tion C	ormati														F	Page:		of		
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Phone:	(303) 740-2614 Fax:	Project Nam	ne:	PRP	PA Rawhio	de				Pace Mana	Project ager:	H	leath	er W	/ilsor	n					Site	Loca	tion		-	_					7
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	Section D Valid Matrix Co Required Client Information MATRIX	odes CODE	eft)	(c		COLL	ECTED					D	reser	votiv	, 00		Y/ N 👃														
TEM #	DRINKING WATER WATER	DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPC	OSITE	COMPO END/GF	SITE RABB	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved		HCI		Na ₂ S ₂ O ₃	Other	lysis Test 👃	Radium-226	Radium-228	lotal Kadıum							Residual Chlorine (Y/N)	Pace	Project	lo / Lab I D	
1	ASH-02-CCR		WT	G	10/9/20	8:30			0,	2	+ +	2	╁			+				×							Ħ	1 acc	Појест	IO., Lab I.D.	_
2	DUP-04		WT	G	10/9/20					2	+ +	2					-		-	X											
3	ASH-05-CCR		WT	G	10/9/20	11:00				2		2						х		x							l				
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	*Important Note: By signing this form you are accepting	ng Pace's NET	30 dav	y paym	nent terms and													DA	TE Si	gned)/9/20	0		P-AL	L-Q-	020rev.08,	² Page 12-0ci-20	15 of \$7	

Pace Analytical

Analyst Must Manually Enter All Fields Highlighted in Yellow. **Quality Control Sample Performance Assessment**

MS/MSD 2

MS/MSD

30386896001 30386896001MS 10/9/2020

Sample I.D. Sample MS I.D. Sample MSD I.D.

Sample Collection Date:

Sample Matrix Spike Control Assessment

20-032 32.183 0.20

Spike I.D.:

MS/MSD Decay Corrected Spike Concentration (pCi/mL); Spike Volume Used in MS (mL); Spike Volume Used in MSD (mL).

0.656 9.808

MS Aliquot (L. g, F): MS Target Conc.(pCi/l., g, F):

Ra-226 MK1 Test: Analyst:

10/21/2020 56818 DW
2026020
-0.062
0.322
0.746
-0.38
N/A
Pass
''

Laboratory Control Sample Assessment	LCSD (Y or N)?	Υ.
	LCS56818	LCSD56818
Count Date:	10/27/2020	10/27/2020
Spike I.D.:	20-032	20-032
Spike Concentration (pCi/mL):	32.182	32.182
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.657	0.664
Target Conc. (pCi/L, g, F);	4.898	4.849
Uncertainty (Calculated):	0.230	0.228
Result (pCi/L, g, F):	4,115	4.133
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.014	0.960
Numerical Performance Indicator:	-1.47	-1.42
Percent Recovery:	84.03%	85.23%
Status vs Numerical Indicator;	Y/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	73%	73%

98.43%

MS Percent Recovery MSD Percent Recovery: 136% 71%

MS/MSD Upper % Recovery Limits: MS/MSD Lower % Recovery Limits:

MSD Status vs Recovery.

Pass χŽ

MS Status vs Numerical Indicator: MSD Status vs Numerical Indicator: MS Status vs Recovery:

-0.178

Sample Matrix Spike Duplicate Result:
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):
MS Numerical Performance Indicator:

MSD Numerical Performance Indicator

Matrix Spike Result Counting Uncertainty (pCi/L, g, F):

Sample Result Counting Uncertainty (pCi/L, g, F):

Sample Matrix Spike Result

0.250 0.301 9.905 1.599

0.461

MSD Target Conc. (pCi/L, g, F): MS Spike Uncertainty (calculated):

MSD Spike Uncertainty (calculated):

Sample Result:

_		***					
Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MSD I.D.	Sample Matrix Spike Result: Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result: Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD:
	Enter Duplicate sample IDs if	other than	the space below.				

LCSD56818 4.115 1.014 4.133 0.960 NO

Sample 1.D.

Duplicate Sample 1.D.

Sample Result (pCi/L, g, F):

Sample Result Counting Uncertainty (pCi/L, g, F):

Sample Duplicate Result (pCi/L, g, F):

Sample Duplicate Result (pCi/L, g, F):

Are sample and/or duplicate results below RL?

Duplicate Sample Assessmen

-0.024 1.42%

N/A Pass 32%

Duplicate Status vs Numerical Indicator Duplicate Status vs RPD:

% RPD Limit:

(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:

Duplicate Numerical Performance Indicator

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

Ml 10-27-20

Ra-226 NELAC QC Printed: 10/27/2020 1:02 PM

Face Analytical

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

28	020	ග ු	
Ra-228	VAL 10/23/2020		
Test	Analyst: Date:	Worklist: Matrix:	

MB Status vs Numerical Indicator:	Pass	
MB Status vs. MDC:	Pass	
, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,		
Laboratory Control Sample Assessment	LCSD (Y or N)?	Ь
	LCS56819	SGS21
Count Date:	10/26/2020	10/26/2
Spike I.D.:	20-030	20-03
Decay Corrected Spike Concentration (pCi/mL):	37.879	37.87
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.806	0.80
Target Conc. (pCi/L, g, F):	4.697	4.68
Uncertainty (Calculated):	0.230	0.23
Result (pCi/L, g, F):	4.010	3,33
LCS/LCSD 2 Sigma CSU (pCi/L, g, F);	1.026	0.85
Numerical Performance Indicator:	-1.28	5.9
Percent Recovery:	85.37%	71.12
Status vs Numerical Indicator:	A/N	₹/Z
Status vs Recovery:	Pass	Pas
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	%09	%09

2026021 0.425 0.426 0.874 1.95

MB Sample ID

Method Blank Assessment

MB concentration:
M/B 2 Sigma CSU:
MB MDC;
MB Numerical Performance Indicator:

	Samulo Matrix Suito Control Accommont	A CONTON	MCMCD 2
	Sample Collection Date:		
		7	
	Sample MS LD	ñ	
	Sample MSD I.D.		
	Spike I.D.:	20-030	
	MS/MSD Decay Corrected Spike Concentration (pCl/mL):	38.094	
	Spike Volume Used in MS (mL);		
	Spike Volume Used in MSD (mL):		
	MS Aliquot (L, g, F):	0.812	
	MS Target Conc.(pCl/l², g, F):		
	MSD Aliquot (L, g, F):		
	MSD Target Conc. (pCi/L, g, F):		
	MS Spike Uncertainty (calculated):	0.460	
Г	MSD Spike Uncertainty (calculated):		
Γ	Sample Result:	0.541	
_	Sample Result 2 Sigma CSU (pCi/L, g, F):		
	Sample Matrix Spike Result:	7.488	
	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1,559	
	Sample Matrix Spike Duplicate Result:		
-	Matrix Spike Duplicate Result 2 Sigma CSU (pClff., g, F);		
	MS Numerical Performance Indicator:	-2.862	
	MSD Numerical Performance Indicator:		
	MS Percent Recovery:	74.07%	
	MSD Percent Recovery:		
	MS Status vs Numerical Indicator:	Warning	
	MSD Status vs Numerical Indicator:		
	MS Status vs Recovery:	Pass	
	MSD Status vs Recovery:		
_	MS/MSD Upper % Recovery Limits:		
_	MS/MSD Lower % Recovery Limits:	%09	

 	MSD Spike Uncertainty (calculate
SD56819	Sample Resi
/26/2020	Sample Result 2 Sigma CSU (pCi/L, g,
20-030	Sample Matrix Spike Resi
37.879	Matrix Spike Result 2 Sigma CSU (pCi/L, g,
0.10	Sample Matrix Spike Duplicate Resi
0.808	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/f., g.
4.689	MS Numerical Performance Indicat
0.230	MSD Numerical Performance Indicat
3,335	MS Percent Recove
0.858	MSD Percent Recove
-2.99	MS Status vs Numerical Indicat
1.12%	MSD Status vs Numerical Indicat
Ϋ́Х	MS Status vs Recove
Pass	MSD Status vs Recove
135%	MS/MSD Upper % Recovery Lim
%09	MS/MSD Lower % Recovery Limi

Duplicate Sample Assessment

 				_		_	_					
Enter Duplicate	sample IDs if	other than	LCS/LCSD in	the space below.								•
LCS56819	LCSD56819	4.010	1.026	3.335	0.858	<u>0</u>	0.890	18.20%	Pass	Pass	36%	
Sample (D.:	Duplicate Sample I.D.	Sample Result (pCl/L, g, F):	Sample Result 2 Sigma CSU (pCi/L, g, F):	Sample Duplicate Result (pCi/L, g, F):	Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	Are sample and/or duplicate results below RL?	Duplicate Numerical Performance Indicator:	(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	Duplicate Status vs Numerical Indicator:	Duplicate Status vs RPD:	% RPD Limit:	

Matrix Spike/Matrix Spike Luplicate Sample Assessment	
Sample I.D.	
Sample MS I.D.	
Sample MSD I.D.	
Sample Matrix Spike Result:	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	
Sample Matrix Spike Duplicate Result:	
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	
Duplicate Numerical Performance Indicator:	
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	
MS/ MSD Duplicate Status vs Numerical Indicator:	
MS/ MSD Duplicate Status vs RPD:	
## 000 %	

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:



Ra-228 NELAC DW2 Printed: 10/27/2020 8:03 AM

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60351578

Sampling Event: October 15, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 21, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 15th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	C	a	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER <2. 			X

Review Parameter			Criteria				Criteri Met?	
Sample-specific Parameters		o" response, li			as direction in ments.	Yes	No	NA
Equipment Blanks	Analyte ERB-04-CCR Radium-228 Total Radium pCi/L - Picocuries F	Conc 60351403	entration 0.584 pCi/L 1.48 pCi/L		ment blank.		X ¹	
Detection Limits Mets		Analyte Radium-226 Radium-226 Per Liter	2 sigma (co the spece Result (pCi/L) 0.309 0.261	σ) uncertainty	multiplied by on limit. MDC (pCi/L) 0.554 0.469		X ²	
Tracer and/or Carrier Recovery	The sample sp	ecific recover	ries were v	within the lab	oratory limits.	X		
Reporting	No reporting i considered neo		und and fu	urther qualific	cation was not	X		
Package Completeness	No results wer	re qualified as	unusable	and the data	are 100%	X		
		Comments						

^{1 -} The associated radium-228 and total radium results for sample ASH-04-CCR were reported at concentrations greater than the minimum detectable concentration (MDC) and reported at concentrations less than 5x the concentration of the blank contamination and were qualified as estimated (J+ be) to reflect the potential high bias indicated by the blank contamination.

< - Less Than pCi/L – Picocuries Per Liter DER – Duplicate Error Ratio

MS/MSD - Matrix Spike/Matrix Spike Duplicate

LCSD - Laboratory Control Sample Duplicate

≤ – Less Than or Equal To

 \pm – Plus or Minus/High or Low Bias

J-Estimated

 $MB-Method\ Blank$

NA - Not Applicable

 $\sigma-Sigma\;(Uncertainty)$

be - Equipment Blank Contamination LCS - Laboratory Control Sample MDC - Minimum Detectable Concentration

v - Compound Identification Issue

^{2 –} The associated results where the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported MDC were qualified as estimated (J v) indicating the detection limit criteria was not met.





November 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407

Dianton M. Wilson

Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351578001	ASH-03-CCR	Water	10/15/20 09:22	10/16/20 09:30
60351578002	ASH-07-CCR	Water	10/15/20 11:20	10/16/20 09:30
60351578003	ASH-04-CCR	Water	10/15/20 13:55	10/16/20 09:30
60351578004	ASH-07-CCR-MS	Water	10/15/20 11:20	10/16/20 09:30
60351578005	ASH-07-CCR-MSD	Water	10/15/20 11:20	10/16/20 09:30



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351578001	ASH-03-CCR	EPA 903.1	 MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351578002	ASH-07-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351578003	ASH-04-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351578004	ASH-07-CCR-MS	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60351578005	ASH-07-CCR-MSD	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Sample: ASH-03-CCR PWS:	Lab ID: 60351578 Site ID:	3001 Collected: 10/15/20 09:22 Sample Type:	Received:	10/16/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Serv	vices - Greensburg				
Radium-226	EPA 903.1	0.622 ± 0.463 (0.609) C:NA T:90%	pCi/L	11/05/20 12:44	13982-63-3	
	Pace Analytical Serv	vices - Greensburg				
Radium-228	EPA 904.0	0.289 ± 0.365 (0.775) C:79% T:89%	pCi/L	10/30/20 14:00	15262-20-1	
	Pace Analytical Serv	vices - Greensburg				
Total Radium	Total Radium Calculation	0.911 ± 0.828 (1.38)	pCi/L	11/05/20 14:26	7440-14-4	



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Sample: ASH-07-CCR PWS:	Lab ID: 6035157 Site ID:	78002 Collected: 10/15/20 11:20 Sample Type:	Received:	10/16/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Ser	rvices - Greensburg				
Radium-226	EPA 903.1	0.261 ± 0.297 (0.469) C:NA T:90%	pCi/L	11/05/20 12:44	13982-63-3	
	Pace Analytical Ser	rvices - Greensburg				
Radium-228	EPA 904.0	0.209 ± 0.350 (0.762) C:77% T:89%	pCi/L	10/30/20 14:00	15262-20-1	
	Pace Analytical Ser	rvices - Greensburg				
Total Radium	Total Radium Calculation	0.470 ± 0.647 (1.23)	pCi/L	11/05/20 14:26	7440-14-4	



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Sample: ASH-04-CCR PWS:	Lab ID: 603515 Site ID:	78003 Collected: 10/15/20 13:55 Sample Type:	Received:	10/16/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Se	ervices - Greensburg				
Radium-226	EPA 903.1	0.309 ± 0.351 (0.554) C:NA T:93%	pCi/L	11/05/20 12:44	13982-63-3	
	Pace Analytical Se	ervices - Greensburg				
Radium-228	EPA 904.0	1.52 ± 0.547 (0.796) C:77% T:86%	pCi/L	10/30/20 14:0	1 15262-20-1	
	Pace Analytical Se	ervices - Greensburg				
Total Radium	Total Radium Calculation	1.83 ± 0.898 (1.35)	pCi/L	11/05/20 14:26	7440-14-4	



Project: 60630103.200.0 PRPA CCR

EPA 904.0

Pace Project No.: 60351578

Radium-228

Lab ID: 60351578004 Sample: ASH-07-CCR-MS Collected: 10/15/20 11:20 Received: 10/16/20 09:30 Matrix: Water PWS: Site ID: Sample Type: Method Act ± Unc (MDC) Carr Trac Units CAS No. **Parameters** Analyzed Qual Pace Analytical Services - Greensburg EPA 903.1 90.61 %REC ± NA (NA) Radium-226 pCi/L 11/05/20 12:44 13982-63-3 C:NA T:NA% Pace Analytical Services - Greensburg

79.33 %REC ± NA (NA)

C:NA T:NA

pCi/L

10/30/20 14:01 15262-20-1



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Radium-228

Sample: ASH-07-CCR-MSD Lab ID: 60351578005 Collected: 10/15/20 11:20 Received: 10/16/20 09:30 Matrix: Water PWS: Site ID: Sample Type: Method Act ± Unc (MDC) Carr Trac Units CAS No. **Parameters** Analyzed Qual Pace Analytical Services - Greensburg EPA 903.1 106.64 %REC 16.25 RPD ± Radium-226 pCi/L 11/05/20 12:44 13982-63-3 NA (NA) C:NA T:NA%

79.98 %REC 0.82 RPD ±

pCi/L

10/30/20 14:01 15262-20-1

NA (NA) C:NA T:NA

Pace Analytical Services - Greensburg

EPA 904.0

(913)599-5665



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

QC Batch: 419095 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60351578001, 60351578002, 60351578003, 60351578004, 60351578005

METHOD BLANK: 2026059 Matrix: Water

Associated Lab Samples: 60351578001, 60351578002, 60351578003, 60351578004, 60351578005

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.256 ± 0.410 (0.890) C:75% T:73%
 pCi/L
 10/30/20 14:01

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

(913)599-5665



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

QC Batch: 419096 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60351578001, 60351578002, 60351578003, 60351578004, 60351578005

METHOD BLANK: 2026060 Matrix: Water

Associated Lab Samples: 60351578001, 60351578002, 60351578003, 60351578004, 60351578005

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 -0.130 ± 0.198 (0.520) C:NA T:88%
 pCi/L
 11/05/20 12:29

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



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 11/06/2020 09:52 AM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351578

Date: 11/06/2020 09:52 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351578001	ASH-03-CCR	EPA 903.1	419096		
60351578002	ASH-07-CCR	EPA 903.1	419096		
60351578003	ASH-04-CCR	EPA 903.1	419096		
60351578004	ASH-07-CCR-MS	EPA 903.1	419096		
60351578005	ASH-07-CCR-MSD	EPA 903.1	419096		
60351578001	ASH-03-CCR	EPA 904.0	419095		
60351578002	ASH-07-CCR	EPA 904.0	419095		
60351578003	ASH-04-CCR	EPA 904.0	419095		
60351578004	ASH-07-CCR-MS	EPA 904.0	419095		
60351578005	ASH-07-CCR-MSD	EPA 904.0	419095		
60351578001	ASH-03-CCR	Total Radium Calculation	421823		
60351578002	ASH-07-CCR	Total Radium Calculation	421823		
60351578003	ASH-04-CCR	Total Radium Calculation	421823		

CHAIN-OF-CUSTODY / Analytical Request Document

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

Face Analytical

Pace Project No./ Lab I.D. Semples Intact Semples Intact DRINKING WATER SAMPLE CONDITIONS F-ALL-Q-020rev.08, 12-Oct-2007 Custody Sealed Coolet (Y/V) OTHER 3 ğ \geq (MY) epi Received on GROUND WATER ₹/<u>></u>/ Page: Residual Chlorine (Y/N) O° ni qmeT REGULATORY AGENCY 8 RCRA 05130 TIME Requested Analysis Filtered (Y/N) ۵ 10-10-21 2/2/01 STATE Site Location NPDES DATE UST freshinger DATE Signed (MMIDDITY): ACCEPTED BY / AFFILIATION muibeA leto] 8SS-muibe> 322-muibe? taeT siaylsnA↓ N/A Same as Section A Other Accounts Payable Methanol Heather Wilson Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to tate charges of 1.5% per month of any involces first paid within 30 days _cO_sS_seN Preservatives Company Name: AECOM HOBN 11033, 42700 HCI nvoice Information; $ec{\mathbf{z}}$ HNO3 12/2 Reference: Pace Project Manager: Pace Profile #: *OS^zH 73 S Section C TIME Unpreserved Attention: Pace Quote Address: A. # OF CONTAINERS SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION 10/0/23 DATE 72:81 B22/01 12/20 02/21/B TIME 02/1 COMPOSITE END/GRAB 02/5/0/ DATE COLLECTED RELINQUISHED BY / AFFILIATION 20100 TIME COMPOSITE START 000 DATE 20py To: Brian Rothmeye Report To: Vasanta Kalluri Required Project Information: ē (G=GRAB C=COMP) SAMPLE TYPE े Jurchase Order No. 5 <u>.</u> **BUOD XIMTAM** Project Number Project Name: Section B Valid Matrix Codes MATRIX CODE かかな D の る B Town DRINKING WATER OF WASTE WASTE WATER WASTE WATER OF PRODUCT SOUGOLD 15H-07-06 P 144-03-CCR TOT - COIL-C Greenwood Village, CO 80111 brian.rothmeyer@aecom.com ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St SAMPLE 1D Section D Required Client Information (303) 740-2614 Section A Required Client Information: Requested Due Date/TAT: AECOM company: Email To: Page 14 of 16 ddress: hone; 9 ÷ 7 'n φ o 0 m ~ ILEM #

Quality Control Sample Performance Assessment

Pace Analytical

Method Blank Assessment

hted in Yellow.

30387693001 30387693001MS MS/MSD 2 10/13/2020

60351578002 60351578004 60351578005

MS/MSD 1 10/15/2020

20-032 32.183 0.20

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Alianyst mast manually Eliter All rields nignigined in	Sample Matrix Spike Control Assessment	Sample Collection Date:	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Spike I.D.:	MS/MSD Decay Corrected Spike Concentration (pCl/mL):	Spike Volume Used in MS (mL):	Spike Volume Used in MSD (mL):	MS Aliquot (L, g, F):	MS Target Conc.(pCi/L, g, F):	MSD Aliquot (L	MSD Target Conc. (pCi/L, g, F):	MS Spike Uncertainty (calculated):	N MSD Spike Uncertainty (calculated):	LCSD56847 Sample Result:	Sample Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Result:	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCl/L, q, F):	MS Numerical Performance Indicator;	MSD Numerical Performance Indicator:	MS Percent Recovery:	MSD Percent Recovery:	MS Status vs Numerical Indicator:	MSD Status vs Numerical Indicator:	MS Status vs Recovery:	MSD Status vs Recovery:	MS/MSD Upper % Recovery Limits:	1 20 20 20 20 20 20 20 20 20 20 20 20 20
Ra-226	MK1	10/27/2020	56847	Š			2026060	0.130	0.190	0.520	-1.34	Y/V	Pass		LCSD (Y or N)?	LCS56847	11/5/2020	20-032	32.182	0.10	0.656	4.908	0.231	4.620	0.842	-0.65	94.13%	K/Z	Pass	135%	730/
www.pacelabs.com	Analyst:	Date:	Batch ID:	Watrix:		ssessment	MB Sample ID	MB concentration:	M/B Counting Uncertainty:	MB MDC:	MB Numerical Performance Indicator;	MB Status vs Numerical Indicator:	MB Status vs. MDC:		rol Sample Assessment		Count Date:	Spike I.D.:	Spike Concentration (pCi/mL):	Volume Used (mL):	Aliquot Volume (L, g, F):	Target Conc. (pCi/L, g, F):	Uncertainty (Calculated):	Result (pCi/L, g, F):	LCS/LCSD Counting Uncertainty (pCi/L, g, F):	Numerical Performance Indicator:	Percent Recovery:	Status vs Numerical Indicator:	Status vs Recovery:	Upper % Recovery Limits:	Ower % Recovery Limite-

Laboratory Control Sample Asses:

123.23%

136% Pass Ϋ́

60351578002 60351578004 60351578005

9.156 1.260 10.949 1.337 -1.914 16.25% N/A Pass 32%

2.732

-0.042 0.142 11.886 1.541

20-032 32.183 0.20 0.20 0.656 0.656 0.461 0.471 0.261 0.261 0.266 9.156 1.337

0.455

Pass MSD Status vs Recovery. 135% MS/MSD Upper % Recovery Limits. 73% MS/MSD Lower % Recovery Limits:	Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D. Sample Ds if other Duplicate Sample MS I.D. Sample MS I.D. Sample MS I.D. LCS/LCSD in the space below. See Below ## Matrix Spike Duplicate Result Counting Uncertainty (pCI/L, g, F). Duplicate Numerical Performance Indicator: (Based on the Percent Recoveries) MS/ MSD Duplicate RPD. MS/ MSD Duplicate Status vs Numerical Indicator: MS/ MSD Duplicate Status vs RPD.
Status vs Recovery: Upper % Recovery Limits: Lower % Recovery Limits:	Duplicate Sample Assessment	Sample I.D.: Sample Result Counting Uncertainty (pCI/L, g, F): Sample Result Counting Uncertainty (pCI/L, g, F): Sample Duplicate Result Counting Uncertainty (pCI/L, g, F): Are sample and/or duplicate results below RL? Duplicate Numerical Performance Indicator: Duplicate RPD: Duplicate RPD: Duplicate RPD: Duplicate RPD: Duplicate RPD: RRDEDIINITE NREPLINITE

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

Ra-226 NELAC QC Printed: 11/5/2020 1:32 PM

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Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

		10000

Ra-228

Face Analytical"

Test Analyst Date:

Worklist Matrix:

MB concentration: M/B 2 Sigma CSU: MB MDC:

MB Status vs Numerical Indicator: MB Status vs. MDC:

MB Numerical Performance Indicator:

MB Sample ID

Method Blank Assessment

VAL		Sample Matrix Spike Control Assessment	1 GSW/SW	MS/MSD 2
10/28/2020		Sample Collection Date:	10/14/2020	10/15/2020
56846		Sample I.D.	30387694001	60351578002
ΜŢ		Sample MS I.D.	30387694001MS	60351578004
		Sample MSD I.D.		60351578005
		Spike I.D.:	20-030	20-030
2026059		MS/MSD Decay Corrected Spike Concentration (pCl/mt_):	38.029	38,029
0.256		Spike Volume Used in MS (mL):	0.20	0,20
0.410		Spike Volume Used in MSD (mL):		0.20
0,890		MS Aliquot (L, g, F):	0.808	0.814
1.22		MS Target Conc.(pCi/L, g, F):	9.419	9.349
Pass		MSD Aliquot (L, g, F):		0.817
Pass		MSD Target Conc. (pCi/L, g, F):		9.307
		MS Spike Uncertainty (calculated):	0.462	0.458
SSD (Y or N)?	z	MSD Spike Uncertainty (calculated):		0.456
LCS56846	LCSD56846	Sample Result:	0,015	0.209
10/30/2020		Sample Result 2 Sigma CSU (pCI/L, g, F):		0.350
20-030		Sample Matrix Spike Result:	7.063	7.625
37.829		Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.531	1.587
0.10		Sample Matrix Spike Duplicate Result:		7.653
0.818		Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.579
4.624		MS Numerical Performance Indicator:	-2.847	-2.244
0.227		MSD Numerical Performance Indicator:		-2.174
4.012		MS Percent Recovery:	74.82%	79.33%
1.007		MSD Percent Recovery:		79.98%
-1.16		MS Status vs Numerical Indicator:	Waming	Waming
86.77%		MSD Status vs Numerical Indicator:	•	Waming
M/A		MS Status vs Recovery:	Pass	Pass
Pass		MSD Status vs Recovery:		Pass
135%		MS/MSD Upper % Recovery Limits:		135%
80%		MS/MSD Lower % Becover I imite-	80%	80%

Laboratory Control Sample Assessment	LCSD (Y or N)?	Z	
	LCS56846	LCSD56846	
Count Date:	10/30/2020		
Spike I.D.:	20-030		*****
Decay Corrected Spike Concentration (pCi/mL):	37.829		
Volume Used (mL):	0.10		
Aliquot Volume (L, g, F):	0.818		
Target Conc. (pCi/L, g, F):	4.624		
Uncertainty (Calculated):	0.227		
Result (pCi/L, g, F):	4.012		
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.007		
Numerical Performance Indicator:	-1.16		
Percent Recovery:	86.77%		
Status vs Numerical Indicator:	ΝΑ		
Status vs Recovery:	Pass		
Upper % Recovery Limits:	135%		
Lower % Recovery Limits:	%09		
Dublicate Sample Assessment			Matrix S

	Matrix Spike/Matrix Spike Duplicate Sample Assessment	
Enter Duplicate	Sample I.D.	60351578002
sample IDs if	Sample MS I.D.	60351578004
other than	Sample MSD I.D.	60351578005
LCS/LCSD in	Sample Matrix Spike Result:	7.625
the space below.	Matrix Spike Result 2 Sigma CSU (pCiff_, g, F):	1.587
	Sample Matrix Spike Duplicate Result:	7.653
	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	1.579
	Duplicate Numerical Performance Indicator:	-0.025
	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	0.82%
	MS/ MSD Duplicate Status vs Numerical Indicator;	Pass
	MS/ MSD Duplicate Status vs RPD;	Pass
	% RPD Limit.	36%

See Below #

Duplicate Numerical Performance Indicator: Duplicate RPD: Duplicate Stafus vs Numerical Indicator:
Duplicate Stafus vs RPD:
% RPD Limit.

Sample I.D.:
Duplicate Sample I.D.:
Sample Result Sigma CSU (pCifl., g, F):
Sample Result Sigma CSU (pCifl., g, F):
Sample Duplicate Result Sigma CSU (pCifl., g, F):
Are sample and/or duplicate results below RL?

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

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Ra-228_56846_DW_W:xls Ra-228 (R086-8 04Sep2019).xls

Ra-228 NELAC DW2 Printed: 11/2/2020 8:56 AM

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60351615

Sampling Event: October 15, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 20, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 15th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
	Data are usable with qualification (noted below).
X	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter		Criteria								
Sample-specific Parameters		For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.								
Chain of Custody, Sample Identification, & Sample Receipt	Samples were recei degree Celsius upor				rature was	<6	X			
Holding Times	The samples were a times.	X								
Method Blanks (MB)	No target analytes i	eported in the	ne associat	ed MB.			X			
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recacceptance limits.	coveries wer	e within th	e laborat	ory determ	ined	X			
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and spike and matrix sp laboratory-determin	ike duplicate	e analyses							
	concentration of the not considered to be Further action with	Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.						X^1		
	Analyte	MS/MSD (%)	Limits (%)	RPD (%)	Limits (%)					
	ASH-07-CCR									
	Chromium	74/74	75-125	0	20					
	% – Percent MS/MSD – Matrix Spike/ M RPD – Relative Percent Dif	Fluoride 0/0 80-120 0 15 % – Percent MS/MSD – Matrix Spike/ Matrix Spike Duplicate RPD – Relative Percent Difference Bold indicates a value that is outside of acceptance limits.								

Review Parameter	Criteria		riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%.			X
	• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%. 			X
	• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte Concentration		X ²	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.		X^3	
Package Completeness	No results were qualified as unusable and the data are 100% complete.		X ⁴	

Comments

1 – As the potential bias implied by the MS/MSD recoveries were considered to be low, the associated chromium result for sample ASH-07-CCR was qualified as estimated (UJ- m).

As the potential bias implied by the MS/MSD recoveries were considered to be low for fluoride, and as the MS/MSD percent recoveries were less than the rejection limit of 30% for inorganics, the associated non-detect fluoride result for sample ASH-06-CCR was qualified as unusable (R).

- 2 As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.
- 3 Several analytes were reported as non-detect at elevated reporting limits. These non-detect results will need to be evaluated by the end user of the data with respect to project objectives.

Review	Criteria	C	riteri	ia
Parameter			Met?	
Sample-specific	For each "No" response, list qualified data and bias direction in	Yes	No	NA
Parameters	Table 1 or explain no qualification in comments.			

4 – With the exception of the non-detect fluoride result for sample ASH-07-CCR, which was qualified as unusable as the MS/MSD recoveries were below the rejection limit of 30% for inorganics, the results are usable as qualified for the project objective. The data are 98% complete.

> — Greater Than ± — Plus or Minus/High or Low Bias LCS — Laboratory Control Sample MB — Method Blank R — Unusable

TDS - Total Dissolved Solids

< - Less Than % - Percent

LCSD – Laboratory Control Sample Duplicate
MS/MSD – Matrix Spike/Matrix Spike Duplicate

RL – Reporting Limit UJ – Estimated ≤ – Less Than or Equal To mg/L – Milligram per Liter m – Matrix Spike Recovery NA – Not Applicable

RPD – Relative Percent Difference





November 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Charles M. Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070



SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
60351615001	ASH-03-CCR	Water	10/15/20 09:22	10/16/20 10:20	
60351615002	ASH-07-CCR	Water	10/15/20 11:20	10/16/20 10:20	
60351615003	ASH-04-CCR	Water	10/15/20 13:55	10/16/20 10:20	



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351615001	ASH-03-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	VRP	3	PASI-K
60351615002	ASH-07-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	VRP	3	PASI-K
60351615003	ASH-04-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	VRP	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Date: 11/06/2020 03:33 PM

Sample: ASH-03-CCR	Lab ID: 6035	1615001	Collected: 10/15/2	20 09:22	Received: 10)/16/20 10:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	782	ug/L	100	1	11/04/20 14:50	11/05/20 20:56	7440-42-8	
Calcium	445000	ug/L	200	1	11/04/20 14:50	11/06/20 12:18	7440-70-2	
ithium	374	ug/L	10.0	1	11/04/20 14:50	11/05/20 20:56	7439-93-2	
020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-38-2	D3
Barium	8.6	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 17:54	7440-41-7	D3
admium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 17:54	7440-43-9	D3
Chromium	8.4	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-47-3	
Cobalt	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-48-4	D3
.ead	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7439-92-1	D3
Nolybdenum	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7439-98-7	D3
Selenium	114	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7782-49-2	
hallium	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-28-0	D3
470 Mercury	Analytical Meth	od: EPA 74	170 Preparation Met	hod: EP	A 7470			
·	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	10/21/20 14:27	10/22/20 10:54	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 25	40C					
	Pace Analytical							
Total Dissolved Solids	5400	mg/L	125	1		10/21/20 09:38		
056 IC Anions	Analytical Meth	od: EPA 90	056					
	Pace Analytical	Services -	Kansas City					
Chloride	90.5	mg/L	10.0	10		10/30/20 21:04	16887-00-6	
Fluoride	ND	mg/L	0.20	1		10/30/20 20:48		
Sulfate	3290	mg/L	500	500		10/30/20 21:20		



ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Date: 11/06/2020 03:33 PM

Sample: ASH-07-CCR	Lab ID: 6035	1615002	Collected: 10/15/2	20 11:20	Received: 10)/16/20 10:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	110 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	766	ug/L	100	1	11/04/20 14:50	11/05/20 20:59	7440-42-8	
Calcium	413000	ug/L	1000	5	11/04/20 14:50	11/06/20 12:32	7440-70-2	M1
_ithium	494	ug/L	10.0	1	11/04/20 14:50	11/05/20 20:59	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-38-2	D3
Barium	13.0	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 18:03	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 18:03	7440-43-9	D3
Chromium	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-47-3	D3,M1
Cobalt	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-48-4	D3
ead	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7439-92-1	D3
Molybdenum	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7439-98-7	D3
Selenium	183	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7782-49-2	
Thallium	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-28-0	D3
7470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	10/21/20 14:27	10/22/20 11:01	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C					
	Pace Analytical	Services -	Kansas City					
Total Dissolved Solids	8140	mg/L	143	1		10/21/20 09:38		
9056 IC Anions	Analytical Meth	od: EPA 90	956					
	Pace Analytical	Services -	Kansas City					
Chloride	197	mg/L	10.0	10		10/30/20 21:37	16887-00-6	
Fluoride	ND	mg/L	0.20	1		10/30/20 23:13		M1
Sulfate	4390	mg/L	500	500		10/31/20 00:18		



ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Date: 11/06/2020 03:33 PM

Sample: ASH-04-CCR	Lab ID: 6035	51615003	Collected: 1	0/15/2	0 13:55	Received: 1	0/16/20 10:20 I	Matrix: Water	
Parameters	Results	Units	Report L	imit _	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation	n Meth	od: EPA	3010			
	Pace Analytical	Services -	Kansas City						
Boron	640	ug/L		100	1	11/04/20 14:50	11/05/20 21:08	7440-42-8	
Calcium	446000	ug/L		200	1	11/04/20 14:50	11/06/20 12:39	7440-70-2	
Lithium	341	ug/L		10.0	1	11/04/20 14:50	11/05/20 21:08	7439-93-2	
6020 MET ICPMS	Analytical Meth	od: EPA 60)20 Preparation	n Meth	od: EPA	3010			
	Pace Analytical	Services -	Kansas City						
Antimony	ND	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7440-36-0	D3
Arsenic	ND	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7440-38-2	D3
Barium	13.5	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7440-39-3	
Beryllium	ND	ug/L		1.5	3	11/02/20 13:57	11/04/20 18:17	7440-41-7	D3
Cadmium	ND	ug/L		1.5	3	11/02/20 13:57	11/04/20 18:17	7440-43-9	D3
Chromium	ND	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7440-47-3	D3
Cobalt	ND	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7440-48-4	D3
_ead	ND	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7439-92-1	D3
Molybdenum	ND	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7439-98-7	D3
Selenium	95.5	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7782-49-2	
Γhallium	ND	ug/L		3.0	3	11/02/20 13:57	11/04/20 18:17	7440-28-0	D3
7470 Mercury	Analytical Meth	od: EPA 74	170 Preparation	n Meth	od: EPA	7470			
	Pace Analytical	Services -	Kansas City						
Mercury	ND	ug/L		0.20	1	10/21/20 14:27	7 10/22/20 11:08	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 25	40C						
	Pace Analytical								
Total Dissolved Solids	5840	mg/L		125	1		10/21/20 09:39)	
9056 IC Anions	Analytical Meth	od: EPA 90)56						
	Pace Analytical	Services -	Kansas City						
Chloride	211	mg/L	:	50.0	50		10/31/20 02:11	16887-00-6	
Fluoride	0.29	mg/L		0.20	1		10/31/20 01:55		
Sulfate	3340	mg/L		500	500		10/31/20 02:27		



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Date: 11/06/2020 03:33 PM

QC Batch: 684295 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2766148 Matrix: Water

Associated Lab Samples: 60351615001, 60351615002, 60351615003

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 10/22/20 10:33

LABORATORY CONTROL SAMPLE: 2766149

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury 5.0 100 80-120 ug/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2766150 2766151

MSD MS 60351615002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Result Result % Rec **RPD** RPD Result Conc. % Rec Limits Qual ND 5 20 Mercury ug/L 5 4.6 4.4 92 89 75-125

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2766152 2766153

MS MSD 60351697001 MS MSD MS MSD % Rec Spike Spike Max **RPD** RPD Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits Qual ND 5 5 4.8 4.8 Mercury 96 96 75-125 0 20 ug/L

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

LABORATORY CONTROL SAMPLE:

Date: 11/06/2020 03:33 PM

QC Batch: 687198 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2777117 Matrix: Water

Associated Lab Samples: 60351615001, 60351615002, 60351615003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	11/05/20 20:41	
Calcium	ug/L	ND	200	11/06/20 11:59	
Lithium	ua/L	ND	10.0	11/05/20 20:41	

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 1000 Boron 958 96 80-120 ug/L

 Boron
 ug/L
 1000
 958
 96
 80-120

 Calcium
 ug/L
 10000
 9890
 99
 80-120

 Lithium
 ug/L
 1000
 959
 96
 80-120

MATRIX SPIKE & MATRIX SF	PIKE DUPLI	CATE: 2777	119		2777120							
			MS	MSD								
	(60351615002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	766	1000	1000	1730	1730	96	96	75-125	0	20	
Calcium	ug/L	413000	10000	10000	477000	468000	634	550	75-125	2	20	M1
Lithium	ug/L	494	1000	1000	1420	1440	93	94	75-125	1	20	

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Date: 11/06/2020 03:33 PM

QC Batch: 686632 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2775263 Matrix: Water

Associated Lab Samples: 60351615001, 60351615002, 60351615003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	11/04/20 17:22	
Arsenic	ug/L	ND	1.0	11/04/20 17:22	
Barium	ug/L	ND	1.0	11/04/20 17:22	
Beryllium	ug/L	ND	0.50	11/04/20 17:22	
Cadmium	ug/L	ND	0.50	11/04/20 17:22	
Chromium	ug/L	ND	1.0	11/04/20 17:22	
Cobalt	ug/L	ND	1.0	11/04/20 17:22	
Lead	ug/L	ND	1.0	11/04/20 17:22	
Molybdenum	ug/L	ND	1.0	11/04/20 17:22	
Selenium	ug/L	ND	1.0	11/04/20 17:22	
Thallium	ug/L	ND	1.0	11/04/20 17:22	

LABORATORY CONTROL SAMPLE:	2775264					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	37.1	93	80-120	
Arsenic	ug/L	40	36.6	92	80-120	
Barium	ug/L	40	36.0	90	80-120	
Beryllium	ug/L	40	36.8	92	80-120	
Cadmium	ug/L	40	37.0	92	80-120	
Chromium	ug/L	40	37.8	95	80-120	
Cobalt	ug/L	40	36.8	92	80-120	
Lead	ug/L	40	36.8	92	80-120	
Molybdenum	ug/L	40	37.7	94	80-120	
Selenium	ug/L	40	36.8	92	80-120	
Thallium	ug/L	40	35.7	89	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLI	CATE: 2775		1400	2775266							
	ú	60351615002	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	37.3	37.3	93	93	75-125	0	20	
Arsenic	ug/L	ND	40	40	39.8	39.5	97	96	75-125	1	20	
Barium	ug/L	13.0	40	40	51.7	51.6	97	96	75-125	0	20	
Beryllium	ug/L	ND	40	40	32.1	32.7	80	82	75-125	2	20	
Cadmium	ug/L	ND	40	40	34.4	34.1	86	85	75-125	1	20	
Chromium	ug/L	ND	40	40	30.0	30.0	74	74	75-125	0	20	M1

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

(913)599-5665



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Date: 11/06/2020 03:33 PM

MATRIX SPIKE & MATRIX	SPIKE DUPLI	CATE: 2775	265		2775266							
	(60351615002	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cobalt	ug/L	ND	40	40	40.2	40.0	99	99	75-125	0	20	
Lead	ug/L	ND	40	40	34.4	34.2	86	85	75-125	1	20	
Molybdenum	ug/L	ND	40	40	47.6	47.4	115	114	75-125	0	20	
Selenium	ug/L	183	40	40	223	225	100	106	75-125	1	20	
Thallium	ug/L	ND	40	40	34.7	34.4	87	86	75-125	1	20	

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

QC Batch: 684213 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2765866 Matrix: Water

Associated Lab Samples: 60351615001, 60351615002, 60351615003

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 10/21/20 09:38

LABORATORY CONTROL SAMPLE: 2765867

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units **Total Dissolved Solids** mg/L 1000 1000 100 80-120

SAMPLE DUPLICATE: 2765868

 Parameter
 Units
 60351615002 Result
 Dup Result
 Max RPD
 RPD
 Qualifiers

 Total Dissolved Solids
 mg/L
 8140
 8190
 1
 10

SAMPLE DUPLICATE: 2765869

Date: 11/06/2020 03:33 PM

60351697001 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 3720 mg/L 3510 6 10

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

QC Batch: 686196 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2773545 Matrix: Water

Associated Lab Samples: 60351615001, 60351615002, 60351615003

Blank Reporting Qualifiers Parameter Units Result Limit Analyzed Chloride mg/L ND 1.0 10/30/20 09:12 Fluoride mg/L ND 0.20 10/30/20 09:12 Sulfate mg/L ND 10/30/20 09:12 1.0

METHOD BLANK: 2775058 Matrix: Water

Associated Lab Samples: 60351615001, 60351615002, 60351615003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/02/20 16:54	
Fluoride	mg/L	ND	0.20	11/02/20 16:54	
Sulfate	mg/L	ND	1.0	11/02/20 16:54	

LABORATORY CONTROL SAMPLE: 2773546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	102	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.1	103	80-120	

LABORATORY CONTROL SAMPLE: 2775059

Date: 11/06/2020 03:33 PM

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L		4.9	99	80-120	
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773548 2773549

Parameter	Units	60351615002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	197	50	50	249	254	102	113	80-120	2	15	E
Fluoride	mg/L	ND	2.5	2.5	ND	ND	0	0	80-120		15	M1
Sulfate	mg/L	4390	2500	2500	7180	7200	112	113	80-120	0	15	

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Date: 11/06/2020 03:33 PM

SAMPLE DUPLICATE: 2773555

Parameter	Units	60351615002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L		193		15	
Fluoride	mg/L	ND	ND		15	
Sulfate	mg/L	4390	4410	1	15	

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



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 11/06/2020 03:33 PM

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351615

Date: 11/06/2020 03:33 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351615001	ASH-03-CCR	EPA 3010	687198	EPA 6010	687268
60351615002	ASH-07-CCR	EPA 3010	687198	EPA 6010	687268
60351615003	ASH-04-CCR	EPA 3010	687198	EPA 6010	687268
60351615001	ASH-03-CCR	EPA 3010	686632	EPA 6020	686669
60351615002	ASH-07-CCR	EPA 3010	686632	EPA 6020	686669
60351615003	ASH-04-CCR	EPA 3010	686632	EPA 6020	686669
60351615001	ASH-03-CCR	EPA 7470	684295	EPA 7470	684520
60351615002	ASH-07-CCR	EPA 7470	684295	EPA 7470	684520
60351615003	ASH-04-CCR	EPA 7470	684295	EPA 7470	684520
60351615001	ASH-03-CCR	SM 2540C	684213		
60351615002	ASH-07-CCR	SM 2540C	684213		
60351615003	ASH-04-CCR	SM 2540C	684213		
60351615001	ASH-03-CCR	EPA 9056	686196		
60351615002	ASH-07-CCR	EPA 9056	686196		
60351615003	ASH-04-CCR	EPA 9056	686196		



Sample Condition Upon Receipt ESI Tech Spec Client



Client Name: DECOL			
Courier: FedEx D UPS	PEX 🗆 ECI 🛭	□ Pace □ Xroads	□ Client □ Other □
Tracking #: 1908 1013 10 1095 10 Pac	e Shipping Labe	l Used? Yes □ No □	o de la companya della companya della companya de la companya della companya dell
Custody Seal on Cooler/Box Present: Yes ☑ No □	Seals intact: `	Yes' No □	
Packing Material: Bubble Wrap □ Bubble Bags □	□ Foan	m □ None □	Other & ZALC
Thermometer Used: 1399 Typ	e of Ice: Wet	Blue None	
Cooler Temperature (°C): As-read D.S Corr. Fact	or to . 2 co	orrected 577	Date and initials of person examining contents: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Temperature should be above freezing to 6°C			
Chain of Custody present:	¥Yes □No □	□N/A	
Chain of Custody relinquished:	ØYes □No □	□N/A	
Samples arrived within holding time:	Yes No D	□N/A	
Short Hold Time analyses (<72hr):	□Yes ②No □	□N/A	
Rush Turn Around Time requested:	□Yes □No □	□n/a	
Sufficient volume:	Øyes □No □	□N/A	
Correct containers used:	ŬYes □No □	JN/A	
Pace containers used:	∭Yes □No □	□N/A	
Containers intact:	ØYes □No □	∃N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No 🕏	Ín/a	
Filtered volume received for dissolved tests?	□Yes □No	II N/A	and the grant was bed from the
Sample labels match COC: Date / time / ID / analyses	ÚYes □No □	□N/A	
Samples contain multiple phases? Matrix:		□N/A	
Containers requiring pH preservation in compliance? (HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	⊭KÚYes □No □	N/A List sample IDs, voldate/time added.	umes, lot #'s of preservative and the
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	□Yes □No		
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No		
Trip Blank present:	□Yes □No Ø	In/a	7
Headspace in VOA vials (>6mm):		TN/A	PART NEW YORK OF THE PART NEW
Samples from USDA Regulated Area: State:	□Yes □No □	In/A	
Additional labels attached to 5035A / TX1005 vials in the field?	□Yes □No □	IN/A	
Client Notification/ Resolution: Copy COC to 0			red? Y / N
Person Contacted: Date/Tii	me:		Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck
Comments/ Resolution:			sample temps.
			Start: 1252 Start:
Project Manager Review:		Date:	End: 1300 End:

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section C

Section B

Required Client Information

Pace Analytical

Pace Project No./ Lab I.D. DRINKING WATER Samples Intact (V/V) 100351W15 SAMPLE CONDITIONS OTHER οţ Cooler (Y/N) Custody Sealed Ice (Y/N) GROUND WATER Received on Page: Residual Chlorine (Y/N) 10 Temp in °C REGULATORY AGENCY 00 RCRA Requested Analysis Filtered (Y/N) TIME 000 STATE: 02/5/01 Site Location NPDES 14/6/32 DATE UST 5240C LDS 7470 Total Mercury K DATE Signed (MM/DD/YY): **alataM latoT 0108 Pale ACCEPTED BY / AFFILIATION *slateM letaT 0208 tacham 8028 CI' E' 204 N/A Analysis Test E Brocket Same as Section A Other Accounts Payable Heather Wilson Nethanol Preservatives Na₂S₂O₃ AECOM 11033, 3 NaOH 42700 HCI Invoice Information: Ses de Company Name: HNO³ Reference: Pace Project Manager: Pace Profile #: [†]OS^ZH ace Quote Address Unpreserved TIME # OF CONTAINERS 6 SAMPLER NAME AND SIGNATURE SAMPLE TEMP AT COLLECTION PRINT Name of SAMPLER: SIGNATURE of SAMPLER: DATE 78:51 oc/8/01 TIME 226 02/10/b) 02/1 02/5/h COMPOSITE END/GRAB COLLECTED 60630103 RELINQUISHED BY / AFFILIATION Project Name: PRPA Rawhide CCR TIME COMPOSITE Sopy To: Brian Rothmeyer DATE Report To: Vasanta Kalluri Required Project Information: (G=GRAB C=COMP) SAMPLE TYPE urchase Order No. Project Number: (see valid codes to left) MATRIX CODE Valid Matrix Codes DRINKING WATER DW WATER WT WASTE WATER WWW PRODUCT P SOLLSOLID SL SL OL OT AR AR TS ms/mess & As Hog 154-03-CCR かりつかしのか 177-40-1 OIL WIPE AIR OTHER TISSUE Greenwood Village, CO 80111 brian.rothmeyer@aecom.com ADDITIONAL COMMENTS 6200 South Quebec St (A-Z, 0-97,.-) Sample IDs MUST BE UNIQUE Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb SAMPLE ID Section D Required Client Information (303) 740-2614 Requested Due Date/TAT: AECOM Company. mail To: ddress hone B, Ca, Li Page 18 of 18 # Mati N 4 w 9 10 m 1 00 6 Ξ 12

F-ALL-Q-020rev 08, 12-Oct-2007

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1,5% per month of any invoices not paid within 30 days.

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60351700

Sampling Event: October 16, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 20, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 16th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria		riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	 The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL. 			Х

Review	Criteria		riteri	
Parameter			Met?	
Sample-specific	For each "No" response, list qualified data and bias direction in	Yes	No	NA
Parameters	Table 1 or explain no qualification in comments.			
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below:			
	• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.			X
	• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte Concentration		X^1	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.		X^2	
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		
	Comments			

1 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

^{2 –} Several analytes were reported as non-detect at elevated reporting limits. These non-detect results will need to be evaluated by the end user of the data with respect to project objectives.

> - Greater Than

^{% -} Percent

LCSD – Laboratory Control Sample Duplicate

NA – Not Applicable TDS – Total Dissolved Solids

< - Less Than mg/L – Milligram per Liter MB – Method Blank

 $RL-Reporting\ Limit$

^{≤ –} Less Than or Equal To LCS – Laboratory Control Sample

MS/MSD – Matrix Spike/Matrix Spike Duplicate RPD – Relative Percent Difference





November 09, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 17, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Charles M. Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070





SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351700001	ASH-06-CCR	Water	10/16/20 09:00	10/17/20 08:35



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351700001	ASH-06-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	VRP	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Date: 11/09/2020 04:19 PM

Sample: ASH-06-CCR	Lab ID: 6035	51700001	Collected: 10/16/2	0 09:00	Received: 10)/17/20 08:35 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	010 Preparation Meth	od: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Boron	312	ug/L	100	1	11/04/20 16:48	11/05/20 20:08	7440-42-8	
Calcium	24500	ug/L	200	1	11/04/20 16:48	11/05/20 20:08	7440-70-2	
Lithium	51.6	ug/L	10.0	1	11/04/20 16:48	11/05/20 20:08	7439-93-2	
020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Meth	od: EP	A 3010			
	Pace Analytical	Services -	Kansas City					
Antimony	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-38-2	D3
Barium	47.7	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/03/20 11:15	11/07/20 17:33	7440-41-7	D3
admium	ND	ug/L	1.5	3	11/03/20 11:15	11/07/20 17:33	7440-43-9	D3
Chromium	5.1	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-47-3	
Cobalt	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-48-4	D3
.ead	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7439-92-1	D3
/lolybdenum	17.7	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7439-98-7	
Selenium	27.6	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7782-49-2	
-hallium	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-28-0	D3
470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Meth	od: EP	A 7470			
	Pace Analytical	Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	10/21/20 14:27	10/22/20 11:19	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 25	40C					
	Pace Analytical	Services -	Kansas City					
Total Dissolved Solids	417	mg/L	10.0	1		10/21/20 09:41		
0056 IC Anions	Analytical Meth	od: EPA 90	056					
	Pace Analytical	Services -	Kansas City					
Chloride	7.7	mg/L	1.0	1		10/31/20 02:43	16887-00-6	
Fluoride	0.84	mg/L	0.20	1		10/31/20 02:43		
Sulfate	82.8	mg/L	10.0	10		10/31/20 03:00		



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Date: 11/09/2020 04:19 PM

QC Batch: 684295 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351700001

METHOD BLANK: 2766148 Matrix: Water

Associated Lab Samples: 60351700001

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 10/22/20 10:33

LABORATORY CONTROL SAMPLE: 2766149

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury 5.0 100 80-120 ug/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2766150 2766151

MSD MS 60351615002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Result Result % Rec % Rec **RPD** RPD Result Conc. Limits Qual

Mercury ug/L ND 5 5 4.6 4.4 92 89 75-125 4 20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2766152 2766153

MS MSD 60351697001 MS MSD MS MSD Spike Spike % Rec Max **RPD** RPD Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits Qual ND 5 5 4.8 4.8 96 20 Mercury 96 75-125 0 ug/L

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

QC Batch: 687269 QC Batch Method: EPA 3010 Analysis Method: EPA 6010

Analysis Description: 6010 MET Laboratory: Pace Analysis

Pace Analytical Services - Kansas City

Associated Lab Samples: 60351700001

METHOD BLANK: 2777327

Date: 11/09/2020 04:19 PM

Matrix: Water

Associated Lab Samples: 60351700001

 Parameter
 Units
 Blank Reporting Result
 Limit
 Analyzed
 Qualifiers

 ug/L
 ND
 100
 11/05/20 19:53
 41/06/20 13:33

 Boron
 ug/L
 ND
 100
 11/05/20 19:53

 Calcium
 ug/L
 ND
 200
 11/06/20 13:33

 Lithium
 ug/L
 ND
 10.0
 11/05/20 19:53

LABORATORY CONTROL SAMPLE: 2777328

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Boron 1000 959 96 80-120 ug/L 10000 9930 Calcium ug/L 99 80-120 Lithium ug/L 1000 976 98 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2777329 2777330 MS MSD 60351697001 MSD MSD Spike Spike MS MS % Rec Max Qual Parameter Conc. Result % Rec % Rec **RPD** RPD Units Result Conc. Result Limits ug/L 1400 20 Boron ND 1000 1000 1500 112 102 75-125 Calcium 374000 10000 378000 373000 ug/L 10000 41 -10 75-125 20 M1 1 Lithium ug/L 172 1000 1000 1250 1170 107 100 75-125 6 20

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

QC Batch: 686726 QC Batch Method: EPA 3010 Analysis Method: EPA 6020

Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351700001

METHOD BLANK: 2775521

Date: 11/09/2020 04:19 PM

Matrix: Water

Associated Lab Samples: 60351700001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
	_				
Antimony	ug/L	ND	1.0	11/07/20 16:40	
Arsenic	ug/L	ND	1.0	11/07/20 16:40	
Barium	ug/L	ND	1.0	11/07/20 16:40	
Beryllium	ug/L	ND	0.50	11/07/20 16:40	
Cadmium	ug/L	ND	0.50	11/07/20 16:40	
Chromium	ug/L	ND	1.0	11/07/20 16:40	
Cobalt	ug/L	ND	1.0	11/07/20 16:40	
Lead	ug/L	ND	1.0	11/07/20 16:40	
Molybdenum	ug/L	ND	1.0	11/07/20 16:40	
Selenium	ug/L	ND	1.0	11/07/20 16:40	
Thallium	ug/L	ND	1.0	11/07/20 16:40	

LABORATORY CONTROL SAMPLE:	2775522					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	38.3	96	80-120	
Arsenic	ug/L	40	38.9	97	80-120	
Barium	ug/L	40	37.4	93	80-120	
Beryllium	ug/L	40	38.1	95	80-120	
Cadmium	ug/L	40	37.6	94	80-120	
Chromium	ug/L	40	37.4	93	80-120	
Cobalt	ug/L	40	38.1	95	80-120	
Lead	ug/L	40	37.1	93	80-120	
Molybdenum	ug/L	40	39.9	100	80-120	
Selenium	ug/L	40	37.6	94	80-120	
Thallium	ug/L	40	36.2	90	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 2775			2775524							
	G	60351697001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	37.5	38.2	94	95	75-125	2	20	
Arsenic	ug/L	ND	40	40	39.4	40.3	97	100	75-125	2	20	
Barium	ug/L	18.3	40	40	54.8	56.5	91	95	75-125	3	20	
Beryllium	ug/L	ND	40	40	35.0	35.4	87	88	75-125	1	20	
Cadmium	ug/L	ND	40	40	35.6	36.4	89	91	75-125	2	20	
Chromium	ug/L	ND	40	40	33.7	34.8	83	86	75-125	3	20	

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Date: 11/09/2020 04:19 PM

MATRIX SPIKE & MATRIX	SPIKE DUPLI	CATE: 2775	523		2775524							
Danasadas		60351697001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec	DDD	Max	01
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cobalt	ug/L	ND	40	40	36.9	37.9	92	94	75-125	3	20	
Lead	ug/L	ND	40	40	37.4	38.5	93	96	75-125	3	20	
Molybdenum	ug/L	3.2	40	40	45.3	45.9	105	107	75-125	1	20	
Selenium	ug/L	ND	40	40	37.1	37.2	92	93	75-125	0	20	
Thallium	ug/L	ND	40	40	36.1	37.3	90	93	75-125	3	20	

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



QUALITY CONTROL DATA

SM 2540C

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

QC Batch: 684213 Analysis Method:

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351700001

METHOD BLANK: 2765866 Matrix: Water

Associated Lab Samples: 60351700001

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 10/21/20 09:38

LABORATORY CONTROL SAMPLE: 2765867

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units **Total Dissolved Solids** mg/L 1000 1000 100 80-120

SAMPLE DUPLICATE: 2765868

 Parameter
 Units
 60351615002 Result
 Dup Result
 Max RPD
 RPD
 Qualifiers

 Total Dissolved Solids
 mg/L
 8140
 8190
 1
 10

SAMPLE DUPLICATE: 2765869

Date: 11/09/2020 04:19 PM

60351697001 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 3720 3510 10 mg/L 6

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

QC Batch: 686196 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351700001

METHOD BLANK: 2773545 Matrix: Water

Associated Lab Samples: 60351700001

Blank Reporting Units Limit Qualifiers Parameter Result Analyzed Chloride mg/L ND 1.0 10/30/20 09:12 Fluoride mg/L ND 0.20 10/30/20 09:12 Sulfate mg/L ND 10/30/20 09:12 1.0

METHOD BLANK: 2775058 Matrix: Water

Associated Lab Samples: 60351700001

Date: 11/09/2020 04:19 PM

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/02/20 16:54	
Fluoride	mg/L	ND	0.20	11/02/20 16:54	
Sulfate	mg/L	ND	1.0	11/02/20 16:54	

LABORATORY CONTROL SAMPLE:	2773546					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		5.1	102	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.1	103	80-120	

LABORATORY CONTROL SAMPLE:	2775059					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	4.9	99	80-120	_
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SP	2773549											
			MS	MSD								
		60351615002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	197	50	50	249	254	102	113	80-120	2	15	E
Fluoride	mg/L	ND	2.5	2.5	ND	ND	0	0	80-120		15	M1
Sulfate	mg/L	4390	2500	2500	7180	7200	112	113	80-120	0	15	

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



QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Date: 11/09/2020 04:19 PM

SAMPLE DUPLICATE: 2773555

Parameter	Units	60351615002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	197	193	2	15	
Fluoride	mg/L	ND	ND		15	
Sulfate	mg/L	4390	4410	1	15	

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



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 11/09/2020 04:19 PM

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60351700

Date: 11/09/2020 04:19 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351700001	ASH-06-CCR	EPA 3010	687269	EPA 6010	687361
60351700001	ASH-06-CCR	EPA 3010	686726	EPA 6020	686968
60351700001	ASH-06-CCR	EPA 7470	684295	EPA 7470	684520
60351700001	ASH-06-CCR	SM 2540C	684213		
60351700001	ASH-06-CCR	EPA 9056	686196		



Sample Condition Upon Receipt



Client Name: A=CO/M		
Courier: FedEx UPS UPS VIA Clay	PEX 🗆 ECI 🗆	Pace □ Xroads □ Client □ Other □
Tracking #: 408 6736 0430 Page	ce Shipping Label U	sed? Yes □ No.□
Custody Seal on Cooler/Box Present: Yes ☐ No ☐	Seals intact: Yes	No □
Packing Material: Bubble Wrap □ Bubble Bags I	□ Foam □	None Other 2 PCC
	fice: Wet Blue	
Cooler Temperature (°C): As-read 17 Corr. Fact	tor <u>-0,4</u> Corr	ected (Date and initials of person examining contents:
Temperature should be above freezing to 6°C		10-17-20 KP
Chain of Custody present:	Yes ONO ON	Α
Chain of Custody relinquished:	Yes ONO ON	Α
Samples arrived within holding time:	Yes No No	A
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/	Α
Rush Turn Around Time requested:	□Yes □No □N/	А
Sufficient volume:	✓Yes □No □N/	А
Correct containers used:	ØYes □No □N/	Α
Pace containers used:	ZYes □No □N/	А
Containers intact:	Áyes □No □N/	А
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No □N/	А
Filtered volume received for dissolved tests?	□Yes □No ☑N/	Α
Sample labels match COC: Date / time / ID / analyses	Øyes □No □N/	Α
Samples contain multiple phases? Matrix: WT	□Yes □N/	Α
Containers requiring pH preservation in compliance?	Yes No N	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT#	603172	date/lime added.
Cyanide water sample checks:	<u> </u>	7
Lead acetate strip turns dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	□Yes □No ☑N/	A
Headspace in VOA vials (>6mm);	☐Yes ☐No ☐NT	<u> </u>
Samples from USDA Regulated Area: State:	□Yes □No ☑N/	A .
Additional labels attached to 5035A / TX1005 vials in the field?	? 🗆 Yes 🗆 No 🗖 N/	A .
Client Notification/ Resolution: Copy COC to	Client? Y / N	Field Data Required? Y / N
Person Contacted: Date/T	ime:	 :
Comments/ Resolution:		
Project Manager Review:	D	ate:

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Project No./ Lab I.D. DRINKING WATER SAMPLE CONDITIONS OTHER ō GROUND WATER Page: Residual Chlorine (Y/N) REGULATORY AGENCY 00 RCRA 12-13-0835 Requested Analysis Filtered (Y/N) TIME Site Location STATE: NPDES DATE UST 5240C LDS 470 Total Mercury ACCEPTED BY / AFFILIATION **slateM latoT 0103 *slateM Netals pace 9026 CI, F, SO4 LAnalysis Test ↓ ↑N/A Other Same as Section A なかべるの Accounts Payable Pace Quote 42700

Reference:
Pace Project Heather Wilson Methanol Preservatives Na₂S₂O₃ ompany Name: AECOM HOBN 11033, 3 HCI HNO3 ^bOS^zH C0.5 nvoice Inform Section C TIME Unpreserved Address: tention: # OF CONTAINERS 00/11/01 SAMPLE TEMP AT COLLECTION DATE 000 TIME COMPOSITE END/GRAB 10/1/A2 DATE COLLECTED RELINQUISHED BY / AFFILIATION PRPA Rawhide CCR TIME COMPOSITE DATE Brian Rothmeyer Report To: Vasanta Kalluri Required Project Information: (G=GRAB C=COMP) SAMPLE TYPE urchase Order No. (see valid codes to left) MATRIX CODE roject Number Project Name: Section B Copy To: Valid Matrix Codes DRINKING WATER DW
WASTE WASTE WATER WW
PRODUCT P
SOLUSOLID SL AIR OTHER TISSUE Greenwood Village, CO 80111 brian.rothmeyer@aecom.com ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St 'Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb SAMPLE ID Required Client Information hone: (303) 740-2614 Required Client Information: Requested Due Date/TAT: AECOM Section D Section A B, Ca, U :ompany: Email To: ddress. 9 7 12 e 2 9 œ 7 4 6 # W31J 7

F-ALL-Q-020rev.08, 12-Oct-2007

(N/Y)

Samples Intact

Custody Sealed Cooler (Y/N)

Received on ice (Y/N)

Э° пі фтэТ

0/1

DATE Signed (MM/DD/YY):

105mg

nahanc

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

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60352322

Sampling Event: October 20, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 21, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 20th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

X	Data are usable without qualification.
	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria			Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA		
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X				
Holding Times	The samples were analyzed within the method required holding times.	X				
Method Blanks (MB)	No target analytes reported in the associated MB.	X				
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X				
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X		
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2. 			X		

Review Parameter	Criteria		riteri Met?	
Sample-specific	For each "No" response, list qualified data and bias direction in	Yes	No	NA
Parameters	Table 1 or explain no qualification in comments.			
Equipment Blanks	No target analytes reported in the associated equipment blank.			
	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$		X^1	
Detection Limits Mets	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.	X		
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.			
Reporting	No reporting issues were found and further qualification was not considered necessary.			
Package Completeness	No results were qualified as unusable and the data are 100% complete.			

Comments

^{1 –} As the associated radium-228 and total radium sample results were reported at concentrations less than the minimum detectable concentration (MDC), qualification was not considered necessary.

< - Less Than C - Less Than

PCi/L - Picocuries Per Liter

LCS - Laboratory Control Sample

MDC - Minimum Detectable Concentration

v - Compound Identification Issue

^{≤ –} Less Than or Equal To ± – Plus or Minus/High or Low Bias LCSD – Laboratory Control Sample Duplicate MS/MSD – Matrix Spike/Matrix Spike Duplicate

σ – Sigma (Uncertainty) DER – Duplicate Error Ratio MB – Method Blank NA – Not Applicable





November 12, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 22, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Chanco M. Welson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L





SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60352322001	ASH-06-CCR	Water	10/20/20 09:40	10/22/20 09:35



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60352322001	ASH-06-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

Sample: ASH-06-CCR PWS:	Lab ID: 60352 Site ID:	322001 Collected: 10/20/20 09:40 Sample Type:	Received:	10/22/20 09:35	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical S	Services - Greensburg				
Radium-226	EPA 903.1	0.213 ± 0.462 (0.852) C:NA T:82%	pCi/L	11/11/20 14:43	3 13982-63-3	
	Pace Analytical S	Services - Greensburg				
Radium-228	EPA 904.0	0.899 ± 0.598 (1.16) C:63% T:80%	pCi/L	11/11/20 12:3	1 15262-20-1	
	Pace Analytical S	Services - Greensburg				
Total Radium	Total Radium Calculation	1.11 ± 1.06 (2.01)	pCi/L	11/12/20 10:3	5 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

QC Batch: 420034 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60352322001

METHOD BLANK: 2030364 Matrix: Water

Associated Lab Samples: 60352322001

ParameterAct \pm Unc (MDC) Carr TracUnitsAnalyzedQualifiersRadium-226-0.187 \pm 0.261 (0.661) C:NA T:95%pCi/L11/11/20 14:43

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

QC Batch: 420035 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60352322001

METHOD BLANK: 2030365 Matrix: Water

Associated Lab Samples: 60352322001

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.194 ± 0.372 (0.811) C:70% T:90%
 pCi/L
 11/11/20 12:30

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



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 11/12/2020 12:18 PM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60352322

Date: 11/12/2020 12:18 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60352322001	ASH-06-CCR	EPA 903.1	420034		
60352322001	ASH-06-CCR	EPA 904.0	420035		
60352322001	ASH-06-CCR	Total Radium Calculation	422802		

Face Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Project No./ Lab I.D. DRINKING WATER SAMPLE CONDITIONS ŏ GROUND WATER Page: Residual Chlorine (Y/N) REGULATORY AGENCY 8 RCRA 833 Requested Analysis Filtered (Y/N) TIME STATE S 2 5 Site Location NPDES DATE UST ACCEPTED BY / AFFILIATION muibeA leto Radium-228 3adium-226 N/A tasi zisylsnA1 Same as Section A Other Accounts Payable Methanol Heather Wilson Preservatives _CO_SS_SbN Company Name: AECOM HOBN Pace Profile #: 11033, 3 42700 HCI nvoice Information; HNO³ [†]OS^zH Pace Quote Reference: Pace Project Manager: Section C Attention: Unpreserved TIME (ddress: # OF CONTAINERS SAMPLE TEMP AT COLLECTION 02/201 DATE TIME 250 COMPOSITE END/GRAB 0/20/70 DATE COLLECTED RELINQUISHED BY / AFFILIATION TIME COMPOSITE Copy To: Brian Rothmeyer DATE Report To: Vasanta Kalluri Required Project Information; ē SAMPLE TYPE (G=GRAB C=COMP) 2 Purchase Order No. Project Number; (see valid codes to left) **BUOD XINTAM** Project Name: Valid Matrix Codes TS WP WP DRINKING WATER WATER WASTE WATER PRODUCT SOIL/SOLID OIL WIPE AIR OTHER TISSUE Greenwood Village, CO 80111 brian.rothmeyer@aecom.com ASHOO CER ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St SAMPLE ID Required Client Information hone: (303) 740-2614 Required Client Information: Requested Due Date/TAT Address: Company ≓mail To; 2 Ξ 7 # WHL! N ŧ, g ۲. o,

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

F-ALL-Q-020rev.08, 12-Oct-2007

Samples Intact (Y/V)

Custody Sealed Cooler (YM)

Received on lce (Y/V)

O° ni qmaT

0202/02/0/

DATE Signed (MM/DD/YY):

4 Some

Jest

Page 10 of 13

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER:

Pittsburgh Lab Sample Condit	1011 C	hou	I REI		
Client Name:	$\mathcal{D}_{\mathcal{L}}$	ree	• 1	Project #	•
Client Name.	_1_	ic.	. ,	110,000.	,
Courier: Fed Ex UPS USPS Client	厂	ommei	rcial	Pace Other Label	,
		OI III IO	ОД	LIMS Login DSW	
Tracking #: 1908 6736 0331 Custody Seal on Cooler/Box Present:			Spale	intact: yes no	•
· ·	•	of Ice:			
Thermometer Used	ype -	. C ot ics:		ection Factor: C Final Temp: C	
Cooler Temperature Observed Temp			Corre	ection Factor. This remp.	
Temp should be above freezing to 6°C				pH paper Lot# Date and Initials of person examining contents: 35M 20132 2000	
Comments:	Yes	No	N/A	1000461 contents: 08M 10 3 4 page 1	
Chain of Custody Present:		-		1.	
Chain of Custody Filled Out:				2.	-
Chain of Custody Relinquished:				3.	-
Sampler Name & Signature on COC:				4.	
Sample Labels match COC:		1		5.	
-Includes date/time/ID Matrix:	W	十	1		
Samples Arrived within Hold Time:	T	+	Ī	6.	
	1			7.	
Short Hold Time Analysis (<72hr remaining):	+			8,	
Rush Turn Around Time Requested:				9.	
Sufficient Volume:	 	-	1	10.	
Correct Containers Used:		-	-	10.	
-Pace Containers Used:		-		11.	
Containers Intact:		 		12.	
Orthophosphate field filtered	1		-	13.	
Hex Cr Aqueous sample field filtered		-		14.	
Organic Samples checked for dechlorination:	+			15.	į.
Filtered volume received for Dissolved tests All containers have been checked for preservation.	+-				
exceptions: VOA, collform, TOC, O&G, Phenolics,	Radon	1	<u></u>	16. pHC 2	
Non-aqueous matrix	, tudon	T			
All containers meet method preservation		-		initial when 230 Date/time of	
requirements.			<u> </u>	completed / preservation	
	<u> </u>	<u> </u>	· · · ·	preservative	
Headspace in VOA Vials (>6mm):		<u> </u>	_	-17.	
Trip Blank Present:			<u> </u>	18.	
Trip Blank Custody Seals Present			<u> </u>	-	The state of the s
Rad Samples Screened < 0.5 mrem/hr		1		Initial when completed: Date: (0) d d 2000	
Client Notification/ Resolution:		1	·		,
Person Contacted:			-Date/	Time:Gontacted By:	•
Comments/ Resolution:					•
					•
					-
					•

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

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

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

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Analyst: Date: Batch ID: Matrix:

MB Sample ID MB concentration: M/B Counting Uncertainty: MB MDC:

Method Blank Assessment

MB Numerical Performance Indicator: MB Status vs Numerical Indicator: MB Status vs. MDC:

Test:

Pace Analytical"

	MS/MSD 2																													
renow.	MS/MSD 1	10/21/2020	30388966001	CMICOCOGGGGGGGG	20-032	32,183	0.20		0.650	9,897			0.465		0000	0.191	8.014	1.271			-2.701		80.97%		N/A		Pass		136%	71%
Analyst must manually Enter All Fields Highlighted in Yellow.	Sample Matrix Spike Control Assessment	Sample Collection Date:	Sample I.D.	Sample MSD I D	Spike I.D.:	MS/MSD Decay Corrected Spike Concentration (pCi/mL):	Spike Volume Used in MS (mL.):	Spike Volume Used in MSD (mL):	MS Aliquot (L, g, F):	MS Target Conc.(pCi/L, g, F):	MSD Aliquot (L, g, F):	MSD Target Conc. (pCi/L, g, F):	MS Spike Uncertainty (calculated);	MSD Spike Uncertainty (calculated):	Sample Result:	Sample Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Result:	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	MS Numerical Performance Indicator:	MSD Numerical Performance Indicator:	MS Percent Recovery:	MSD Percent Recovery.	MS Status vs Numerical Indicator:	MSD Status vs Numerical Indicator;	MS Status vs Recovery:	MSD Status vs Recovery:	MS/MSD Upper % Recovery Limits:	MS/MSD Lower % Recovery Limits:
														Z	LCSD56990															
Ba-226	MK 5	11/3/2020	56990 DW	;		2030364	-0.187	0.260	0.661	-1.41	A/A	Pass		SD (Y or N)?	LCS56990	11/11/2020	20-032	32.182	0.10	0.658	4.889	0.230	4.154	0.897	-1.55	84.97%	ď,X	Pass	135%	73%

Laboratory Control Sample Assessment	LCSD (Y or N)?	z	
	LCS56990	LCSD56990	
Count Date:	11/11/2020		
Spike I.D.:	20-032		
Spike Concentration (pCi/mL):	32.182		
Volume Used (mL):	0,10		
Aliquot Volume (L, g, F):	0.658		Matrix Sp
Target Cond. (pCl/L, g, F):	4.889		•
Uncertainty (Calculated):	0.230		
Result (pC/L, g, F):	4.154		
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.897		
Numerical Performance Indicator:	-1.55		
Percent Recovery:	84.97%		
Status vs Numerical Indicator:	A/X		
Status vs Recovery:	Pass		
Upper % Recovery Limits:	135%		
Lower % Recovery Limits:	73%		
Duplicate Sample Assessment			Matrix Spil
Sample I.D.:	30388961001	Enter Duplicate	
Duplicate Sample I.D.	30388961001DUP	sample IDs if	
Sample Result (pCi/L, g, F):	0.050	other than	
Sample Result Counting Uncertainty (pCl/L, g, F):	0.257	LCS/LCSD in	
Sample Duplicate Result (pCl/L, g, F):	0.000	the space below.	
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	0.264		
Are sample and/or duplicate results below RL?	See Below #		Matrix Sp
Duplicate Numerical Performance Indicator:	0.264	30388961001	
Duplicate RPD:	200.00%	30388961001DUP	(Base
Duplicate Status vs Numerical Indicator:	N/A		
Duplicate Status vs RPD;	Failtre		
% RPD Limit:	32%		
## Evaluation of dentificate prediction is not applicable if either the sample or dentificate results are dentificated.	choole of duplined	triolog ord otherway	i c

	Matrix Spike/Matrix Spike Duplicate Sample Assessment
er Duplicate	Sample I.D.
mple IDs if	Sample MS I.D.
ther than	Sample MSD I.D.
S/LCSD in	Sample Matrix Spike Result:
space below.	Matrix Spike Result Counting Uncertainty (pCi/L, g, F);
	Sample Matrix Spike Duplicate Result:
	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):
388961001	Duplicate Numerical Performance Indicator:
8961001DUP	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:
	MS/ MSD Duplicate Status vs Numerical Indicator:
	MS/ MSD Duplicate Status vs RPD:
	Caa %

Batch must be re-prepped due to unacceptable precision.

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL

Comments:

1 of 1

Ra-226 NELAC QC Printed: 11/11/2020 3:41 PM

Face Analytical

Quality Control Sample Performance Assessment

VAL 11/4/2020 Ra-228 56991 WT Test: Analyst: Date: Worklist: Matrix:

2030365 0.194

MB Sample ID

Method Blank Assessment

0.372 1.02 Pass Pass

MB concentration: M/B 2 Sigma CSU: MB MDC:

MB Numerical Performance Indicator: MB Status vs Numerical Indicator: MB Status vs. MDC:

Analyst Must Manually Enter All Fields Highlighted in Yellow.

	Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
	Sample Collection Date:	10/21/2020	
	Sample I.D.	30388966001	
	Sample MS I.D.	30388966001MS	
	Sample MSD I.D.		
	Spike I.D.:	20-030	
	MS/MSD Decay Corrected Spike Concentration (pCl/mL):	37.945	
	Spike Volume Used in MS (mL):	0.20	
	Spike Volume Used in MSD (mL):		
	MS Aliquot (L, g, F):	0.800	
	MS Target Conc.(pCi/L, g, F):	9.483	
	MSD Aliquot (L, g, F):		
	MSD Target Conc. (pCi/L, g, F):		
	MS Spike Uncertainty (calculated):	0.465	
Z	MSD Spike Uncertainty (calculated):		
LCSD56991	Sample Result:	0.512	
	Sample Result 2 Sigma CSU (pCi/L, g, F):		
	Sample Matrix Spike Result:	8.016	
	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.698	
	Sample Matrix Spike Duplicate Result:		
	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
	MS Numerical Performance Indicator:	-2.154	
	MSD Numerical Performance Indicator.		
	MS Percent Recovery:	79.13%	
	MSD Percent Recovery:		
	MS Status vs Numerical Indicator:	Warning	
	MSD Status vs Numerical Indicator:		
	MS Status vs Recovery:	Pass	
	MSD Status vs Recovery:		
	MOMAN Lines of December 1	135%	

LCS 56991 11/11/2020 20-030 37 680 0.10 0.810 4.654 0.228 3.953 1.006 -1.33

Volume Used (mL): Aliquot Volume (L, g, F): Target Conc. (pCi/L, g, F): Uncertainty (Calculated):

Count Date: Spike I.D.:

Laboratory Control Sample Assessment

Decay Corrected Spike Concentration (pCi/mL):

Result (pCI/L, g, F): LCS/LCSD 2 Sigma CSU (pCI/L, g, F):

Numerical Performance Indicator:

Percent Recovery: Status vs Numerical Indicator: Status vs Recovery: Upper % Recovery Limits: Lower % Recovery Limits:

MS/MSD Upper % Recovery Limits: MS/MSD Lower % Recovery Limits:	135% 60%	
Matrix Spike/Matrix Spike Duplicate Sample Assessment		

N/A Pass 135% 60%

Enter Duplicate	Sample I.D.
sample IDs if	Sample MS I.D.
other than	Sample MSD I.D.
LCS/LCSD in	Sample Matrix Spike Result:
the space below.	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):
	Sample Matrix Spike Duplicate Result:
	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):
30388961001	Duplicate Numerical Performance Indicator:
30388961001DUP	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:
	MS/ MSD Duplicate Status vs Numerical Indicator:
	MS/ MSD Duplicate Status vs RPD:
	1,200 %

Sample I.D.: 3

Duplicate Sample I.D. 303

Sample Result 2 Signa CSU (pCil., g, F):
Sample Duplicate Result (pCil., g, F):
Sample Duplicate Result (pCil., g, F):
Are sample and/or duplicate results below RL?

Duplicate Sample Assessment

_				Matrix Spike Re	Sample	Matrix Spike Duplicate Re	Duplicate Ni	P (Based on the Percent Recove	MS/ MSD Duplicate	/SW	
	Enter Duplicate sample IDs if	other than	LCS/LCSD in	the space below.			30388961001	30388961001DU			
	30388961001 30388961001DUP	0.487	0.405	-0.103	0.386	See Below ##	2.064	306.83%	Warning	Fail***	36%
	3038					Se	Ŀ	ö	٠	ö	H.

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Duplicate Status vs Numerical Indicator: Duplicate Status vs RPD: RRPD Limit:

Duplicate Numerical Performance Indicator: Duplicate RPD:

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60353136

Sampling Event: October 5, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 21, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 5th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	C	a	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. Analyte Concentration MB 2026011 Radium-228 1.05 ± 0.493 pCi/L ± - Plus or Minus pCi/L - Picocuries Per Liter MB - Method Blank		X ¹	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X

Review Parameter	Criteria		riteri Met?	riteria Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA	
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2. 			X	
Equipment Blanks	No target analytes reported in the associated equipment blank.		X^2		
Detection Limits Mets	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.	X			
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X			
Reporting	No reporting issues were found and further qualification was not considered necessary.	X			
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X			

Comments

^{1 –} The associated radium-228 result for sample ASH-01-CCR was reported at a concentration greater than the minimum detectable concentration (MDC) and reported at a concentration less than 5x the concentration of the blank contamination and was qualified as estimated (J+ bl) to reflect the potential high bias indicated by the blank contamination.

^{2 –} The associated radium-228 result for sample ASH-01-CCR was reported at a concentration greater than the MDC and reported at a concentration less than 5x the concentration of the blank contamination and was qualified as estimated (J+ be) to reflect the potential high bias indicated by the blank contamination.

< - Less Than
pCi/L - Picocuries Per Liter
bl - Laboratory blank Contamination
LCS - Laboratory Control Sample
MDC - Minimum Detectable Concentration

^{≤ -} Less Than or Equal To ± - Plus or Minus/High or Low Bias DER - Duplicate Error Ratio LCSD - Laboratory Control Sample Duplicate MS/MSD - Matrix Spike/Matrix Spike Duplicate

σ – Sigma (Uncertainty)
be – Equipment Blank Contamination
J – Estimated
MB – Method Blank
NA – Not Applicable





November 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 08, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407

Dianton M. Wilson

Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L

(913)599-5665



SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351175001	ASH-01-CCR	Water	10/05/20 09:15	10/08/20 09:30

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351175001	ASH-01-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

Sample: ASH-01-CCR PWS:	Lab ID: 60351 Site ID:	175001 Collected: 10/05/20 09:15 Sample Type:	Received:	10/08/20 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical S	Services - Greensburg				
Radium-226	EPA 903.1	0.202 ± 0.350 (0.626) C:NA T:85%	pCi/L	10/28/20 13:39	9 13982-63-3	
	Pace Analytical S	Services - Greensburg				
Radium-228	EPA 904.0	1.12 ± 0.557 (0.981) C:72% T:73%	pCi/L	10/30/20 11:59	9 15262-20-1	
	Pace Analytical S	Services - Greensburg				
Total Radium	Total Radium Calculation	1.32 ± 0.907 (1.61)	pCi/L	11/01/20 12:49	7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

QC Batch: 419061 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60351175001

METHOD BLANK: 2026011 Matrix: Water

Associated Lab Samples: 60351175001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.418 ± 0.455 (0.950) C:74% T:69%	pCi/L	10/30/20 11:59	
Radium-228	1.05 ± 0.493 (0.827) C:68% T:80%	pCi/L	10/26/20 15:15	

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

QC Batch: 419060 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60351175001

METHOD BLANK: 2026010 Matrix: Water

Associated Lab Samples: 60351175001

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 0.319 ± 0.370 (0.598) C:NA T:92%
 pCi/L
 10/27/20 13:52

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



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 11/06/2020 10:23 AM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

(913)599-5665



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353136

Date: 11/06/2020 10:23 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351175001	ASH-01-CCR	EPA 903.1	419060		
60351175001	ASH-01-CCR	EPA 904.0	419061		
60351175001	ASH-01-CCR	Total Radium Calculation	421105		

Face Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Project No./ Lab I.D. (N/A) DRINKING WATER Samples Intacl SAMPLE CONDITIONS F-ALL-Q-020rev.08, 12-Oct-2007 OTHER ö Cooler (Y/N) Custody Sealer (N/Y) epi Received on GROUND WATER Page: Residual Chlorine (Y/N) き O" ni qmaT REGULATORY AGENCY 8 88 Requested Analysis Filtered (Y/N) TIME DATE Signed 10/06/2020 Site Location STATE 6830 NPDES DATE UST ACCEPTED BY / AFFILIATION muibeA leto 8SS-muibe5 822-muibe? t fest Test↓ 1 N /A Same as Section A **1941**C Accounts Payable the same Nethanol Heather Wilson Impordant Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days. Preservatives _EO_SS_S6V N bylowski Company Name: AECOM Paland Manager: Pace Profile #: 11033, 3 HOBN 42700 HCI Invoice Information, cf Cf HNO³ OS2H Reference: Pace Project 16:30 Unpreserved TIME ttention: ace Quote Address: CP # OF CONTAINERS C SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION 10/6/20 DATE TIME COMPOSITE END/GRAB DATE COLLECTED RELINQUISHED BY / AFFILIATION TIME ASS SEE SEE COMPOSITE START Copy To: Brian Rothmeyer DATE Report To: Vasanta Kalluri Required Project Information: D ٥ (G=GRAB C=COMP) SAMPLE TYPE Purchase Order No. MATRIX CODE (see valid codes to left) roject Name: Project Number Section B Valid Matrix Codes 7 3 2 4 8 5 5 t DRINKING WATER IN WATER WASTE WATER WASTE WATER WENDUCT RESOURCE OF SOURCE O OIL WIPE AIR OTHER TISSUE Greenwood Village, CO 80111 のみてーの当代一つの兄 brian.rothmeyer@aecom.com ADDITIONAL COMMENTS (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St SAMPLE ID #5H-()--CC Section D Required Client Information (303) 740-2614 equired Client Information: equested Due Date/TAT: Page 10 of 15 mail To: ddress; 9 Ŧ 72 'n φ ∞ Φ

Pittsburgh Lab Sample Cond	ition U	pon R	Receipt	
Pace Analytical Client Name:	AE	Cor		
Courier: Fed Ex UPS USPS Clie Tracking #: 1908 4734 1058	nt ⊡or	mmercial	Label LIMS Login	
Custody Seal on Cooler/Box Present: Eyes Thermometer Used U H			eals intact:	_
Cooler Temperature Observed Temp Temp should be above freezing to 6°C		°C Cc	orrection Factor: °C Final Temp: °C	_
Comments:	Yes	No N	pH paper Lot# Date and Initials of person examining contents: BT 70-8-7020	
Chain of Custody Present:		<u>'</u>	1.	7
Chain of Custody Filled Out:			2.	7
Chain of Custody Relinquished:			3.	1
Sampler Name & Signature on COC:			4.	1
Sample Labels match COC:			5. Fime on Soumple BAT-OUR-CCR	1
-Includes date/time/ID Matrix:	WT		is 1330	
Samples Arrived within Hold Time:			6.	1
Short Hold Time Analysis (<72hr remaining):			7.	1
Rush Turn Around Time Requested:			8.	1
Sufficient Volume:			9.	1
Correct Containers Used:			10.	1
-Pace Containers Used:				
Containers Intact:			11.	1
Orthophosphate field filtered			12.	1
Hex Cr Aqueous sample field filtered			13.	1
Organic Samples checked for dechlorination:			14.	1
Filtered volume received for Dissolved tests			15.	1
All containers have been checked for preservation.			16. 01+ 1 7	1
exceptions: VOA, coliform, TOC, O&G, Phenolics Non-aqueous matrix	, Radon,		-16. PH 22	
All containers meet method preservation requirements.			Initial when Completed ET Date/time of preservation	
requierrents.	1	I.	Lot # of added preservative	
Headspace in VOA Vials (>6mm):			17.	
Trip Blank Present:			18.]
Trip Blank Custody Seals Present				
Rad Samples Screened < 0.5 mrem/hr			Initial when completed: ET Date: 10-8-7070	
Client Notification/ Resolution:	<u> </u>		<u> </u>	1
Person-Contacted:		——Dat	te/Time: Contacted-By:	
Comments/ Resolution:				-
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				-

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

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

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



CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

Section	A	Section E	В							Sec	ction	С														Г	_				
	d Client Information:	Required									ice In																Page:	:	of		
Compan	y: AECOM	Report To:	Vas	anta	Kalluri					Atte	ntion:		Acco	ounts	s Pa	yable)														
Address:	6200 South Quebec St	Copy To:	Bria	n Ro	thmeyer					Con	npany	Nam	ne: A	ECC	MC						RE	GUL	.ATOI	RY A	GEN	CY					
	Greenwood Village, CO 80111									Add	lress:		Sam	e as	Se	ction	Α					NF	DES		GR	DUND	WAT	ER 🗌	DRINKING	WATER	
Email To	brian.rothmeyer@aecom.com	Purchase (Order I	No.:							e Quote		4270	00								US	T		RCI	RA			OTHER		_
Phone:	(303) 740-2614 Fax:	Project Na	me:	PRF	PA Rawhio	de				Pace	e Proje		Hea	her	Wils	on					s	ite L	ocatio	n						////	///
Request	ed Due Date/TAT:	Project Nu	mber:									e #:	1103	33, 3	3							9	STATE	:		CO					
																			Req	ueste	d Ana				(Y/N)		7	///	<i>HH</i> .	////	//
	Section D Valid Matrix Required Client Information MATRIX	Codes CODE	eft)	(a		COLL	ECTED.						Pres	erva:	tives	,	2	* I	T			Í									
	DRINKING WATER WATER WASTE WAS	DW WT	ODE (see valid codes to left)	YPE (G=GRAB C=COMP)	COMPC	OSITE	COMPC END/G	DSITE RAB	TEMP AT COLLECTION	CONTAINERS	ved						Toct	est 💠	228	Jinm							Chlorine (Y/N)			.,,,,	<i>,,</i>
ITEM #			MATRIX CODE	SAMPLE TYPE	DATE	TIME	DATE	TIME	SAMPLE TE	# OF CON	Unpreser	H ₂ SO₄	HNO	NaOH	Na ₂ S ₂ O ₃	Methanol	I Analysis	Podium (Radium-228	Total Radium							Residual	Pace	Project N	lo./ Lab I.D	
1	ASH-01-CCR		WT	G	10/5/20	9:15				2		2					4)	x x	Х								1			
2														_	_		4	L													
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	ADDITIONAL COMMENTS		REL	INQUI	ISHED BY /	AFFILIATI	ON	DATI	E		TIME				AC	CEPT	ED B	Y/A	FFILI	ATION			ATE		TIME			SAME	PLE CONDIT	IONS	
				Se	ee Original	COC		10/6/2	20		16:30)				See 0	Origi	nal (COC			10)/8/20		9:30						
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			-				SIGNATUR	RE of SAME	PLER:	: Se	e Ori	gina	al CO	С			Jilal		DATE	Signe DD/YY)	d	020)	10/6	6/20			Temp in °	Received on Ice (Y/N)	School Stock	(A/V) 12 of \$5	
	*Important Note: By signing this form you are accept	oting Pace's NE	: 1 30 da	ay paym	nent terms and	agreeing to) late charges	or 1.5% per r	month	tor an	y invoid	ces no	ot paid to	vitnin	JU αa¹	vs.	_							_	_	r-A	LL-Q	-020rev.08,	12-001-200		

Pace Analytical

Ra-226 MK1 10/2/2020

56814 DW

Batch ID: Matrix:

Test: Analyst: Date:

0.319 0.368 0.598 1.70 N/A Pass

MB concentration:
M/B Counting Uncertainty:
M/B M/B M/C;

MB Sample ID

Method Blank Assessment

MB Numerical Performance Indicator: MB Status vs Numerical Indicator: MB Status vs. MDC:

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

2	
3	
Building on the second	

	Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
	Sample Collection Date:	10/8/2020	10/8/2020
	Sample I.D.	60351179003	60351176004
	Sample MS I.D.	60351179004	60351176005
	Sample MSD I.D.	60351179005	60351176006
	Spike I.D.:	20-032	20-032
	MS/MSD Decay Corrected Spike Concentration (pCi/mt.):	32.183	32,183
	Spike Volume Used in MS (mL):	0.20	0.20
	Spike Volume Used in MSD (mL):	0.20	0.20
	MS Aliquot (L, g, F):	0.660	0.659
	MS Target Conc.(pCl/L, g, F):	9.751	9.773
	MSD Aliquot (L, g, F):		0.654
	MSD Target Conc. (pCi/L, g, F):	9.855	9.840
	MS Spike Uncertainty (calculated):	0.458	0.459
z	MSD Spike Uncertainty (calculated):	0.463	0.462
56814	Sample Result:		0.119
	Sample Result Counting Uncertainty (pCi/L, g, F):	298.0	0.438
	Sample Matrix Spike Result:	8.724	10.220
	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.270	1.450
	Sample Matrix Spike Duplicate Result:	11.463	9.723
	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F);	1.647	1.330
	MS Numerical Performance Indicator:	-1.911	0.406
	MSD Numerical Performance Indicator:	1.422	-0.313
	MS Percent Recovery:	%00'98	103.36%
	MSD Percent Recovery:	112.88%	97.61%
	MS Status vs Numerical Indicator:	N/A	N/A
	MSD Status vs Numerical Indicator:	A/A	A/N
	MS Status vs Recovery:	Pass	Pass
	MSD Status vs Recovery:	Pass	Pass
	MS/MSD Upper % Recovery Limits:	136%	136%
1	MS/MSD Lower % Recovery Limits:	71%	71%

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56814	LCSD56814
Count Date:	10/27/2020	
Spike I.D.:	20-032	
Spike Concentration (pCl/mL):	32.182	
Volume Used (mL);	0.10	
Aliquot Volume (L. g, F):	0.656	
Target Conc. (pCi/L, g, F):	4.902	
Uncertainty (Calculated):	0.230	
Result (pCi/L, g, F):	5.792	****
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.192	
Numerical Performance Indicator:	4.	
Percent Recovery:	118.14%	
Status vs Numerical Indicator:	A/N	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

	60351179003	60351179004	60351179005	8.724	1.270	11.463	1.647	-2.581	27.03%	Ϋ́Ν	Pass	32%
Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Sample Matrix Spike Result:	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD:	- SPD Linit
	Enter Duplicate	sample IDs if	other than	LCS/LCSD in	the space below.							

See Below 排

Sample I.D.:

Sample Sample I.D.:

Sample Result (DCI/L, g. F):

Sample Counting Uncertainty (DCI/L, g. F):

Sample Duplicate Result (COI/L, g. F):

Sample Duplicate Result (COI/L, g. F):

Are sample and/or duplicate results below RI.?

Duplicate Sample Assessment

60351176004 60351176005 60351176006 10.220 1.450 9.723 1.330 0.495 5.72%

N/A Pass 32%

10/28/20

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

Duplicate Status vs Numerical Indicator: Duplicate Status vs RPD: % RPD Limit:

Duplicate Numerical Performance Indicator:

Duplicate RPD:

Ra-226 NELAC QC Printed: 10/28/2020 2:14 PM

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Quality Control Sample Performance Assessment

0/22/2020 56815 ٨ Worklist: Matrix: Date: Analyst

60351176004 60351176005 60351176006 20-030 38.107 0.20 0.20 0.810 9.407

20-030 38.107

Spike I.D.:

0.20 0.20 0.807 9.447 0.811

Spike Volume Used in MSD (mL):
MS Aliquot (L, g, F):
MS Target Conc (pCift, g, F):
MSD Target Conc. (pCift, g, F):

Spike Volume Used in MS (ml.):

MS/MSD Decay Corrected Spike Concentration (pCi/mL):

Sample I.D. Sample MS I.D. Sample MSD I.D.

Sample Collection Date:

Sample Matrix Spike Control Assessment

MS/MSD 2 10/8/2020

MS/MSD

Analyst Must Manually Enter All Fields Highlighted in Yellow.

z	LCSD (Yor NY)	Laboratory Control Sample Assessment
	Fail*	MB Status vs. MDC:
	Fail*	MB Status vs Numerical Indicator:
	4.19	MB Numerical Performance Indicator:
	0.827	MB MDC:
	0.493	M/B 2 Sigma CSU:
	1.053	MB concentration:
		_

MB Sample ID

Method Blank Assessment

CS56815

Count Date:

Spike I.D.:

20-030

Decay Corrected Spike Concentration (pCi/mL):

Volume Used (mt.): Aliquot Volume (L, g, F): Target Conc. (pCi/L, g, F): Uncertainty (Calculated):

	MSD Target Conc. (pCM, g. F.): MS Spike Uncertainty (calculated): MSD Spike Uncertainty (calculated): Sample Result:	9.402 0.463 0.461 2.878
LCSD56815	Sample Result 2 Sigma CSU (pC)/L, _{9,} F); Sample Result Sample Matrix Spike Result.	2.878 1.119 10.637
	Matrix Spike Result 2 Sigma CSU (pCif., g, F); Sample Matrix Spike Duplicate Result 2 Sigma CSU (pCif., g, F); Matrix Spike Duplicate Result 2 Sigma CSU (pCif., g, F); MS Nirmarical Performance Indicator:	2.260 10.290 2.197
	MSD Numerical Performance Indicator: MS Percent Recovery: MSD Percent Recovery:	-1.555 82.13% 78.83%
	MS Status vs Numerical Indicator: MSD Status vs Numerical Indicator: MS Status vs Recovery: MS Status vs Recovery:	Pass Pass
	MS/MSD Upper % Recovery Limits: MS/MSD Lower % Recovery Limits:	135% 60%

0.10 0.818 4.632 0.227 5.132 1.196 0.81 N/A Pass 135% 60%

Result (pC/IL, g, F): LCS/LCSD 2 Sigma CSU (pC/IL, g, F): Numerical Performance Indicator;

Status vs Numerical Indicator: Status vs Recovery: Upper % Recovery Limits: Lower % Recovery Limits:

Percent Recovery

9.317 0.461 0.457 2.094 0.907 9.649 2.301 9.653 2.143 80.31% 80.31% 81.13% 81.13% 81.13% 81.3

Are sample and/or duplicate results below

Sample Duplicate Result 2 Sigma CSU (pCi/L

Duplicate Sample Assessment

36%	36%	% RPD Limit
Pass	Pass	MS/ MSD Duplicate Status vs RPD:
Pass	Pass	MS/ MSD Duplicate Status vs Numerical Indicator:
1.01%	4.10%	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:
-0.003	0.216	Duplicate Numerical Performance Indicator:
2.145	2.197	Matrix Spike Duplicate Result 2 Sigma CSU (pCI/L, g, F):
9.653	10.290	Sample Matrix Spike Duplicate Result
2.301	2.260	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):
9.649	10.637	Sample Matrix Spike Result:
603511760	60351179005	Sample MSD I.D.
603511760	60351179004	Sample MS I.D.
603511760	60351179003	Sample I.D.
		Matrix Spike/Matrix Spike Duplicate Sample Assessment

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Comments:

of the lowest activity sample in this batch is greater than ten times the blank value, the blank is acceptable; otherwise this batch must be re-prepped.

Ra-228 NELAC DW2 Printed: 10/27/2020 2:56 PM

6 of 10

Face Analytical

Analyst Must Manually Enter All Fields Highlighted in Yellow. Quality Control Sample Performance Assessment

MS/MSD 2

MS/MSD 1

Sample I.D. Sample MS I.D. Sample MSD I.D. Sample Collection Date:

Spike LD.:

MS/MSD Decay Corrected Spike Concentration (pCi/mL):

Spike Volume Used in MS (mL): Spike Volume Used in MSD (mL);

MS Aliquot (L. g, F);

Sample Matrix Spike Control Assessment Ra-228 Test: Analyst

VAL 10/22/2020 56815 WT		2026011	0.418	0.455	0.950	1.80	Pass	Pass
		202	0	0	O	•	a.	£
Analyst. Date: Worklist Matrix:	Method Blank Assessment	MB Sample ID	MB concentration:	M/B 2 Sigma CSU:	MB MDC:	MB Numerical Performance Indicator:	MB Status vs Numerical Indicator:	MB Status vs. MDC:

MS Target Conc. (pCit., g, F):
MSD Aliquot (L, g, F):
MSD Target Conc. (pCif., g, F):
MS Spike Uncertainty (calculated):
MSD Spike Uncertainty (calculated):

Duplicate Sample Assessment

			WS Spike Uncertainty (carculated);
Laboratory Control Sample Assessment	LCSD (Y or N)?	z	MSD Spike Uncertainty (calculated):
	LCS56815	LCSD56815	Sample Result:
Count Date:	#N/A	#N/A	Sample Result 2 Sigma CSU (pCi/L, g, F):
Spike I.D.:	#N/A	#N/A	Sample Matrix Spike Result:
Decay Corrected Spike Concentration (pCi/mt_):	Y/N#	#N/A	Matrix Spike Result 2 Sigma CSU (pCi/l., g, F):
Volume Used (mL):		W/A#	Sample Matrix Spike Duplicate Result:
Aliquot Volume (L, g, F):	A/N#	¥N/¥	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/l., g, F):
Target Conc. (pCi/L, g, F):	79-	#N/A	MS Numerical Performance Indicator.
Uncertainty (Calculated):	#N/A	#N/A	MSD Numerical Performance Indicator;
Result (pCi/L, g, F):	V/N#	#N/A	MS Percent Recovery:
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	V/N#		MSD Percent Recovery:
Numerical Performance Indicator.	Y/N#	#N/A	MS Status vs Numerical Indicator;
Percent Recovery:	Y/N#	#N/A	MSD Status vs Numerical Indicator;
Status vs Numerical Indicator:	V/N#	#N/A	MS Status vs Recovery:
Status vs Recovery:	V/N#	#N/A	MSD Status vs Recovery:
Upper % Recovery Limits:	A/N#	#N/A	MS/MSD Upper % Recovery Limits:
Lower % Recovery Limits:	Y/N#	#N/A	MS/MSD Lower % Recovery Limits:

**************************************	To see the second	Office of the second of the se
		Duplicate Status vs RPD: % RPD Limit:
		Duplicate Status vs Numerical Indicator;
		Duplicate RPD:
		Duplicate Numerical Performance Indicator:
	See Below 排	Are sample and/or duplicate results below RL?
		Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):
the space below.		Sample Duplicate Result (pCl/L, g, F):
LCS/LCSD in		Sample Result 2 Sigma CSU (pCi/L, g, F):
other than		Sample Result (pCi/L, g, F);
sample IDs if		Duplicate Sample I.D.
Enter Duolicate		Sample I.D.:
	Enter Duplicate sample IDs if other than CS/LCSD in the space below.	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.

Evaluation of dupilicate precision

Comments:

∀/V#

Ra-228 NELAC DW2 Printed: 11/1/2020 12:22 PM

1 of 1

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60353680

Sampling Event: October 8, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 20, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 8th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

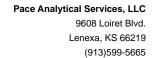
Data Review Checklist

Review	Criteria					Criteri			
Parameter							_	Met?	
Sample-specific	For each "No" res					ı in	Yes	No	NA
Parameters	Table 1 or	explain no q	ualificatio	n in com	ments.				
Chain of Custody, Sample Identification, & Sample Receipt	Samples were recei degree Celsius upor				rature was	<6	X		
Holding Times	The samples were a times.	nalyzed with	nin the me	thod requ	iired holdir	ıg	X		
Method Blanks (MB)	No target analytes i	reported in the	ne associat	ed MB.			X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.					ined	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.								
	Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.					s are		X^1	
	Analyte								
	ASH-08-CCR	1							
	Beryllium	71/72	75-125	1	20				
	Lead	74 /75	75-125	1	20				
	Fluoride 77/75 80-120 2 15 % - Percent MS/MSD – Matrix Spike/ Matrix Spike Duplicate RPD – Relative Percent Difference Bold indicates a value that is outside of acceptance limits								

Review Parameter	Criteria		Criteri Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:			
	• When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%.	X		
	• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below:			
	• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.			X
	• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			
Equipment Blanks	No target analytes reported in the associated equipment blank. Analyte Concentration		X^2	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.		X^3	
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

- 1 As the potential bias implied by the MS/MSD recoveries were considered to be low, the associated beryllium, lead, and sulfate results for sample ASH-08-CCR were qualified as estimated (UJ-/J- m).
- 2 As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.
- 3 Several analytes were reported as non-detect at elevated reporting limits. These non-detect results will need to be evaluated by the end user of the data with respect to project objectives.





November 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 09, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Kansas City

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

Sincerely,

Charles M. Wilson

Heather Wilson heather.wilson@pacelabs.com 1(913)563-1407 Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 20-020-0

Arkansas Drinking Water

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070

(913)599-5665



SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
60350879003	ASH-08-CCR	Water	10/08/20 13:30	10/09/20 08:50	

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60350879003	ASH-08-CCR	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Date: 11/06/2020 11:09 AM

Sample: ASH-08-CCR	Lab ID: 603	50879003	Collected: 10/08/2	20 13:30	Received: 10)/09/20 08:50 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
6010 MET ICP	Analytical Meth	od: EPA 60	110 Preparation Met	hod: EP	A 3010			
	Pace Analytica	l Services -	Kansas City					
Boron	1020	ug/L	100	1	10/30/20 08:55	10/30/20 18:33	7440-42-8	
Calcium	425000	ug/L	200	1	10/30/20 08:55	10/30/20 18:33	7440-70-2	
Lithium	339	ug/L	10.0	1	10/30/20 08:55	10/30/20 18:33	7439-93-2	
020 MET ICPMS	Analytical Meth	od: EPA 60	20 Preparation Met	hod: EP	A 3010			
	Pace Analytica	l Services -	Kansas City					
Antimony	ND	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7440-38-2	D3
Barium	16.6	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7440-39-3	
Beryllium	ND	ug/L	0.50	1	10/30/20 08:55	11/01/20 16:19	7440-41-7	M1
Cadmium	ND	ug/L	0.50	1	10/30/20 08:55	11/01/20 16:19	7440-43-9	
Chromium	ND	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7440-47-3	D3
Cobalt	1.7	ug/L	1.0	1	10/30/20 08:55	11/01/20 16:19	7440-48-4	
.ead	ND	ug/L	1.0	1	10/30/20 08:55	11/01/20 16:19	7439-92-1	M1
Nolybdenum	1.5	ug/L	1.0	1	10/30/20 08:55	11/01/20 16:19	7439-98-7	
Selenium	ND	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7782-49-2	D3
hallium	ND	ug/L	1.0	1	10/30/20 08:55	11/01/20 16:19	7440-28-0	
470 Mercury	Analytical Meth	od: EPA 74	70 Preparation Met	hod: EP	A 7470			
	Pace Analytica	l Services -	Kansas City					
Mercury	ND	ug/L	0.20	1	10/14/20 13:29	10/15/20 12:05	7439-97-6	
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C					
	Pace Analytica	l Services -	Kansas City					
Total Dissolved Solids	4830	mg/L	100	1		10/14/20 08:58		
0056 IC Anions	Analytical Meth	od: EPA 90	956					
	Pace Analytica	l Services -	Kansas City					
Chloride	21.0	mg/L	2.0	2		10/27/20 01:03	16887-00-6	
Fluoride	0.22	mg/L	0.20	1		10/26/20 23:58		M1
Sulfate	2610	mg/L	500	500		10/27/20 02:08		M1



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Date: 11/06/2020 11:09 AM

QC Batch: 682721 Analysis Method: EPA 7470

QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350879003

METHOD BLANK: 2759679 Matrix: Water

Associated Lab Samples: 60350879003

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.20 10/15/20 12:01

LABORATORY CONTROL SAMPLE: 2759680

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units Mercury ug/L 4.6 93 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2759681 2759682

MS MSD

60350879003 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Result ND 5 20 Mercury ug/L 5 4.9 4.6 96 92 75-125 5

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



Analysis Method:

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Date: 11/06/2020 11:09 AM

QC Batch: 686072 QC Batch Method: EPA 3010

Analysis Description: 6010 MET

Laboratory: Pace Analytical Services - Kansas City

EPA 6010

Associated Lab Samples: 60350879003

METHOD BLANK: 2773023 Matrix: Water

Associated Lab Samples: 60350879003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Boron	ug/L	ND ND	100	10/30/20 17:58	
Calcium	ug/L	ND	200	10/30/20 17:58	
Lithium	ug/L	ND	10.0	10/30/20 17:58	

LABORATORY CONTROL SAMPLE:	2773024					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Boron	ug/L	1000	980	98	80-120	
Calcium	ug/L	10000	9340	93	80-120	
Lithium	ug/L	1000	1020	102	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUP	LICATE: 2773	025		2773026							
		60350840001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	936	1000	1000	1880	1920	94	98	75-125	2	20	
Calcium	ug/L	372000	10000	10000	374000	383000	19	104	75-125	2	20	M1
Lithium	ug/L	253	1000	1000	1260	1270	101	102	75-125	1	20	

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 2773	027		2773028							
			MS	MSD								
		60350879002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	244	1000	1000	1230	1250	99	100	75-125	1	20	
Calcium	ug/L	79600	10000	10000	86300	87800	67	82	75-125	2	20	M1
Lithium	ug/L	77.9	1000	1000	1090	1100	101	102	75-125	0	20	

MATRIX SPIKE & MATRIX SF	IKE DUPL	ICATE: 2773	029		2773030							
			MS	MSD								
		60350879003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	1020	1000	1000	2010	2040	100	102	75-125	1	20	
Calcium	ug/L	425000	10000	10000	434000	436000	85	111	75-125	1	20	
Lithium	ug/L	339	1000	1000	1400	1410	106	107	75-125	0	20	

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Date: 11/06/2020 11:09 AM

QC Batch: 686073 QC Batch Method: EPA 3010 Analysis Method: EPA 6020 Analysis Description: 6020 MET

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350879003

METHOD BLANK: 2773033 Matrix: Water

Associated Lab Samples: 60350879003

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Antimony	ug/L	ND ND	1.0	11/02/20 17:08	
Arsenic	ug/L	ND	1.0	11/02/20 17:08	
Barium	ug/L	ND	1.0	11/02/20 17:08	
Beryllium	ug/L	ND	0.50	11/01/20 15:13	
Cadmium	ug/L	ND	0.50	11/01/20 15:13	
Chromium	ug/L	ND	1.0	11/02/20 17:08	
Cobalt	ug/L	ND	1.0	11/01/20 15:13	
Lead	ug/L	ND	1.0	11/01/20 15:13	
Molybdenum	ug/L	ND	1.0	11/01/20 15:13	
Selenium	ug/L	ND	1.0	11/02/20 17:08	
Thallium	ug/L	ND	1.0	11/01/20 15:13	

LABORATORY CONTROL SAMPLE:	2773034					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	38.0	95	80-120	
Arsenic	ug/L	40	39.0	97	80-120	
Barium	ug/L	40	36.9	92	80-120	
Beryllium	ug/L	40	37.7	94	80-120	
Cadmium	ug/L	40	39.0	97	80-120	
Chromium	ug/L	40	39.3	98	80-120	
Cobalt	ug/L	40	39.5	99	80-120	
Lead	ug/L	40	36.9	92	80-120	
Molybdenum	ug/L	40	39.8	99	80-120	
Selenium	ug/L	40	38.4	96	80-120	
Thallium	ug/L	40	35.7	89	80-120	

MATRIX SPIKE & MATRIX	SPIKE DUPL	ICATE: 2773			2773036							
Parameter	Units	60350840001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	40	40	36.8	37.4	90	92	75-125	2	20	
Arsenic	ug/L	ND	40	40	39.4	40.2	97	99	75-125	2	20	
Barium	ug/L	24.7	40	40	62.0	62.8	93	95	75-125	1	20	
Beryllium	ug/L	ND	40	40	28.9	29.2	72	73	75-125	1	20	M1
Cadmium	ug/L	ND	40	40	34.6	35.3	86	88	75-125	2	20	
Chromium	ug/L	ND	40	40	33.7	34.3	82	84	75-125	2	20	

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



Project: 60630103.200.0 PRPA CCR

Date: 11/06/2020 11:09 AM

MATRIX SPIKE & MATRIX	SPIKE DUP	LICATE: 2773			2773036							
Parameter	Units	60350840001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	45.5	45.7	111	112	75-125	1	20	
Lead	ug/L	ND	40	40	30.0	30.6	74	76	75-125	2	20	M1
Molybdenum	ug/L	13.0	40	40	60.4	61.2	119	120	75-125	1	20	
Selenium	ug/L	58.4	40	40	94.7	96.7	91	96	75-125	2	20	
Thallium	ug/L	ND	40	40	30.3	31.0	76	77	75-125	2	20	
MATRIX SPIKE & MATRIX	SPIKE DUPI	LICATE: 2773	037		2773038	<u> </u>						
			MS	MSD								
		60350879002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	37.9	37.9	94	95	75-125	0	20	
Arsenic	ug/L	ND	40	40	40.3	40.3	98	98	75-125	0	20	
Barium	ug/L	32.7	40	40	69.9	68.6	93	90	75-125	2	20	
Beryllium	ug/L	ND	40	40	34.4	34.8	86	87	75-125	1	20	
Cadmium	ug/L	ND	40	40	36.5	36.6	91	92	75-125	0	20	
Chromium	ug/L	ND	40	40	38.8	39.1	94	95	75-125	1	20	
Cobalt	ug/L	ND	40	40	41.9	41.6	104	104	75-125	1	20	
Lead	ug/L	ND	40	40	32.4	32.5	81	81	75-125	0	20	
Molybdenum	ug/L	8.3	40	40	53.4	53.5	113	113	75-125	0	20	
Selenium	ug/L	ND	40	40	39.8	40.5	92	94	75-125	2	20	
Thallium	ug/L	ND	40	40	31.9	32.1	80	80	75-125	0	20	
MATRIX SPIKE & MATRIX	SPIKE DUP	LICATE: 2773	039		2773040	<u> </u>						
			MS	MSD								
		60350879003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	37.5	37.4	93	93	75-125	0	20	
Arsenic	ug/L	ND	40	40	40.3	40.2	99	99	75-125	0	20	
Barium	ug/L	16.6	40	40	53.9	54.2	93	94	75-125	1	20	
Beryllium	ug/L	ND	40	40	28.5	28.7	71	72	75-125	1	20	M1
Cadmium	ug/L	ND	40	40	35.8	35.9	89	90	75-125	0	20	
	ug/L	ND	40	40	33.6	33.8	83	83	75-125	1	20	
			40	40	46.8	46.2	113	111	75-125	1	20	
Chromium	ug/L	1.7	40	70								
Chromium Cobalt Lead	ug/L ug/L	1.7 ND	40	40	29.5	29.9	74	75	75-125	1	20	M1
Chromium Cobalt Lead	•				29.5 51.0	29.9 51.0	74 124	75 124	75-125 75-125	1 0	20 20	M1
Chromium Cobalt	ug/L	ND	40	40							_	M1

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

QC Batch: 682625 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350879003

METHOD BLANK: 2759317 Matrix: Water

Associated Lab Samples: 60350879003

Blank Reporting Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L ND 5.0 10/14/20 08:57

LABORATORY CONTROL SAMPLE: 2759318

Spike LCS LCS % Rec Conc. Result % Rec Limits Qualifiers Parameter Units **Total Dissolved Solids** mg/L 1000 1050 105 80-120

SAMPLE DUPLICATE: 2759319

60350879003 Dup Max Parameter Units Result Result **RPD RPD** Qualifiers 4830 **Total Dissolved Solids** mg/L 4740 2 10

SAMPLE DUPLICATE: 2759320

Date: 11/06/2020 11:09 AM

60350964013 Dup Max RPD RPD Parameter Units Result Result Qualifiers Total Dissolved Solids 17200 10 mg/L 18600 8

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

QC Batch: 685060 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350879003

METHOD BLANK: 2769666 Matrix: Water

Associated Lab Samples: 60350879003

Blank Reporting Qualifiers Parameter Units Result Limit Analyzed Chloride mg/L ND 1.0 10/26/20 09:13 Fluoride mg/L ND 0.20 10/26/20 09:13 Sulfate mg/L ND 10/26/20 09:13 1.0

METHOD BLANK: 2770399 Matrix: Water

Associated Lab Samples: 60350879003

Blank Reporting Parameter Units Result Limit Analyzed Qualifiers Chloride ND 1.0 10/27/20 09:06 mg/L Fluoride mg/L ND 0.20 10/27/20 09:06 Sulfate mg/L ND 1.0 10/27/20 09:06

METHOD BLANK: 2771511 Matrix: Water

Associated Lab Samples: 60350879003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/28/20 09:04	
Fluoride	mg/L	ND	0.20	10/28/20 09:04	
Sulfate	mg/L	ND	1.0	10/28/20 09:04	

LABORATORY CONTROL SAMPLE: 2769667 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 5 5.0 99 80-120 Fluoride mg/L 2.5 2.5 100 80-120 Sulfate mg/L 5 5.2 104 80-120

LABORATORY CONTROL SAMPLE: 2770400

Date: 11/06/2020 11:09 AM

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

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



Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Fluoride

Sulfate

Date: 11/06/2020 11:09 AM

LABORATORY CONTRO	DL SAMPLE:	2771512										
			Spike	LC	S	LCS	% R	ec				
Parameter		Units Conc		Result		% Rec	Limits		Qualifiers	_		
Chloride		mg/L		5	4.9	97	' 8	30-120				
Fluoride		mg/L	2.5		2.6	102		80-120				
Sulfate		mg/L		5	5.1	102	2 8	30-120				
MATRIX SPIKE & MATRI	IX SPIKE DUP	LICATE: 2769	1668		2769669							
			MS	MSD								
		60350879002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Chloride	mg/L	126	50	50	180	179	107	105	80-120	0	15	
Fluoride	mg/L	0.64	2.5	2.5	2.9	3.0	92	95	80-120	3	15	
Sulfate	mg/L	323	250	250	570	565	99	97	7 80-120	1	15	
MATRIX SPIKE & MATRI	IX SPIKE DUP	LICATE: 2769	1671		2769672							
			MS	MSD	2.000.2							
		60350879003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Chloride	 mg/L	21.0	10	10	31.9	32.7	109	 117	80-120	2	15	
Fluoride	mg/L	0.22	2.5	2.5	2.1	2.1	77	75	80-120	2	15	M1
Sulfate	mg/L	2610	2500	2500	5210	5260	104	106	80-120	1	15	M1
SAMPLE DUPLICATE:	2769670											
0, WII EE DOT EIO, (TE.	2,000,0		603508	79002	Dup			Max				
Parameter		Units	Res		Result	RPD)	RPD	Qualif	iers		
Chloride		mg/L		126	122	 2	4	1	5			
Fluoride		mg/L		0.64	0.64	4	1	1	5			
Sulfate		mg/L		323	310)	4	1	5			
SAMPLE DUPLICATE:	2769673											
			603508		Dup			Max	•			
Parameter		Units	Res		Result	RPD	· 	RPD	Qualif	iers		
Chloride		mg/L		21.0	21.0)	0	1	5			
-· · ·		//		0.00					_			

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

0.22

2610

ND

2740

15

15

5

mg/L

mg/L

(913)599-5665



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Date: 11/06/2020 11:09 AM

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

(913)599-5665



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353680

Date: 11/06/2020 11:09 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60350879003	ASH-08-CCR	EPA 3010	686072	EPA 6010	686255
60350879003	ASH-08-CCR	EPA 3010	686073	EPA 6020	686257
60350879003	ASH-08-CCR	EPA 7470	682721	EPA 7470	682799
60350879003	ASH-08-CCR	SM 2540C	682625		
60350879003	ASH-08-CCR	EPA 9056	685060		



Sample Condition Upon Receipt ESI Tech Spec Client



Client Name: AEcom			
Courier: FedEx UPS UPS UPS Clay	PEX D ECI D	Pace □ Xroads	□ Client □ Other □
Tracking #: 1908 10134 0945 Pag	e Shipping Label Us	ed? Yes □ No 😾	
Custody Seal on Cooler/Box Present: Yes □ No X	Seals intact: Yes		
Packing Material: Bubble Wrap □ Bubble Bags □	☐ Foam ☐	None □	Other M Zplc
Thermometer Used: 7299 Typ	e of Ice We Blu	e None	ч Фр
Cooler Temperature (°C): As-read 4,8 Corr. Fact	or 0.2 Corre	cted 5.0	Date and initials of person examining contents: 10/9/2005
Temperature should be above freezing to 6°C			
Chain of Custody present:	Yes No N/A		
Chain of Custody relinquished:	Yes DNo DN/A		
Samples arrived within holding time:	¹X√res □No □N/A		
Short Hold Time analyses (<72hr):	□Yes 🖎 n/A		
Rush Turn Around Time requested:	□Yes No □N/A		
Sufficient volume:	XYes □No □N/A		
Correct containers used:	Yes □No □N/A		
Pace containers used:	Yes □No □N/A		
Containers intact:	Yes No NA		Market Commercial
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No □XI/A		
Filtered volume received for dissolved tests?	□Yes □No □N/A		
Sample labels match COC: Date / time / ID / analyses	Yes □No □N/A		
Samples contain multiple phases? Matrix: W	□Yes WNo □N/A		
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)	Yes No N/A	List sample IDs, voludate/time added.	imes, lot #'s of preservative and the
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)			
Cyanide water sample checks:		JS 12 11 - 3511	
Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No		
	☐Yes ☐No		
Trip Blank present:	□Yes □No MN/A		ALL CONTRACTOR OF THE SECOND
Headspace in VOA vials (>6mm):	□Yes □No XIN/A		
Samples from USDA Regulated Area: State:	□Yes □No ₩N/A		
Additional labels attached to 5035A / TX1005 vials in the field?	Yes □No NoN/A		
Client Notification/ Resolution: Copy COC to	Client? Y / N	Field Data Require	ed? Y / N
Person Contacted: Date/Ti	me:		Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.
el de la			Start: Start:
			End: End:
Project Manager Review:	Dat		Temp: Temp:



CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Project No./ Lab I.D. t (N/Y) DRINKING WATER Samples intact 1032087A MS/MSD collected SAMPLE CONDITIONS OTHER Cooler (Y/N) ₹ 8A7-13 Custody Sealed (N/Y) eol Received on GROUND WATER Page: Residual Chlorine (Y/N) 0 O° ni qmeT S REGULATORY AGENCY 00 RCRA Requested Analysis Filtered (Y/N) ON Dabso TIME DATE SIGNED 10/68/2020 Site Location STATE: NPDES DATE UST 5240C LDS 2 470 Total Mercury ACCEPTED BY / AFFILIATION **slateM latoT 0108 5020 Total Metals* 9028 CI' E' 204 Analysis Test 1 N /A Same as Section A Tahto Accounts Payable Heather Wilson Methanol Preservatives _EO_SS_SbN AECOM いるとうでい HOBN 11033, 42700 HCI HNO³ 3 company Name: H2SO4 Reference Pace Project Manager: ace Profile #: Section C 0000 Pace Quole TIME Unpreserved J 66 Address # OF CONTAINERS M Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for Iny SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER SIGNATURE of SAMPLER: SAMPLE TEMP AT COLLECTION 0.8/3/0 DATE TIME COLLECTED RELINQUISHED BY / AFFILIATION WT6 10/7/20 (3:30 PRPA Rawhide CCR 10/5/20 9:00 TIME MT 6 10/8/20 11:15 Jeff Dosko well COMPOSITE Brian Rothmeyer Report To: Vasanta Kalluri Required Project Information: و (G=GRAB C=COMP) 39YT 3J9MAS urchase Order No (see valid codes to left) MATRIX CODE roject Name roject Number Section B Copy To CODE Valid Matrix Codes DRINKING WATER V WATER V WASTE WATER V PRODUCT SOIL/SOLID SOIL/SOLID WIPE V WIPE A AIR A SOIL/SOLID V WIPE V WIPE A AIR A SOIL/SOLID V WIPE A AIR A AIR A SOIL/SOLID V WIPE A AIR Greenwood Village, CO 80111 brian.rothmeyer@aecom.com - CCR ADDITIONAL COMMENTS BAT-10 - CCA (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE 6200 South Quebec St Be, Cr. Co. As, Se, Mo. Cd. Sb, Ba, TI, Pb SAMPLE ID 1000 (303) 740-2614 Required Client Information Requested Due Date/TAT: BAT AECOM Section D Section A B Ca II mail To: Address Ξ 유 12 Page 16 of 17 # MaTi 7 4 ĸ 9 7 00 6

F-ALL-Q-020rev 08, 12-Oct-2007



CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

Section Require	n A d Client Information:	Section I Required		et Infor	mation:						ction	n C Inform	ation:															Page	:	of		
Compan		Report To:									ention			ount	s Pa	yable	9				П						<u> </u>					
Address	6200 South Quebec St	Сору То:	Bria	an Ro	thmeyer	Company Name: AECOM						REG	ULA	TOR'	Υ Α(3EN(CY															
	Greenwood Village, CO 80111									Add	lress:	:	San	ne a	s Se	ction	A				-		NPDE				OUND	WAT	ΓER □	DRINKIN	G WAT	FR
Email To	brian.rothmeyer@aecom.com	Purchase	Order	No.:							e Quot		427	00									UST			RCR			П	OTHER	•	
Phone:	(303) 740-2614 Fax:	Project Na	me:	PRF	PA Rawhio	de				Pace	erence e Proje	ect	Hea	ther	Wils	son					\dashv		Loca	tion	_				77	7777	777	7777
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	Required Client Information MATRIX	CODE	o left)	MP)	_	COLL	ECTED				L		Pres	erva	tives	S	N/A											\angle	<u>////</u>	<u>////</u>	<u> </u>	<u>////</u>
	DRINKING WATE WASTE WATER WASTE WATEI PRODUCT SOIL/SOILO OIL WIPE AIR	WT R WW P SL OL WP	(see valid codes to left)	(G=GRAB C=COMP)	COMPC		COMPC END/G	DSITE RAB	COLLECTION	S	1						-	<u>.</u>	als*	als**	ercury							e (Y/N)				
ITEM#	(A-Z, 0-9 /,-) OTHER Sample IDs MUST BE UNIQUE	AR OT TS	MATRIX CODE (SAMPLE TYPE (G:	DATE	TIME	DATE	TIME	SAMPLE TEMP AT (# OF CONTAINERS	pezdesedul	Uripreserved H ₂ SO ₄	HNO ₃	HCI	Na ₂ S ₂ O ₃	Methanol	Analysis Test	- 10	_	Total	otal M	2540C TDS						Residual Chlorine (Y/N)	Pac	e Project	No./ L	ab I.D.
1	ASH-08-CCR		WT	G	10/8/20	13:30				3			1					>	χ X	Х	Х	Х										
2																																
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12	ADDITIONAL COMPLIES				101155 51/ /				<u> </u>				Н								<u> </u>			<u></u>						DI 5 001101		
*Be. Cr.	ADDITIONAL COMMENTS Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb		KEL	INQU	ISHED BY /	AFFILIATI	ON	DAT	=		TIMI	E			AC	CEPT	ED B	Y/A	FFILI	ATIO	N .		DAT	E		ГІМЕ			SAIVI	PLE CONDI	TIONS	
**B, Ca,				Se	ee Original	COC		10/8/2	20		16:0	00				See	Origi	nal C	COC			_	10/9/	20		8:50				<u> </u>	—	
B, Ca,																																
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	*Important Note: By signing this form you are acco	epting Pace's NE	T 30 da	av pavn	nent terms and	agreeing to) late charges	of 1.5% per	month	for an	v invo	oices n	ot paid	withir	30 da	VS.			,vi/L	-/ 1	,-			5,07			F-A	LL-Q	-020rev.08	. . 12-Öct-2(/07	

Platte River Power Authority – Rawhide DATA REVIEW CHECK

Data Package: 60353753

Sampling Event: October 8, 2020

Data Reviewer: Brian Rothmeyer

Peer Reviewer: Katie Abbott

Date Completed: December 21, 2020

Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 8th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

	Data are usable without qualification.
X	Data are usable with qualification (noted below).
	Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria		riteri Met?	a
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. Analyte Concentration MB 2026011 Radium-228 1.05 ± 0.493 pCi/L ± - Plus or Minus pCi/L - Picocuries Per Liter MB - Method Blank		X ¹	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X

Review Parameter	Criteria		riteri Met?	
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	 The field duplicate sample results satisfied the evaluation criteria below: The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2. 			X
Equipment Blanks	No target analytes reported in the associated equipment blank.		X^2	
Detection Limits Mets	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.	X		
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

^{1 –} The associated radium-228 result for sample ASH-08-CCR was reported at a concentration greater than the minimum detectable concentration (MDC) and reported at a concentration less than 5x the concentration of the blank contamination and was qualified as estimated (J+ bl) to reflect the potential high bias indicated by the blank contamination.

²⁻ The associated radium-228 and total radium results for sample ASH-08-CCR were reported at concentrations greater than the MDC and reported at concentrations less than 5x the concentration of the blank contamination and were qualified as estimated (J+ be) to reflect the potential high bias indicated by the blank contamination.

< - Less Than
pCi/L - Picocuries Per Liter
bl - Laboratory blank Contamination

LCS – Laboratory Control Sample MDC – Minimum Detectable Concentration

^{≤ -} Less Than or Equal To ± - Plus or Minus/High or Low Bias DER - Duplicate Error Ratio LCSD - Laboratory Control Sample Duplicate MS/MSD - Matrix Spike/Matrix Spike Duplicate

σ – Sigma (Uncertainty)
be – Equipment Blank Contamination
J – Estimated
MB – Method Blank
NA – Not Applicable





November 06, 2020

Vasanta Kalluri AECOM 6200 South Quebec Street Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 09, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

• Pace Analytical Services - Greensburg

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

Sincerely,

Heather Wilson

heather.wilson@pacelabs.com 1(913)563-1407

Dianton M. Wilson

Project Manager

Enclosures

cc: Ann Cinabro, AECOM Jeremy Hurshman, AECOM Brian Rothmeyer, AECOM







CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

Pace Analytical Services Pennsylvania

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457

New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

(913)599-5665



SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351176007	ASH-08-CCR	Water	10/08/20 13:30	10/09/20 09:15

REPORT OF LABORATORY ANALYSIS

(913)599-5665



SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351176007	ASH-08-CCR	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

Sample: ASH-08-CCR PWS:	Lab ID: 6035 Site ID:	1176007 Collected: 10/08/20 13:30 Sample Type:	Received:	10/09/20 09:15	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg				
Radium-226	EPA 903.1	0.615 ± 0.523 (0.735) C:NA T:85%	pCi/L	10/27/20 14:0	8 13982-63-3	
	Pace Analytical	Services - Greensburg				
Radium-228	EPA 904.0	1.36 ± 0.607 (1.01) C:68% T:70%	pCi/L	10/30/20 11:59	9 15262-20-1	
	Pace Analytical	Services - Greensburg				
Total Radium	Total Radium Calculation	1.98 ± 1.13 (1.75)	pCi/L	11/01/20 12:49	9 7440-14-4	

REPORT OF LABORATORY ANALYSIS



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

QC Batch: 419061 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60351176007

METHOD BLANK: 2026011 Matrix: Water

Associated Lab Samples: 60351176007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.418 ± 0.455 (0.950) C:74% T:69%	pCi/L	10/30/20 11:59	
Radium-228	1.05 ± 0.493 (0.827) C:68% T:80%	pCi/L	10/26/20 15:15	

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



QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

QC Batch: 419060 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 60351176007

METHOD BLANK: 2026010 Matrix: Water

Associated Lab Samples: 60351176007

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 0.319 ± 0.370 (0.598) C:NA T:92%
 pCi/L
 10/27/20 13:52

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

REPORT OF LABORATORY ANALYSIS



QUALIFIERS

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Date: 11/06/2020 04:50 PM

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR

Pace Project No.: 60353753

Date: 11/06/2020 04:50 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351176007	ASH-08-CCR	EPA 903.1	419060		
60351176007	ASH-08-CCR	EPA 904.0	419061		
60351176007	ASH-08-CCR	Total Radium Calculation	421105		

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

DRINKING WATER OTHER ö GROUND WATER Page: REGULATORY AGENCY 8 RCRA Site Location NPDES STATE UST Same as Section A Accounts Payable Pace Quote 42700
Raterance:
Pace Project
Manager:
Pace Profile #: 11033, 3 Company Name: AECOM Involce Information: Attention: Accr Section C Address Copy To: Brian Rothmeyer Report To: Vasanta Kalluri Section B Required Project Information: rev urchase Order No. Project Name; Project Number Greenwood Village, CO 80111 brian.rothmeyer@aecom.com 6200 South Quebec St hone: (303) 740-2614 Section A Required Client Information: Requested Due Date/TAT: AECOM Email To: Company. Address:

Section						STATE			
n unon	Valid Matrix Codes		- - -			Requested Analysis Filtered (Y/N)	(N/A)		
Required Client Information	MATRIX CODE DRINKING WATER DW			Preservatives	↑ N /\				
SAMPLE ID	WATER WY WASTE WAYER WW PRODUCT P SOUSDLID SI. OIL O'L WIPE WP AIR AR	C=COMPOSITE START START START	COMPOSITE ENDIGRAB		l js		(N/A) ə		
ا	TISSUE	OOD SIMILE TYPE SMANLE TYPE ON THE THE THE THE THE THE THE TH	u S F	Miner legister legist	eT eieylenA 82S-muibe 82S-muibe muibeЯ leid		, ninoIdO laubis		
CRB-03-6		6 19/7/20 9:30 S		1 1 1 C? U 1 1 1 1	超 2 対 2		9A	Pace Project No./ Lab I.D.	G
BAT- 13-CCF		6 10 8/20							
1 1		- 安田 8/6/01 9 1M	0					MS/MSD collecter	d of
ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION	DATE						
		H Deblowshi	0	0	ACCEPTED BY / AFFILIATION	DATE TIME	1	SAMPLE CONDITIONS	
								→	
	- Arrange - Arra				***				
		SAMPLER NAME AND SIGNATURE	AND SIGNATURE						

F-ALL-Q-020rev.08, 12-Oct-2007

Samples Intact Samples Intact

Cooler (Y/N)

ice (Y/V)

Received on

O° ni qmeT

DATE Signed 10/0 8/2020

Colored Services

SIGNATURE of SAMPLER: PRINT Name of SAMPLER:

"important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1,5% per month for Ary invoices not paid within 30 days.

Page 10 of 15

Pittsburgh L	ab Sample Condit	ion L	Jpon	Re	ceipt			
Pace Analytical	Client Name:	٠	Pa	æ	KS	Project #	<u>!</u>	_
	□ups □usps □client 6736 1680		ommei	rcial	Pace Other		LabelLIMS Login	
-	er/Box Present: yes		o	Seals	intact: yes	no		_
Thermometer Used					Blue (None)			
Cooler Temperature	Observed Temp	-	°C		ection Factor:	°C _{Fina}	l Temp: C	
Temp should be above fre	ezing to 6°C		•					-
Comments:		Yes	No	N/A	pH paper Lot#	Date and conten	l Initials of person examining ts: <u> </u>	
Chain of Custody Prese	ent:				1.			
Chain of Custody Filled	Out:				2.			
Chain of Custody Reline	quished:				3.			
Sampler Name & Signa					4.			_
Sample Labels match C					5.			
-Includes date/time/l	D Matrix: V	マナ	•					
Samples Arrived within	Hold Time:				6.			
Short Hold Time Analy	sis (<72hr remaining):				7.			
Rush Turn Around Tim	ne Requested:				8.			
Sufficient Volume:					9.			
Correct Containers Use	d:				10.			
-Pace Containers Us	sed:]			
Containers Intact:					11.			
Orthophosphate field fill	tered				12.			
Hex Cr Aqueous sample	e field flitered				13.			
Organic Samples che	cked for dechlorination:			-	14.			
Filtered volume received	d for Dissolved tests				15.			
All containers have been c	hecked for preservation.				16.			
exceptions: VOA, colife Non-aqueous matrix	orm, TOC, O&G, Phenolics,	Radon,			PH.	c= 7_		
All containers meet met requirements.	hod preservation				Initial when completed	Date/time of preservation		
requirements.				L	Lot # of added	preservation		
			I		preservative			-
Headspace in VOA Vials	s (>6mm):	 			17.			
Trip Blank Present:					18.			
Trip Blank Custody Seal Rad Samples Screened					Initial when AZW	1.0	1.00	
Rad Samples Screened	a < 0.5 mienimi				completed: 05	Date: 10	10/2020	
Client Notification/ Res	solution:							
	1			-Date/	Time:	Cont	acted-B <u>y:</u>	
Comments/ Resolution	n:							-
								-
								-
						· · · · · · · · · · · · · · · · · · ·		_

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

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

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



CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

Section Required	A Client Information:	Section I Required		t Infor	mation:						tion (ion:														Page:	:	of		
Company	: AECOM	Report To:	: Vas	anta	Kalluri					Atte	ntion:	-	Acco	ınts	Pay	able										_					
Address:	6200 South Quebec St	Сору То:	Bria	ın Ro	thmeyer					Com	pany	Name	: Al	СО	М						RE	GUL	ATOR	Y A	GEN	CY					
	Greenwood Village, CO 80111									Addı	ress:	;	Same	as	Sect	tion A	4					NP	DES		GRO	DUND	WAT	TER	DRINKIN	3 WATER	
Email To:	brian.rothmeyer@aecom.com	Purchase (Order	No.:							Quote		4270)								US	Т		RCF	RA			OTHER		_
Phone:	(303) 740-2614 Fax:	Project Na	me:	PRF	PA Rawhi	de				_	Projec	ct	Heath	er V	Vilso	n					s	ite Lo	cation	1					////		///
Requeste	ed Due Date/TAT:	Project Nu	mber:							_	Profile	e #: •	1103	3, 3								s	TATE:			0					
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	SAMPLE ID WIPE AR	WP AR OT	ees)	0=9)		İ			AT CC	ERS							est	ı									rine				
	(A-Z, 0-9 / ,-) OTHER Sample IDs MUST BE UNIQUE	TS	ODE	TYPE						TAIN	ved						T S		228	in							Shic				
#			NX C	ᄪ					LE TE	00 N	eser	4	8	_	တို့	anol	alys	Ľ,	y-mr	Rac							dual				
ITEM			MATRIX CODE	SAMPLE	DATE	TIME	DATE	TIME	SAMPLE TEMP	# OF CONTAINERS	Jnpr	H ₂ SO₄	N N N N N N N	NaOH	Na ₂ S ₂ O ₃	Metha Other	↓ Analysi	Radium-226	Radium-228	Total Radium							Residual	Pace	Project I	lo./ Lab I.[
1	ASH-08-CCR		WT		10/8/20	13:30	DATE		0,	2	+	2	+	_			╀	X	1	X							Ť	1 400	e i i oject i	10.7 Lab 1.L	<u>,, </u>
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		• —	_			SAMPLI	ER NAME A	ND SIGNA	TURI	E																	ပွ	Received on Ice (Y/N)	Custody Sealed	(N/V)	_
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							SIGNATUR	RE of SAMP	LER:	See	e Orio	ginal	COC	;				D	ATE S	Signed D/YY):	b		10/8	/20			Ter	Recei	Page	12 of \$5	
	*Important Note: By signing this form you are accepting	ing Pace's NE	T 30 da	ay payn	nent terms an	d agreeing t	o late charges	of 1.5% per n	nonth 1	for any	/ invoic	es not	paid w	thin 30	J days	S.		<u> </u>		,			2. 31			F-A	LL-Q	-020Tev.08	, 12-Oct-20)7	

Pace Analytical

Ra-226 MK1 10/2/2020

56814 DW

Batch ID: Matrix:

Test: Analyst: Date:

0.319 0.368 0.598 1.70 N/A Pass

MB concentration:
M/B Counting Uncertainty:
M/B M/B M/C;

MB Sample ID

Method Blank Assessment

MB Numerical Performance Indicator: MB Status vs Numerical Indicator: MB Status vs. MDC:

Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

2	
3	
Building page 1 mg against a san against a s	

	Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
	Sample Collection Date:	10/8/2020	10/8/2020
	Sample I.D.	60351179003	60351176004
	Sample MS I.D.	60351179004	60351176005
	Sample MSD I.D.	60351179005	60351176006
	Spike I.D.:	20-032	20-032
	MS/MSD Decay Corrected Spike Concentration (pCi/mt.):	32.183	32,183
	Spike Volume Used in MS (mL):	0.20	0.20
	Spike Volume Used in MSD (mL):	0.20	0.20
	MS Aliquot (L, g, F):	0.660	0.659
	MS Target Conc.(pCl/L, g, F):	9.751	9.773
	MSD Aliquot (L, g, F):		0.654
	MSD Target Conc. (pCi/L, g, F):	9.855	9.840
	MS Spike Uncertainty (calculated):	0.458	0.459
z	MSD Spike Uncertainty (calculated):	0.463	0.462
56814	Sample Result:		0.119
	Sample Result Counting Uncertainty (pCi/L, g, F):	298.0	0.438
	Sample Matrix Spike Result:	8.724	10.220
	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.270	1.450
	Sample Matrix Spike Duplicate Result:	11.463	9.723
	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F);	1.647	1.330
	MS Numerical Performance Indicator:	-1.911	0.406
	MSD Numerical Performance Indicator:	1.422	-0.313
	MS Percent Recovery:	%00'98	103.36%
	MSD Percent Recovery:	112.88%	97.61%
	MS Status vs Numerical Indicator:	N/A	N/A
	MSD Status vs Numerical Indicator:	A/A	A/N
	MS Status vs Recovery:	Pass	Pass
	MSD Status vs Recovery:	Pass	Pass
	MS/MSD Upper % Recovery Limits:	136%	136%
1	MS/MSD Lower % Recovery Limits:	71%	71%

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56814	LCSD56814
Count Date:	10/27/2020	
Spike I.D.:	20-032	
Spike Concentration (pCl/mL):	32.182	
Volume Used (mL);	0.10	
Aliquot Volume (L. g, F):	0.656	
Target Conc. (pCi/L, g, F):	4.902	
Uncertainty (Calculated):	0.230	
Result (pCi/L, g, F):	5.792	****
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.192	
Numerical Performance Indicator:	4.	
Percent Recovery:	118.14%	
Status vs Numerical Indicator:	A/N	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

	60351179003	60351179004	60351179005	8.724	1.270	11.463	1.647	-2.581	27.03%	Ϋ́Ν	Pass	32%
Matrix Spike/Matrix Spike Duplicate Sample Assessment	Sample I.D.	Sample MS I.D.	Sample MSD I.D.	Sample Matrix Spike Result:	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	MS/ MSD Duplicate Status vs Numerical Indicator:	MS/ MSD Duplicate Status vs RPD:	- SPD Linit
	Enter Duplicate	sample IDs if	other than	LCS/LCSD in	the space below.							

See Below 排

Sample I.D.:

Sample Sample I.D.:

Sample Result (DCI/L, g. F):

Sample Counting Uncertainty (DCI/L, g. F):

Sample Duplicate Result (COI/L, g. F):

Sample Duplicate Result (COI/L, g. F):

Are sample and/or duplicate results below RI.?

Duplicate Sample Assessment

60351176004 60351176005 60351176006 10.220 1.450 9.723 1.330 0.495 5.72%

N/A Pass 32%

10/28/20

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

Duplicate Status vs Numerical Indicator: Duplicate Status vs RPD: % RPD Limit:

Duplicate Numerical Performance Indicator:

Duplicate RPD:

Ra-226 NELAC QC Printed: 10/28/2020 2:14 PM

Face Analytical"

Quality Control Sample Performance Assessment

0/22/2020 56815 ٨ Worklist: Matrix: Date: Analyst

60351176004 60351176005 60351176006 20-030 38.107 0.20 0.20 0.810 9.407

20-030 38.107

Spike I.D.:

0.20 0.20 0.807 9.447 0.811

Spike Volume Used in MSD (mL):
MS Aliquot (L, g, F):
MS Target Conc (pCift, g, F):
MSD Target Conc. (pCift, g, F):

Spike Volume Used in MS (ml.):

MS/MSD Decay Corrected Spike Concentration (pCi/mL):

Sample I.D. Sample MS I.D. Sample MSD I.D.

Sample Collection Date:

Sample Matrix Spike Control Assessment

MS/MSD 2 10/8/2020

MS/MSD

Analyst Must Manually Enter All Fields Highlighted in Yellow.

z	LCSD (Yor NY)	Laboratory Control Sample Assessment
	Fail*	MB Status vs. MDC:
	Fail*	MB Status vs Numerical Indicator:
	4.19	MB Numerical Performance Indicator:
	0.827	MB MDC:
	0.493	M/B 2 Sigma CSU:
	1.053	MB concentration:
		_

MB Sample ID

Method Blank Assessment

CS56815

Count Date:

Spike I.D.:

20-030

Decay Corrected Spike Concentration (pCi/mL):

Volume Used (mt.): Aliquot Volume (L, g, F): Target Conc. (pCi/L, g, F): Uncertainty (Calculated):

	MSD Target Conc. (pCM, g. F): MS Spike Uncertainty (calculated): MSD Spike Uncertainty (calculated): Sample Result:	9.402 0.463 0.461 2.878
LCSD56815	Sample Result 2 Sigma CSU (pC)/L, _{9,} F); Sample Result Sample Matrix Spike Result.	2.878 1.119 10.637
	Matrix Spike Result 2 Sigma CSU (pCif., g, F); Sample Matrix Spike Duplicate Result 2 Sigma CSU (pCif., g, F); Matrix Spike Duplicate Result 2 Sigma CSU (pCif., g, F); MS Nirmarical Performance Indicator:	2.260 10.290 2.197
	MSD Numerical Performance Indicator: MS Percent Recovery: MSD Percent Recovery:	-1.555 82.13% 78.83%
	MS Status vs Numerical Indicator: MSD Status vs Numerical Indicator: MS Status vs Recovery: MS Status vs Recovery:	Pass Pass
	MS/MSD Upper % Recovery Limits: MS/MSD Lower % Recovery Limits:	135% 60%

0.10 0.818 4.632 0.227 5.132 1.196 0.81 N/A Pass 135% 60%

Result (pC/IL, g, F): LCS/LCSD 2 Sigma CSU (pC/IL, g, F): Numerical Performance Indicator;

Status vs Numerical Indicator: Status vs Recovery: Upper % Recovery Limits: Lower % Recovery Limits:

Percent Recovery

9.317 0.461 0.457 2.094 0.907 9.649 2.301 9.653 2.143 80.31% 80.31% 81.13% 81.13% 81.13% 81.3

Are sample and/or duplicate results below

Sample Duplicate Result 2 Sigma CSU (pCi/L

Duplicate Sample Assessment

36%	36%	% RPD Limit
Pass	Pass	MS/ MSD Duplicate Status vs RPD:
Pass	Pass	MS/ MSD Duplicate Status vs Numerical Indicator:
1.01%	4.10%	(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:
-0.003	0.216	Duplicate Numerical Performance Indicator:
2.145	2.197	Matrix Spike Duplicate Result 2 Sigma CSU (pCI/L, g, F):
9.653	10.290	Sample Matrix Spike Duplicate Result
2.301	2.260	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):
9.649	10.637	Sample Matrix Spike Result:
603511760	60351179005	Sample MSD I.D.
603511760	60351179004	Sample MS I.D.
603511760	60351179003	Sample I.D.
		Matrix Spike/Matrix Spike Duplicate Sample Assessment

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Comments:

of the lowest activity sample in this batch is greater than ten times the blank value, the blank is acceptable; otherwise this batch must be re-prepped.

Ra-228 NELAC DW2 Printed: 10/27/2020 2:56 PM

6 of 10

Face Analytical

Analyst Must Manually Enter All Fields Highlighted in Yellow. Quality Control Sample Performance Assessment

MS/MSD 2

MS/MSD 1

Sample I.D. Sample MS I.D. Sample MSD I.D. Sample Collection Date:

Spike LD.:

MS/MSD Decay Corrected Spike Concentration (pCi/mL):

Spike Volume Used in MS (mL): Spike Volume Used in MSD (mL);

MS Aliquot (L. g, F);

Sample Matrix Spike Control Assessment Ra-228 Test: Analyst

VAL 10/22/2020 56815 WT		2026011	0.418	0.455	0.950	1.80	Pass	Pass
		202	0	0	O	•	a.	£
Analyst. Date: Worklist Matrix:	Method Blank Assessment	MB Sample ID	MB concentration:	M/B 2 Sigma CSU:	MB MDC:	MB Numerical Performance Indicator:	MB Status vs Numerical Indicator:	MB Status vs. MDC:

MS Target Conc. (pCit., g, F):
MSD Aliquot (L, g, F):
MSD Target Conc. (pCif., g, F):
MS Spike Uncertainty (calculated):
MSD Spike Uncertainty (calculated):

Duplicate Sample Assessment

			WS Spike Uncertainty (carculated);
Laboratory Control Sample Assessment	LCSD (Y or N)?	z	MSD Spike Uncertainty (calculated):
	LCS56815	LCSD56815	Sample Result:
Count Date:	#N/A	#N/A	Sample Result 2 Sigma CSU (pCi/L, g, F):
Spike I.D.:	#N/A	#N/A	Sample Matrix Spike Result:
Decay Corrected Spike Concentration (pCi/mt_):	Y/N#	#N/A	Matrix Spike Result 2 Sigma CSU (pCi/l., g, F):
Volume Used (mL):		W/A#	Sample Matrix Spike Duplicate Result:
Aliquot Volume (L, g, F):	A/N#	¥N/¥	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/l., g, F):
Target Conc. (pCi/L, g, F):	79-	#N/A	MS Numerical Performance Indicator.
Uncertainty (Calculated):	#N/A	#N/A	MSD Numerical Performance Indicator;
Result (pCl/L, g, F):	V/N#	#N/A	MS Percent Recovery:
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	V/N#		MSD Percent Recovery:
Numerical Performance Indicator.	Y/N#	#N/A	MS Status vs Numerical Indicator;
Percent Recovery:	Y/N#	#N/A	MSD Status vs Numerical Indicator;
Status vs Numerical Indicator:	V/N#	#N/A	MS Status vs Recovery:
Status vs Recovery:	4/N#	#N/A	MSD Status vs Recovery:
Upper % Recovery Limits:	A/N#	#N/A	MS/MSD Upper % Recovery Limits:
Lower % Recovery Limits:	Y/N#	#N/A	MS/MSD Lower % Recovery Limits:

**************************************	To see the second	Office of the second of the se
		Duplicate Status vs RPD: % RPD Limit:
		Duplicate Status vs Numerical Indicator;
		Duplicate RPD:
		Duplicate Numerical Performance Indicator:
	See Below 排	Are sample and/or duplicate results below RL?
		Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):
the space below.		Sample Duplicate Result (pCl/L, g, F):
LCS/LCSD in		Sample Result 2 Sigma CSU (pCi/L, g, F):
other than		Sample Result (pCi/L, g, F);
sample IDs if		Duplicate Sample I.D.
Enter Duolicate		Sample I.D.:
	Enter Duplicate sample IDs if other than CS/LCSD in the space below.	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.

Evaluation of dupilicate precision

Comments:

∀/V#

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1 of 1

AECOM Environment

Appendix C

Statistical Analysis Results

	Α	В	С	D	E	F	G	Н	I	J	K	l	L
1		Hear Sala	cted Options	•	d Statistics fo	or Data Sets	WITH NON-D	etects					
2	Г	ate/Time of C	-		1/27/2020 11	·02·24 ΔΜ							
3			From File		ProUCL Inpu								
5		Fu	ıll Precision	OFF									
6		Confidence	Coefficient	95%									
7			Coverage	95%									
8	Different	or Future K O	bservations	1									
9	Numbe	r of Bootstrap	Operations	2000									
10													
_	В												
12													
13	General S	Statistics											
14			Total	Number of C	Observations	17			Numbe	r of Distinct O			
15					Minimum	0.283				F	irst Quartile		
16				Sec	cond Largest	0.58					Mediar		471
17					Maximum	0.63				TI	nird Quartile		
18				Coofficient	Mean	0.457					Skownoss		0984
19					t of Variation logged Data	0.215 -0.808				6D °41	Skewness logged Data	_	188 236
20				ivied[] Of	ogged Data	-0.008				3U UT	oggeu Data	0.2	230
21				Crit	ical Values f	or Backgrou	nd Threshol	ld Values (R	TVs)				
22			Tole	rance Factor		2.486	na mesno	id Valdes (D	1 43)	d2m:	ax (for USL)	2 (475
23			1010	141100 1 40101	1 (1 01 0 1 1)	2.100				QZIII.	ux (101 00L)		.,,
24 25						Normal (GOF Test						
26			S	Shapiro Wilk T	Test Statistic	0.91			Shapiro W	ilk GOF Test			
27			5% S	hapiro Wilk C	Critical Value	0.892		Data app	ear Normal a	nt 5% Significa	nce Level		
28				Lilliefors 7	Test Statistic	0.237			Lilliefors	GOF Test			
29			5	% Lilliefors C	Critical Value	0.207		Data No	ot Normal at	5% Significan	ce Level		
30				Data	appear App	roximate No	rmal at 5% \$	Significance	Level				
31													
32					ackground S		suming Norn	nal Distributi	ion				
33			95% (UTL with 95		0.702					ercentile (z		583
34					95% UPL (t)	0.634					ercentile (z		619
35					95% USL	0.701				99% P	ercentile (z)	0.6	686
36						Gammo	GOF Test						
37				A-D T	Test Statistic	1.027	GOI 1691	Ande	rson-Darling	Gamma GO	F Test		
38					Critical Value	0.738	D		_	ted at 5% Sigr		vel	
39 40					Test Statistic	0.267	_			ov Gamma G			
41				5% K-S C	Critical Value	0.209	D			ted at 5% Sigr		vel	
42				Da	nta Not Gami	ma Distribut	ed at 5% Sig	gnificance Le	evel				
43													
44						Gamma	Statistics						
45					k hat (MLE)	20.47				star (bias cori			
46	-		-		ta hat (MLE)	0.0223			Theta	star (bias cori			
47					nu hat (MLE)	696				nu star (bia			
48			М	LE Mean (bia	s corrected)	0.457				MLE Sd (bia	s corrected)	0.	111
49								B! . !! :	•				
50		000/ 1471	on Hilf-in As		ackground S		uming Gam	ma Distribut	ion	000	/ De '''		604
51			on Hilferty (W			0.661					% Percentile		604
52			rins Wixley (H			0.666 0.757					% Percentile		654 754
53		95% WH Appr								99%	% Percentile	U.,	754
54		95% HW Appı	rox. Gamma l	UILWITH 95		0.767							

59	5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level						
60	Lilliefors Test Statistic	0.281	Lilliefors Lognormal GOF Test						
61	5% Lilliefors Critical Value	0.207	Data Not Lognormal at 5% Significance Level						
62	Data Not L	ognormal a	t 5% Significance Level						
63	Parkers and Oke	A!-A!	noine I amangal Distribution						
64	95% UTL with 95% Coverage	0.802	ming Lognormal Distribution 90% Percentile (z)	0.603					
65	95% UPL (t)	0.681	95% Percentile (z)	0.658					
66 67	95% USL	0.8	99% Percentile (z)	0.772					
68			(-/						
69	Nonparametric	Distribution	Free Background Statistics						
70	Data appear Appr	oximate No	rmal at 5% Significance Level						
71									
72		er Limits fo	r Background Threshold Values						
73	Order of Statistic, r	17	95% UTL with 95% Coverage	0.63					
74	Approx, f used to compute achieved CC	0.895	Approximate Actual Confidence Coefficient achieved by UTL	0.582					
75	OFO/ Developing Developing UTL with OFO/ Occurred	0.00	Approximate Sample Size needed to achieve specified CC	59					
76	95% Percentile Bootstrap UTL with 95% Coverage 95% UPL	0.63	95% BCA Bootstrap UTL with 95% Coverage 90% Percentile	0.63 0.556					
77	90% Chebyshev UPL	0.761	95% Percentile	0.550					
78	95% Chebyshev UPL	0.898	99% Percentile	0.622					
70			99% Percentile 0						
79 80	95% USL	0.63							
80	-	0.63							
80 81	95% USL		of BTV, especially when the sample size starts exceeding 20.						
80	95% USL Note: The use of USL tends to yield a conservativ	ve estimate	of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers						
80 81 82	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observa	ve estimate only when the tions collected	ne data set represents a background data set free of outliers led from clean unimpacted locations.						
80 81 82 83	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balance.	ve estimate only when the tions collect ce between	ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data						
80 81 82 83 84	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balance.	ve estimate only when the tions collect ce between	ne data set represents a background data set free of outliers led from clean unimpacted locations.						
80 81 82 83 84 85 86 87	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of USL	ve estimate only when the tions collect ce between	ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data						
80 81 82 83 84 85 86 87	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balance.	ve estimate only when the tions collect ce between	ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data						
80 81 82 83 84 85 86 87 88	Note: The use of USL tends to yield a conservative. Therefore, one may use USL to estimate a BTV and consists of observation. The use of USL tends to provide a balant represents a background data set and when the conservation of the conservatio	ve estimate only when the tions collect ce between	ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data						
80 81 82 83 84 85 86 87 88 89	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to yield a conservation of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to provide a balant tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of the use of USL tends to yield a part of USL	ve estimate only when the tions collect ce between	ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data	15					
80 81 82 83 84 85 86 87 88 89 90	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balant represents a background data set and where Ca	we estimate only when the tions collect ce between nen many or	ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data asite observations need to be compared with the BTV.	15 320					
80 81 82 83 84 85 86 87 88 89 90 91	Note: The use of USL tends to yield a conservative. Therefore, one may use USL to estimate a BTV of and consists of observations. The use of USL tends to provide a balant represents a background data set and which the use of the use of the use of USL tends to provide a balant represents a background data set and which the use of the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a balant represents a background data set and which the use of USL tends to provide a background data set and which the use of USL tends to provide a background data set and which the use of USL tends to provide a background data set and which the use of USL tends to provide a background data set and which the use of USL tends to provide a background data set and the use of USL tends to provide a background data set and the use of USL tends to provide a background data set and the use of USL tends to provide a background data set and the use of USL tends to provide a background data	we estimate only when the tions collect ce between men many or	ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data asite observations need to be compared with the BTV. Number of Distinct Observations						
80 81 82 83 84 85 86 87 88 89 90	Note: The use of USL tends to yield a conservative. Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and which the conservations are presented in the conservations. Total Number of Observations Minimum	ve estimate only when the tions collection collection many or many or 17 26.7	ne data set represents a background data set free of outliers led from clean unimpacted locations. false positives and false negatives provided the data insite observations need to be compared with the BTV. Number of Distinct Observations First Quartile	320					
80 81 82 83 84 85 86 87 88 89 90 91 92	Note: The use of USL tends to yield a conservative. Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and when the conservations are presented in the conservations. Total Number of Observations and Minimum and Second Largest Maximum Mean Mean	ve estimate only when the tions collection collections many or the tions are many or the tions are the tions collections. The tions collection are many or the tions are t	Number of Distinct Observations First Quartile Median Third Quartile SD	320 346 363 143.5					
80 81 82 83 84 85 86 87 88 89 90 91 92 93	Note: The use of USL tends to yield a conservative. Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and where the constant of the const	ve estimate only when the tions collection collection many or the tions collection in the tion collection in the tions collection in the tion collection in the tion collection in the tion collection in the tion collection	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness	320 346 363 143.5 -1.326					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94	Note: The use of USL tends to yield a conservative. Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and when the conservations are presented in the conservations. Total Number of Observations and Minimum and Second Largest Maximum Mean Mean	ve estimate only when the tions collection collections many or the tions are many or the tions are the tions collections. The tions collection are many or the tions are t	Number of Distinct Observations First Quartile Median Third Quartile SD	320 346 363 143.5					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97	Note: The use of USL tends to yield a conservative. Therefore, one may use USL to estimate a BTV of and consists of observations. The use of USL tends to provide a balant represents a background data set and where the conservations of the conservations. General Statistics Total Number of Observations of Minimum of Second Largest of Maximum of Meant of Coefficient of Variation of Meant of logged Data	ve estimate only when the tions collection collection men many or series of the tions collection in th	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data	320 346 363 143.5 -1.326					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and what the construction of the construction	ve estimate only when the tions collections collections collections collections are many or service between the ma	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data	320 346 363 143.5 -1.326 1.118					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and what the construction of the construction	ve estimate only when the tions collection collection men many or series of the tions collection in th	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data	320 346 363 143.5 -1.326					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and what the construction of the construction	ve estimate only when the tions collect ce between men many or 17 26.7 375 380 276.9 0.518 5.266 or Backgrou 2.486	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data Ind Threshold Values (BTVs)	320 346 363 143.5 -1.326 1.118					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observations The use of USL tends to provide a balant represents a background data set and where the construction of the construction	ve estimate only when the tions collect ce between men many or 17 26.7 375 380 276.9 0.518 5.266 or Backgrou 2.486	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data	320 346 363 143.5 -1.326 1.118					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observations The use of USL tends to provide a balant represents a background data set and where the construction of the construction	ve estimate only when the tions collection collection ce between then many or service between the many or service	Number of Distinct Observations Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data and Threshold Values (BTVs) GOF Test	320 346 363 143.5 -1.326 1.118					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a balant represents a background data set and when the use of USL tends to provide a background data set and when the use of USL tends to provide a background data set and when the use of USL tends to provide a background data set and when the use of USL tends to provide a background data set and when the use of USL tends to provide a background data set and when the use of USL tends to prov	ve estimate only when the tions collections collections collections collections collections are many or series of the tions collections are many or series of the tions collections are many or series of the tions are many o	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data Ind Threshold Values (BTVs) GOF Test Shapiro Wilk GOF Test	320 346 363 143.5 -1.326 1.118					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observations and consists of observations and consists of observations are presents a background data set and when the construction of	ve estimate only when the tions collections collections collections collections collections are many or the tions are many or the ti	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data Ind Threshold Values (BTVs) Shapiro Wilk GOF Test Data Not Normal at 5% Significance Level	320 346 363 143.5 -1.326 1.118					
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105	Note: The use of USL tends to yield a conservative Therefore, one may use USL to estimate a BTV and consists of observations. The use of USL tends to provide a balant represents a background data set and where the construction of the construction	17 26.7 375 380 276.9 0.518 5.266 Normal 0 0.63 0.892 0.383 0.207	ne data set represents a background data set free of outliers led from clean unimpacted locations. false positives and false negatives provided the data insite observations need to be compared with the BTV. Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data Ind Threshold Values (BTVs) GOF Test Shapiro Wilk GOF Test Data Not Normal at 5% Significance Level Lilliefors GOF Test	320 346 363 143.5 -1.326 1.118					

\Box	A B C D E	F	G H I J K Suming Normal Distribution	L							
109	95% UTL with 95% Coverage	633.7		460.9							
110	95% UPL (t)	534.8		513							
111	95% USL	632.1		610.8							
112	2000		(-)								
114		Gamma	GOF Test								
115	A-D Test Statistic	3.686	Anderson-Darling Gamma GOF Test								
116	5% A-D Critical Value	0.755	Data Not Gamma Distributed at 5% Significance Leve	el							
117	K-S Test Statistic	0.439	Kolmogorov-Smirnov Gamma GOF Test								
118	5% K-S Critical Value	0.213	Data Not Gamma Distributed at 5% Significance Level								
119	Data Not Gamn	na Distribut	ed at 5% Significance Level								
120											
121		Gamma	Statistics								
122	k hat (MLE)	1.543	k star (bias corrected MLE)	1.31							
123	Theta hat (MLE)	179.5	Theta star (bias corrected MLE)	211.4							
124	nu hat (MLE)	52.46	nu star (bias corrected)	44.53							
125	MLE Mean (bias corrected)	276.9	MLE Sd (bias corrected)	242							
126											
127	•		uming Gamma Distribution								
128	95% Wilson Hilferty (WH) Approx. Gamma UPL	806		596.6							
129	95% Hawkins Wixley (HW) Approx. Gamma UPL	891.6		755.2							
130	95% WH Approx. Gamma UTL with 95% Coverage	1168	99% Percentile	1117							
131	95% HW Approx. Gamma UTL with 95% Coverage	1369	250 111110	1000							
132	95% WH USL	1161	95% HW USL	1360							
133		1	LOOFT								
134	Shapiro Wilk Test Statistic	0.572	I GOF Test Shapiro Wilk Lognormal GOF Test								
135	5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level								
136	Lilliefors Test Statistic	0.892	Lilliefors Lognormal GOF Test								
137	5% Lilliefors Critical Value	0.438	Data Not Lognormal at 5% Significance Level								
138			: 5% Significance Level								
139	344.1012		. 0.70 G.g								
140 141	Background Sta	tistics assu	ming Lognormal Distribution								
142	95% UTL with 95% Coverage	3121		811.7							
143	95% UPL (t)	1444		1219							
144	95% USL	3083	99% Percentile (z)	2611							
145			```								
146	Nonparametric	Distribution	Free Background Statistics								
147	Data do not fo	ollow a Disc	ernible Distribution (0.05)								
148											
149		er Limits fo	r Background Threshold Values								
150	Order of Statistic, r	17		380							
151	Approx, f used to compute achieved CC	0.895	Approximate Actual Confidence Coefficient achieved by UTL	0.582							
152			Approximate Sample Size needed to achieve specified CC	59							
153	95% Percentile Bootstrap UTL with 95% Coverage	380	-	380							
154	95% UPL	380		372							
155	90% Chebyshev UPL	720		376							
156	95% Chebyshev UPL	920.6	99% Percentile	379.2							
157	95% USL	380									
158											
159	•		of BTV, especially when the sample size starts exceeding 20.								
160		•	ne data set represents a background data set free of outliers								
161			ed from clean unimpacted locations.								
162	The use of USL tends to provide a balan	ce between	false positives and false negatives provided the data								

	A B C D E	F	G	Н	I	J	K	L	
163	represents a background data set and wl	nen many or	site observat	ions need to	be compare	ed with the BTV.			
164									
165	CI								
166									
167	General Statistics		T						
168	Total Number of Observations	15				of Distinct Obser		12	
169	10.	7.0			Number	of Missing Obser		1	
170	Minimum	7.8					Quartile	19.2	
171	Second Largest	25 29					Median	20.2	
172	Maximum	19.63				Third C	SD	6.438	
173	Mean Coefficient of Variation	0.328				Ska	ewness	-0.899	
174	Mean of logged Data	2.907				SD of logge		0.424	
175	Mean or logged Data	2.907				SD of logge	d Dala	0.424	
176	Critical Values for	or Backgrou	nd Threehold	l Values (R)	Γ\/e\				
177	Tolerance Factor K (For UTL)	2.566	ilu illiesilolu	i values (D	1 43)	d2max (fc	or LISL\	2.409	
178	Tolerance Factor IX (For OTE)	2.000				azmax (ie	or ool)	2.400	
179		Normal (GOF Test						
180	Shapiro Wilk Test Statistic	0.867			Shapiro Wi	lk GOF Test			
181	5% Shapiro Wilk Critical Value	0.881		Data No	-	5% Significance Le	evel		
182	Lilliefors Test Statistic	0.261				GOF Test			
183	5% Lilliefors Critical Value	0.22		Data No	t Normal at 5	5% Significance Le	evel		
184 185	Data Not	Normal at 5	 5% Significan						
186									
187	Background S	tatistics Ass	suming Norma	al Distribution	on				
188	95% UTL with 95% Coverage	36.15				90% Percer	ntile (z)	27.88	
189	95% UPL (t)	31.34				95% Percer	ntile (z)	30.22	
190	95% USL	35.14		99% Percentile (z)					
191									
192		Gamma	GOF Test						
193	A-D Test Statistic	1.37		Ander	son-Darling	Gamma GOF Tes	st		
194	5% A-D Critical Value	0.738	Da	ita Not Gam	ma Distribut	ed at 5% Significa	nce Lev	el	
195	K-S Test Statistic	0.314				v Gamma GOF T			
196	5% K-S Critical Value	0.222				ed at 5% Significa	nce Lev	el	
197	Data Not Gamr	na Distribut	ed at 5% Sigr	nificance Le	vel				
198									
199			Statistics						
200	k hat (MLE)	7.279				star (bias corrected	′	5.868	
201	Theta hat (MLE)	2.697			I heta :	star (bias corrected		3.346	
202	nu hat (MLE)	218.4				nu star (bias cor		176	
203	MLE Mean (bias corrected)	19.63				MLE Sd (bias cor	rected)	8.105	
204	Background St	tatietics Acc	umina Com-	na Diotribust	on				
205	95% Wilson Hilferty (WH) Approx. Gamma UPL	35.46	uning daniff	เล ษเอนเมน์นี้	OII	90% Per	rcentile	30.47	
206	95% Wilson Fillerty (WH) Approx. Gamma UPL	36.29				90% Per 95% Per		34.58	
207	95% WH Approx. Gamma UTL with 95% Coverage	44.47				95% Pei		43.2	
208	95% HW Approx. Gamma UTL with 95% Coverage	46.31				33 /0 PEI	Conde	70.2	
209	95% WH USL	42.46				95% H	WUSI	44.05	
210	33% WIT 03L	12.70				337011	., 552	.4.00	
211		Lognorma	I GOF Test						
212	Shapiro Wilk Test Statistic	0.768	. 301 1001	Shar	iro Wilk Loc	normal GOF Test	t		
213	5% Shapiro Wilk Critical Value	0.881		-	_	t 5% Significance			
214	Lilliefors Test Statistic	0.335			-	ormal GOF Test			
215	5% Lilliefors Critical Value	0.22				t 5% Significance	Level		
216	2.5 Emilion Stradal Value			_ 3.5 11011					

	A B C D E	F	G H I J K	L
217	Data Not Lo	ognormal a	t 5% Significance Level	
218	Dealers and Cha	tieties seev	ming Lagrama Distribution	
219	95% UTL with 95% Coverage	54.3	ming Lognormal Distribution 90% Percentile (z)	31.5
220	95% UPL (t)	39.57	95% Percentile (z)	36.75
221	95% USL	50.81	99% Percentile (z)	49.06
222	33 % 332	00.01	55 % 1 615611ali6 (2)	
223 224	Nonparametric I	Distribution	Free Background Statistics	
225	-		cernible Distribution (0.05)	
226				
227	Nonparametric Upp	er Limits fo	r Background Threshold Values	
228	Order of Statistic, r	15	95% UTL with 95% Coverage	29
229	Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537
230			Approximate Sample Size needed to achieve specified CC	59
231	95% Percentile Bootstrap UTL with 95% Coverage	29	95% BCA Bootstrap UTL with 95% Coverage	29
232	95% UPL	29	90% Percentile	25
233	90% Chebyshev UPL	39.58	95% Percentile	26.2
234	95% Chebyshev UPL	48.62	99% Percentile	28.44
235	95% USL	29		
236	Note: The use of LICI tands to will a second	o oction -t	of PTV connecially when the comple size starts are still 20	
237	•		of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers	
238			ted from clean unimpacted locations.	
239			false positives and false negatives provided the data	
240			nsite observations need to be compared with the BTV.	
241				
242 243 F	:			
244				
245		General	Statistics	
246	Total Number of Observations	17	Number of Missing Observations	0
247	Number of Distinct Observations	12		
248	Number of Detects	12	Number of Non-Detects	5
249	Number of Distinct Detects	12	Number of Distinct Non-Detects	1
250	Minimum Detect	0.12	Minimum Non-Detect	0.2
251	Maximum Detect	1.65	Maximum Non-Detect	0.2
252	Variance Detected	0.172	Percent Non-Detects	29.41%
253	Mean Detected Mean of Detected Logged Data	0.593	SD Detected	0.415
254	Mean of Detected Logged Data	-0.743	SD of Detected Logged Data	0.719
255	Critical Values fo	r Backgrou	und Threshold Values (BTVs)	
256	Tolerance Factor K (For UTL)	2.486	d2max (for USL)	2.475
257 258	. 5.5.2.35 (33.5)		(III 60E)	
258	Norma	al GOF Tes	st on Detects Only	
260	Shapiro Wilk Test Statistic	0.866	Shapiro Wilk GOF Test	
261	5% Shapiro Wilk Critical Value	0.859	Detected Data appear Normal at 5% Significance Level	I
262	Lilliefors Test Statistic	0.193	Lilliefors GOF Test	
263	5% Lilliefors Critical Value	0.243	Detected Data appear Normal at 5% Significance Level	l
264	Detected Data a	ppear Norr	mal at 5% Significance Level	
265				
266		ground Sta	tistics Assuming Normal Distribution	
267	KM Mean	0.454	KM SD	0.397
268	95% UTL95% Coverage	1.442	95% KM UPL (t)	1.168
		0.000	050(1015) (1)	4 4 0 7
269	90% KM Percentile (z) 99% KM Percentile (z)	0.963 1.378	95% KM Percentile (z) 95% KM USL	1.107

	A B C D	Е	F	G	Н	I	J	K	L			
271												
272	DL/2 Substituti	on Back	ground Stati	stics Assumi	ng Normal	Distribution	on					
273		Mean	0.448					SD	0.415			
274	95% UTL95% Co	overage	1.479				(95% UPL (t)	1.193			
275	90% Perce	entile (z)	0.98				95% P	ercentile (z)	1.13			
276	99% Perce	entile (z)	1.413					95% USL	1.474			
277	DL/2 is not a recommend	led meth	od. DL/2 pro	vided for cor	nparisons a	and histor	ical reasons	"				
278												
279	Gamr	na GOF	Tests on De	tected Obse	rvations Or	nly						
280	A-D Test	Statistic	0.214		A	nderson-l	Darling GOF Te	st				
281	5% A-D Critica	al Value	0.74	Detected	data appea	ar Gamma	Distributed at 5	% Significan	ce Level			
282	K-S Test	Statistic	0.133		I	Kolmogoro	ov-Smirnov GO	F				
283	5% K-S Critica	al Value	0.248	Detected data appear Gamma Distributed at 5% Significan								
284	Detected data	a appear	Gamma Di	stributed at 5	% Significa	nce Leve	I					
285												
286	(Gamma	Statistics or	Detected Da	ata Only							
287	k ha	at (MLE)	2.418				k star (bias cori	rected MLE)	1.869			
288	Theta ha	at (MLE)	0.245			The	ta star (bias cori	rected MLE)	0.317			
289		at (MLE)	58.03					s corrected)	44.86			
290	MLE Mean (bias co	rrected)	0.593				· · · · · · · · · · · · · · · · · · ·	,				
291	MLE Sd (bias co	rrected)	0.434			95% Per	centile of Chisqu	are (2kstar)	9.06			
292							<u></u>	, ,				
293	Gamı	ma ROS	sing Imputed	Non-Detec	ets							
294	GROS may not be used whe						at multiple DLs					
295	GROS may not be used when kstar of de				-			.g., <15-20)				
296	For such situations,				-			,				
297			_	n the sample								
298	For gamma distributed detected data		-	•			ibution on KM es	stimates				
299		1inimum	0.01 Mean									
300	M	aximum	1.65					Median	0.33			
		SD	0.433					CV	1.008			
301	k ha	at (MLE)	0.743				k star (bias corr	rected MLE)	0.651			
302	Theta ha	, ,	0.578			The	ta star (bias cori		0.66			
304		at (MLE)	25.25				nu star (bia		22.12			
	MLE Mean (bias co		0.429				MLE Sd (bia	,	0.532			
305	95% Percentile of Chisquare		4.548					% Percentile	1.096			
306	95% Pe	` ′	1.501					Percentile	2.472			
307	The following statistics			g Gamma RO	OS Statistic	s on Impi						
308	Upper Limits using											
309		VH	HW	,		,, 		WH	HW			
310		2.591	3.163		. 9	5% Appro	x. Gamma UPL	1.616	1.817			
311		2.573	3.137									
312	3370 Gamma 33E		5									
313	Fetima	ites of G	amma Para	meters using	KM Estims	ates						
314		an (KM)	0.454					SD (KM)	0.397			
315		ce (KM)	0.158				SF of	Mean (KM)	0.101			
316		nat (KM)	1.307				OL 01	k star (KM)	1.116			
317		nat (KM)	44.44	nu star (KM)								
318		nat (KM)	0.347					ta star (KM)	37.93 0.407			
319	80% gamma percent		0.724			c	90% gamma per		1.018			
320	95% gamma percent	, ,	1.309				90% gamma per 99% gamma per		1.98			
321	ээ% даннна регсенс	''ı∈ (ı∠ı∧ı)	1.508				70 yanına per	Cerrule (KIVI)	1.30			
322	The following statisti	ce ore c	omputed us	na aommo di	etribution a	and KM co	etimates					
323	Upper Limits using		-									
324	Opper Limits using	y wiison	i i iiiierty (VV	i j aliu Hawk	IIIS VVIXIEY	(17VV) IVIET	IIUUS					

	Α	В		С		D	E	F	G		Н		I		J	K	L	
325	QE% Appr	ox. Gamm	na LIT	L with O	15% C	overage	WH 1.829	HW 1.952				05	% Approx	Ga	mma LIDI	WH 1.263	HW 1.297	
326	95% Appi			(M Gamı			1.029	1.932				90			mma USL	1.819	1.297	
327			0 /0 1	avi daiiii	illa i c	STOCTIMO	1.100	1.170					3070	o du	mina ool	1.010	1.04	
328 329						Lo	gnormal GC	F Test on D	etected	Obse	rvations	s On	ılv					
330					Shapi		est Statistic	0.976					-	Vilk	GOF Test			
331							ritical Value	0.859		Dete	cted Dat		-			ignificance L	_evel	
332					Li	illiefors T	est Statistic	0.134					Lilliefor	s G	OF Test			
333				ļ	5% Li	Iliefors C	ritical Value	0.243		Dete	cted Dat	ta ap	pear Logr	norm	al at 5% S	ignificance L	_evel	
334						Dete	cted Data ap	pear Logno	rmal at	5% Si	gnifican	ice L	_evel					
335																		
336			Back	ground			OS Statistics	s Assuming	Lognorn	nal Di	stributio	n Us	sing Imput	ted I	Non-Detec	ts		
337					Me	ean in O	riginal Scale	0.455							Mean i	n Log Scale		
338							riginal Scale	0.41								n Log Scale		
339							% Coverage	3.076					959	% B(% Coverage		
340			95%	Bootstra	ap (%	•	% Coverage	1.65								95% UPL (t)		
341							Percentile (z)	1.016							95% P	ercentile (z)		
342						99% P	ercentile (z)	2.656								95% USL	3.045	
343				01-4		! 1/1	M			d A			Dist	!l	A!			
344							M estimates ogged Data		Jata and	u Assi						% Coverage	2.649	
345							ogged Data	0.854				95 %			,	% Coverage (Lognormal)		
346				95% KN			ognormal (z)	1.292								(Lognormal)		
347				33 /0 IXIV	vi i eic	Jennie L	ognormai (2)	1.232						33 /	NIVI OSL	(Logilolillai)	2.024	
348						Backo	round DL/2	Statistics As	sumina	Loan	ormal D	istril	bution					
349					Me	_	riginal Scale	0.448	ssuming Lognormal Distribution Mean in Log Scale -1 20								-1.202	
350							riginal Scale	0.415		J								
351 352							% Coverage	3.148					SD in Log Scale 95% UPL (t)					
353							ercentile (z)	1.009								ercentile (z)	1.422	
354						99% P	ercentile (z)	2.707								95% USL	3.115	
355				DL/2 is ı	not a	Recomn	nended Meth	nod. DL/2 pro	ovided for	or con	npariso	ns a	nd historic	cal r	easons.			
356																		
357						No	nparametric	Distribution	Free Ba	ackgro	ound Sta	atisti	ics					
358					Dat	a appea	r to follow a	Discernible	Distribu	tion a	t 5% Sig	gnific	cance Lev	rel				
359																		
360				Nonpara	ametr		Limits for B	· -	nction n	nade l	betweer	n det						
361							of Statistic, r									% Coverage		
362							chieved CC		Appro	ximate	e Actual	Cor	fidence C	oeffi	cient achie	eved by UTL	0.582	
363	Approxim	nate Sampl	ie Siz	ze neede	ed to a	achieve s	specified CC	59						05)/ IZB4 (C)	95% UPL	1.65	
364							95% USL	1.65						95	% KM Che	byshev UPL	2.236	
365		Noto: Th	0 1100	of Hel	tonda	to viola	2 0000007/54	ive estimata	of PT\/	Acno	طبيد بدالماد	on +1	he cample	cia	etarte ove	eeding 20		
366							a conservati imate a BTV											
367		111616101	, UI	io iliay u			ts of observa								a set ilee	or oddiets		
368		-	The	use of LIS			ovide a balar								ided the da	nta		
369							ita set and w											
370		•	- 15.00				2 - 21 - 21 - W					0	,					
371 372	pН																	
373	-																	
	General Sta	tistics																
375				Tota	al Nun	nber of C	bservations	15					Numb	er o	f Distinct C	bservations	15	
376													Numbe	er of	Missing C	bservations	2	
377							Minimum	6.55							F	irst Quartile	6.985	
378						Sec	ond Largest	9.25								Median	7.24	
5,0								I.	l								1	

	٨	D	T	^		Ъ	-	F	F			- 11	-	- 1	Т		-	Т	I/	_	1
379	A	В		С		D		E Maximum	9.63	G		<u>H</u>		<u> </u>			J	Thire	K d Quartil	е	8.13
380								Mean	7.591										SI	D	0.909
381						Coeffic	ient of	Variation	0.12									5	Skewnes	s	1.209
382						Mear	of log	ged Data	2.021								SD	of log	ged Dat	а	0.114
383																					
384						(Critica	l Values	or Backgrou	und Thre	sholo	d Values	(BT	Vs)							
385				Т	olera	nce Fac	ctor K	(For UTL)	2.566								ď	2max	(for USL	_)	2.409
386																					
387									Normal	GOF Tes	st										
388					Sha	apiro W	ilk Tes	st Statistic	0.856					Shapir	o Will	k G	OF Te	est			
389				5%	6 Sha	•		ical Value				Data	Not	Norma			-		Level		
390						Lilliefo	rs Tes	st Statistic	0.288					Lillie	fors (GOF	Test	i			
391					5%	Lilliefo	ical Value						Norma	al at 5	5% S	ignific	cance	Level			
392							Data No	t Normal at	5% Signi	fican	ce Leve	ı									
393	Declaration of Chatatian Assumpting Margard Distribution																				
394	Background Statistics Assuming											al Distril	butio	n							
395				95	% UT	L with		•											centile (z		8.757
396								% UPL (t)											centile (z		9.087
397								95% USL	9.782								99%	% Per	centile (z	Z)	9.706
398									0	00F T-	-4										
399						٨	D Too	st Statistic	Gamma 0.856	GOF 16	SI	۸n	dore	on Do	rling (Cor	ma (20E 1	Foot		
400								ical Value	0.836		D	ata Not G		son-Da	_					ovol	
401								st Statistic	0.734		D.			rov-Sr						evei	
402								ical Value	0.204		Da									evel	
403						07010			-	Data Not Gamma Distributed at 5% Significance Level uted at 5% Significance Level											
404											J 0.9										
405 406									Gamma	Statistic	:S										
407							k	hat (MLE)	80.13						ks	star (bias o	correc	ted MLE	Ξ)	64.15
408						-		hat (MLE)	0.0947					Tł	neta s	star (bias o	correc	ted MLE	<u>(</u>	0.118
409							nu	hat (MLE)	2404							nu	star (bias d	corrected	d) .	1925
410					MLE	Mean	(bias	corrected)	7.591							MLE	Sd (bias c	corrected	d)	0.948
411									I												
412							Bacl	kground S	tatistics Ass	suming G	amn	na Distri	butic	on							
413				-				mma UPL	9.266								,	90% F	Percentil	е	8.828
414				,	`	,		mma UPL	9.269										Percentil		9.215
415		95% WH Ap															,	99% F	Percentil	е	9.969
416	9	95% HW Ap	prox.	. Gamn	na UT	L with															
417							95%	WH USL	9.87									95%	HW US	L	9.883
418																					
419					01	min= 101	:II. T	r Or-rivit	Lognorma	II GOF T	est		h '	un \A#!!	- - -	n c=	! C	OF T			
420				En		•		st Statistic						iro Wilk						al.	
421				5%	o sna			ical Value				рата ар		efors L			_		nce Leve	#I	
422					E0/			st Statistic				Data N							t ce Level		
423					J 70				oximate Log	normal a	t 5%					. J /0	oigiil	iicali(e revel		
424						Da	ια αμμ	oai Appil	Alliale LUG	iiviiiidi d	. 570	Significa	ance	LEVE							
425							Back	round St	atistics assu	ımina I o	anor	mal Dist	ributi	ion							
426				95	% LJT						gvii	0130					90%	6 Per	centile (z	z)	8.729
427	050/ 1101																		centile (z		9.098
428								95% USL	9.924										centile (z	1	9.831
429 430																			(2	′	
431							Nonp	arametric	Distribution	Free Ba	ackgr	ound St	atisti	ics							
						Dat	-		ximate Log		_										
432																					

	A B C D E		F	G	Н	I	J		K	L				
433						-	•			-				
434	Nonparametri	с Upp	er Limits for	Backgrour	nd Threshold	Values								
435	Order of Statis	stic, r	15			95%	6 UTL with	95%	Coverage	9.63				
436	Approx, f used to compute achieved	d CC	0.789	Approxima	ate Actual Co	nfidence C	coefficient	achiev	ed by UTL	0.537				
437				Approxi	mate Sample	Size need	led to achi	eve sp	ecified CC	59				
438	95% Percentile Bootstrap UTL with 95% Cove	erage	9.63		95% BCA	A Bootstrap	p UTL with	95%	Coverage	9.63				
439	95%	UPL	9.63					90%	Percentile	8.862				
440	90% Chebyshev	UPL	10.41					95%	Percentile	9.364				
441	95% Chebyshev	UPL	11.68					99%	Percentile	9.577				
442	95%	USL	9.63											
443		,												
444	Note: The use of USL tends to yield a cons	ervativ	ve estimate	of BTV, esp	ecially when	the sample	e size start	s exce	eding 20.					
445	Therefore, one may use USL to estimate a	BTV	only when th	ne data set r	represents a b	ackground	d data set	free of	outliers					
446	and consists of ob	serva	tions collect	ed from clea	an unimpacte	d locations	S.							
447	The use of USL tends to provide a	balan	ce between	false positiv	ves and false	negatives	provided t	he data	3					
448	represents a background data set and when many onsite observations need to be compared with the BTV.													
449														
	SO4													
451														
452			General	Statistics										
453	Total Number of Observa	tions	15			Numb	er of Miss	ing Ob	servations	1				
454	Number of Distinct Observa	tions	10											
455	Number of De	tects	14				Numbe	er of No	n-Detects	1				
456	Number of Distinct De	tects	9			Num	ber of Dist	inct No	n-Detects	1				
457	Minimum D	etect	75.7				Mini	mum N	lon-Detect	1				
	Maximum D	etect	2740				Maxi	mum N	Ion-Detect	1				
458	Variance Dete	ected	794198				Per	ent No	n-Detects	6.667%				
459	Mean Dete		1717) Detected	891.2				
460	Mean of Detected Logged		7.043			S	D of Detec	ted Lo	gged Data	1.26				
461	33								33					
462	Critical Va	lues fo	or Backgrou	nd Thresho	old Values (B	ΓVs)								
463	Talana a Fanta IV (Fan		2.566		(-	,		d2max	(for USL)	2.409				
464	()	/							(
465		Norm	al GOF Tes	t on Detect	s Only									
466	Shapiro Wilk Test Sta		0.732		,	Shapiro V	Wilk GOF	Test						
467	5% Shapiro Wilk Critical V		0.874		Data No	t Normal a			e Level					
468	Lilliefors Test Sta		0.367		2444.10		rs GOF Te		2 2010.					
469	50/ Lilling Co. (C. (1)		0.226		Data No	t Normal a			e I evel					
470			Normal at 5	% Significa		3								
471														
472	Kaplan Meier (KM)) Back	ground Stat	tistics Assu	ming Normal	Distribution	on							
473			1603				-		KM SD	933.5				
474	95% UTL95% Cove		3998					95% k	(M UPL (t)	3301				
475	90% KM Percentil	_	2799				95%		centile (z)					
476	99% KM Percentil	. ,	3774				33701		% KM USL	3851				
477	33 /6 TAWLE GLOCATE	(2)	3,,,,					337		0001				
478	DL/2 Substitution	Backe	round Stati	stice Assur	ning Normal	Distributio	n							
479		Mean	1602	Javo Assul	Horillal		••		SD	966.4				
480	95% UTL95% Cove		4082					QF	5% UPL (t)					
481	90% Percentil		2841				0		rcentile (z)	3192				
482	90% Percentil	` '	3851				9	J /0 FEI	95% USL					
483		` '		wided for -	omnerie	nd bloter!	ool resear		ჟე% USL	3331				
484	DL/2 is not a recommended	metno	ou. טבוע pro	viuea for C	omparisons a	niu nistorio	cai reasor	3						
485		005	Toots are D	tootod Ol	omiotics - C	ls e								
486	Gamma	GUF	ests on De	electea Obs	servations On	ıy								

	Α	В	С	D	Е	F	G	Н		J	K	L		
487					est Statistic				Anderson-Da					
488					Critical Value	0.753	D		nma Distribut	-		rel .		
489				K-S T	est Statistic	0.443			Kolmogorov-					
490					critical Value				nma Distribut	ed at 5% Sig	nificance Lev	rel		
491				Da	ta Not Gamı	ma Distribute	ed at 5% Sig	gnificance Lo	evel					
492														
493						Statistics or	Detected D	Data Only						
494					k hat (MLE)					star (bias cor	•	1.129		
495					ta hat (MLE)				Theta	star (bias cor	,	1521		
496					nu hat (MLE)					nu star (bia	s corrected)	31.61		
497				LE Mean (bia	· · · · · · · · · · · · · · · · · · ·									
498				MLE Sd (bia	s corrected)	1616			95% Percer	itile of Chisqu	Jare (2kstar)	6.482		
499														
500					amma ROS									
501		multiple DLs												
502		GROS may						-	the sample sinuction of the sample sinus in the sample sinus in the sample sample sample sinus in the sample sa		e.g., <15-20)			
503			ΓVs											
504	This is especially true when the sample size is small. For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates													
505		For gan	nma distribut	ted detected of			y be comput	ted using ga	mma distribu	tion on KM e				
506					Minimum	75.7					Mean	1656		
507					Maximum						Median	2000		
508					SD	890.3					CV	0.538		
509					k hat (MLE)					star (bias cor	-	1.178		
510					ta hat (MLE)				Theta	star (bias cor	rected MLE) as corrected)	1406		
511					nu hat (MLE)					35.34				
512				LE Mean (bia	,					1526				
513			95% Percen	ntile of Chisqu		6.664					% Percentile	3663		
514					% Percentile						% Percentile	7032		
515				_		-	_		cs on Impute					
516			L	Jpper Limits (-		H) and Haw	kins Wixley	(HW) Method	ds				
517					WH	HW					WH	HW		
518	95% App	rox. Gamma		% Coverage		9109		9	95% Approx. (Jamma UPL	5041	5659		
519			95% (Gamma USL	6991	8280								
520								1214 = .1						
521				Es	timates of G		meters using	g KM Estima	ates			222.5		
522					Mean (KM)					05	SD (KM)	933.5		
523				va	ariance (KM)					SE 0	f Mean (KM)	250.1		
524					k hat (KM)						k star (KM)	2.402		
525					nu hat (KM)						nu star (KM)	72.05		
526			000		eta hat (KM)				000	the gamma per	eta star (KM)	667.2 2987		
527				6 gamma per	, ,					6 gamma per 6 gamma per	` '	4917		
528			95%	o yanına per	cennie (KIVI)	309 I			99%	o yanına pel	cennie (KIVI)	491/		
529			Th.	following at	atietice ere -	omnutod uc	ina aomma	dietrikutler	and KM estin	natos				
530									(HW) Metho					
531				ppper Limits I	wsing wilsor	HW	n) and Maw	MIIS WIXIEY	(UAAA) INIETUO	นซ	WH	HW		
532	OEO/ Ann	ray Camma	LITI with OF	0/ Cayaraga					NEO/ Approx (Commo LIDI				
533	050/ 101 0									7008				
534	334								11098					
535	I LOSET I DI LICOLUI CI OL													
536	OL 1 MENT 101 CC O OAF													
537	F0/ Ob. 12 M/H O 21 1 1 / 1													
538			5% SI	-		0.874		⊔ata Not			ance Level			
539			_		est Statistic									
540			5	% Lilliefors C	ritical Value	0.226		Data Not Lognormal at 5% Significance Level						

	A B C D E	F	G H I J K	L								
541	Data Not L	ognormal at	5% Significance Level									
542	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
543 544	Mean in Original Scale	1610	Mean in Log Scale	6.885								
545	SD in Original Scale	954.1	SD in Log Scale 1.3									
546	95% UTL95% Coverage	32012	95% BCA UTL95% Coverage 2740									
547	95% Bootstrap (%) UTL95% Coverage	2740	95% UPL (t)	11595								
548	90% Percentile (z)	5583	95% Percentile (z)	9149								
549	99% Percentile (z)	23110	95% USL	25860								
550												
551	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
552	KM Mean of Logged Data	6.573	95% KM UTL (Lognormal)95% Coverage	161793								
553	KM SD of Logged Data	2.113	95% KM UPL (Lognormal)	33396								
554	95% KM Percentile Lognormal (z)	23113	95% KM USL (Lognormal)	116133								
555	Pooleground DI /0.6	Ctatiotics As	ouning Lagranuc Distribution									
556	Mean in Original Scale		suming Lognormal Distribution Mean in Log Scale	6.527								
557	SD in Original Scale	966.4	SD in Log Scale	2.338								
558	95% UTL95% Coverage		95% UPL (t)									
559	90% Percentile (z)			31958								
560	99% Percentile (z)		95% USL									
561	. ,		ovided for comparisons and historical reasons.									
562 563												
564	Nonparametric	Distribution	Free Background Statistics									
565	Data do not fo	ollow a Disc	ernible Distribution (0.05)									
566												
567	Nonparametric Upper Limits for B	TVs(no disti	nction made between detects and nondetects)									
568	Order of Statistic, r	15	95% UTL with95% Coverage	2740								
569	Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537								
570	Approximate Sample Size needed to achieve specified CC	59	95% UPL	2740								
571	95% USL	2740	95% KM Chebyshev UPL	5805								
572												
573	•		of BTV, especially when the sample size starts exceeding 20.									
574	·	-	ne data set represents a background data set free of outliers									
575			ed from clean unimpacted locations.									
576			false positives and false negatives provided the data									
577	represents a background data set and wi	nen many or	nsite observations need to be compared with the BTV.									
578	The											
3/9	TDS											
580	General Statistics											
301	Total Number of Observations	17	Number of Distinct Observations	13								
582	Minimum	384	First Quartile	3250								
583 584	Second Largest	3600	Median	3400								
585	Maximum	3900	Third Quartile	3600								
586	Mean	2788	SD	1315								
587	Coefficient of Variation	0.472	Skewness	-1.324								
588	Mean of logged Data	7.698	SD of logged Data	0.857								
589												
590	Critical Values for	or Backgrou	nd Threshold Values (BTVs)									
591	Tolerance Factor K (For UTL)	2.486	d2max (for USL)	2.475								
592			-									
593		Normal (GOF Test									
594	Shapiro Wilk Test Statistic	0.647	Shapiro Wilk GOF Test									

	A B C D E	F	G H I J K	L								
595	5% Shapiro Wilk Critical Value	0.892	Data Not Normal at 5% Significance Level									
596	Lilliefors Test Statistic	0.402	Lilliefors GOF Test									
597	5% Lilliefors Critical Value	0.207	Data Not Normal at 5% Significance Level									
598	Data Not	Normal at 5	% Significance Level									
599												
600	Background S	tatistics Ass	suming Normal Distribution									
601	95% UTL with 95% Coverage	6056	90% Percentile (z)	4473								
602	95% UPL (t)	5150	95% Percentile (z)	4950								
603	95% USL	6041	99% Percentile (z)	5846								
604												
605		Gamma	GOF Test									
606	A-D Test Statistic	3.421	Anderson-Darling Gamma GOF Test									
607	5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Leve	el								
608	K-S Test Statistic	0.441	Kolmogorov-Smirnov Gamma GOF Test									
609	5% K-S Critical Value	0.211	Data Not Gamma Distributed at 5% Significance Leve	el								
610	Data Not Gamr	na Distribut	ed at 5% Significance Level									
611												
612		Gamma	Statistics									
613	k hat (MLE)	2.283	k star (bias corrected MLE)	1.919								
614	Theta hat (MLE)	1221	Theta star (bias corrected MLE)	1452								
615	nu hat (MLE)	77.62	nu star (bias corrected)	65.25								
616	MLE Mean (bias corrected)	2788	MLE Sd (bias corrected)	2012								
617												
618	Background St	atistics Ass	uming Gamma Distribution									
619	95% Wilson Hilferty (WH) Approx. Gamma UPL	7046	90% Percentile	5475								
620	95% Hawkins Wixley (HW) Approx. Gamma UPL	7559	95% Percentile	6699								
621	95% WH Approx. Gamma UTL with 95% Coverage	9748	99% Percentile	9422								
622	95% HW Approx. Gamma UTL with 95% Coverage	10913										
623	95% WH USL	9699	95% HW USL	10851								
624												
625		Lognorma	GOF Test									
626	Shapiro Wilk Test Statistic	0.607	Shapiro Wilk Lognormal GOF Test									
627	5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level									
628	Lilliefors Test Statistic	0.439	Lilliefors Lognormal GOF Test									
629	5% Lilliefors Critical Value	0.207	Data Not Lognormal at 5% Significance Level									
630	Data Not L	ognormal at	5% Significance Level									
631												
632			ming Lognormal Distribution									
633	95% UTL with 95% Coverage		90% Percentile (z)	6614								
634	95% UPL (t)	10285	95% Percentile (z)	9031								
635	95% USL	18399	99% Percentile (z)	16200								
636												
637			Free Background Statistics									
638	Data do not fo	ollow a Disc	ernible Distribution (0.05)									
639												
640			r Background Threshold Values									
641	Order of Statistic, r	17	95% UTL with 95% Coverage	3900								
642	Approx, f used to compute achieved CC	0.895	Approximate Actual Confidence Coefficient achieved by UTL	0.582								
643			Approximate Sample Size needed to achieve specified CC	59								
644	95% Percentile Bootstrap UTL with 95% Coverage	3900	95% BCA Bootstrap UTL with 95% Coverage	3900								
645	95% UPL	3900	90% Percentile	3600								
646	90% Chebyshev UPL	6846	95% Percentile	3660								
647	95% Chebyshev UPL	8685	99% Percentile	3852								
648	95% USL	3900										

	Α	В	С	D	Е	F	G	Н	I	J	K	L
649												
650	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
651	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
652		and consists of observations collected from clean unimpacted locations.										
653	The use of USL tends to provide a balance between false positives and false negatives provided the data											
654		represents a background data set and when many onsite observations need to be compared with the BTV.										
655												

	А	В	С			F	G	Н	I	J	K	L	
1				Background Statis	stics fo	or Data Sets	with Non-De	etects					
2			cted Options										
3	Dat	e/Time of Co		ProUCL 5.11/27/20									
4			From File	Ash Landfill ProUC	CL Inp	ut 2019.xls							
5			II Precision	OFF									
6		Confidence		95%									
7			Coverage	95%									
8		Future K Ob		1									
9	Number o	of Bootstrap	Operations	2000									
10													
11	As	<u>is</u>											
12													
13		General Statistics Total Number of Observations 17 Number of Missing Observations 0										0	
14				of Distinct Observa					Nullibei	or missing Obs	ervations	0	
15			Nullibe	Number of De		_				Number of Nor	n_Detects	14	
16			N	umber of Distinct De		-			Numbe	er of Distinct Nor		3	
17				Minimum [Numbe	Minimum No		0.001	
18				Maximum [Maximum No		0.004	
19				Variance Det						Percent Nor		82.35%	
20		Variance Detected Mean Detected									Detected	0	
21		Mean of Detected Logged Data							SD	of Detected Log		0	
22				o. 2 0.00.00 209900		-6.908					900 2010		
23	١	Varning: On	nlv one distin	ct data value was d	detect	ed! ProUCL	(or any othe	r software)	should not be	e used on such	a data set	<u>.</u>	
24 25	1	_	=	ite specific values			-	-					
26	- "			•						<u> </u>			
27				The d	lata se	et for variable	e As was not	processed	!				
28													
29													
30	Ва	Ва											
31													
32	General Sta												
33		ntistics											
34		ntistics	Total	Number of Observa					Number	r of Distinct Obs		8	
35		tistics	Total	Min	imum	0.008			Numbe		t Quartile	0.009	
		itistics	Total	Min Second La	nimum argest	0.008 0.067			Numbe	Firs	t Quartile Median	0.009	
36		itistics	Total	Min Second La Max	nimum argest kimum	0.008 0.067 0.072			Number	Firs	t Quartile Median d Quartile	0.009 0.01 0.012	
36 37		ntistics	Total	Min Second La Max	nimum argest kimum Mean	0.008 0.067 0.072 0.0232			Number	Firs	t Quartile Median d Quartile SD	0.009 0.01 0.012 0.025	
37 38		ntistics	Total	Min Second La Max Coefficient of Var	argest kimum Mean riation	0.008 0.067 0.072 0.0232 1.079			Number	Firs Third	Median d Quartile SD Skewness	0.009 0.01 0.012 0.025 1.389	
37 38 39		ntistics	Total	Min Second La Max	argest kimum Mean riation	0.008 0.067 0.072 0.0232 1.079			Number	Firs	Median d Quartile SD Skewness	0.009 0.01 0.012 0.025	
37 38 39 40		ntistics	Total	Min Second La Max Coefficient of Var Mean of logged	argest kimum Mean riation	0.008 0.067 0.072 0.0232 1.079 -4.182	nd Theodol	d Volume (F		Firs Third	Median d Quartile SD Skewness	0.009 0.01 0.012 0.025 1.389	
37 38 39 40 41		ntistics		Min Second La Max Coefficient of Var Mean of logged	argest kimum Mean riation d Data	0.008 0.067 0.072 0.0232 1.079 -4.182	nd Threshol	d Values (B		Firs Third S SD of log	Median d Quartile SD Skewness ged Data	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42		atistics		Min Second La Max Coefficient of Var Mean of logged	argest kimum Mean riation d Data	0.008 0.067 0.072 0.0232 1.079 -4.182	nd Threshol	d Values (B		Firs Third S SD of log	Median d Quartile SD Skewness	0.009 0.01 0.012 0.025 1.389	
37 38 39 40 41 42 43		atistics		Min Second La Max Coefficient of Var Mean of logged	argest kimum Mean riation d Data	0.008 0.067 0.072 0.0232 1.079 -4.182 For Backgrout 2.486		d Values (E		Firs Third S SD of log	Median d Quartile SD Skewness ged Data	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43		ntistics	Tole	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For	argest kimum Mean riation d Data alues f	0.008 0.067 0.072 0.0232 1.079 -4.182 For Backgrout 2.486	nd Threshol	d Values (B	ITVs)	Firs Third S SD of log d2max	Median d Quartile SD Skewness ged Data	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43 44		atistics	Tole	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For	argest dimum Mean riation d Data alues f	0.008 0.067 0.072 0.0232 1.079 -4.182 For Backgrout 2.486 Normal (TVs) Shapiro Wi	Firs Third S SD of log d2max	Median d Quartile SD Skewness ged Data (for USL)	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43 44 45		atistics	Tole	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For	argest dimum Mean riation d Data alues f UTL)	0.008 0.067 0.072 0.0232 1.079 -4.182 For Backgrout 2.486 Normal (0.59 0.892			STVs) Shapiro Wi	Firs Third S SD of log d2max Ik GOF Test 5% Significance	Median d Quartile SD Skewness ged Data (for USL)	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43 44 45 46		atistics	Tole S 5% S	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For	argest cimum Mean riation d Data alues for UTL) catistic Value atistic	0.008 0.067 0.072 0.0232 1.079 -4.182 For Backgrout 2.486 Normal (0.59 0.892 0.437		Data N	Shapiro Wi ot Normal at S	Firs Third S SD of log d2max Ik GOF Test 5% Significance GOF Test	Median d Quartile SD Skewness ged Data (for USL)	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43 44 45 46 47		atistics	Tole S 5% S	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For hapiro Wilk Test St. Lilliefors Test St. % Lilliefors Critical	argest cimum Mean riation d Data lues f UTL) catistic Value atistic Value	0.008 0.067 0.072 0.0232 1.079 -4.182 for Backgrout 2.486 Normal (0.59 0.892 0.437 0.207	GOF Test	Data N	Shapiro Wi ot Normal at S	Firs Third S SD of log d2max Ik GOF Test 5% Significance	Median d Quartile SD Skewness ged Data (for USL)	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43 44 45 46 47 48		atistics	Tole S 5% S	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For hapiro Wilk Test St. Lilliefors Test St. % Lilliefors Critical	argest cimum Mean riation d Data lues f UTL) catistic Value atistic Value	0.008 0.067 0.072 0.0232 1.079 -4.182 for Backgrout 2.486 Normal (0.59 0.892 0.437 0.207		Data N	Shapiro Wi ot Normal at S	Firs Third S SD of log d2max Ik GOF Test 5% Significance GOF Test	Median d Quartile SD Skewness ged Data (for USL)	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43 44 45 46 47 48 49		atistics	Tole S 5% S	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For hapiro Wilk Test State hapiro Wilk Critical Lilliefors Test State Lilliefors Critical	argest cimum Mean riation d Data alues for UTL) catistic Value atistic v	0.008 0.067 0.072 0.0232 1.079 -4.182 for Backgrou 2.486 Normal (0.59 0.892 0.437 0.207 t Normal at §	GOF Test Sw Significan	Data No Data No Dace Level	Shapiro Wi ot Normal at 5 Lilliefors ot Normal at 5	Firs Third S SD of log d2max Ik GOF Test 5% Significance GOF Test	Median d Quartile SD Skewness ged Data (for USL)	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43 44 45 46 47 48 49 50		atistics	Tole S 5% S	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For hapiro Wilk Test State hapiro Wilk Critical Lilliefors Test State Lilliefors Critical Da Backgro	argest cimum Mean riation d Data alues for UTL) attistic Value at	0.008 0.067 0.072 0.0232 1.079 -4.182 for Backgrou 2.486 Normal (0.59 0.892 0.437 0.207 t Normal at 5	GOF Test	Data No Data No Dace Level	Shapiro Wi ot Normal at 5 Lilliefors ot Normal at 5	Firs Third S SD of log d2max Ik GOF Test 5% Significance GOF Test 5% Significance	t Quartile Median d Quartile SD Skewness ged Data (for USL) Level	0.009 0.01 0.012 0.025 1.389 0.849 2.475	
37 38 39 40 41 42 43 44 45 46 47 48 49 50 51		atistics	Tole S 5% S	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For hapiro Wilk Test Str hapiro Wilk Critical Lilliefors Test Str % Lilliefors Critical Da Backgro JTL with 95% Cov	argest cimum Mean riation d Data lues for UTL) attistic Value att	0.008 0.067 0.072 0.0232 1.079 -4.182 For Backgrou 2.486 Normal 0 0.59 0.892 0.437 0.207 t Normal at \$ Statistics Ass 0.0854	GOF Test Sw Significan	Data No Data No Dace Level	Shapiro Wi ot Normal at 5 Lilliefors ot Normal at 5	Firs Third S SD of log d2max Ik GOF Test 5% Significance GOF Test	t Quartile Median d Quartile SD Skewness gged Data (for USL) Level Level	0.009 0.01 0.012 0.025 1.389 0.849	
37 38 39 40 41 42 43 44 45 46 47 48 49 50		atistics	Tole S 5% S	Min Second La Max Coefficient of Var Mean of logged Critical Var rance Factor K (For hapiro Wilk Test Stanapiro Wilk Critical Lilliefors Test Stanapiro Critical Background Background JTL with 95% Covening 95% U	argest cimum Mean riation d Data lues for UTL) attistic Value att	0.008 0.067 0.072 0.0232 1.079 -4.182 For Backgrou 2.486 Normal 0 0.59 0.892 0.437 0.207 t Normal at \$ Statistics Ass 0.0854	GOF Test Sw Significan	Data No Data No Dace Level	Shapiro Wi ot Normal at 5 Lilliefors ot Normal at 5	Firs Third S SD of log d2max Ik GOF Test 5% Significance GOF Test 5% Significance	t Quartile Median d Quartile SD Skewness ged Data (for USL) Level Level centile (z) centile (z)	0.009 0.01 0.012 0.025 1.389 0.849 2.475	

	Α	В	С		D	Е	F	G	Н	I	J	K	L			
55							Gamma GOF Test									
56				A d	D#	0	NE T									
57						Test Statistic	3.26	Anderson-Darling Gamma GOF Test								
58				5%		Critical Value	0.759	Data Not Gamma Distributed at 5% Significance Level Kolmogorov-Smirnov Gamma GOF Test								
59				Ε0		Test Statistic Critical Value	0.414						1			
60				5%			-	0.214 Data Not Gamma Distributed at 5% Significance Level a Distributed at 5% Significance Level								
61					D	ata Not Gam	na Distribute	eu at 5% Sig	milicance Lo	evei						
62							Gamma	Statistics								
63						k hat (MLE)		Otationes		k s	star (hias co	rrected MLF)	1.143			
64					The	ta hat (MLE)		k star (bias corrected MLE) 1.14 Theta star (bias corrected MLE) 0.02								
65						nu hat (MLE)	45.58				•	as corrected)	38.87			
66				MLE Me		as corrected)	0.0232				•	as corrected)	0.0217			
68					(
69					В	ackground S	tatistics Ass	uming Gamı	ma Distribut	ion						
70		95% W	ilson Hilferty	(HW)			0.069				90)% Percentile	0.0516			
71		95% Hav	wkins Wixley	(WH)	pprox. (Gamma UPL	0.0693				95	5% Percentile	0.0662			
72	g	5% WH Ap	prox. Gamma	a UTL w	ith 95	% Coverage	0.103				99	% Percentile	0.0998			
73	g	5% HW Ap	prox. Gamma	a UTL w	ith 95	% Coverage	0.107									
74					9	5% WH USL	0.102				S	5% HW USL	0.106			
75																
76							Lognorma	GOF Test								
77				Shapiro	o Wilk	Test Statistic	0.65		Sha	piro Wilk Log	normal GO	F Test				
78			5%			Critical Value	0.892	Data Not Lognormal at 5% Significance Level								
79						Test Statistic		Lilliefors Lognormal GOF Test								
80				5% Lill	iefors (Critical Value				Lognormal a	t 5% Signific	ance Level				
81						Data Not L	ognormal at	5% Signific	ance Level							
82																
83			050	/ LITI		ckground Sta		ming Lognor	mai Distribi	ution	000/ 1	D	0.0450			
84			95%	6 UIL W		% Coverage	0.126					Percentile (z)	0.0453			
85						95% UPL (t) 95% USL	0.0702 0.125	95% Percentile (z) 0.0 99% Percentile (z) 0.1								
86						93 % USL	0.123	33701 GEETHIG (2) 0.11								
87					No	nparametric	Distribution	Free Backo	round Statis	stics						
88						Data do not f		•								
90										/						
91					Nonpa	rametric Up	per Limits for	r Backgroun	d Threshold	l Values						
92					Order	of Statistic, r	17	95% UTL with 95% Coverage 0								
93			Approx, f use	ed to cor	mpute a	achieved CC	0.895	Approxima	te Actual Co	onfidence Co	efficient achi	ieved by UTL	0.582			
94								Approxin	nate Sample	Size needed	to achieve	specified CC	59			
95	(95% Percei	ntile Bootstra	p UTL w	ith 95	% Coverage	0.072		95% BC	A Bootstrap l	JTL with 95	5% Coverage	0.072			
96						95% UPL	0.072	90% Percentile 0.								
97				90)% Che	byshev UPL	0.1				95	5% Percentile	0.068			
98				95	5% Che	byshev UPL	0.135				99	9% Percentile	0.0712			
99						95% USL	0.072									
100			-							-		-				
101			he use of US					·								
102		Therefo	ore, one may				•		-	•	lata set free	of outliers				
103			-			sts of observa			-							
104										negatives pr						
105			represents a	раскдго	ound da	ata set and w	nen many on	isite observa	uons need t	o be compare	eu with the E	DIV.				
106	Be.															
107	Be															
108	<u> </u>															

General Statistics	<u> </u>
1111 Number of Distinct Observations 2 112 Number of Detects 0 Number of Non-Detect 113 Number of Distinct Detects 0 Number of Distinct Non-Detect 114 Minimum Detect N/A Minimum Non-Detect 115 Maximum Detect N/A Maximum Non-Detect 116 Variance Detected N/A Percent Non-Detect 117 Mean Detected N/A SD Detected N/A SD Detected Logged Data 118 Mean of Detected Logged Data 119 Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDsI 120 Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDsI 121 Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit 122 The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT 123 124 The data set for variable Be was not processed! 125 126 127 Cd 128 129 General Statistics 130 Total Number of Distinct Observations 17 Number of Missing Observation 131 Number of Distinct Observations 14 Number of Distinct Detects 0 Number of Distinct Non-Detect 132 Number of Distinct Detects 0 Number of Distinct Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Maximum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected Logged Dat 138 Mean of Detected Logged Data N/A SD of Detected Logged Dat	0
Number of Detects Number of Non-Detects Number of Non-Detect	
Number of Distinct Detects 0 Number of Distinct Non-Detect 114 Minimum Detect N/A Minimum Non-Detect 115 Maximum Detect N/A Maximum Non-Detect 116 Variance Detected N/A Percent Non-Detect 117 Mean Detected N/A Percent Non-Detect 118 Mean of Detected Logged Data N/A SD of Detected Logged Data 119 Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit 122 The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT 123 The data set for variable Be was not processed! 125 126 127 Cd 128 129 General Statistics 129 General Statistics 130 Total Number of Distinct Observations 17 Number of Missing Observation 131 Number of Distinct Observations 4 132 Number of Distinct Observations 4 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Minimum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected Logged Data 139 Mean of Detected Logged Data N/A SD of Detected Logged Data 139	i 17
114	
Maximum Detect N/A	
Namber of Distinct Detects Namber of Distinct Observations 17 Number of Missing Observation 131 Number of Distinct Observations 14 Number of Distinct Observations 14 Number of Distinct Observations 15 Number of Distinct Non-Detects 16 Number of Distinct Non-Detects 17 Number of Distinct Non-Detects 18 Number of Distinct Non-Detect 18 Number of Detects Number of Distinct Non-Detect 18 Number of Detects	0.002
Mean Detected N/A SD Detected 118 Mean of Detected Logged Data N/A SD of Detected Logged Data 119	100%
118	N/A
Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDsI Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT The Detect of National Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT The Detect of National Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT The Detect of National Project Of Officer Office	N/A
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative set of specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative set of specific values to estimate environmental parameters (e.g., EPC, BT) The Project Team may decide to use alternative set of specific values to estima	
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT 123 124 The data set for variable Be was not processed! 125 126 127 Cd 128 129 General Statistics 130 Total Number of Observations 17 Number of Missing Observation 131 Number of Distinct Observations 4 132 Number of Detects 0 Number of Distinct Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Potect N/A Maximum Non-Detect 136 Variance Detected N/A Mean Detected N/A Mean Observation 14 N/A SD Detected Logged Data 139 Mean of Detected Logged Data N/A Minimum Non-Detect N/A SD of Detected Logged Data 139	
124	
The data set for variable Be was not processed! 125 126 127 Cd 128 129 General Statistics 130 Total Number of Observations 17 Number of Missing Observation 131 Number of Distinct Observations 4 132 Number of Detects 0 Number of Number of Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data N/A SD of Detected Logged Data 139	<i>/</i>).
125 126 127 Cd 128 129 General Statistics 130 Total Number of Observations 17 Number of Missing Observation 131 Number of Distinct Observations 4 132 Number of Detects 0 Number of Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD of Detected Logged Data 139	
126 127 Cd 128 129 General Statistics 130 Total Number of Observations 17 Number of Missing Observation 131 Number of Distinct Observations 4 132 Number of Detects 0 Number of Distinct Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data 139	
128 129 General Statistics 130 Total Number of Observations 17 Number of Missing Observation 131 Number of Distinct Observations 4 132 Number of Distinct Detects 0 Number of Distinct Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data N/A SD of Detected Logged Data 139 N/A SD of Detected Logged Data N/A SD of Detected Logged Data 139 N/A SD of Detected Logged Data N/A SD of Detected Logged Data 139 N/A SD of Detected Logged Data N/A SD of Detected Logged Data 139 N/A SD of Detected	
128 129	
129 General Statistics 130 Total Number of Observations 17 Number of Missing Observation 131 Number of Distinct Observations 4 132 Number of Distinct Detects 0 Number of Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data N/A SD of Detected Logged Data 139 N/A SD of Det	
Total Number of Observations 17 Number of Missing Observation 131 Number of Distinct Observations 4 132 Number of Detects 0 Number of Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data 139	
131 Number of Distinct Observations 4 132 Number of Detects 0 Number of Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data 139	0
Number of Detects 0 Number of Non-Detect 133 Number of Distinct Detects 0 Number of Distinct Non-Detect Number of Distinct Number of Di	
133 Number of Distinct Detects 0 Number of Distinct Non-Detect 134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data N/A SD of Detected Logged Data 139	i 17
134 Minimum Detect N/A Minimum Non-Detect 135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data N/A SD of Detected Logged Data 139	
135 Maximum Detect N/A Maximum Non-Detect 136 Variance Detected N/A Percent Non-Detect 137 Mean Detected N/A SD Detectet 138 Mean of Detected Logged Data N/A SD of Detected Logged Data 139	
N/A Percent Non-Detect N/A Percent Non-Detect N/A SD Detected N/A SD Detected N/A SD of Detected Logged Data N/A SD of Detected Logged Data N/A SD of Detected Logged Data	
137 Mean Detected N/A SD Detected 138 Mean of Detected Logged Data N/A SD of Detected Logged Data 139 We will see All shows the see All SD of Detected Logged Data SD of Detected Logg	
138 Mean of Detected Logged Data N/A SD of Detected Logged Data 139 Warrier All shows the same Non Detected (NDs) the referse all statistics and estimates should also be NDs.	I N/A
139	n N/A
Maminus All phonystians are Non Detecto (AIDs), thousand a statistics and estimates about also be AIDs!	
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!	
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT	/).
143	
The data set for variable Cd was not processed!	
145	
146	
147 Co	
148	
149 General Statistics Total Number of Observations 17 Number of Missing Observation	
Number of Distinct Observations 2	0
Number of Date to 0	17
Number of Distinct Detects 0 Number of Distinct Non Detect	
Minimum Detect N/A Minimum Non Detect	
154 Maximum Detect N/A Maximum Non-Detect N/A Maximum N/A	
156 Variance Detected N/A Percent Non-Detect	
157 Mean Detected N/A SD Detected	I N/A
158 Mean of Detected Logged Data N/A SD of Detected Logged Data	n N/A
159	
Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!	
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!	
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BT	/).

	А	В	С	D	Е		F	G	Н	I	J	K	L
163													
164					The da	ta se	t for variable	e Co was not	t processed!				
165													
166	0												
107	Cr												
168							Gonoral	Statistics					
169			Total N	Number of (Obcorvat	ione	17	Statistics		Numbo	r of Missing	Observations	0
170				of Distinct			5			Nullibe	i oi iviissiily	Observations	U
171			Nullibel		er of Det		4				Number of	Non-Detects	13
172			Niu	mber of Dis			3			Numbe		Non-Detects	
173			INUI		imum De		0.002			Numb		m Non-Detect	0.001
174					imum De		0.042					m Non-Detect	
175							3.9358E-4					Non-Detects	
176					ean Dete		0.0123				T CICCIII	SD Detected	0.0198
177			Mean o	f Detected			-5.352			SD	of Detected	Logged Data	
178			Widaii d		Loggod	Dutu	0.002				0. 20.00.00	Logged Data	1.107
179				Cri	tical Valı	ues fo	or Backgrou	nd Threshol	d Values (B)	ΓVs)			
180			Tolera	ance Factor			2.486		a valuos (5	,	d2r	max (for USL)	2.475
181					(J,						(.0. 002)	2
182 183						Norm	al GOF Tes	t on Detects	Only				
			Sh	apiro Wilk			0.648		,	Shapiro W	ilk GOF Tes	st .	
184 185				apiro Wilk (0.748		Data No	•	5% Significa		
186				Lilliefors			0.429				GOF Test		
187			5%	6 Lilliefors	Critical V	alue	0.375		Data No	t Normal at	5% Significa	ince Level	
188					Data	a Not	Normal at 5	5% Significar					
189													
190				Kaplan Me	ier (KM)	Back	ground Sta	tistics Assur	ning Normal	Distribution	1		
191					KM N	l ean	0.00367					KM SD	0.0096
192			(95% UTL95	5% Cove	rage	0.0275				959	% KM UPL (t)	0.0209
193				90% KM I	Percentil	e (z)	0.016				95% KM	Percentile (z)	0.0195
194				99% KM I	Percentile	e (z)	0.026				,	95% KM USL	0.0274
195													
196				DL/2 Subs			-	istics Assum	ing Normal I	Distribution			
197						1ean	0.00341					SD	
198			(95% UTL95			0.0282					95% UPL (t)	0.0213
199					Percentile	` '	0.0162				95%	Percentile (z)	
200			 		Percentile	` '	0.0266					95% USL	0.0281
201			0∟/2 is no	ot a recomi	mended	meth	od. DL/2 pro	ovided for co	mparisons a	nd historica	al reasons		
202				-	On	00-	Toots	ata ata d Ot	am rodi	la e			
203								etected Obse		-	ulina OOF T	·aat	
204					Test Stat		0.797				rling GOF T		10
205				5% A-D (0.675	D				gnificance Lev	vei
206				5% K-S	Test Stat		0.431			_	-Smirnov GO	gnificance Le	اما
207								ed at 5% Sig			ieu ai 3% SI(gillicalice Lev	v e i
208				יט	ala NUL	adıllı	וומ טופוע פוו	ou at 070 Olg	minuance Le	V G1			
209					Gar	nma	Statistics or	n Detected D	ata Only				
210					k hat (N		0.644	. Detected D	ata Omy	l _r	star (hias co	orrected MLE)	0.328
211				The	eta hat (N	- 1	0.019					orrected MLE)	0.0374
212					nu hat (N		5.151			111610	•	ias corrected)	
213			MI	E Mean (bi		- 1	0.0123				114 3141 (1)1		2.021
214				MLE Sd (bi			0.0123			95% Percei	ntile of Chien	quare (2kstar)	2.913
215			ľ	VILL OU (DI	us conec	iou)	0.0214			0070 F CICEI	Tallo OI OIIISC	facio (Trotal)	2.313
216													

\Box	Α	В	С	D	E Gamma ROS	F Statistics II	G eina Imputer	H d Non-Detec	l l	J	K	L
217			GROS may		d when data s					multinle DI s		
218		GROS may		-				-		ize is small (e	og <15-20)	
219		artoo may			tions, GROS						g., 110 20)	
220					This is especi		-					
222		For gar	mma distribu							ition on KM es	stimates	
223					Minimum	0.002					Mean	0.0105
224					Maximum	0.042					Median	0.01
225					SD	0.00865					CV	0.821
226					k hat (MLE)	2.353			k	star (bias cor	rected MLE)	1.977
227				The	eta hat (MLE)	0.00448			Theta	star (bias cor	rected MLE)	0.00533
228					nu hat (MLE)	79.99				`	s corrected)	67.21
229				ILE Mean (bia		0.0105				MLE Sd (bia	*	0.00749
230			95% Percei	ntile of Chisq		9.412					% Percentile	0.0205
231			The		% Percentile	0.0251	- O	00 01-11-11			6 Percentile	0.0351
232				_	tistics are co	-	_					
233				Opper Limits	WH	HW	n) and naw	KINS WIXIEY	(HW) Metho	as	WH	HW
234	95% Ann	rox Gamma	LITI with 9F	5% Coverage		0.0376		9	5% Annrox	Gamma UPL	0.0259	0.0265
235	33 % App	JOX. Gaillina		Gamma USL		0.0374			570 Applox.	Callilla Of L	0.0233	0.0203
236					0.000	0.007						
237				E	stimates of G	amma Para	meters using	g KM Estima	ites			
239					Mean (KM)	0.00367					SD (KM)	0.0096
240				V	ariance (KM)	9.2127E-5				SE o	f Mean (KM)	0.00269
241					k hat (KM)	0.146					k star (KM)	0.16
242					nu hat (KM)	4.977				ĺ	nu star (KM)	5.432
243				th	neta hat (KM)	0.0251					eta star (KM)	0.023
244			809	% gamma pe	rcentile (KM)	0.0042			909	% gamma per	centile (KM)	0.011
245			959	% gamma pe	rcentile (KM)	0.02			999	% gamma per	centile (KM)	0.0457
246												
247				_	atistics are c	-						
248				Upper Limits	using Wilson	HW	H) and Haw	KINS WIXIEY	(HW) Metno	as	WH	HW
249	95% Ann	rox Gamma	LITI with 9F	5% Coverage		0.0174		9	5% Annrox	Gamma UPL	0.0114	0.0103
250	00 70 7 tpp			na Percentile		0.00909				Gamma USL	0.0114	0.0173
251 252												
253				L	ognormal GC	F Test on D	etected Obs	servations O	nly			
254			5	Shapiro Wilk	Test Statistic	0.723			Shapiro Wi	ilk GOF Test		
255			5% S	Shapiro Wilk (Critical Value	0.748		Data Not	Lognormal a	t 5% Significa	ance Level	
256				Lilliefors	Test Statistic	0.372			Lilliefors	GOF Test		
257			Ę	5% Lilliefors (0.375				ormal at 5% S	ignificance Le	evel
258				Detected D	ata appear A	pproximate	Lognormal	at 5% Signif	icance Leve	I		
259												
260		В	Background				Lognormal D	Distribution U	Jsing Impute	ed Non-Detec		
261					original Scale	0.00298					in Log Scale	-8.833
262					Original Scale	0.0101			050/		in Log Scale	2.537
263		0	15% Rootstra	95% UTL95 ap (%) UTL95	5% Coverage	0.0799			95%	BCA UTL95	% Coverage 95% UPL (t)	0.042
264			10 /0 DUUISIF8	,	Percentile (z)	0.042					ercentile (z)	0.0139
265					Percentile (z)	0.0533				JJ /0 F	95% USL	0.00940
266				33701	313311116 (2)	5.0000					00 /0 OOL	0.0777
267			Stati	stics usina K	M estimates	on Logaed	Data and As	suming Loa	normal Distr	ibution		
268 269				KM Mean of		-6.525				ognormal)95	% Coverage	0.0139
270					Logged Data	0.903			•	5% KM UPL	-	0.00743
2/0					55		1				/	-

	A B C D E	F	G	Н	I	J K	L
271	95% KM Percentile Lognormal (z)	0.00648				95% KM USL (Lognormal)	0.0137
272							
273	Background DL/2 S	Statistics As	suming Log	normal Distr	ibution		
274	Mean in Original Scale	0.00341				Mean in Log Scale	-6.926
275	SD in Original Scale	0.00998				SD in Log Scale	1.174
276	95% UTL95% Coverage	0.0182				95% UPL (t)	0.0081
277	90% Percentile (z)	0.00442				95% Percentile (z)	0.00678
278	99% Percentile (z)	0.0151				95% USL	0.018
279	DL/2 is not a Recommended Meth	od. DL/2 pro	ovided for c	omparisons a	and hist	orical reasons.	
280							
281	Nonparametric	Distribution	Free Back	ground Statis	tics		
282	Data appear to follow a I	Discernible	Distribution	at 5% Signif	icance	Level	
283							
284	Nonparametric Upper Limits for B	TVs(no disti	nction made	e between de	etects a	nd nondetects)	
285	Order of Statistic, r	17				95% UTL with95% Coverage	0.042
286	Approx, f used to compute achieved CC	0.895	Approxima	ate Actual Co	nfidenc	e Coefficient achieved by UTL	0.582
287	Approximate Sample Size needed to achieve specified CC	59				95% UPL	0.042
288	95% USL	0.042				95% KM Chebyshev UPL	0.0467
289						,	
290	Note: The use of USL tends to yield a conservation	ve estimate	of BTV, esp	ecially when	the sam	ple size starts exceeding 20.	
291	Therefore, one may use USL to estimate a BTV						
292	and consists of observa	tions collect	ed from clea	an unimpacte	d location	ons.	
293	The use of USL tends to provide a balan	ce between	false positiv	es and false	negativ	es provided the data	
294	represents a background data set and wh	nen many or	site observa	ations need to	o be cor	npared with the BTV.	
295							
	F						
297							
298		General	Statistics				
299	Total Number of Observations	17			Nu	mber of Missing Observations	0
300	Number of Distinct Observations	12					
301	Number of Detects	12				Number of Non-Detects	5
302	Number of Distinct Detects	12			N	umber of Distinct Non-Detects	1
303	Minimum Detect	0.12				Minimum Non-Detect	0.2
304	Maximum Detect	1.65				Maximum Non-Detect	0.2
305	Variance Detected	0.172				Percent Non-Detects	29.41%
306	Mean Detected	0.593				SD Detected	0.415
307	Mean of Detected Logged Data	-0.743				SD of Detected Logged Data	0.719
308						I.	
309	Critical Values for	or Backgrou	nd Thresho	ld Values (B	TVs)		
310	Tolerance Factor K (For UTL)	2.486				d2max (for USL)	2.475
311			I				
312	Norm	al GOF Tes	t on Detect	s Only			
313	Shapiro Wilk Test Statistic	0.866			Shapi	o Wilk GOF Test	
314	5% Shapiro Wilk Critical Value	0.859	D	etected Data	appear	Normal at 5% Significance Lev	el
315	Lilliefors Test Statistic	0.193			Lillie	fors GOF Test	
316	5% Lilliefors Critical Value	0.243	D	etected Data	appear	Normal at 5% Significance Lev	el
317	Detected Data a	appear Norn	nal at 5% Si	gnificance L	evel		
318							
319	Kaplan Meier (KM) Back	ground Sta	tistics Assu	ming Norma	Distrib	ution	
320	KM Mean	0.454				KM SD	0.397
321	95% UTL95% Coverage	1.442				95% KM UPL (t)	1.168
322	90% KM Percentile (z)	0.963				95% KM Percentile (z)	1.107
323	99% KM Percentile (z)	1.378				95% KM USL	1.437
324			I			I	
527							

	Α	В	С	D	Е	F	G	Н	I	J	K	L
325				DL/2 Subst	titution Back		stics Assum	ing Normal	Distribution			
326					Mean	0.448					SD	0.415
327			9		% Coverage	1.479					95% UPL (t)	1.193
328					ercentile (z)	0.98				95% P	ercentile (z)	1.13
329					ercentile (z)	1.413					95% USL	1.474
330			DL/2 is no	t a recomm	ended meth	od. DL/2 pro	ovided for co	mparisons a	and historica	al reasons		
331												
332							etected Obse		-			
333					est Statistic	0.214	Datasta			rling GOF Te		
334					ritical Value	0.74	Detected			istributed at 5	_	ce Level
335					est Statistic	0.133	Datasta			-Smirnov GOI istributed at 5		oo Lovol
336							stributed at 5			isiributeu at 5	% Significan	ce Level
337				Detected	uata appeai	Gaillilla Di	suibuleu al c	70 Significa	IIICE FEAGI			
338					Gamma	Statistics or	Detected D	ata Only				
339					k hat (MLE)	2.418	l Dottoottod D	dia Only	k	star (bias corr	rected MLF)	1.869
340					a hat (MLE)	0.245				star (bias corr	′	0.317
341					u hat (MLE)	58.03				nu star (bia:		44.86
342			MLE		s corrected)	0.593				(//	-
344			N	/ILE Sd (bia	s corrected)	0.434			95% Percer	ntile of Chisqu	are (2kstar)	9.06
345												
346				G	amma ROS	Statistics u	sing Imputed	Non-Detec	ts			
347			GROS may n	ot be used	when data s	et has > 50%	NDs with m	any tied obs	servations at	multiple DLs		
348		GROS may	not be used v	vhen kstar o	of detects is	small such a	s <1.0, espec	cially when t	he sample si	ize is small (e	.g., <15-20)	
349			For	such situati	ons, GROS i	method may	yield incorre	ct values of	UCLs and B	TVs		
350				Т	his is especi	ally true whe	n the sample	size is sma	all.			
351		For gan	nma distribute	d detected (data, BTVs a	nd UCLs ma	y be comput	ed using ga	mma distribu	ition on KM es	stimates	
352					Minimum	0.01					Mean	0.429
353					Maximum	1.65					Median	0.33
354					SD	0.433					CV	1.008
355					k hat (MLE)	0.743				star (bias corr		0.651
356					a hat (MLE)	0.578			I heta	star (bias corr	′	0.66
357			NAL E		u hat (MLE) s corrected)	25.25 0.429				nu star (bia:	<i>'</i>	0.532
358			95% Percentil	•	,	4.548				•	6 Percentile	1.096
359			33 % Felcellul	·	% Percentile	1.501					Percentile	2.472
360			The fol				g Gamma R	OS Statistic	es on Impute		or creenine	2.472
361 362				•		•	H) and Hawk		-			
363					WH	HW	,		()		WH	HW
364	95% App	rox. Gamma	UTL with 95%	Coverage	2.591	3.163		9	5% Approx.	Gamma UPL	1.616	1.817
365				amma USL	2.573	3.137						
366							I					
367				Es	timates of G	amma Para	meters using	KM Estima	ites			
368					Mean (KM)	0.454					SD (KM)	0.397
369				Va	riance (KM)	0.158				SE of	Mean (KM)	0.101
370					k hat (KM)	1.307					k star (KM)	1.116
371		-			nu hat (KM)	44.44					nu star (KM)	37.93
372					eta hat (KM)	0.347					ta star (KM)	0.407
373				• •	centile (KM)	0.724				% gamma per	` ′	1.018
374			95% (gamma per	centile (KM)	1.309			999	% gamma per	centile (KM)	1.98
375									1162.5			
376						•	ing gamma d					
377			Up	per Limits			H) and Hawk	uns Wixley	(HW) Metho	as	1471	1.0547
378					WH	HW					WH	HW

	A B C D E	F	G H I J K	L
379	95% Approx. Gamma UTL with 95% Coverage 1.829	1.952	95% Approx. Gamma UPL 1.263	1.297
380	95% KM Gamma Percentile 1.156	1.179	95% Gamma USL 1.819	1.94
381				
382			etected Observations Only	
383	Shapiro Wilk Test Statistic	0.976	Shapiro Wilk GOF Test	
384	5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Lognormal	evel
385	Lilliefors Test Statistic	0.134	Lilliefors GOF Test	
386	5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Lognormal	evel
387	Detected Data ap	pear Logno	rmal at 5% Significance Level	
388				
389			Lognormal Distribution Using Imputed Non-Detects	
390	Mean in Original Scale	0.455	Mean in Log Scale	-1.162
391	SD in Original Scale	0.41	SD in Log Scale	0.919
392	95% UTL95% Coverage	3.076	95% BCA UTL95% Coverage	1.65
393	95% Bootstrap (%) UTL95% Coverage	1.65	95% UPL (t)	1.632
394	90% Percentile (z)	1.016	95% Percentile (z)	1.42
395	99% Percentile (z)	2.656	95% USL	3.045
396				
397	-	on Logged	Data and Assuming Lognormal Distribution	
398	KM Mean of Logged Data	-1.148	95% KM UTL (Lognormal)95% Coverage	2.649
399	KM SD of Logged Data	0.854	95% KM UPL (Lognormal)	1.47
400	95% KM Percentile Lognormal (z)	1.292	95% KM USL (Lognormal)	2.624
401				
402	Background DL/2	Statistics As	suming Lognormal Distribution	
403	Mean in Original Scale	0.448	Mean in Log Scale	-1.202
404	SD in Original Scale	0.415	SD in Log Scale	0.945
405	95% UTL95% Coverage	3.148	95% UPL (t)	1.641
406	90% Percentile (z)	1.009	95% Percentile (z)	1.422
407	99% Percentile (z)	2.707	95% USL	3.115
408	DL/2 is not a Recommended Meth	od. DL/2 pro	ovided for comparisons and historical reasons.	
409				
410	Nonparametric	Distribution	Free Background Statistics	
411	Data appear to follow a	Discernible	Distribution at 5% Significance Level	
412				
413	Nonparametric Upper Limits for B	TVs(no disti	nction made between detects and nondetects)	
414	Order of Statistic, r	17	95% UTL with95% Coverage	1.65
415	Approx, f used to compute achieved CC	0.895	Approximate Actual Confidence Coefficient achieved by UTL	0.582
416	Approximate Sample Size needed to achieve specified CC	59	95% UPL	1.65
417	95% USL	1.65	95% KM Chebyshev UPL	2.236
418				
419	•		of BTV, especially when the sample size starts exceeding 20.	
420			ne data set represents a background data set free of outliers	
421	and consists of observa	tions collect	ed from clean unimpacted locations.	
422	•		false positives and false negatives provided the data	
423	represents a background data set and when the set and whe	hen many or	site observations need to be compared with the BTV.	
424				
425	Hg			
426				
427		General	Statistics	
428	Total Number of Observations	17	Number of Missing Observations	0
429	Number of Distinct Observations	2		
430	Number of Detects	0	Number of Non-Detects	17
431	Number of Distinct Detects	0	Number of Distinct Non-Detects	2
432	Minimum Detect	N/A	Minimum Non-Detect	1.0000E-4
.02				

	A B C D E	F	G H I J K L
433	Maximum Detec		Maximum Non-Detect 2.0000E
434	Variance Detecte	d N/A	Percent Non-Detects 100%
435	Mean Detecte	d N/A	SD Detected N/A
436	Mean of Detected Logged Dat	a N/A	SD of Detected Logged Data N/A
437			
438	Warning: All observations are Non-Dete	cts (NDs), the	nerefore all statistics and estimates should also be NDs!
439	~		tistics are also NDs lying below the largest detection limit!
440	The Project Team may decide to use alternative	site specific	values to estimate environmental parameters (e.g., EPC, BTV).
441	<u> </u>		
442	The data s	set for variabl	ole Hg was not processed!
443			
444			
445	Li		
446			
447	General Statistics		
448	Total Number of Observation	s 17	Number of Distinct Observations 16
449	Minimur	n 0.052	First Quartile 0.38
450	Second Larges	st 0.525	Median 0.40
451	Maximui	m 0.57	Third Quartile 0.41
452	Mea	n 0.344	SD 0.16
453	Coefficient of Variatio	n 0.484	Skewness -1.018
454	Mean of logged Dat	a -1.298	SD of logged Data 0.84
455			
456	Critical Values	for Backgrou	ound Threshold Values (BTVs)
457	Tolerance Factor K (For UTL		d2max (for USL) 2.47
458	,	,	, ,
459		Normal	GOF Test
460	Shapiro Wilk Test Statisti	c 0.76	Shapiro Wilk GOF Test
461	5% Shapiro Wilk Critical Valu		Data Not Normal at 5% Significance Level
462	Lilliefors Test Statisti	c 0.367	Lilliefors GOF Test
463	5% Lilliefors Critical Valu	e 0.207	Data Not Normal at 5% Significance Level
464	Data N	ot Normal at	5% Significance Level
465			
466	Background	Statistics As	ssuming Normal Distribution
467	95% UTL with 95% Coverage		90% Percentile (z) 0.55
468	95% UPL (t) 0.643	95% Percentile (z) 0.61
469	95% USI	0.755	99% Percentile (z) 0.73
470			
471		Gamma	a GOF Test
471	A-D Test Statisti	c 2.796	Anderson-Darling Gamma GOF Test
473	5% A-D Critical Valu	e 0.748	Data Not Gamma Distributed at 5% Significance Level
474	K-S Test Statisti	c 0.421	Kolmogorov-Smirnov Gamma GOF Test
475	5% K-S Critical Valu	e 0.211	Data Not Gamma Distributed at 5% Significance Level
476	Data Not Gar	nma Distribut	Ited at 5% Significance Level
477			
478		Gamma	a Statistics
479	k hat (MLE	2.321	k star (bias corrected MLE) 1.95
480	Theta hat (MLE	0.148	Theta star (bias corrected MLE) 0.17
481	nu hat (MLE	78.9	nu star (bias corrected) 66.31
482	MLE Mean (bias corrected	d) 0.344	MLE Sd (bias corrected) 0.24
483		1	
484	Background	Statistics Ass	ssuming Gamma Distribution
485	95% Wilson Hilferty (WH) Approx. Gamma UP	L 0.864	90% Percentile 0.67
- 50	95% Hawkins Wixley (HW) Approx. Gamma UP	L 0.924	95% Percentile 0.82
486	3376 Hawkins Wixley (1707) Approx. Callina Of		

	A B C D E	F	G	Н	I	J K	L
487	95% WH Approx. Gamma UTL with 95% Coverage	1.193				99% Percentile	1.154
488	95% HW Approx. Gamma UTL with 95% Coverage	1.33					
489	95% WH USL	1.187				95% HW USL	1.323
490							
491		Lognorma	I GOF Test				
492	Shapiro Wilk Test Statistic	0.66		Sha	piro Wilk Lo	gnormal GOF Test	
493	5% Shapiro Wilk Critical Value				•	at 5% Significance Level	
494	Lilliefors Test Statistic	0.425				ormal GOF Test	
495	5% Lilliefors Critical Value	0.207			Lognormal a	at 5% Significance Level	
496	Data Not L	ognormal at	t 5% Signific	ance Level			
497							
498	Background Sta		ming Lognoi	mal Distribu	ıtion		
499	95% UTL with 95% Coverage					90% Percentile (z)	0.804
500	95% UPL (t)	1.24				95% Percentile (z)	1.091
501	95% USL	2.195				99% Percentile (z)	1.937
502							
503	Nonparametric						
504	Data do not f	ollow a Disc	ernible Distr	ibution (0.0	5)		
505							
506	Nonparametric Upp		r Backgroun	d Threshold			
507	Order of Statistic, r					UTL with 95% Coverage	0.57
508	Approx, f used to compute achieved CC	0.895				pefficient achieved by UTL	0.582
509	050/ P	0.57	Approxin			ed to achieve specified CC	59
510	95% Percentile Bootstrap UTL with 95% Coverage			95% BC	A Bootstrap	UTL with 95% Coverage	0.57
511	95% UPL	0.57				90% Percentile	0.474
512	90% Chebyshev UPL	0.857				95% Percentile	
513	95% Chebyshev UPL	1.09 0.57				99% Percentile	0.563
514	95% USL	0.57					
515	Note: The use of USL tends to yield a conservati	vo octimato	of RTV ocno	scially whon	the cample	sizo starts avacading 20	
516	Therefore, one may use USL to estimate a BTV		•	•		•	
517	and consists of observa					data set free of outliers	
518	The use of USL tends to provide a balar					rovided the data	
519	represents a background data set and w						
520	. op. oooa a aaog. aaa aa.a aaa a				- 20 00pa.		
521	Мо						
522							
523 524		General	Statistics				
525	Total Number of Observations	17			Numbe	er of Missing Observations	0
526	Number of Distinct Observations	8					
527	Number of Detects	5				Number of Non-Detects	12
528	Number of Distinct Detects	5			Numb	er of Distinct Non-Detects	3
529	Minimum Detect	0.002				Minimum Non-Detect	0.001
530	Maximum Detect	0.056				Maximum Non-Detect	0.004
531	Variance Detected	4.4270E-4				Percent Non-Detects	70.59%
532	Mean Detected	0.0352				SD Detected	0.021
533	Mean of Detected Logged Data	-3.774			SD	of Detected Logged Data	1.386
534		I.	II.				
535	Critical Values f	or Backgrou	nd Threshol	d Values (B	TVs)		
536	Tolerance Factor K (For UTL)	2.486				d2max (for USL)	2.475
537		L	JL				
538	Norm	nal GOF Tes	t on Detects	Only			
539	Shapiro Wilk Test Statistic	0.925			Shapiro W	ilk GOF Test	
540	5% Shapiro Wilk Critical Value	0.762	De	etected Data	appear Nor	mal at 5% Significance Lev	/el
J40	•	1				-	

	Α	В	T	С		D	Е		F	G		Н		ı	J		K	Т	L
541						Lilliefors	Test Statist	ic	0.209					Lilliefors					
542					5%	Lilliefors	Critical Valu	ıe	0.343		De	tected Dat	ta ap	pear Nor	mal at 5	% Sig	nificance I	_eve	el
543						De	etected Dat	а арре	ear Norn	nal at 5%	Sig	nificance	Leve	l					
544																			
545					K	aplan Me	ier (KM) Ba	ackgro	und Sta	tistics Ass	sum	ning Norma	al Di	stributior	า				
546							KM Mea	an C	0.0111								KM S	D	0.0186
547					95	% UTL9	5% Coverag	je C	0.0574							95%	KM UPL	(t)	0.0445
548					(90% KM	Percentile (z) (0.0349						95%	KM P	ercentile (z)	0.0417
549					(99% KM	Percentile (z) (0.0544							9	5% KM US	3L	0.0572
550																			
551						L/2 Sub	stitution Ba	ckgrou	und Stati	istics Ass	umi	ing Norma	al Dis	tribution					
552							Mea	an C	0.0109								S	D	0.0193
553					95	% UTL95	5% Coverage	je C	0.0589								95% UPL	(t)	0.0456
554						90%	Percentile (z) (0.0356						(95% P	ercentile (z)	0.0426
555						99%	Percentile (z) (0.0558								95% US	3L	0.0587
556				DL/2	is not		mended me	,	DL/2 pro	vided for	COI	mparisons	and	historica	al reaso	ns			
557									•			<u> </u>							
558						-	Gamma GC	F Tes	ts on De	etected OI	bse	rvations C	Only						
							Test Statist		0.692					erson-Da	arlina G	OF Te	st		
559							Critical Valu		0.688		Da	ata Not Ga			-			eve	l
560							Test Statist		0.333					nogorov		-			-
561							Critical Valu		0.363	Detec	cted	d data appe						anco	e I evel
562					D		ata follow A									, a at 0	- 70 Olgilillo		
563						otootoa a	ata ionow i	ippi. c	Janima	Diou ibade	<i>,</i> ,,,	it 070 Olgii	iiiou	100 2010					
564							Gamm	a Stat	tietice or	n Detected	4 D	ata Only							
565							k hat (MLI		1.313	Detected	<i>1</i> D	ata Offiy		k	etar (his	ac cor	rected MLI	=1	0.658
566						The	eta hat (MLI	1	0.0268						•		rected MLI	1	0.0535
567							nu hat (MLI		13.13					THELA	•		s correcte		6.585
568					N 41 -		•	1							nu sta	ar (bia	s correcte	u)	0.363
569						,	as correcte		0.0352				٥٢	0/ D)h:	(01	>	4 500
570					IVII	LE Sa (bi	as correcte	a) (0.0434				95	% Perce	ntile of C	nisqu	ıare (2ksta	.r)	4.582
571							O D0	0001-	41-41	-1 1		N. D.							
572				2000			Gamma RC			<u> </u>				:		- DI -			
573		0000			-		d when data					•					45.00	2)	
574		GROS m	nay n				of detects i					•				nali (e	e.g., < 15-20	J)	
575					For s		tions, GRO			•				Ls and B	SIVS				
576							This is espe				-								
577		For g	jamn	na distri	buted	detected	data, BTVs			y be com	pute	ed using ga	amm	a distribu	ution on	KM es			0.0474
578							Minimu		.002								Mea		0.0174
579							Maximu		0.056								Media		0.01
580									0.0158									V	0.909
581							k hat (MLI		1.761						`		rected MLI	1	1.49
582							eta hat (MLI	,	.00989					Theta	•		rected MLI	1	0.0117
583							nu hat (MLI	-	59.88								s correcte		50.65
584						•	as correcte	,	0.0174						MLE S		s correcte		0.0143
585			9	5% Perd	centile		uare (2ksta		7.779								% Percenti		0.0363
586							% Percenti		0.0455							99%	6 Percentil	е	0.0661
587				Th		_	tistics are	-		-				-				_	
588					Upp	er Limits	using Wils			H) and Ha	awk	ins Wixley	y (HV	V) Metho	ods				
589							WH	Н	łW								WH		HW
590	95% App	rox. Gamn	na U	TL with	95%	Coverage	0.0677	C	0.0712				95%	Approx.	Gamma	UPL	0.0473		0.0481
591				959	% Gar	mma USI	0.0674	C	0.0708									\top	
592							1	1		I							I		
593						Е	stimates of	Gamr	na Para	meters us	ing	KM Estim	nates	i					
594							Mean (KN	/I) (0.0111								SD (KI	Л)	0.0186
J34							`	-1									,		

	Α	В	T	С	D	Е	F	G	H	1	I	J	K	L
595			•		V	ariance (KM)	3.4679E-4					SE	of Mean (KM)	0.00505
596						k hat (KM)	0.353						k star (KM)	0.33
597						nu hat (KM)	12.01						nu star (KM)	11.23
598					th	neta hat (KM)	0.0313					1	theta star (KM)	0.0335
599				80%	gamma pe	ercentile (KM)	0.0173				90	% gamma p	percentile (KM)	0.0322
600				95%	gamma pe	ercentile (KM)	0.0491				99	% gamma p	percentile (KM)	0.0923
601														
602				The	following s	tatistics are o	omputed usi	ng gamm	a distribu	tion ar	nd KM esti	mates		
603				U	pper Limits	using Wilson	n Hilferty (W	H) and Ha	awkins W	ixley (l	HW) Metho	ods		
604						WH	HW						WH	HW
605	95% Appr	ox. Gamm	na UT	L with 95	% Coverage	0.0761	0.0826			95	% Approx.	Gamma UF	PL 0.0432	0.043
606		9	95% K	M Gamm	a Percentile	e 0.0375	0.0367				95%	Gamma US	SL 0.0755	0.0818
607							I.	II.					1	
608					L	ognormal GC	F Test on D	etected C	Observation	ns On	nly			
609				S	napiro Wilk	Test Statistic	0.71				Shapiro W	ilk GOF Te	est	
610				5% Sł	napiro Wilk	Critical Value	0.762		Data	Not L	ognormal a	at 5% Signif	ficance Level	
611					Lilliefors	Test Statistic	0.367				Lilliefors	GOF Test	,	
612				5'	% Lilliefors	Critical Value	0.343		Data	Not L	ognormal a	at 5% Signif	ficance Level	
613						Data Not I	.ognormal at	5% Sign	ificance L	evel				
614														
615			Back	ground L	ognormal F	ROS Statistics	s Assuming I	_ognorma	al Distribu	tion Us	sing Imput	ed Non-Det	tects	
616					Mean in C	Original Scale	0.0109					Mea	n in Log Scale	-6.746
617					SD in C	Original Scale	0.0193					S	D in Log Scale	2.428
618					95% UTL95	5% Coverage	0.492				95%	6 BCA UTL	95% Coverage	0.056
619			95%	Bootstrap	(%) UTL95	5% Coverage	0.056						95% UPL (t)	0.0923
620					90%	Percentile (z)	0.0264					95%	6 Percentile (z)	0.0638
621					99%	Percentile (z)	0.334						95% USL	0.479
622							I.	II.						
623				Statis	tics using k	(M estimates	on Logged I	Data and	Assuming	Logn	ormal Dist	ribution		
624				k	M Mean of	Logged Data	-5.979			95%	KM UTL (I	Lognormal)	95% Coverage	0.127
625					KM SD of	Logged Data	1.576				,	95% KM UF	PL (Lognormal)	0.0429
626				95% KM	Percentile L	ognormal (z)	0.0338				!	95% KM US	SL (Lognormal)	0.125
627														
628					Back	ground DL/2	Statistics As	suming L	ognormal	Distril	bution			
629					Mean in C	Original Scale	0.0109					Mea	n in Log Scale	-6.329
630					SD in C	Original Scale	0.0193					S	D in Log Scale	1.88
631					95% UTL95	5% Coverage	0.191						95% UPL (t)	0.0523
632					90%	Percentile (z)	0.0198					95%	6 Percentile (z)	0.0393
633						Percentile (z)							95% USL	0.187
634			I	DL/2 is no	ot a Recom	mended Meth	nod. DL/2 pro	ovided for	comparis	sons a	nd historic	al reasons.		
635														
636					N	onparametric	Distribution	Free Bac	kground	Statisti	ics			
637					Data appea	ar to follow a	Discernible	Distributio	on at 5% S	Signific	cance Leve	əl		
638														
639				Nonparar	netric Uppe	er Limits for B	TVs(no disti	nction ma	de betwe	en det	tects and n	ondetects)		
640					Order	of Statistic, r					959	% UTL with	95% Coverage	0.056
641		A	Appro	x, f used	to compute	achieved CC	0.895	Approxi	mate Actu	al Con	nfidence Co	efficient ac	hieved by UTL	0.582
642	Approxim	ate Samp	le Siz	e needed	to achieve	specified CC	59						95% UPL	0.056
643						95% USL	0.056					95% KM C	hebyshev UPL	0.0946
644														
645		Note: Th	ne use	of USL to	ends to yield	d a conservat	ive estimate	of BTV, e	specially v	when th	he sample	size starts e	exceeding 20.	
646		Therefo	re, on	e may us	e USL to es	timate a BTV	only when th	ne data se	t represer	nts a ba	ackground	data set fre	ee of outliers	
647					and consi	sts of observa	ations collect	ed from c	lean unim	pacted	l locations.			
648			The u	ise of US	tends to p	rovide a balaı	nce between	false pos	itives and	false r	negatives p	rovided the	data	
1														

		Α	В		С			Е	F	G	Н	1	J	K	L
649				repre	sents a ba	ackgrou	und dat	a set and	vhen many o	nsite observa	ations need	to be compa	red with the B	IV.	
650	Dt.														
651	Pb														
652									Gonoral	Statistics					
653					Total	Numbe	ar of O	bservation		Otationics		Numh	er of Missing (Thearvations	0
654								bservation				Numb	Ci oi wiissiiig (O .
655								r of Detect					Number of	Non-Detects	15
656 657	-				Nı	umber o	of Disti	nct Detect				Numl	ber of Distinct	Non-Detects	3
658							Minir	num Detec	t 0.001				Minimum	n Non-Detect	0.001
659							Maxir	num Detec	t 0.002				Maximum	n Non-Detect	0.004
660						\	√arianα	ce Detecte	5.0000E-7				Percent	Non-Detects	88.24%
661							Mea	n Detecte	0.0015				,	SD Detected	7.0711E-4
662					Mean	of Dete	cted L	ogged Dat	-6.561			SI	O of Detected	Logged Data	0.49
663									"	1					II.
664								Warning:	Data set has	only 2 Dete	cted Values	S.			
665					TI	his is n	ot eno	ugh to con	pute meanir	gful or relial	ole statistic	s and estima	ates.		
666															
667															
668									for Backgrou	ınd Thresho	ld Values (BTVs)		"	0.455
669					Tole	rance F	actor I	K (For UTL	2.486				d2m	nax (for USL)	2.475
670								No		t an Datast	Only				
671									mal GOF Tes nough Data t						
672								NOLE	lough Data t	o Perioriii G	OF Test				
673	-					Kanla	n Mais	r (KM) Ra	ekaround Sta	tietice Aceu	mina Norm	al Distributio	n.		
674						Itapia	II WIOIC	KM Mea		usucs Assu	Illing North		//I	KM SD	2.4944E-4
675						95% U	JTL95%	6 Coverage					95%	6 KM UPL (t)	
676 677	-							ercentile (z						Percentile (z)	0.00148
678								ercentile (z						95% KM USL	0.00168
679								`							
680						DL/2	Subst	itution Bac	kground Stat	istics Assun	ning Norma	al Distribution	n		
681								Mea	7.6471E-4					SD	5.3379E-4
682						95% U	JTL95%	6 Coverag	0.00209					95% UPL (t)	0.00172
683						Ć	90% P	ercentile (z	0.00145				95% F	Percentile (z)	0.00164
684								ercentile (z						95% USL	0.00209
685					DL/2 is r	not a re	comm	ended me	hod. DL/2 pr	ovided for co	omparisons	s and historic	cal reasons		
686															
687							G		F Tests on D			Only			
688								Not E	nough Data t	o Perform G	OF Test				
689	-							Comm	Statistics o	n Dotootod "	Data Only				
690								k hat (MLE		i Detected I	Jala Offiy	ı	k star (bias co	rrected MI E\	N/A
691	-) 1.7334E-4				a star (bias coi		N/A
692	-							u hat (MLE				111616	•	as corrected)	N/A
693					MI	LE Mea		s corrected	·				5:31 (5)10		
694					.411		•	corrected				95% Perce	entile of Chisq	uare (2kstar)	N/A
695 696	-						(<u> </u>	1				()	
696							Est	imates of	Gamma Para	meters usin	g KM Estin	nates			
698	1							Mean (KN			-			SD (KM)	2.4944E-4
699									6.2222E-8				SE c	of Mean (KM)	
700	1							k hat (KM) 18.29					k star (KM)	15.1
701	1						l	nu hat (KM	621.7					nu star (KM)	513.3
	-						the	ta hat (KM) 5.8333E-5				the	eta star (KM)	7 0649F-5

_		_	—					_	-							1	
703	А	В			30% ga	D mma pe	rcentile (KM)	0.00129	G		Н		I	90%	J gamma p	ercentile (KM)	0.00143
703							rcentile (KM)	0.00155							•	ercentile (KM)	0.00181
704							. ,	·							- r	. ,	
703				т	he foll	owing st	atistics are c	omputed us	ing gamn	na dist	ributio	n and	d KM	estim	ates		
707					Uppe	er Limits	using Wilsor	Hilferty (W	H) and H	awkin	s Wixle	эу (Н	W) N	lethod	s		
708							WH	HW								WH	HW
709	95% Appr	ox. Gamn	na UT	L with	95% C	Coverage	0.00164	0.00163				95%	6 App	orox. G	amma UP	L 0.00146	0.00145
710		S	95% K	(M Gar	mma P	ercentile	0.00142	0.00141						95% G	amma US	L 0.00163	0.00163
711																	
712						Le	ognormal GC	F Test on D	etected (Obser	ations	Only	y				
713							Not En	ough Data to	Perform	GOF	Test						
714																	
715			Back	groun	d Logr	normal R	OS Statistics	Assuming	Lognorma	al Dist	ributio	n Usi	ing In	nputed	l Non-Dete	ects	
716					N	lean in O	riginal Scale	2.5953E-4							Mea	n in Log Scale	-9.526
717						SD in O	riginal Scale	5.0902E-4							SI) in Log Scale	1.666
718					959	% UTL95	% Coverage	0.00459						95%	BCA UTL9	5% Coverage	0.002
719			95%	Boots	trap (%	6) UTL95	% Coverage	0.002								95% UPL (t)	0.00145
720						90% F	Percentile (z)	6.1669E-4							95%	Percentile (z)	0.00113
721							Percentile (z)	0.00351								95% USL	0.0045
722							. ,										
723				Sta	atistics	using K	M estimates	on Logged	Data and	Assur	ning L	ogno	rmal	Distrib	oution		
724						-	Logged Data	-6.862			_	-				5% Coverage	0.00161
725					K	M SD of	Logged Data	0.173						95	5% KM UP	L (Lognormal)	0.00143
726				95% K			ognormal (z)	0.00139								L (Lognormal)	0.00161
727							5076								, ,		
						Back	ground DL/2	Statistics As	suming L	.ognoi	mal D	istrib	ution				
728 729					N		riginal Scale								Mear	n in Log Scale	-7.332
							riginal Scale) in Log Scale	0.519
730 731					959		% Coverage	0.00237								95% UPL (t)	0.00166
732							Percentile (z)	0.00127							95%	Percentile (z)	0.00154
							Percentile (z)	0.00219								95% USL	0.00236
733 734				DL/2 is	s not a		mended Meth	od. DL/2 pr	ovided fo	r com	oarisor	ns an	d his	torical	reasons.		
735																	
736						No	onparametric	Distribution	Free Ba	ckgrou	ınd Sta	atistic	s				
737							Data do not f	ollow a Disc	ernible D	istribu	ition (C).05)					
738			=														
739				Nonpa	aramet	ric Uppe	r Limits for B	TVs(no dist	nction ma	ade be	etween	dete	ects a	nd no	ndetects)		
740							of Statistic, r	17								5% Coverage	0.004
741			Appro	ox, f us	ed to c	ompute	achieved CC	0.895	Approx	mate	Actual	Conf	idenc	e Coe	fficient ach	nieved by UTL	0.582
741	Approxim						specified CC	59								95% UPL	0.004
743							95% USL	0.004						9	5% KM Ch	nebyshev UPL	0.00219
744									1								
745		Note: Th	ne use	of US	SL tend	s to yield	l a conservati	ve estimate	of BTV, e	specia	ally wh	en the	e san	nple si	ze starts e	xceeding 20.	
745						•	timate a BTV			•	-			•		•	
747							sts of observa										
747			The ι	use of I			ovide a balar								vided the	data	
749							ata set and w										
750														-			
	Ra																
751																	
752								General	Statistics	}							
753				To	tal Nu	mber of (Observations	15					Nı	ımber	of Missina	Observations	2
754							Observations	15							9		=
755							er of Detects	12							Number o	f Non-Detects	3
756						. 101110	0. 00.000										

	Α	В	С	D	Е	F	G	Н	I J K	L			
757			N	lumber of Dist	tinct Detects	12			Number of Distinct Non-Detects	3			
758				Mini	mum Detect	0.797	Minimum Non-Detect 0.48						
759				Maxi	mum Detect	3	Maximum Non-Detect 1.66						
760				Varian	ce Detected	0.544	Percent Non-Detects 20%						
761				Me	an Detected	1.473			SD Detected	0.738			
762			Mean	of Detected L	ogged Data	0.289			SD of Detected Logged Data	0.447			
763					,								
764			TVs)										
765			Tole	erance Factor	K (For UTL)	2.566			d2max (for USL)	2.409			
766													
767					Norm	al GOF Tes	t on Detects	Only					
768				Shapiro Wilk T		0.824			Shapiro Wilk GOF Test				
769			5% S	Shapiro Wilk C	Critical Value	0.859		Data No	ot Normal at 5% Significance Level				
770				Lilliefors T	est Statistic	0.228			Lilliefors GOF Test				
771			Ę	5% Lilliefors C		0.243			appear Normal at 5% Significance Lev	/el			
772				Detected	Data appear	Approximat	e Normal at	5% Significa	ance Level				
773													
774				Kaplan Mei	er (KM) Back	ground Sta	tistics Assur	ning Normal	Distribution				
775					KM Mean	1.309			KM SD	0.726			
776				95% UTL95	% Coverage	3.172			95% KM UPL (t)	2.63			
777				90% KM P	ercentile (z)	2.24			95% KM Percentile (z)	2.504			
778				99% KM P	ercentile (z)	2.998			95% KM USL	3.058			
779													
780				DL/2 Subs	titution Back	ground Stat	istics Assum	ning Normal	Distribution				
781					Mean	1.274			SD	0.783			
782				95% UTL95		3.282	95% UPL (t)						
783					Percentile (z)	2.277			95% Percentile (z)	2.561			
784					Percentile (z)	3.094			95% USL	3.159			
785			DL/2 is	not a recomm	nended meth	od. DL/2 pro	ovided for co	mparisons a	and historical reasons				
786													
787				G	amma GOF	Tests on De	etected Obse		<u>* </u>				
788					est Statistic	0.625			nderson-Darling GOF Test				
789					Critical Value	0.732	Detecte	• • • • • • • • • • • • • • • • • • • •	ar Gamma Distributed at 5% Significan	ce Level			
790					est Statistic	0.203			Kolmogorov-Smirnov GOF				
791					Critical Value	0.246			ar Gamma Distributed at 5% Significan	ce Level			
792				Detected	data appear	Gamma Di	stributed at	5% Significa	nce Level				
793													
794							Detected D	oata Only					
795					k hat (MLE)	5.236			k star (bias corrected MLE)	3.982			
796					ta hat (MLE)	0.281			Theta star (bias corrected MLE)	0.37			
797					nu hat (MLE)	125.7			nu star (bias corrected)	95.58			
798			M	LE Mean (bia	ŕ	1.473			050/ D (2)	J= 1-			
799				MLE Sd (bia	s corrected)	0.738			95% Percentile of Chisquare (2kstar)	15.46			
800													
801					amma ROS								
802		0000						•	ervations at multiple DLs				
803		GROS may							he sample size is small (e.g., <15-20)				
804			F				-		UCLs and BTVs				
805					his is especia								
806		For gan	ıma distribu	ted detected			y be comput	ted using gar	mma distribution on KM estimates	,			
807					Minimum	0.214	Mean 1.2						
808					Maximum	3 0.793			Median	1			
809	SD								CV	0.624			
810					k hat (MLE)	2.456			k star (bias corrected MLE)	2.01			

	Δ.	Г Б					-							1		1	IZ.	
811	A	В	С		D Th	E eta hat (ML	E)	F 0.518	G		Н		T	heta s	J star (bia		K rected MLE)	0.633
812			73.69							nu sta	ar (bia	s corrected)	60.29					
813				MLE	Mean (b	as correcte	d)	1.272	MLE Sd (bias corrected) 0.							0.897		
814			95% Pe	ercentil	e of Chiso	quare (2ksta	ar)	9.519								90%	6 Percentile	2.47
815	95% Percentile 3.012 99% Percentile									Percentile	4.212							
816			Т	The foll	owing sta	itistics are	con	nputed usin	g Gamn	na R	OS Sta	tistics	on In	nputed	d Data			
817				Up	per Limits	using Wils	son	Hilferty (W	H) and H	Hawk	cins Wix	dey (F	lW) N	/lethod	ds			
818	WH HW WH										HW							
819	95% App	rox. Gamma	a UTL wit	th 95%	Coverage	e 4.446		4.815				959	% App	orox. (Gamma	UPL	3.159	3.297
820	0E9/ Commo IICI 4.1E1 4.4E0																	
821																		
822					E			amma Para	meters u	using	KM Es	timate	es					
823						Mean (Kl	-	1.309									SD (KM)	0.726
824					\ 	'ariance (Kl		0.527								SE of	Mean (KM)	0.197
825						k hat (Kl	-	3.253									k star (KM)	2.646
826					_	nu hat (Kl		97.58									nu star (KM)	79.39
827				0001		heta hat (Kl	1	0.403						000	/ ~		ta star (KM)	0.495
828						ercentile (Kl		1.896									centile (KM)	2.388
829				95% (jamma pe	ercentile (Kl	VI)	2.85						99%	o gamn	ıa per	centile (KM)	3.859
830				The fo	llowing s	tatietice an	2 00	mputed us	ina aam	ma d	lietribut	ion an	d KM	ectim	atas			
831								Hilferty (W										
832				Op	per Lillia	WH	-	HW HW		IGWI	(III) 111/	ucy (i	1 7 7 1		1 5		WH	HW
833	95% App	rox. Gamma	a UTL wit	h 95%	Coverage			3.824				959	% Anı	orox (Gamma	UPI	2.771	2.809
834	00707155		5% KM G					2.604							Gamma		3.487	3.591
835			370 TAWI CI	amma	T CICCITUM	2.001		2.004						30 70 0	Jamma	OOL	0.407	0.001
836					L	ognormal (GOI	F Test on D	etected	Obs	ervatio	ns Onl	V					
838	Shapiro Wilk Test Statistic 0.9 Shapiro Wilk GOF Test																	
839			5	% Sha	piro Wilk	Critical Val	ue	0.859		Dete	ected Da	ata ap	pear l	Logno	rmal at	5% S	ignificance L	evel
840					Lilliefors	Test Statis	tic	0.178	Lilliefors GOF Test									
841				5%	Lilliefors	Critical Val	ue	0.243		Dete	ected Da	ata ap	pear l	Logno	rmal at	5% S	ignificance L	evel
842					Det	ected Data	ap	pear Logno	rmal at &	5% S	ignifica	nce L	evel					
843																		
844		l	Backgrou					Assuming	Lognorn	nal D	istributi	on Us	ing Ir	npute				
845						Original Sca		1.31							N		n Log Scale	0.136
846						Original Sca		0.744						0=0/			n Log Scale	0.529
847			050/ D			5% Covera	_	4.452						95%	BCA U		% Coverage	3
848		,	95% Boo	tstrap (5% Covera		3									95% UPL (t)	2.999
849						Percentile (Percentile (` ′	2.257 3.922								95% P	ercentile (z) 95% USL	2.735 4.097
850					99%	reicentile ((2)	3.922									90% USL	4.09/
851			Ç	Statistic	es usina l	(M estimat	es c	on Logged I	Data and	d Acc	sumina	Loana	rmal	Distri	bution			
852					-	Logged Da		0.129	- a.u aik	/ 101	iii	_				al)95°	% Coverage	4.406
853						Logged Da		0.528				/ 0			-		_	2.971
854			95%			ognormal (2.71	95% KM UPL (Lognormal) 95% KM USL (Lognormal)					4.056				
855 856			- "-			<u> </u>	. /										. 5	
857					Back	ground DL	/2 S	statistics As	suming	Logi	normal	Distrib	ution	<u> </u>				
858	Mean in Original Scale						1.274	Mean in Log Scale							0.0546			
859					SD in 0	Original Sca	le	0.783								SDi	n Log Scale	0.671
860				9	5% UTL9	5% Covera	ge	5.905	95% UPL (t)					95% UPL (t)	3.578			
861	000/ Danagatila (a) 2 405								ercentile (z)	3.183								
862	000/ D 111 / \ 5 000								5.315									
863			DL/2	is not	a Recom	mended M	eth	od. DL/2 pro	ovided fo	or co	mparis	ons ar	nd his	torica	l reaso	ns.		
864																		
JUT																		

	A B C D E	F	G H I J K	L										
865	•		Free Background Statistics											
866	Data appear to follow a	Discernible	Distribution at 5% Significance Level											
867	Nonparametric Upper Limits for B	TVs(no disti	nction made between detects and nondetects)											
868	Order of Statistic. r	15	95% UTL with95% Coverage	3										
869	Approx, f used to compute achieved CC	0.789	Approximate Actual Confidence Coefficient achieved by UTL	0.537										
870 871	Approximate Sample Size needed to achieve specified CC	59	95% UPL	3										
872	95% USL	3	95% KM Chebyshev UPL	4.578										
873	30 % GOL 0 30 MW Offensiles Of L													
874	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.													
875	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers													
876	and consists of observations collected from clean unimpacted locations.													
877	The use of USL tends to provide a balance between false positives and false negatives provided the data													
878	represents a background data set and when many onsite observations need to be compared with the BTV.													
879														
880	Sb													
881														
882			Statistics											
883	Total Number of Observations	17	Number of Missing Observations	0										
884	Number of Distinct Observations	3												
885	Number of Detects	0	Number of Non-Detects	17										
886	Number of Distinct Detects	0	Number of Distinct Non-Detects	3										
887	Minimum Detect Maximum Detect	N/A N/A	Minimum Non-Detect Maximum Non-Detect	0.001										
888	Variance Detected	N/A N/A		100%										
889	Mean Detected	N/A N/A	SD Detected	N/A										
890	Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A										
891	Wear of Detected Logged Data	IN/A	3D of Defected Logged Data	IN/A										
892	Warning: All observations are Non-Detect	s (NDs), the	refore all statistics and estimates should also be NDs!											
893 894	-		stics are also NDs lying below the largest detection limit!											
895			alues to estimate environmental parameters (e.g., EPC, BTV).											
896	· · · · · · · · · · · · · · · · · · ·													
897	The data se	t for variable	Sb was not processed!											
898														
899														
900	Se													
901														
902		General	Statistics											
903	Total Number of Observations	17	Number of Missing Observations	0										
904	Number of Distinct Observations	8												
905	Number of Detects	11	Number of Non-Detects	6										
906	Number of Distinct Detects	7	Number of Distinct Non-Detects	3										
907	Minimum Detect	0.001	Minimum Non-Detect	0.001										
908	Maximum Detect Variance Detected	0.034	Maximum Non-Detect Percent Non-Detects	0.004 35.29%										
909	Variance Detected Mean Detected	0.0108	SD Detected	0.0126										
910	Mean of Detected Logged Data	-5.311	SD of Detected Logged Data	1.34										
911	mount of Detected Logged Data	0.011	OD 01 Detected Logged Data											
912	Critical Values for	or Backarou	nd Threshold Values (BTVs)											
913	Tolerance Factor K (For UTL)	2.486	d2max (for USL)	2.475										
914	15.5.5.100 (25.5.1 ())		a2ax (.0. 002)											
915 916	Norm	al GOF Tes	t on Detects Only											
917	Shapiro Wilk Test Statistic	0.736	Shapiro Wilk GOF Test											
	5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level											
918	5.5 S. aspiro Trint Simoni Vuluo	3.00												

	Α	В	С	D	Е	F	G	Н	I	J	K	L			
919					Test Statistic	0.368									
920				5% Lilliefors C		0.251 Data Not Normal at 5% Significance Level Normal at 5% Significance Level									
921					Data Not	Normal at 5	% Significar	nce Level							
922															
923				Kaplan Mei			tistics Assur	ning Norma	l Distribution						
924					KM Mean	0.00742					KM SD	0.0107			
925					% Coverage	0.0341					6 KM UPL (t)	0.0267			
926					Percentile (z)	0.0212					Percentile (z)	0.0251			
927				99% KM F	Percentile (z)	0.0324				9	5% KM USL	0.034			
928															
929				DL/2 Subs	titution Back		stics Assum	ing Normal	Distribution						
930					Mean	0.00732					SD	0.0111			
931					% Coverage	0.035					95% UPL (t)	0.0273			
932					Percentile (z)	0.0216				95% F	Percentile (z)	0.0256			
933					Percentile (z)	0.0332					95% USL	0.0349			
934			DL/2 is	not a recomn	nended meth	od. DL/2 pro	ovided for co	mparisons	and historica	l reasons					
935	Commo COE Toots on Detected Observations Only														
936							etected Obse		-						
937					Test Statistic	1.372			Anderson-Da						
938				5% A-D C	Critical Value	0.762	D			•	nificance Lev	el			
939				K-S 1	Test Statistic	0.333			Kolmogorov-						
940	5% K-S Critical Value 0.265 Data Not Gamma Distributed at 5% Significance Leve									el					
941				Da	ita Not Gamr	ma Distribute	ed at 5% Sig	nificance Lo	evel						
942															
943					Gamma	Statistics or	Detected D	ata Only							
944					k hat (MLE)	0.762				star (bias cor	1	0.615			
945	Theta hat (MLE)					0.0142			Theta	star (bias cor	rected MLE)	0.0176			
946	nu hat (MLE)				16.76				nu star (bia	as corrected)	13.52				
947			N	/ILE Mean (bia	s corrected)	0.0108									
948				MLE Sd (bia	s corrected)	0.0138			95% Percer	tile of Chisq	uare (2kstar)	4.385			
949											<u> </u>				
950				G	amma ROS	Statistics us	sing Imputed	l Non-Detec	ets						
951			GROS ma	y not be used	when data s	et has > 50%	NDs with m	any tied obs	servations at	multiple DLs					
952		GROS may		d when kstar				-			e.g., <15-20)				
953			F	or such situati	ions, GROS i	method may	yield incorre	ct values of	UCLs and B	ΓVs					
954					his is especi	•	-								
955		For gar	mma distribi	uted detected	data, BTVs a	nd UCLs ma	y be comput	ed using ga	mma distribu	tion on KM e	stimates				
956					Minimum	0.001					Mean	0.0105			
957					Maximum	0.034					Median	0.01			
958					SD	0.01					CV	0.95			
959					k hat (MLE)	1.121			k	star (bias cor	rected MLE)	0.963			
960				The	ta hat (MLE)	0.00939		Theta star (bias corrected MLE)							
961				r	nu hat (MLE)	38.12				nu star (bia	as corrected)	32.73			
962				/ILE Mean (bia	,	0.0105				MLE Sd (bia	s corrected)	0.0107			
963			95% Perce	entile of Chisqu	uare (2kstar)	5.846				90	% Percentile	0.0245			
964				959	% Percentile	0.032				999	% Percentile	0.0494			
965			The	following stat	istics are co	mputed usin	g Gamma R	OS Statistic	s on Impute	d Data	1				
966				Upper Limits	using Wilsor	Hilferty (W	H) and Hawl	kins Wixley	(HW) Method	ds					
967					WH	HW					WH	HW			
968	95% Approx. Gamma UTL with 95% Coverage 0.0519					0.0578		9	5% Approx. (Gamma UPL	0.0341	0.036			
969			95%	Gamma USL	0.0515	0.0574									
970															
971				Es	timates of G	amma Parai	meters using	KM Estima	ates						
972					Mean (KM)	0.00742					SD (KM)	0.0107			
3,2					-	<u> </u>	1								

	A B C D E	F	GHIJK	L										
973	Variance (KM)	1.1522E-4	SE of Mean (KM)	0.00273										
974	k hat (KM)	0.478	k star (KM)	0.433										
975	nu hat (KM)	16.24	nu star (KM)	14.71										
976	theta hat (KM)	0.0155	theta star (KM)	0.0171										
977	80% gamma percentile (KM)	0.0121	90% gamma percentile (KM)	0.0207										
978	95% gamma percentile (KM)	0.03	99% gamma percentile (KM)	0.0533										
979														
980	The following statistics are of	computed us	ing gamma distribution and KM estimates											
981	Upper Limits using Wilson	n Hilferty (W	H) and Hawkins Wixley (HW) Methods											
982	WH	HW	WH	HW										
983	95% Approx. Gamma UTL with 95% Coverage 0.0438	0.0469	95% Approx. Gamma UPL 0.0266	0.0268										
984	95% KM Gamma Percentile 0.0236	0.0234	95% Gamma USL 0.0435	0.0465										
985														
986	Lognormal GC	F Test on D	Detected Observations Only											
987	Shapiro Wilk Test Statistic	0.785	Shapiro Wilk GOF Test											
988	5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level											
989	Lilliefors Test Statistic	0.295	Lilliefors GOF Test											
990	5% Lilliefors Critical Value	0.251	Data Not Lognormal at 5% Significance Level											
991	Data Not I	ognormal a	t 5% Significance Level											
992														
993	Background Lognormal ROS Statistics	s Assuming	Lognormal Distribution Using Imputed Non-Detects											
994	Mean in Original Scale	0.00719	Mean in Log Scale -	-6.199										
995	SD in Original Scale	0.0112	SD in Log Scale	1.709										
996	95% UTL95% Coverage			0.034										
996	95% Bootstrap (%) UTL95% Coverage			0.0437										
	90% Percentile (z)	0.0181	``	0.0338										
998	00% Davisatile (a) 0.400													
1000	· · · · · · · · · · · · · · · · · · ·													
1000	Statistics using KM estimates	on Logged	Data and Assuming Lognormal Distribution											
1001	KM Mean of Logged Data			0.0667										
	KM SD of Logged Data		95% KM UPL (Lognormal)											
1003	95% KM Percentile Lognormal (z)	0.0232	, -	0.0281										
1004														
1005	Background DL/2	Statistics As	ssuming Lognormal Distribution											
1006	Mean in Original Scale			-5.973										
1007	SD in Original Scale		SD in Log Scale	1.452										
1008	95% UTL95% Coverage			0.0346										
1009	90% Percentile (z)			0.0277										
1010	99% Percentile (z)		` 1	0.0925										
1011	. ,		ovided for comparisons and historical reasons.											
1012	DEL IO HOL A MODERNI MONICO MICH.	552 pi	and the companies and motorious reduction											
1013	Nonnarametric	Distribution	Free Background Statistics											
1014			ernible Distribution (0.05)											
1015	Data do Hot I		Complete Stockhouser (0.00)											
1016	Nonnarametric I Inner I imite for P	TVs/no dieti	inction made between detects and nondetects)											
1017	Order of Statistic, r			0.034										
1018	Approx, f used to compute achieved CC			0.582										
1019	Approximate Sample Size needed to achieve specified CC			0.034										
1020	95% USL	0.034		0.0556										
1021	33 // 002	0.004	3070 KWI OHODYSHEV OF L	0.0000										
1022	Note: The use of USL tends to yield a conservat	ive estimate	of BTV, especially when the sample size starts exceeding 20.											
1023	•		he data set represents a background data set free of outliers											
1024			ted from clean unimpacted locations.											
1025														
1026	ine use of USL tends to provide a bala	ice between	false positives and false negatives provided the data											

	Α	В	С	D	E	F	G	Н	I	J	K	L	
1027		rep	resents a b	ackground data	set and w	hen many c	nsite observat	ions need to	be compare	ed with the B	TV.		
1028													
1029	TI												
1030													
1031						Genera	l Statistics						
1032			Total	Number of Obs	ervations	17			Number	of Missing (Observations	0	
1033			Numbe	r of Distinct Obs	ervations	3							
1034				Number o	of Detects	0				Number of	Non-Detects	17	
1035			N	umber of Distino	t Detects	0			Numbe	er of Distinct	Non-Detects	3	
1036				Minimu	ım Detect	N/A		Minimum Non-Detect					
1037				Maximu	ım Detect	N/A		Maximum Non-Detect					
1038				Variance	Detected	N/A				Percent	Non-Detects	100%	
1039				Mean	Detected	N/A				;	SD Detected	N/A	
1040			Mean	of Detected Log	ged Data	N/A			SD	of Detected	Logged Data	N/A	
1041											<u>.</u>		
1042		Warn	ing: All obs	ervations are N	on-Detect	ts (NDs), th	erefore all sta	tistics and e	estimates sh	ould also be	NDs!		
1043		Specific	cally, sampl	e mean, UCLs,	UPLs, an	d other stat	tistics are also	NDs lying	below the la	rgest detecti	ion limit!		
1044	٦	he Project T	eam may d	ecide to use alte	ernative s	ite specific	values to esti	mate enviro	nmental par	ameters (e.ç	J., EPC, BTV).	
1045													
1046				TI	ne data s	et for variat	ole TI was not	processed!					
1047													
1048													

▼File: Untitled1.syz

IMPORT successfully completed.

▼Descriptive Statistics reporting units in ug/L

	CO_BAT_5	SE_ASH_3	SE_ASH_4	SE_ASH_5	SE_ASH_7	LI_ASH_7
95.0% Lower Confidence Limit	8.1418	55.6848	34.8530	80.1236	81.4292	516.7096
95.0% Upper Confidence Limit	13.3515	87 <u>.</u> 0152	65.0898	98.6764	177.7458	565.7904