2021 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond

Kansas City, Kansas Board of Public Utilities

Nearman Creek Power Station

Project No. 88777

01/28/2022

2021 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond

prepared for

Kansas City, Kansas Board of Public Utilities
Nearman Creek Power Station

Kansas City, Kansas

Project No. 88777

01/28/2022

prepared by

Burns & McDonnell
Kansas City, Missouri

TABLE OF CONTENTS

Page No.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
2020 reduced list of Appendix IV parameters	Appendix IV parameters that were detected during the May 2020 sampling event
ASD	*Alternate Source Demonstration for the Arsenic Detection Observed at MW-8A, October 2020*
BA Pond	Bottom Ash Pond
BPU	Kansas City Board of Public Utilities
CCR	Coal Combustion Residuals
CCR Final Rule	*Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule*, dated April 17, 2015, amended July 30, 2018, and on September 28, 2020
Cell 1	Nearman Creek Power Station Bottom Ash Pond
CFR	Code of Federal Regulations
Groundwater Monitoring Program	*Groundwater Monitoring Plan for the Nearman Creek Power Station Bottom Ash Pond*
GWPS	groundwater protection standard
KDHE	Kansas Department of Health and Environment
mg/L	milligrams per liter
NCPS	Nearman Creek Power Station
NTU	Nephelometric Turbidity Unit
ORP	oxidation-reduction potential
Report	Annual Groundwater Monitoring and Corrective Action Report
SAP	*Sampling and Analysis Plan for the Nearman Creek Power Station*
Site	Nearman Creek Power Station
SSI	statistically significant increase
USEPA	United States Environmental Protection Agency

1.0 EXECUTIVE SUMMARY

The Kansas City Board of Public Utilities (BPU) Nearman Creek Power Station (NCPS or Site) Bottom Ash Pond (BA Pond or Cell 1) surface impoundment consisted of a bottom ash pond and a clear water pond, which were historically used for storage of bottom ash and settling of solids, respectively. Conventionally, the bottom ash was removed from the boiler via a sluice water transport system. The fines in the slurry settled out in the Bottom Ash Pond and the water flowed through a submerged pipe into a holding pond (clear-well) for storage and subsequent reuse in this closed-loop system. NCPS's bottom ash system was converted to a dry process in 2018. Bottom ash is now dry force-air conveyed via piping and stored in a bottom ash silo prior to off-site disposal/beneficial reuse. As per the United States Environmental Protection Agency's (USEPA's) *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule*, 40 Code of Federal Regulations (CFR) Part 257 and 261, dated April 17, 2015, and amended on July 30, 2018 and on September 28, 2020 (USEPA, 2015; USEPA, 2018; USEPA, 2020a; and USEPA, 2020b) (CCR Final Rule), BPU is required to submit an Annual Groundwater Monitoring and Corrective Action Report. This document serves as the 2021 Annual Groundwater Monitoring and Corrective Action Report and is the fifth Annual Groundwater Monitoring and Corrective Action Report prepared for the Nearman Creek Power Station BA Pond in accordance with the CCR Final Rule.

In 2021, assessment monitoring was conducted at the BA Pond pursuant to 40 CFR 257.95. Per 40 CFR §257.94(e), BPU initiated the assessment monitoring program in March 2018 in response to the findings that select Appendix III parameters were identified at statistically significant concentrations above background limits that were calculated for the BA Pond. During the October 2020 groundwater sampling event, arsenic was detected at a statistically significant level greater than the groundwater protection standard (GWPS) at downgradient Monitoring Well MW-8A. In response to the October 2020 arsenic detection at MW-8A, and in accordance with 40 CFR §257.95, BPU completed an alternate source demonstration (ASD) to evaluate the MW-8A GWPS exceedance. The results of this ASD are presented in a report titled *Alternate Source Demonstration for the Arsenic Detection Observed at MW-8A, October 2020* (Burns & McDonnell, 2021a) dated March 17, 2021. The results of the ASD assessment identified multiple lines of evidence that suggest the elevated arsenic concentrations observed during the October 2020 event are due to natural variations within the aquifer geochemistry and are not a result of a release of CCR from the BA Pond. Results of groundwater monitoring performed in 2021 meet the requirements for closure by removal. Therefore, neither assessment nor detection monitoring will be conducted at the BA Pond in 2022.

As a voluntary corrective action, BPU initiated a project to remove CCR from within the BA Pond for beneficial reuse in 2018. The last known volume of CCR removed for beneficial use occurred on February 12, 2020, which is also the date on which voluntary impoundment closure activities were initiated. On March 23, 2020, CCR removal activities were considered substantially complete. Over-excavation of the existing impoundment soil liner materials commenced on March 26, 2020. The impoundment liner over-excavation activities were completed on June 23, 2020. The embankment berms of the BA Pond were razed, and soil visually confirmed to be free of ash, was used to regrade the BA Pond in order to generally restore the natural stormwater drainage pattern per the *Bottom Ash Pond CQA Plan* (Burns & McDonnell, 2020a). Groundwater monitoring conducted in May 2021 and October 2021 confirmed that concentrations of constituents listed in 40 CFR 257, Appendix IV did not exceed their respective groundwater protection standards established pursuant to 40 CFR §257.95(h) and closure by removal of CCR activities were complete per 40 CFR §257.102(c). As a result, a certification of closure by removal in accordance with 40 CFR §257.102(h) was prepared and sealed by a Kansas Professional Engineer on December 23, 2021 (Burns & McDonnell, 2021(b).

2.0 INTRODUCTION

This Report was prepared by Burns & McDonnell on behalf of BPU to present groundwater monitoring activities performed under the USEPA's *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule*, 40 Code of Federal Regulations (CFR) Part 257 and 261, dated April 17, 2015 and amended on July 30, 2018 and September 28, 2020 (USEPA, 2015; USEPA, 2018; USEPA, 2020a; and 2020b) at the BA Pond located at BPU's NCPS. This Report has been prepared to provide an account of groundwater monitoring and closure activities performed in 2021 in support of BPU's compliance with the Final Rule. Groundwater monitoring activities were performed in general accordance with the *Groundwater Monitoring Plan for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2016b) (Groundwater Monitoring Program) and the *Sampling and Analysis Plan for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2016c) (SAP) and included the following:

- Statistical evaluation of groundwater data for samples collected from 2015 through 2021.
- Implementation of assessment groundwater monitoring per 40 CFR 257.95.
- Establishing groundwater protection standards (GWPSs) for those Appendix IV parameters detected during the assessment monitoring program being implemented at the BA Pond.
- Certification of closure by removal of CCR.

2.1 Purpose and Scope

This Report has been prepared per 40 CFR 257.90(e) to document the status of the groundwater monitoring and corrective action program at the BA Pond, summarize key actions completed, describe any problems encountered, discuss any actions to resolve the problems, and provide key activities for the upcoming year. This document is the fifth annual Report for the BA Pond.

2.2 Overview

This Report is organized in sections as summarized below:

- **Section 1.0 Executive Summary**
- **Section 2.0 Introduction**
- **Section 3.0 Groundwater Monitoring Activities and Results –** Section 3.0 presents a narrative of the background, detection, and assessment monitoring activities that have been performed during the reporting period. Groundwater monitoring results are also included in this section.

- **Section 4.0 Statistical Analysis –** Section 4.0 discusses statistical analyses of data generated during the reporting period.
- **Section 5.0 Account of Voluntary Corrective Actions Completed** – Section 5.0 discusses remedial activities that took place at the BA Pond as a part of the voluntary corrective action program.
- **Section 6.0 Certifications and Notifications to the Operating Record –** Section 6.0 lists certifications and notifications that were prepared during the reporting period.
- **Section 7.0 Key Activities for the Upcoming Year** – Section 7.0 presents an account of anticipated activities for 2022.
- **Section 8.0 References** – Section 8.0 includes a full bibliography for references made within this report.

Figure 2-1 presents the location of the BA Pond relative to the NCPS. A description of the site setting is presented in Section 3.0 of the Groundwater Monitoring Program.

3.0 GROUNDWATER MONITORING ACTIVITIES AND RESULTS

3.1 Description of the Groundwater Monitoring Program

In 2021, the BA Pond was in assessment monitoring status. Following the October 2021 sampling event, a total of 9 detection monitoring events and 10 assessment monitoring events have been performed at the BA Pond since 2015. These events were reported on in the *2017 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2018a), the *2018 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2019a), the *2019 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2020b), and the *2020 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2021c).

In 2021, two groundwater monitoring events were conducted at the BA Pond as a part of assessment monitoring activities. The following bullets present a summary of the timing of each of the groundwater sampling events, presents the analytes that were sampled, and gives rationale for each sampling event. Sampling was performed in general accordance with the Groundwater Monitoring Program.

- May 2021 – Groundwater samples were collected from all wells presented in Figure 3-1, including: Monitoring Wells MW-2A, MW-3, MW-4, MW-8A, MW-10, MW-13, MW-14, MW-15, and MW-16. Samples were analyzed for the complete list of Appendix III and Appendix IV parameters per the requirements of 40 CFR 257.95(b). The results of this sampling event were statistically evaluated and compared to background concentrations that were developed using the statistical methods included in the September 13, 2018 *Update to Statistical Method for Evaluating Groundwater at Kansas City Board of Public Utilities Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2018b). The results of this evaluation, which are summarized in the September 14, 2021 *Statistical Evaluation of May 2021 Assessment Monitoring Data Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2021d), indicated that none of the parameters listed in Appendix IV of 40 CFR 257.95 were detected at concentrations above their respective GWPSs. The May 2021 statistical analysis is included in Appendix A of this report.
- October 2021 – Monitoring Wells MW-2A, MW-3, MW-4, MW-8A, MW-10, MW-13, MW-14, MW-15, and MW-16 were sampled for the complete list of Appendix III parameters and those Appendix IV parameters detected during the May 2021 event per the requirements of 40 CFR 257.95(b) and 40 CFR 257.95(d)(1), respectively. The results of this sampling event

were statistically evaluated and compared to background concentrations that were developed using the statistical methods included in the September 13, 2018 *Update to Statistical Method for Evaluating Groundwater at Kansas City Board of Public Utilities Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2018b). The results of this statistical evaluation is summarized in the December 22, 2021 *Statistical Evaluation of October 2021 Assessment Monitoring Data Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2021e), which indicated that none of the parameters listed in Appendix IV of 40 CFR 257.95 analyzed during the October 2021 sampling event were detected at concentrations above their respective GWPSs. The October 2021 statistical analysis is included in Appendix A of this report.

3.2 Groundwater Sampling Activities

The depth to groundwater was gauged at each of the wells presented on Figure 3-1 during the May 2021 and October 2021 sampling events using a decontaminated water level meter and recorded in the field logbook, included in Appendix B. The measured depth to groundwater and calculated groundwater elevations for each sampling event of 2021 are presented on Tables 3-1 and 3-2. Measured water levels used to develop the May 2021 and October 2021 piezometric surface contours are presented on Figures 3-2 and 3-3, respectively. Prior to groundwater sample collection, monitoring wells were purged using dedicated pumps and low-flow sampling techniques. Wells were purged until stabilization criteria had been met and turbidity was below 5 Nephelometric Turbidity Units (NTUs). Once groundwater parameters stabilized, the BA Pond monitoring wells were sampled for the parameters presented in Section 3.1 using the analytical methods presented on Table 3-3. Monitoring well sampling forms for each of the groundwater monitoring events are included in Appendix B. Samples were stored and transported in accordance with the SAP included in the Groundwater Monitoring Program and were shipped to Pace Analytical National Center for Testing & Innovation for laboratory analysis. No issues were encountered during the sampling events performed at the BA Pond in 2021. Copies of the 2021 laboratory analytical data packages are included in Appendix C. Laboratory data was validated in accordance with the SAP and all data are considered viable for reporting as qualified. Copies of data validation reports are provided in Appendix C. None of the detected parameters from the May 2021 or October 2021 sampling event exceeded their respective GWPS. A summary of May 2021 and October 2021 sampling results are presented in Table 3-3.

As presented on Figure 3-2 and 3-3, the primary groundwater gradients observed during the May 2021 and October 2021 sampling event are to the north-northwest, toward MW-14. The predominant groundwater flow direction historically observed at the BA Pond is to the northwest toward Monitoring

Well MW-14. However, periodic and temporary reversals in the groundwater flow direction, similar to the gradients observed in May 2020, have been observed (Burns & McDonnell, 2021c). These temporary reversals have been attributed to fluctuating elevation stage of the Missouri River channel.

4.0 STATISTICAL ANALYSIS

In accordance with 40 CFR 257.93(h)(2), statistical analysis of the groundwater water quality data collected from October 2015 through October 2021 was completed on September 14, 2021, and December 22, 2021, within 90 days following laboratory analysis of the samples collected during the May 2021 and October 2021 sampling events, respectively. The results of these assessments were used to update GWPSs. As presented in Appendix A, the following parameters were observed at concentrations above calculated background values in downgradient monitoring wells, but below their respective GWPSs.

May 2021 Sampling Event	October 2021 Sampling Event
Boron (MW-8A and MW-10)	Boron (MW-8A and MW-10)
Molybdenum (MW-8A)	Molybdenum (MW-8A)
Sulfate (MW-8A and MW-14)	Sulfate (MW-8A)
--	Total Dissolved Solids (MW-8A)

In addition to the statistical evaluations presented above, an ASD was completed in 2021 in response to the October 2020 sampling results where arsenic was detected at a concentration slightly above its GWPS. This evaluation was summarized in the March 17, 2021 report titled *Alternate Source Demonstration for the Arsenic Detection Observed at MW-8A, October 2020* (Burns & McDonnell, 2021a). The evaluations included in the ASD provide multiple lines of evidence that the elevated arsenic concentrations observed during the October 2020 event are due to natural variation within the aquifer and are not a result of a release of CCR from the BA Pond.

5.0 ACCOUNT OF VOLUNTARY CORRECTIVE ACTIONS COMPLETED

In 2020, BPU voluntarily initiated closure by removal activities for the BA Pond in accordance with the *Bottom Ash Closure Plan* dated November 2, 2018 (Burns & McDonnell, 2018b) and the KDHE-approved *Bottom Ash Pond CQA Plan* (Burns & McDonnell, 2020a). The following is a discussion of the voluntary closure activities completed during 2020:

The last known volume of CCR removed from the BA Pond for beneficial use occurred on February 12, 2020, which is also the date on which voluntary impoundment closure activities were initiated. On March 23, 2020, CCR removal activities were considered substantially complete. Over-excavation of the existing impoundment soil liner materials commenced on March 26, 2020. The impoundment liner over-excavation activities were completed on June 23, 2020. The embankment berms of the BA Pond were razed and soil, visually confirmed to be free of ash, was used to regrade the BA Pond in order to generally restore the natural stormwater drainage pattern per the *Bottom Ash Pond CQA Plan* (Burns & McDonnell, 2020a). Six additional inches of topsoil were then backfilled and seeded in order to sustain and promote vegetative growth. The addition of the topsoil layer and seeding activities were completed on October 19, 2020.

In March of 2021, BPU voluntarily, and in accordance with 40 CFR 257.95(g)(3), completed an ASD in response to the October 2020 arsenic detection above the GWPS at MW-8A. The results of the ASD provided multiple lines of evidence that suggest the elevated arsenic concentrations observed during the October 2020 event are due to natural variations within the aquifer geochemistry and are not a result of a release of CCR from the BA Pond (Burns & McDonnell 2021a). Arsenic results for MW-8A during the May and October 2021 events were below the GWPS, further supporting the conclusions of the ASD.

The May and October 2021 sampling events provide two sequential sampling events following the removal of CCR from the BA Pond where none of the Appendix IV parameters were observed at concentrations above their respective GWPS. As such, closure by removal was completed in accordance with 40 CFR §257.102(c), and a certification of completion of closure by removal activities was prepared and sealed by a Kansas Professional Engineer following the statistical evaluation of the October 2021 sample results in accordance with 40 CFR §257.102(h). A copy of this certificate is provided in Appendix D.

6.0 CERTIFICATIONS AND NOTIFICATIONS TO THE OPERATING RECORD

The following certifications and notifications were made to the operating record and/or were posted to the BPU's publicly accessible CCR website during the reporting period:

- *Alternate Source Demonstration for the Arsenic Detection Observed at MW-8A, October 2020* (Burns & McDonnell, 2021a)
- *2020 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2021c)
- Documentation of the measurements of the groundwater monitoring wells, as required by 257.91€(1).
- Copies of analytical data reports as required by the CCR groundwater monitoring program.
- GWPSs
- *Statistical Evaluation of May 2021 Assessment Monitoring Data Nearman Creak Power Station Bottom Ash Pond* (Burns & McDonnell, 2021d)
- *Statistical Evaluation of October 2021 Assessment Monitoring Data Nearman Creak Power Station Bottom Ash Pond* (Burns & McDonnell, 2021e)
- *Closure by Removal of Coal Combustion Residuals Certification (Burns & McDonnell, 2021b)*
- *Final Periodic Hazard Potential Classification Assessment* (Burns & McDonnell, 2021f), as required by 40 CFR §257.73(a)(2).
- *Final Periodic Structural Stability Assessment, as required* (Burns & McDonnell, 2021f), by 40 CFR §257.73(d).
- *Final Periodic Safety Factor Assessment* (Burns & McDonnell, 2021f), as required by 40 CFR §257.73(e).
- *Final Periodic Inflow Design Flood Control System Plan* (Burns & McDonnell, 2021g), as required by 40 CFR §257.82.

7.0 KEY ACTIVITIES FOR THE UPCOMING YEAR

No additional activities are planned for 2022 as closure by removal activities were completed in 2021 and post-closure requirements are not applicable, per 40 CFR §257.104(a)(2).

8.0 REFERENCES

Burns & McDonnell, 2016a, *Groundwater Monitoring Plan for the Nearman Creek Power Station Bottom Ash Pond*, March 14.

Burns & McDonnell, 2016b, *Sampling and Analysis Plan for the Nearman Creek Power Station Bottom Ash Pond*, March 14.

Burns & McDonnell, 2018a. *2017 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond.* January 31.

Burns & McDonnell, 2018b. *Bottom Ash Closure Plan.* November 2.

Burns & McDonnell, 2018c. *Update to Statistical Method for Evaluating Groundwater at Kansas City Board of Public Utilities Nearman Creek Power Station Bottom Ash Pond.* September 13.

Burns & McDonnell, 2019a. *2018 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond.* January 31.

Burns & McDonnell, 2020a. *Bottom Ash Pond CQA Plan*. Revised June 5.

Burns & McDonnell, 2020b. *2019 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond.* January 31.

Burns & McDonnell, 2020c. *Notification Regarding Groundwater Protection Standards.* February 10.

Burns & McDonnell, 2020d. *Statistical Evaluation of May 2020 Assessment Monitoring Data*. September 11.

Burns & McDonnell, 2021a. *Alternate Source Demonstration for the Arsenic Detection Observed at MW-8A, October 2020.* March 17.

Burns & McDonnell, 2021b. *Closure by Removal of Coal Combustion Residuals Certification.* December 23.

Burns & McDonnell, 2021c. *2020 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond.* February 5.

Burns & McDonnell, 2021d. *Statistical Evaluation of May 2021 Assessment Monitoring Data Nearman Creak Power Station Bottom Ash Pond.* September 14.

Burns & McDonnell, 2021e. *Statistical Evaluation of October 2021 Assessment Monitoring Data Nearman Creak Power Station Bottom Ash Pond.* December 22.

Burns & McDonnell, 2021f. *Final Periodic Hazard Potential Classification Assessment*. October 12.

Burn & McDonnell, 2021f. *Final Periodic Structural Stability Assessment*. October 12.

Burns & McDonnell, 2021f. *Final Periodic Safety Factor Assessment*. October 12.

Burns & McDonell, 2021g. *Final Periodic Inflow Design Flood Control System Plan*. October 12.

United States Environmental Protection Agency (USEPA), 2015, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, 40 CFR Parts 257 and 261, Federal Register, Vol. 80, No. 74, April 17, http://www.gpo.gov/fdsys/pkg/FR-2015-04-17/pdf/2015-00257.pdf.

USEPA, 2018. *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One).* 40 CFR Part 257, Federal Registrar, Vol. 83, No. 146, July 30. https://www.federalregister.gov/documents/2018/07/30/2018-16262/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric-utilities.

USEPA, 2020a. *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; A Holistic Approach to Closure Part A: Deadline to Initiate Closure.* 40 CFR Part 257, Federal Register, Vol. 85, No. 53516 September 28. https://www.federalregister.gov/documents/2020/08/28/2020-16872/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric

USEPA, 2020b. *Final Rule - A Holistic Approach to Closure Part B: Alternate Liner Demonstration.* 40 CFR Part 257, Federal Register, Vol. 85, No. 219 December 14. Federal Register: Hazardous and Solid Waste Management System: Disposal of CCR; A Holistic Approach to Closure Part B: Alternate Demonstration for Unlined Surface Impoundments

TABLES

Table 3-1
Monitoring Well Gauging Data - May 27, 2021
Kansas City Board of Public Utilities
Nearman Creek Power Station Bottom Ash Pond

Well	Date Measured	Top of Casing Elevation (ft MSL)[1]	Total Depth Constructed (ft bTOC)	Measured Total Depth (ft bTOC)	Measured Water Level (ft bTOC)	Elevation of Water Level (ft MSL)
MW-2A	5/27/2021	747.86	31.68	31.52	21.95	725.91
MW-3	5/27/2021	750.44	34.70	34.35	24.53	725.91
MW-4	5/27/2021	746.90	31.75	31.71	21.25	725.65
MW-8A	5/27/2021	750.10	35.17	35.10	24.92	725.18
MW-10	5/27/2021	745.25	29.50	29.42	19.68	725.57
MW-13	5/27/2021	747.81	33.48	NM	19.78	728.03
MW-14	5/27/2021	749.18	33.27	NM	26.31	722.87
MW-15	5/27/2021	752.88	32.70	NM	23.51	729.37
MW-16	5/27/2021	748.43	32.59	NM	22.28	726.15

Notes:

[1] - Elevations as presented by Atlas Surveyors on *Survey of Monitoring Wells* dated December 4, 2018.

ft - feet

ft bTOC - feet below top of casing

ft MSL - feet above mean sea level

NM - not measured during the May 27, 2021 monitoring event

Table 3-2
Monitoring Well Gauging Data - October 4, 2021
Kansas City Board of Public Utilities
Nearman Creek Power Station Bottom Ash Pond

Well	Date Measured	Top of Casing Elevation (ft MSL)[1]	Total Depth Constructed (ft bTOC)	Measured Total Depth (ft bTOC)	Measured Water Level (ft bTOC)	Elevation of Water Level (ft MSL)
MW-2A	10/4/2021	747.86	31.68	NM	23.36	724.50
MW-3	10/4/2021	750.44	34.70	NM	25.61	724.83
MW-4	10/4/2021	746.90	31.75	NM	22.16	724.74
MW-8A	10/4/2021	750.10	35.17	NM	26.68	723.42
MW-10	10/4/2021	745.25	29.50	NM	21.38	723.87
MW-13	10/4/2021	747.81	33.48	NM	21.40	726.41
MW-14	10/4/2021	749.18	33.27	NM	29.25	719.93
MW-15	10/4/2021	752.88	32.70	NM	26.05	726.83
MW-16	10/4/2021	748.43	32.59	NM	22.76	725.67

Notes:

[1] - Elevations as presented by Atlas Surveyors on *Survey of Monitoring Wells* dated December 4, 2018.

ft - feet

ft bTOC - feet below top of casing

ft MSL - feet above mean sea level

NM - not measured during the October 4, 2021 monitoring event

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3
					Sample Date	10/29/2015	1/27/2016	4/27/2016	7/25/2016	10/25/2016	1/24/2017	4/24/2017	7/25/2017	9/14/2017
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**									
Appendix III - Detection Monitoring														
6010B	Boron	mg/L	0.272	--	--	0.218	0.219	0.244	0.272	0.24	0.208	0.2 U	0.218	0.226
6010B	Calcium	mg/L	246	--	--	194	199	201	235	218	212	191	218	195
9056MOD	Chloride	mg/L	32.67	--	--	4.45	4.65	4.64	4.37	5.23	5.88	7.83	6.69	5.63
9056MOD	Fluoride	mg/L	0.5844	--	--	0.158	0.125	0.139	0.1 U	0.138	0.176	0.136	0.141	0.157
9040C	pH	su	8.29	--	--	6.83 J	6.93 J	6.82 J	6.75 J	8.29 J	6.56 J	6.85 J	6.78 J	6.79 J
In Situ	pH	su	8.67	--	--	6.93	6.7	6.33	6.87	6.74	6.75	6.68	6.63	6.6
9056MOD	Sulfate	mg/L	213.5	--	--	109	114	121	117	121	130	115	143	106
2540 C-2011	Total Dissolved Solids	mg/L	975.4	--	--	717	749	771	845	697	831	715	827	733
Appendix IV - Assessment Monitoring														
6010B/6020	Antimony	mg/L	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/L	0.035	0.035	0.035	0.0021	0.00269	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/L	0.326	2	--	0.151	0.152	0.154	0.197	0.173	0.165	0.145	0.159	0.177
6010B	Beryllium	mg/L	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/L	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/L	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/L	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/L	0.584	4	--	0.158	0.125	0.139	0.1 U	0.138	0.176	0.136	0.141	0.157
6010B/6020	Lead	mg/L	--	--	--	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/L	0.0699	0.0699	--	0.0441	0.0525	0.0528	0.0536	0.0551	0.0542	0.0548	0.0461	0.0486
7470A	Mercury	mg/L	--	--	--	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/L	0.005	0.100	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/L	0.0562	0.0562	--	0.01 U	0.00576	0.00406	0.0196	0.00685	0.002 U	0.002 U	0.00411	0.00568
6010B/6020	Thallium	mg/L	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--	0.637	1.63	2.09	0.630 J	1.06	4.26	1.27 J	NS	1.27 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3
					Sample Date	3/8/2018	6/4/2018	10/2/2018	11/20/2018	7/1/2019	11/26/2019	5/27/2020	10/19/2020	5/28/2021	10/05/2021
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**										
Appendix III - Detection Monitoring															
6010B	Boron	mg/l	0.272	--	--	NS	0.212	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--	NS	215	207	NS	136	181	153	198	170	164
9056MOD	Chloride	mg/l	32.67	--	--	NS	5.74	7.13	NS	7.37	7.35	9.33	6.91	6.8	7.31
9056MOD	Fluoride	mg/l	0.5844	--	--	NS	0.173 J+	0.186	NS	0.218	0.180	0.191	0.178	0.220	0.21
9040C	pH	su	8.29	--	--	NS	6.94 J	6.83 J	NS	7.23 J	6.84 J	7.09 J	6.97 J	7.1	7.22 J
In Situ	pH	su	8.67	--	--	6.45	7.18	6.66	6.6	6.74	6.74	6.3	6.65	6.41	6.41
9056MOD	Sulfate	mg/l	213.5	--	--	NS	137	136	NS	66.9	93.4	106	117	117	104
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--	NS	788	747	NS	506	638	609	737	621	655
Appendix IV - Assessment Monitoring															
6010B/6020	Antimony	mg/l	--	--	--	0.002 U	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	0.004 U	NS
6020	Arsenic	mg/l	0.035	0.035	0.035	0.00219	0.002 U	0.0021	0.002 U	0.00216	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/l	0.326	2	--	0.164	0.159	0.163	NS	0.162	0.183	0.151	0.17	0.134	0.134
6010B	Beryllium	mg/l	--	--	--	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS
6010B	Cadmium	mg/l	--	--	--	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS
6010B	Chromium	mg/l	--	--	--	0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS
6010B	Cobalt	mg/l	--	--	--	0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS
9056MOD	Fluoride	mg/l	0.584	4	--	0.134	0.173 J+	0.186	NS	0.218	0.18	0.191	0.178	0.22	0.21
6010B/6020	Lead	mg/l	--	--	--	0.002 U	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U	0.002 U	NS
6010B	Lithium	mg/l	0.0699	0.0699	--	0.0608	0.0606	0.0481	NS	0.0239	0.0462	0.0421	0.0521	0.038	0.0463
7470A	Mercury	mg/l	--	--	--	0.0002 U	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U	0.0002 U	NS
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.01 U	NS	NS	NS	0.002 U	0.01 U	0.002 U	0.00224	0.00207 B	0.002 U
6010B/6020	Thallium	mg/l	--	--	--	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--	1.06	1.62	0.555 J	NS	2.07	1.01	1.19	0.118	0.442 J	1.67 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4
					Sample Date	10/30/2015	1/27/2016	4/27/2016	7/25/2016	10/25/2016	1/24/2017	4/24/2017	7/26/2017	9/14/2017
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**									
Appendix III - Detection Monitoring														
6010B	Boron	mg/l	0.272	--	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--	200	191	206	181 V	186	207	224	193	186
9056MOD	Chloride	mg/l	32.67	--	--	9.72	8.98	13.4	3.9	6.27	11.2	12.4	6.6	4.92
9056MOD	Fluoride	mg/l	0.5844	--	--	0.112	0.12	0.108	0.104	0.131	0.172	0.119	0.135	0.148 J-
9040C	pH	su	8.29	--	--	6.92 J	7.02 J	6.84 J	6.87 J	7.30 J	6.87 J	6.86 J	6.71 J	6.88 J
In Situ	pH	su	8.67	--	--	6.8	6.7	6.11	6.81	6.86	6.81	6.69	6.79	6.7
9056MOD	Sulfate	mg/l	213.5	--	--	116	109	128	74.5	96.2	148	148	117	100
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--	780	736	755	683	837	774	840	736	732
Appendix IV - Assessment Monitoring														
6010B/6020	Antimony	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/l	0.326	2	--	0.16	0.148	0.152	0.141	0.149	0.173	0.151	0.14	0.146
6010B	Beryllium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.584	4	--	0.112	0.12	0.108	0.104	0.131	0.172	0.119	0.135	0.148 J-
6010B/6020	Lead	mg/l	--	--	--	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0699	0.0699	--	0.0372	0.0439	0.0418	0.0425	0.0464	0.0411	0.0442	0.0353	0.0428
7470A	Mercury	mg/l	--	--	--	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.0423	0.0562	0.00642	0.0315	0.0383	0.0155	0.002 U	0.022	0.0186
6010B/6020	Thallium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--	0.266	1.16	0.46	0.700 J	0.756	0.18 U*	0.191	NS	0.191 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	DUP-1
						Sample Date	3/8/2018	6/4/2018	10/2/2018	11/20/2018	7/2/2019	11/26/2019	5/27/2020	10/19/2020	5/29/2021	10/05/2021	10/05/2021
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**											*Duplicate Pair*	
Appendix III - Detection Monitoring																	
6010B	Boron	mg/l	0.272	--	--		NS	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--		NS	214 O1 V	176	NS	89.9	128	125	122	131	132	133
9056MOD	Chloride	mg/l	32.67	--	--		NS	3.59	1.95	NS	8.22	6.94	7.45	9.94	12.3	12.4	12.3
9056MOD	Fluoride	mg/l	0.5844	--	--		NS	0.156 J+	0.177	NS	0.314	0.235	0.15 U	0.175	0.211	0.194	0.194
9040C	pH	su	8.29	--	--		NS	6.93 J	6.91 J	NS	7.56 J	7.10 J	7.41 J	7.23 J	6.92	7.51 J	7.56 J
In Situ	pH	su	8.67	--	--		6.68	6.94	6.80	6.7	7.29	6.9	6.35	6.85	6.21	6.21	6.21
9056MOD	Sulfate	mg/l	213.5	--	--		NS	116	87	NS	64.1	59.7	36.3	66.5	71.4	88	87.6
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--		NS	741	619	NS	358	481	488	478	483	539	541
Appendix IV - Assessment Monitoring																	
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	0.004 U	NS	NS
6020	Arsenic	mg/l	0.035	0.035	0.035		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/l	0.326	2	--		0.135	0.134	0.121	NS	0.112	0.134	0.14	0.118	0.0883	0.104	0.105
6010B	Beryllium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS
6010B	Cadmium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS
6010B	Chromium	mg/l	--	--	--		0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS	NS
6010B	Cobalt	mg/l	--	--	--		0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS	NS
9056MOD	Fluoride	mg/l	0.584	4	--		0.132	0.156 J+	0.177	NS	0.314	0.235	0.15 U	0.175	0.211	0.194	0.194
6010B/6020	Lead	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U	0.002 U	NS	NS
6010B	Lithium	mg/l	0.0699	0.0699	--		0.0458	0.051	0.0304	NS	0.0177	0.0265	0.0281	0.034	0.025	0.0337	0.032
7470A	Mercury	mg/l	--	--	--		0.0002 U	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U	0.0002 U	NS	NS
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.01 U	NS	NS	NS	0.002 U	0.01 U	0.00289	0.00252	0.002 U	0.00532	0.00519
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--		0.168	0.876	0.186 J	NS	1.66 J	0.115	0.0763	2.34	0.271 U	0.359 U	0.511 U

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-2A	MW-2A	DUP-1	MW-2A	MW-2A	MW-2A	MW-2A	MW-2A	DUP-2	MW-2A	DUP-1
					Sample Date	10/29/2015	1/27/2016	1/27/2016	4/27/2016	7/25/2016	10/25/2016	1/23/2017	4/24/2017	4/24/2017	7/25/2017	7/25/2017
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**		*Duplicate Pair*						*Duplicate Pair*		*Duplicate Pair*	
Appendix III - Detection Monitoring																
6010B	Boron	mg/l	0.272	--	--	0.2 U	0.2 U	0.221	0.353	0.261	0.2 U	0.495	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--	223	208	206	200 V	231	163	193	128	130	138	140
9056MOD	Chloride	mg/l	32.67	--	--	7.54	5.81	5.92	6.47	6.64	9.7	14.9	9.83	9.88	9.67	9.67
9056MOD	Fluoride	mg/l	0.5844	--	--	0.129	0.159	0.154	0.158	0.114	0.13	0.187	0.181	0.191	0.189	0.192
9040C	pH	su	8.29	--	--	6.86 J	6.91 J	6.93 J	6.85 J	6.69 J	7.00 J	6.84 J	7.0 J	7.02 J	6.94 J	7.01 J
In Situ	pH	su	8.67	--	--	6.96	6.8	6.8	6.26	6.63	6.86	6.75	6.85	6.85	6.84	6.84
9056MOD	Sulfate	mg/l	213.5	--	--	227	180	182	153	196	127	153	81.6	82.5	74.6	74.7
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--	852	811	783	848	865	616	734	508	478	512	506
Appendix IV - Assessment Monitoring																
6010B/6020	Antimony	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.00361	0.00468	0.00465	0.00416	0.00492	0.00499	0.00541	0.00381	0.00326	0.00578	0.00553
6010B	Barium	mg/l	0.326	2	--	0.127	0.125	0.126	0.12	0.135	0.102	0.129	0.0796	0.0796	0.111	0.111
6010B	Beryllium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--	0.0112	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.584	4	--	0.129	0.159	0.154	0.158	0.114	0.13	0.187	0.181	0.191	0.189	0.192
6010B/6020	Lead	mg/l	--	--	--	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0699	0.0699	--	0.0357	0.0395	0.04	0.0442	0.0457	0.0351	0.0334	0.0305	0.0305	0.0206	0.0221
7470A	Mercury	mg/l	--	--	--	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--	0.763	2.45	1.21	1.33	1.68	0.72	1.7	0.214 J	0.597 J	NS	NS

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-2A	DUP-1	MW-2A	MW-2A	MW-2A	MW-2A	MW-2A	DUP-1	MW-2A	DUP-1
						Sample Date	9/14/2017	9/14/2017	3/8/2018	6/4/2018	10/1 & 10/3/2018	11/20/2018	7/1/2019	7/1/2019	11/26/2019	11/26/2019
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**		*Duplicate Pair*						*Duplicate Pair*		*Duplicate Pair*	
Appendix III - Detection Monitoring																
6010B	Boron	mg/l	0.272	--	--		0.2 U	0.2 U	NS	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--		155	155	NS	156	163	NS	127 V	127	122	123
9056MOD	Chloride	mg/l	32.67	--	--		6.26	6.33	NS	4.34	5.12	NS	8.82	8.96	14.0	13.9
9056MOD	Fluoride	mg/l	0.5844	--	--		0.186	0.181	NS	0.274 J+	0.208	NS	0.23	0.229	0.274	0.271
9040C	pH	su	8.29	--	--		6.91 J	6.99 J	NS	7.05 J	6.96 J	NS	8.23 J	7.47 J	7.23 J	7.23 J
In Situ	pH	su	8.67	--	--		6.8	6.8	6.39	6.81	6.80	6.7	6.85	6.85	7.01	7.01
9056MOD	Sulfate	mg/l	213.5	--	--		89	89.6	NS	53.8	68.5	NS	86.3	87.2	108	109
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--		571	568	NS	537	580	NS	462	462	471	436
Appendix IV - Assessment Monitoring																
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.00487	0.00487	0.00428	0.002 U	0.00359	0.00324	0.002 U	0.002 U	0.00248	0.00246
6010B	Barium	mg/l	0.326	2	--		0.116	0.115	0.184	0.147	0.157	NS	0.11	0.107	0.116	0.115
6010B	Beryllium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS
6010B	Cadmium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS
6010B	Chromium	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS	NS
6010B	Cobalt	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS	NS
9056MOD	Fluoride	mg/l	0.584	4	--		0.186	0.181	0.166	0.274 J+	0.208	NS	0.23	0.229	0.274	0.271
6010B/6020	Lead	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS
6010B	Lithium	mg/l	0.0699	0.0699	--		0.0294	0.0298	0.0372	0.0352	0.027	NS	0.0204	0.0202	0.0205	0.0223
7470A	Mercury	mg/l	--	--	--		0.0002 U	0.0002 U	0.0002 U	NS	NS	NS	0.0002 U	0.0002 U	NS	NS
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.002 U	0.002 U	0.01 U	NS	NS	NS	0.002 U	0.002 U	0.01 U	0.01 U
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--		1.31 J	1.10 J	0.864	1.64	1.25 J	NS	0.318 J	0.396 J	0.696	0.519

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-2A	MW-2A	MW-2A	MW-2A	MW-8A	DUP-1A	MW-8A	MW-8A	DUP-2	MW-8A	MW-8A
					Sample Date	5/27/2020	10/19/2020	5/28/2021	10/05/2021	10/29/2015	10/29/2015	1/27/2016	4/28/2016	4/28/2016	7/25/2016	10/25/2016
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**					*Duplicate Pair*			*Duplicate Pair*			
Appendix III - Detection Monitoring																
6010B	Boron	mg/l	0.272	--	--	0.2 U	0.221	0.2 U	0.2 U	2.37	2.38	2.48	2.61	2.67	2.66	2.29
6010B	Calcium	mg/l	246	--	--	137	168 V	144	162	186	185	168	186	182	204	156
9056MOD	Chloride	mg/l	32.67	--	--	14	12.7	12.7	10.7	26.5	30.3	30.4	30.2	30.1	29.3	30.3
9056MOD	Fluoride	mg/l	0.5844	--	--	0.278	0.234	0.258	0.242	0.54	0.318	0.267	0.339	0.339	0.292	0.355
9040C	pH	su	8.29	--	--	7.73 J	7.14 J	7.13	7.47 J	6.94 J	6.97 J	7.04 J	6.93 J	6.88 J	6.78 J	7.97 J
In Situ	pH	su	8.67	--	--	6.38	6.79	6.44	6.44	6.94	6.94	6.9	6.75	6.75	6.56	6.92
9056MOD	Sulfate	mg/l	213.5	--	--	110	113	72.7	81.6	491	598	471	520	522	453	412
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--	545	622	512	614	1180	1130	1060	1170	1170	1190	1040
Appendix IV - Assessment Monitoring																
6010B/6020	Antimony	mg/l	--	--	--	0.004 U	0.004 U	0.004 U	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.0042	0.00289	0.002 U	0.00312	0.012	0.0132	0.0127	0.0308	0.0299	0.0122	0.0134
6010B	Barium	mg/l	0.326	2	--	0.143	0.171	0.13	0.161	0.073	0.0738	0.0635	0.0937	0.0924	0.0624	0.0473
6010B	Beryllium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.584	4	--	0.278	0.234	0.258	0.242	0.54	0.318	0.267	0.339	0.339	0.292	0.355
6010B/6020	Lead	mg/l	--	--	--	0.005 U	0.005 U	0.002 U	NS	0.005 U	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0699	0.0699	--	0.0172	0.0302	0.0222	0.0365	0.0243	0.0242	0.0309	0.0298	0.0298	0.0368	0.0316
7470A	Mercury	mg/l	--	--	--	0.0002	0.0002 U	0.0002 U	NS	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.00584	0.00591	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.002 U	0.002 U	0.002 U	0.002 U	0.01 U	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--	1.06	0.727	0.583 J	1.82 J	0.36	0.298	1.44	0.673	0.127	1.45	1.11

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A	DUP-1	MW-8A	DUP-1	MW-8A	MW-8A	MW-8A
						Sample Date	1/23/2017	4/24/2017	7/25/2017	9/14/2017	3/8/2018	3/8/2018	6/4/2018	6/4/2018	10/1 & 10/3/2018	11/20/2018	7/1/2019
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**						*Duplicate Pair*		*Duplicate Pair*				
Appendix III - Detection Monitoring																	
6010B	Boron	mg/l	0.272	--	--		2.38	2.26	2.4	2.27	NS	NS	2.44	2.47	2.31	NS	1.06
6010B	Calcium	mg/l	246	--	--		146	126	161	153	NS	NS	129	129	122	NS	105
9056MOD	Chloride	mg/l	32.67	--	--		26.9	29.6	28.9	28.4	NS	NS	25.7	25.5	26.2	NS	21.0
9056MOD	Fluoride	mg/l	0.5844	--	--		0.413	0.37	0.325	0.268	NS	NS	0.453 J+	0.441 J+	0.394	NS	0.251
9040C	pH	su	8.29	--	--		6.72 J	6.91 J	6.88 J	6.89 J	NS	NS	6.97 J	6.98 J	6.95 J	NS	7.25 J
In Situ	pH	su	8.67	--	--		6.88	6.86	6.73	6.74	6.91	6.91	6.86	6.86	6.86	6.6	7.14
9056MOD	Sulfate	mg/l	213.5	--	--		386	383	477	380	NS	NS	353	360	419	NS	223
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--		935	880	1020	1000	NS	NS	853	881	920	NS	636
Appendix IV - Assessment Monitoring																	
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	NS	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.0156	0.0232	0.0145	0.0144	0.0206	0.021	0.0204	0.0195	0.0278	0.0183	0.0128
6010B	Barium	mg/l	0.326	2	--		0.0524	0.0565	0.0539	0.0541	0.0657	0.065	0.0559	0.0548	0.0602	NS	0.201
6010B	Beryllium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	NS	0.002 U
6010B	Cadmium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	NS	0.002 U
6010B	Chromium	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	NS	NS	0.01 U
6010B	Cobalt	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	NS	NS	0.01 U
9056MOD	Fluoride	mg/l	0.584	4	--		0.413	0.37	0.325	0.268	0.348	0.347	0.453 J+	0.441 J+	0.394	NS	0.251
6010B/6020	Lead	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	NS	0.002 U
6010B	Lithium	mg/l	0.0699	0.0699	--		0.0268	0.0275	0.0201	0.0269	0.029	0.0281	0.0262	0.031	0.0174	NS	0.0277
7470A	Mercury	mg/l	--	--	--		0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	NS	NS	NS	NS	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--		0.00623	0.00685	0.00569	0.005 U	0.00833	0.00816	0.00865	0.00876	0.00967	NS	0.00524
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.002 U	0.002 U	0.002 U	0.002 U	0.01 U	0.01 U	NS	NS	NS	NS	0.002 U
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	NS	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--		0.536	1.07 J	NS	0.980 J	0.628	0.308	1.61	1.54	0.589 J	NS	0.107 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A	DUP-1	MW-8A	MW-10	MW-10	MW-10	DUP-1
					Sample Date	11/26/2019	5/27/2020	10/19/2020	12/8/2020	5/28/2021	5/28/2021	10/06/2021	10/29/2015	1/27/2016	4/27/2016	4/27/2016
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**					*Duplicate Pair*					*Duplicate Pair*	
Appendix III - Detection Monitoring																
6010B	Boron	mg/l	0.272	--	--	2.09 O1	2.24	2.66	NS	2.51	2.52	2.39	1.08	0.907	1.35	1.35
6010B	Calcium	mg/l	246	--	--	115 O1	99.8	160	NS	151	152	156	217	213	179	178
9056MOD	Chloride	mg/l	32.67	--	--	27.0	27.2	23.9	NS	24.7	24.7	25.5	30.2	17	21.9	21.8
9056MOD	Fluoride	mg/l	0.5844	--	--	0.329	0.428	0.357	NS	0.376	0.379	0.356	0.327	0.104	0.125	0.105
9040C	pH	su	8.29	--	--	7.11 J	7.64 J	7.17 J	NS	7.26	7.13	7.42 J	6.82 J	6.89 J	6.92 J	6.96 J
In Situ	pH	su	8.67	--	--	7.07	6.62	6.9	NS	6.47	6.47	6.47	7.03	7.1	6.5	6.5
9056MOD	Sulfate	mg/l	213.5	--	--	324	285	353	NS	378	381	395	623	227	220	226
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--	787	689	953	NS	942	944	998	1130	916	797	820
Appendix IV - Assessment Monitoring																
6010B/6020	Antimony	mg/l	--	--	--	0.002 U	0.004 U	0.004 U	NS	0.004 U	0.004 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.0266	0.0197	**0.0373**	**0.0354**	0.0241	0.025	0.0256	0.00743	0.00489	0.0135	0.0115
6010B	Barium	mg/l	0.326	2	--	0.176 O1	0.147	0.194	NS	0.174	0.175	0.17	0.183	0.106	0.0871	0.0857
6010B	Beryllium	mg/l	--	--	--	NS	0.002 U	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--	NS	0.002 U	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--	NS	0.01 U	0.01 U	NS	0.01 U	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--	NS	0.01 U	0.01 U	NS	0.01 U	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.584	4	--	0.329	0.428	0.357	NS	0.376	0.379	0.356	0.327	0.104	0.125	0.105
6010B/6020	Lead	mg/l	--	--	--	NS	0.005 U	0.005 U	NS	0.002 U	0.002 U	NS	0.005 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0699	0.0699	--	0.0188	0.0195	0.0281	NS	0.0201	0.0204	0.0431	0.0501	0.0571	0.045	0.0446
7470A	Mercury	mg/l	--	--	--	NS	0.0002	0.0002 U	NS	0.0002 U	0.0002 U	NS	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--	0.00953	0.0111	0.0105	NS	0.00861	0.00771	0.00643 J+	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.01 U	0.002 U	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.01 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--	NS	0.002 U	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--	0.491	0.0386	0.919	NS	0.413 J	0.567 J	1.36 J	0.442	2.32	1.77	1.16

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-10	DUP-1	MW-10	DUP-1	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10
					Sample Date	7/25/2016	7/25/2016	10/26/2016	10/26/2016	1/23/2017	4/24/2017	7/25/2017	9/14/2017	3/8/2018	6/4/2018
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**			*Duplicate Pair*							
Appendix III - Detection Monitoring															
6010B	Boron	mg/l	0.272	--	--	1.05	1.04	1.04	0.2 U	1.29	1.24	1.29	1.19	NS	1.5
6010B	Calcium	mg/l	246	--	--	218	217	217	221	191	157	193	195	NS	168
9056MOD	Chloride	mg/l	32.67	--	--	20.4	20.4	18	46.3	23.2	21.6	26	22.6	NS	19.6
9056MOD	Fluoride	mg/l	0.5844	--	--	0.125	0.1 U	0.111	0.101	0.183	0.161	0.143	0.144	NS	0.235 J+
9040C	pH	su	8.29	--	--	6.73 J	6.78 J	7.02 J	7.46 J	6.86 J	7.01 J	6.88 J	6.82 J	NS	6.94 J
In Situ	pH	su	8.67	--	--	6.66	6.66	6.7	6.7	6.78	6.87	6.7	6.64	6.41	6.61
9056MOD	Sulfate	mg/l	213.5	--	--	223	217	228	75	238	193	280	258	NS	214
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--	905	903	911	739	845	709	852	880	NS	748
Appendix IV - Assessment Monitoring															
6010B/6020	Antimony	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS
6020	Arsenic	mg/l	0.035	0.035	0.035	0.00519	0.00536	0.00351	0.00365	0.0107	0.0143	0.00612	0.00635	0.0158	0.0126
6010B	Barium	mg/l	0.326	2	--	0.0875	0.0875	0.0825	0.082	0.0897	0.088	0.0748	0.0705	0.0993	0.107
6010B	Beryllium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS
6010B	Cadmium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS
6010B	Chromium	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS
6010B	Cobalt	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS
9056MOD	Fluoride	mg/l	0.584	4	--	0.125	0.1 U	0.111	0.11	0.183	0.161	0.143	0.144	0.164	0.235 J+
6010B/6020	Lead	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS
6010B	Lithium	mg/l	0.0699	0.0699	--	0.0549	0.0545	0.0578	0.0571	0.0494	0.0399	0.0376	0.0495	0.0418	0.0445
7470A	Mercury	mg/l	--	--	--	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	NS
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.01 U	NS
6010B/6020	Thallium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--	0.550 J	0.520 J	0.877 J	0.603 J	0.253	0.848 J	NS	1.10 J	0.102	1.18

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-10	DUP-1	MW-10	DUP	MW-10	MW-10	MW-10	DUP-1	MW-10	DUP-1
						Sample Date	10/1 & 10/3/2018	10/1 &10/3/2018	11/20/2018	11/20/2018	7/1/2019	11/26/2019	5/27/2020	5/27/2020	10/19/2020	10/19/20
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**		*Duplicate Pair*						*Duplicate Pair*		*Duplicate Pair*	
Appendix III - Detection Monitoring																
6010B	Boron	mg/l	0.272	--	--		1.22	1.23	NS	NS	0.2 U	1.36	1.17	1.14	1.22	1.2
6010B	Calcium	mg/l	246	--	--		179	179	NS	NS	101	198	173	173	168	170
9056MOD	Chloride	mg/l	32.67	--	--		18.6	18.7	NS	NS	11.3	16.3	9.86	9.87	12.2	12.1
9056MOD	Fluoride	mg/l	0.5844	--	--		0.219	0.217	NS	NS	0.26	0.146	0.162	0.162	0.167	0.168
9040C	pH	su	8.29	--	--		6.98 J	6.96 J	NS	NS	7.47 J	6.91 J	6.99 J	7.06 J	7.42 J	7.50 J
In Situ	pH	su	8.67	--	--		6.80	6.80	6.6	6.6	7.2	6.74	6.25	6.25	6.7	6.7
9056MOD	Sulfate	mg/l	213.5	--	--		234	232	NS	NS	104	180	138	138	143	144
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--		822	808	NS	NS	441	832	761	751	752	736
Appendix IV - Assessment Monitoring																
6010B/6020	Antimony	mg/l	--	--	--		NS	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.0245	0.0241	0.00789	0.00821	0.00228	0.002 U	0.002 U	0.002 U	0.00461	0.00475
6010B	Barium	mg/l	0.326	2	--		0.129	0.128	NS	NS	0.0725	0.138	0.129	0.128	0.116	0.116
6010B	Beryllium	mg/l	--	--	--		NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--		NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--		NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--		NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.584	4	--		0.219	0.217	NS	NS	0.26	0.146	0.162	0.162	0.167	0.168
6010B/6020	Lead	mg/l	--	--	--		NS	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0699	0.0699	--		0.0281	0.0286	NS	NS	0.0165	0.0483	0.04	0.0367	0.0446	0.0412
7470A	Mercury	mg/l	--	--	--		NS	NS	NS	NS	0.0002 U	NS	0.0002	0.0002	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	NS	NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		NS	NS	NS	NS	0.00922	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--		NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--		0.35 J	0.35	NS	NS	0.414	2.06	0.213	0.808	1.26	0.888

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-10	MW-10	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-14
						Sample Date	05/28/2021	10/05/2021	10/1/2018	11/19/2018	7/2/2019	11/26/2019	5/28/2020	10/19/2020	5/28/2021	10/04/2021	10/1/2018
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**												
Appendix III - Detection Monitoring																	
6010B	Boron	mg/l	0.272	--	--		0.89	1.1	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--		175	168	95	NS	90.9	115	125	181	114	114	200
9056MOD	Chloride	mg/l	32.67	--	--		10.6	12.3	19.5	NS	22.1	21.3	20.2	20.6	16.7	18.6	21.5
9056MOD	Fluoride	mg/l	0.5844	--	--		0.197	0.151	0.38	NS	0.317	0.405	0.375	0.294	0.305	0.318	0.208
9040C	pH	su	8.29	--	--		7.19	7.36 J	7.1 J	NS	7.08 J	7.08 J	7.40 J	6.94	7.18	7.35 J	6.7 J
In Situ	pH	su	8.67	--	--		6.36	6.36	8.67	6.979	6.79	7.01	6.45	6.77	6.31	6.31	6.7
9056MOD	Sulfate	mg/l	213.5	--	--		128	155	155	NS	154	165	146	92.4	143	165	221
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--		707	748	542	NS	520	580	637 J4	704	542	564	839
Appendix IV - Assessment Monitoring																	
6010B/6020	Antimony	mg/l	--	--	--		0.004 U	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	0.004 U	NS	NS
6020	Arsenic	mg/l	0.035	0.035	0.035		0.00763	0.00321	0.0252	0.024	0.00957	0.0201	0.024	0.0303	0.0195	0.0227	0.002 U
6010B	Barium	mg/l	0.326	2	--		0.121	0.105	0.205	NS	0.235	0.251	0.285	0.354	0.235	0.237	0.0765
6010B	Beryllium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS
6010B	Cadmium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS
6010B	Chromium	mg/l	--	--	--		0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS	NS
6010B	Cobalt	mg/l	--	--	--		0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS	NS
9056MOD	Fluoride	mg/l	0.584	4	--		0.197	0.151	0.38	NS	0.317	0.405	0.375	0.294	0.305	0.318	0.208
6010B/6020	Lead	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U	0.002 U	NS	NS
6010B	Lithium	mg/l	0.0699	0.0699	--		0.0365	0.045	0.0296	NS	0.0314	0.0358	0.0336	0.0356	0.0314	0.0287	0.0297
7470A	Mercury	mg/l	--	--	--		0.0002 U	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U	0.0002 U	NS	NS
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.002 U	0.00467	NS	NS	0.002 U	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U	NS
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--		0.705 J	1.36 J	0.765 J	NS	1.18 J	0.546	0.776	3.19	0.618 J	2.77	0.138 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15
						Sample Date	11/19/2018	7/2/2019	11/26/2019	5/27/2020	10/19/2020	5/28/2021	10/06/2021	10/1/2018	11/19/2018	7/1/2019	11/26/2019
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**												
Appendix III - Detection Monitoring																	
6010B	Boron	mg/l	0.272	--	--		NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--		NS	114	130	200	218	245	212	78.3	NS	88	71.4
9056MOD	Chloride	mg/l	32.67	--	--		NS	10.5	12.9	22.1	16	16.7	15.9	16.4	NS	17.4	13.9
9056MOD	Fluoride	mg/l	0.5844	--	--		NS	0.231	0.265	0.22	0.199	0.186	0.178	0.462	NS	0.282	0.486
9040C	pH	su	8.29	--	--		NS	7.21 J	7.11 J	7.12 J	6.83 J	6.84	7.29 J	7.45 J	NS	7.71 J	7.45 J
In Situ	pH	su	8.67	--	--		6.804	6.93	6.94	6.49	6.59	6.19	6.19	6.9	6.878	7.55	7.34
9056MOD	Sulfate	mg/l	213.5	--	--		NS	82	121	253	181	244	196	194	NS	164	162
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--		NS	490	533	915	882	984	934	505	NS	496	452
Appendix IV - Assessment Monitoring																	
6010B/6020	Antimony	mg/l	--	--	--		NS	0.002 U	0.002 U	0.004 U	0.004 U	0.004 U	NS	NS	NS	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00482	0.00509	0.00324	0.0104
6010B	Barium	mg/l	0.326	2	--		NS	0.074	0.0864	0.129	0.138	0.139	0.121	0.107	NS	0.097	0.103
6010B	Beryllium	mg/l	--	--	--		NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	NS
6010B	Cadmium	mg/l	--	--	--		NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	NS
6010B	Chromium	mg/l	--	--	--		NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	NS
6010B	Cobalt	mg/l	--	--	--		NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	NS
9056MOD	Fluoride	mg/l	0.584	4	--		NS	0.231	0.265	0.22	0.199	0.186	0.178	0.462	NS	0.282	0.486
6010B/6020	Lead	mg/l	--	--	--		NS	0.002 U	NS	0.005 U	0.005 U	0.002 U	NS	NS	NS	0.002 U	NS
6010B	Lithium	mg/l	0.0699	0.0699	--		NS	0.015 U	0.0154	0.0273	0.0287	0.0315	0.0337	0.0428	NS	0.0295	0.0414
7470A	Mercury	mg/l	--	--	--		NS	0.0002 U	NS	0.0002	0.0002 U	0.0002 U	NS	NS	NS	0.0002 U	NS
6010B	Molybdenum	mg/l	0.005	0.100	--		NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		NS	0.002 U	0.01 U	0.002 U	0.0118	0.0547	0.0294	NS	NS	0.002 U	0.01 U
6010B/6020	Thallium	mg/l	--	--	--		NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--		NS	0.69 J	0.107	1.26	1.51	1.04	2.14 J	1.35 J	NS	0.219 J	0.398

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through October 2021 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16	MW-16
					Sample Date	5/27/2020	10/20/2020	05/28/2021	10/05/2021	11/19/2018	7/1/2019	11/25/2019	5/28/2020	10/19/2020	5/28/2021	10/04/2021
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**											
Appendix III - Detection Monitoring																
6010B	Boron	mg/l	0.272	--	--	0.2 U	0.2 U	0.2 U	0.2 U	NS	0.217	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--	78.8	82.6	74.7 O1	68.6	NS	246	224	183	231 V	178	194
9056MOD	Chloride	mg/l	32.67	--	--	20.8	21.4	21.6	19.2	NS	2.54	4.01	11.7	35.4	4.76	5.51
9056MOD	Fluoride	mg/l	0.5844	--	--	0.208	0.424	0.292	0.384	NS	0.155	0.136	0.15 U	0.15 U	0.15	0.15 U
9040C	pH	su	8.29	--	--	7.80 J	7.71	7.79	7.89 J	NS	6.76 J	6.76 J	6.88 J	6.84 J	6.97	7.71 J
In Situ	pH	su	8.67	--	--	7.88	7.28	6.81	6.81	6.863	6.58	6.8	6.58	6.57	6.19	6.19
9056MOD	Sulfate	mg/l	213.5	--	--	218	211	170	179	NS	172	123	121	115	87.4	80.8
2540 C-2011	Total Dissolved Solids	mg/l	975.4	--	--	521	560	481	504	NS	942	784	747 J4	821	644	697 J
Appendix IV - Assessment Monitoring																
6010B/6020	Antimony	mg/l	--	--	--	0.004 U	0.004 U	0.004 U	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	0.004 U	NS
6020	Arsenic	mg/l	0.035	0.035	0.035	0.00227	0.00488	0.00314	0.00667	0.035	0.0341	0.0342	0.0305	0.0313	0.0253	0.0247
6010B	Barium	mg/l	0.326	2	--	0.0977	0.114	0.0811 O1	0.105	NS	0.259	0.257	0.245	0.298	0.2	0.238
6010B	Beryllium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS
6010B	Cadmium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS
6010B	Chromium	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS
6010B	Cobalt	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	NS
9056MOD	Fluoride	mg/l	0.584	4	--	0.208	0.424	0.292	0.384	NS	0.155	0.136	0.15 U	0.15 U	0.15	0.15 U
6010B/6020	Lead	mg/l	--	--	--	0.005 U	0.005 U	0.002 U	NS	NS	0.002 U	NS	0.005 U	0.005 U	0.002 U	NS
6010B	Lithium	mg/l	0.0699	0.0699	--	0.0405	0.0526	0.0408	0.056	NS	0.0635	0.0646	0.0594	0.0596	0.0477	0.0511
7470A	Mercury	mg/l	--	--	--	0.0002	0.0002 U	0.0002 U	NS	NS	0.0002 U	NS	0.0002	0.0002 U	0.0002 U	NS
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.002 U	0.002 U	0.002 U	0.002 U	NS	0.002 U	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.268	5	--	0.859	0.234	0.465 J	1.1 J	NS	1.69 J	0.995	0.198	2.49	0.938	2.33 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Background limit as calculated during the December 22, 2021 evaluation of the October 2021 assessment monitoring event data.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Background limit for arsenic as calculated during the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

pCi/L = picocurie per liter

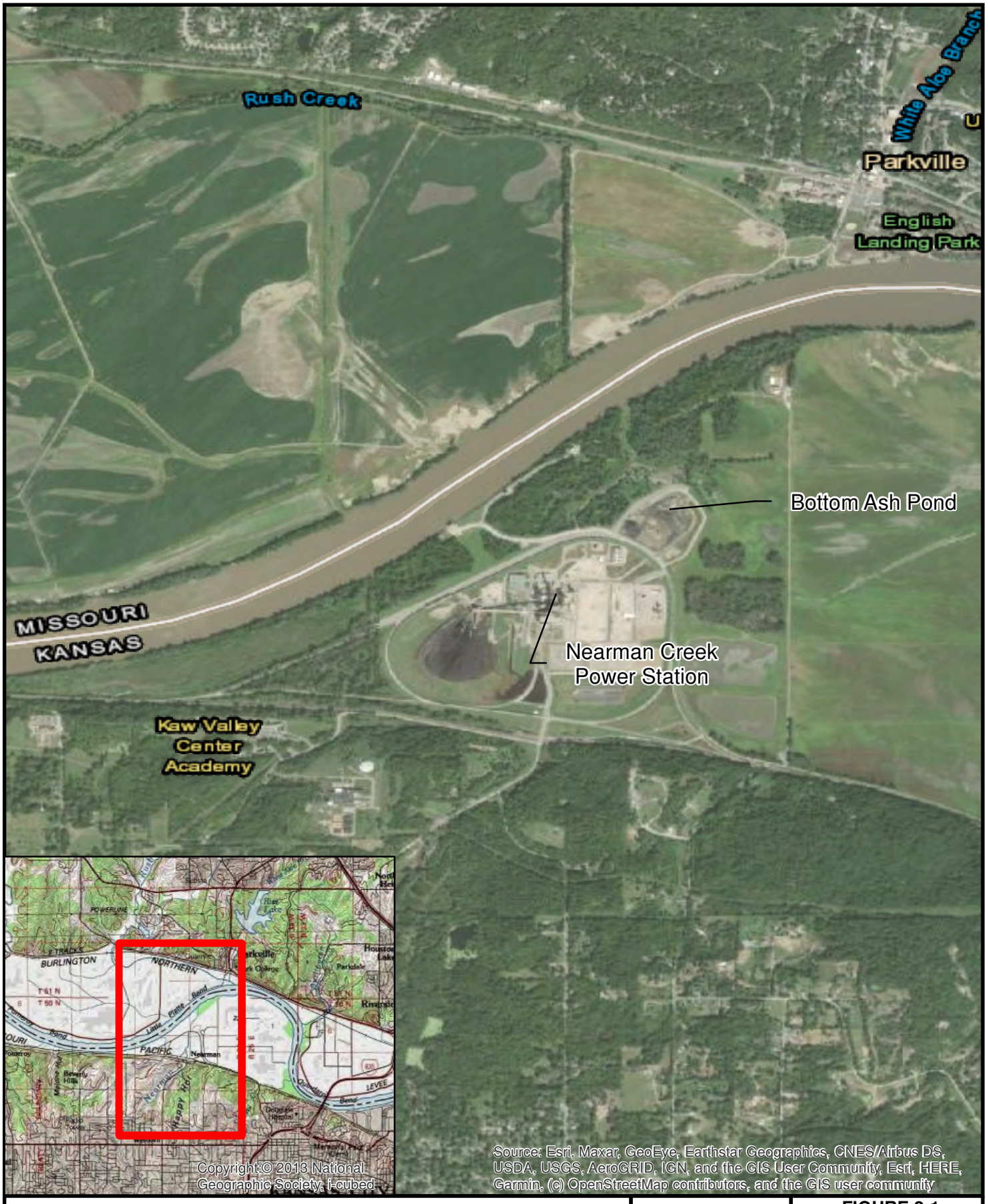
su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

FIGURES



0 1,000 2,000
Feet

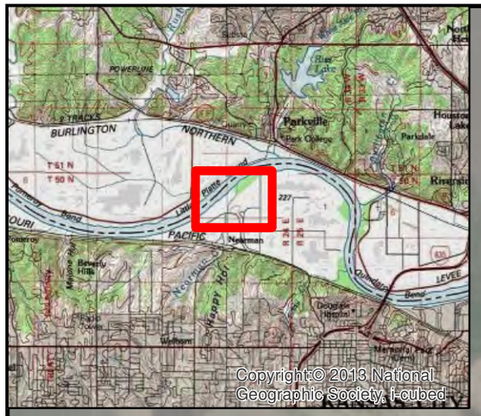
N

BURNS McDONNELL

FIGURE 2-1
SITE LOCATION
NEARMAN CREEK
POWER STATION
KANSAS CITY BPU
KANSAS CITY, KS

Source: ESRI and Burns & McDonnell Engineering.
Issued: December,31 2021

Path: Z:\Clients\ENS\KCBPU\88777_CCRGWMON\Studies\Geospatial\ArcDocs\2020 Report\Figure 2-1_Site Location Map.mxd



MW-13

MW-14

MW-10

MW-2A

MW-8A

MW-3

MW-15

MW-4

MW-16

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- BA Pond Monitoring Well - Upgradient
- BA Pond Monitoring Well - Downgradient

0 250 500

Feet

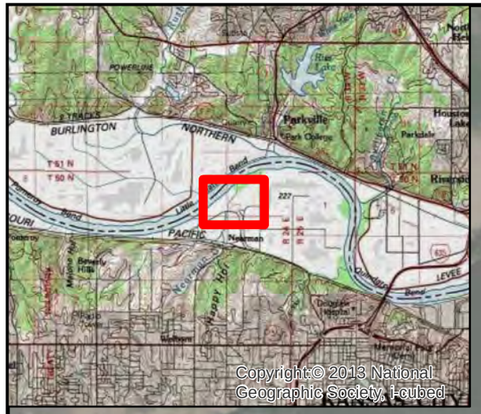
N

Source: ESRI and Burns & McDonnell Engineering.

BURNS McDONNELL

FIGURE 3-1
MONITORING WELL LOCATIONS
NEARMAN CREEK POWER STATION
KANSAS CITY BPU
KANSAS CITY, KS

Issued: January, 6 2021



MW-13
728.03

MW-14
722.87

MW-10
725.57

MW-2A
725.91

MW-8A
725.18

MW-3
725.91

MW-15
729.32

MW-4
725.65

MW-16
726.15

724
725
726
727
728

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Monitoring Well
- 722.87 Water Level Elevation
- Approximate Groundwater Flow Direction
- Piezometric Surface Contour

Notes

1 - Piezometric surface was inferred using groundwater elevation data collected on May 27, 2021 and should be considered approximate.

0 250 500
Feet

N

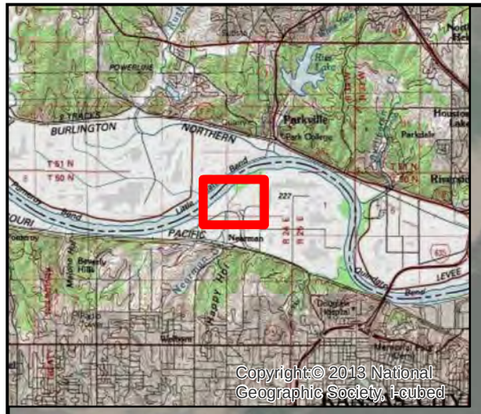
Source: ESRI and Burns & McDonnell Engineering.

BURNS McDONNELL

FIGURE 3-2
MAY 27, 2021 POTENTIOMETRIC MAP
NEARMAN CREEK POWER STATION
KANSAS CITY BPU
KANSAS CITY, KS

Z:\Clients\ENS\KCBPU\88777_CCRGWMON\Studies\Deliverables\Groundwater\2021 Annual Groundwater Monitoring Report - Privileged & Confidential\Figures

Issued: January, 17 2022



MW-13
726.41

MW-14
719.93

MW-2A
724.50

MW-10
723.87

MW-8A
723.42

MW-3
724.83

MW-15
726.83

MW-4
724.74

MW-16
725.67

719.93 Water Level Elevation

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- Piezometric Surface Contour

Notes

1 - Piezometric surface was inferred using groundwater elevation data collected on October 4, 2021 and should be considered approximate.

0 250 500
Feet

N

Source: ESRI and Burns & McDonnell Engineering.

BURNS McDONNELL

FIGURE 3-3
OCT. 4, 2021 POTENTIOMETRIC MAP
NEARMAN CREEK POWER STATION
KANSAS CITY BPU
KANSAS CITY, KS

Z:\Clients\EN\SK\CBPU\68777_CCR\GW\MON\Studies\Deliverables\Groundwater\2021 Annual Groundwater Monitoring Report - Privileged & Confidential\Figures

Issued: January, 17 2022

APPENDIX A – STATISTICAL EVALUATIONS

September 14, 2021

Ms. Ingrid Setzler
Kansas City Board of Public Utilities
300 N 65th Street
Kansas City, KS, 66102

Re: Statistical Evaluation of May 2021 Assessment Monitoring Data
Nearman Creek Power Station Bottom Ash Pond

Dear Ms. Setzler:

This letter presents the results of the statistical evaluation of analytical data from the May 2021 assessment monitoring event performed at the Nearman Creek Power Station Bottom Ash Pond (BA Pond) in accordance with the requirements of U.S. Environmental Protection Agency's *Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (40 Code of Federal Regulations [CFR] Part 257, Subpart D)*. This letter also presents a comparison of the May 2021 sampling results to groundwater protection standards (GWPSs) that were first established for the BA Pond in September of 2018. The GWPSs for the groundwater monitoring network are updated as additional data is collected. The GWPSs for the groundwater monitoring network were updated as part of the statistical evaluation completed for the May 2021 sampling event and are presented on Table 1 (Attachment A). A comparison of the May 2021 data to the updated GWPSs is presented on Table 2 (Attachment B). The statistical evaluation presented herein was performed in accordance with the *Update to Statistical Method for Evaluating Groundwater at Kansas City Board of Public Utilities Nearman Creek Power Station Bottom Ash Pond* dated September 13, 2018.

In May 2021, the BA Pond Monitoring Well Network was sampled for Appendix III and Appendix IV parameters per the requirements of 40 CFR §257.95(d)(1). This sampling event served as the first Semi-annual sampling event completed at the BA Pond in 2021. While this sampling event will be reported on as part of the 2021 Annual Groundwater Monitoring and Corrective Action Report, this letter presents the results of the statistical evaluation of the May 2021 assessment monitoring event for inclusion in the BA Pond Operating Record. GWPSs were developed in accordance with 40 CFR §257.95(h) which describes a GWPS as the higher value between a determined background concentration for a site and the established maximum concentration limit whereas 40 CFR §257.95(h)(2) presents GWPS criteria for select Appendix IV parameters. While certain parameters were detected in May 2021 at concentrations above the calculated background limits included in Attachment C, none of the detected parameters were observed at concentrations above their respective GWPS. Attachment C of this letter contains the results of an Interwell Prediction Limit evaluation that was performed to compare the concentrations of Appendix III and Appendix IV parameters observed in May 2021 at downgradient monitoring wells MW-2A, MW-8A, MW-10, and MW-14 to prediction limits that were established using data collected from 2015 through May of 2021 for upgradient monitoring wells MW-3, MW-4, MW-13, MW-15, and MW-16. As presented on Attachment C, the following parameters were observed in samples collected from one or more downgradient monitoring wells in May 2021 at concentrations above their respective calculated background limit:

- Boron (MW-8A and MW-10)
- Molybdenum (MW-8A).

- Sulfate (MW-8A and MW-14)

Given that certain Appendix III and IV constituents were observed at concentrations above calculated background limits, and that none of the detected parameters exceeded their respective GWPSs, the BA Pond will remain in assessment monitoring per the requirements of 40 CFR §257.95(f).

If you have questions regarding the information presented herein, please contact the undersigned at samartin@burnsmcd.com or bhoye@burnsmcd.com.

Sincerely,

Mr. Scott A. Martin, PE
Professional Engineer

Mr. Brian R. Hoye, PG
Project Manager

BRH/sam

Attachments:
Attachment A – Table 1 – Summary of Groundwater Protection Standards
Attachment B – Table 2 – Summary of May 2021 Analytical Results
Attachment C – Sanitas ™ Statistical Output

Attachment A

Table 1
Summary of Groundwater Protection Standards
Kansas City Board of Public Utilities
Nearman Creek Power Station Bottom Ash Pond

Appendix IV Parameter	Units	Background*	MCL	§257.95(h)(2) Criteria	Groundwater Protection Standard
Arsenic	mg/L	0.035	0.010	--	0.035
Barium	mg/L	0.342	2	--	2
Fluoride	mg/L	0.564	4	--	4
Lithium	mg/L	0.0702	--	0.040	0.0702
Molybdenum	mg/L	0.005	--	0.100	0.100
Selenium**	mg/L	0.0562	0.05	--	0.0562
Combined Radium 226 and 228***	pCi/L	3.852	5	--	5

Notes:

*Background concentrations were determined utilizing interwell prediction limits (Attachment C). Upgradient wells MW-3, MW-4, MW-13, MW-15 and MW-16 were used to determine these background concentrations. This included data ranging from October 2015 through May 2021.

** Selenium is was reported as nondetect for each of the samples collected from downgradinet monitoring wells in May 2021 with a reporting limit of 0.00200 mg/L. As a result, no prediction limit evaluation was performed and the GWPS was not updated from previous events.

***Combined radium is reported with an associated range. However, this range cannot be incorporated into statistical calculations as it varies per result and is not a standard value. Therefore, to maintain consistency in reporting these results, the reported laboratory concentration was used for the statistical analyses.

mg/L - milligrams per Liter
pCi/L - picocuries per Liter
MCL - Maximum Contaminant Level

Attachment B

Table 2
Summary of May 2021 Results
Kansas City Board of Public Utilities
Nearman Creek Power Station Bottom Ash Pond

		Sample Location Sample Date Lab ID	Calculated Background[1]	GWPS[2]	MW-2A 5/28/2021 L1359630-01	MW-3 5/28/2021 L1359630-02	MW-4 5/28/2021 L1359630-03	MW-8A 5/28/2021 L1359630-04	DUP-1 5/28/2021 L1359630-10	MW-10 5/28/2021 L1359630-05	MW-13 5/28/2021 L1359630-06	MW-14 5/28/2021 L1359630-07	MW-15 5/28/2021 L1359630-08	MW-16 5/28/2021 L1359630-09
Analytical Method	**Analyte**	**Unit**						*Duplicate Pair*						
Appendix III - Detection Monitoring														
6010B	Boron	mg/L	0.272	--	0.2 U	0.2 U	0.2 U	**2.51**	**2.52**	**0.89**	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/L	246	--	144	170	131	151	152	175	114	245	74.7 O1	178
9056MOD	Chloride	mg/L	32.85	--	12.7	6.8	12.3	24.7	24.7	10.6	16.7	16.7	21.6	4.76
9056MOD	Fluoride	mg/L	0.564	--	0.258	0.22	0.211	0.376	0.379	0.197	0.305	0.186	0.292	0.15
9040C	pH	su	8.29	--	7.13	7.1	6.92	7.26	7.13	7.19	7.18	6.84	7.79	6.97
In Situ	pH	su	8.54	--	6.44	6.41	6.21	6.47	6.47	6.36	6.31	6.19	6.81	6.19
9056MOD	Sulfate	mg/L	212.3	--	72.7	117	71.4	**378**	**381**	128	143	**244**	170	87.4
2540 C-2011	Total Dissolved Solids	mg/L	990.3	--	512	621	483	942	944	707	542	984	481	644
Detected Appendix IV - Assessment Monitoring														
6020	Arsenic	mg/L	0.035	0.035	0.002 U	0.002 U	0.002 U	0.0241	0.025	0.00763	0.0195	0.002 U	0.00314	0.0253
6010B	Barium	mg/L	0.342	2	0.13	0.138	0.0883	0.174	0.175	0.121	0.235	0.139	0.0811 O1	0.2
9056MOD	Fluoride	mg/L	0.564	4	0.258	0.22	0.211	0.376	0.379	0.197	0.305	0.186	0.292	0.15
6010B	Lithium	mg/L	0.0702	0.0702	0.0222	0.038	0.025	0.0201	0.0204	0.0365	0.0314	0.0315	0.0408	0.0477
6010B	Molybdenum	mg/L	0.005	0.100	0.005 U	0.005 U	0.005 U	**0.00861**	**0.00771**	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6020	Selenium	mg/l	0.0562	0.0562	0.002 U	0.00207 B	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0547	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.852	5	0.583 J	0.442 J	0.271 U	0.413 J	0.567 J	0.705 J	0.618 J	1.04	0.465 J	0.938

Notes

1 - Background concentrations were determined utilizing interwell prediction limits. Upgradient wells MW-3, MW-4, MW-13, MW-15, and MW-16 were used to determine these background concentrations. This included data ranging from October 2015 through May 2021.

2 - GWPSs were developed in accordance with §257.95(h).

Bold - Analyte detected above calculated background concentration.

No parameters were detected in wells located downgradient of the Bottom Ash Pond at a concentration greater than the GWPS.

B - The same analyte is found in the associated blank.

GWPS - Groundwater Protection Standard

J - qualified as estimated during data validation

mg/l - milligram per liter

O1 - The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.

pCi/L - picocurie per liter

su - standard unit

U - Non Detect at the identified concentration

Attachment C

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR2 Printed 9/13/2021, 9:18 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (mg/l)	MW-2A	0.035	n/a	5/28/2021	0.001ND	No	56	55.36	n/a	0.0171	NP (NDs)
Arsenic (mg/l)	MW-8A	0.035	n/a	5/28/2021	0.0241	No	56	55.36	n/a	0.0171	NP (NDs)
Arsenic (mg/l)	MW-10	0.035	n/a	5/28/2021	0.00763	No	56	55.36	n/a	0.0171	NP (NDs)
Arsenic (mg/l)	MW-14	0.035	n/a	5/28/2021	0.001ND	No	56	55.36	n/a	0.0171	NP (NDs)
Barium (mg/l)	MW-2A	0.3419	n/a	5/28/2021	0.13	No	51	0	ln(x)	0.01	Param
Barium (mg/l)	MW-8A	0.3419	n/a	5/28/2021	0.174	No	51	0	ln(x)	0.01	Param
Barium (mg/l)	MW-10	0.3419	n/a	5/28/2021	0.121	No	51	0	ln(x)	0.01	Param
Barium (mg/l)	MW-14	0.3419	n/a	5/28/2021	0.139	No	51	0	ln(x)	0.01	Param
Boron (mg/l)	MW-2A	0.272	n/a	5/28/2021	0.1ND	No	49	79.59	n/a	0.01943	NP (NDs)
Boron (mg/l)	**MW-8A**	**0.272**	**n/a**	**5/28/2021**	**2.51**	**Yes**	**49**	**79.59**	**n/a**	**0.01943**	NP (NDs)
Boron (mg/l)	**MW-10**	**0.272**	**n/a**	**5/28/2021**	**0.89**	**Yes**	**49**	**79.59**	**n/a**	**0.01943**	NP (NDs)
Boron (mg/l)	MW-14	0.272	n/a	5/28/2021	0.1ND	No	49	79.59	n/a	0.01943	NP (NDs)
Calcium (mg/l)	MW-2A	246	n/a	5/28/2021	144	No	48	0	n/a	0.01981	NP (normality)
Calcium (mg/l)	MW-8A	246	n/a	5/28/2021	151	No	48	0	n/a	0.01981	NP (normality)
Calcium (mg/l)	MW-10	246	n/a	5/28/2021	175	No	48	0	n/a	0.01981	NP (normality)
Calcium (mg/l)	MW-14	246	n/a	5/28/2021	245	No	48	0	n/a	0.01981	NP (normality)
Chloride (mg/l)	MW-2A	32.85	n/a	5/28/2021	12.7	No	49	0	x^(1/3)	0.01	Param
Chloride (mg/l)	MW-8A	32.85	n/a	5/28/2021	24.7	No	49	0	x^(1/3)	0.01	Param
Chloride (mg/l)	MW-10	32.85	n/a	5/28/2021	10.6	No	49	0	x^(1/3)	0.01	Param
Chloride (mg/l)	MW-14	32.85	n/a	5/28/2021	16.7	No	49	0	x^(1/3)	0.01	Param
Combined Radium (pCi/l)	MW-2A	3.852	n/a	5/28/2021	0.583J	No	49	0	x^(1/3)	0.01	Param
Combined Radium (pCi/l)	MW-8A	3.852	n/a	5/28/2021	0.413J	No	49	0	x^(1/3)	0.01	Param
Combined Radium (pCi/l)	MW-10	3.852	n/a	5/28/2021	0.705J	No	49	0	x^(1/3)	0.01	Param
Combined Radium (pCi/l)	MW-14	3.852	n/a	5/28/2021	1.04	No	49	0	x^(1/3)	0.01	Param
Dissolved Solids (mg/l)	MW-2A	990.3	n/a	5/28/2021	512	No	49	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-8A	990.3	n/a	5/28/2021	942	No	49	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-10	990.3	n/a	5/28/2021	707	No	49	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-14	990.3	n/a	5/28/2021	984	No	49	0	No	0.01	Param
Fluoride (mg/l)	MW-2A	0.5644	n/a	5/28/2021	0.258	No	51	7.843	ln(x)	0.01	Param
Fluoride (mg/l)	MW-8A	0.5644	n/a	5/28/2021	0.376	No	51	7.843	ln(x)	0.01	Param
Fluoride (mg/l)	MW-10	0.5644	n/a	5/28/2021	0.197	No	51	7.843	ln(x)	0.01	Param
Fluoride (mg/l)	MW-14	0.5644	n/a	5/28/2021	0.186	No	51	7.843	ln(x)	0.01	Param
Lithium (mg/l)	MW-2A	0.07019	n/a	5/28/2021	0.0222	No	51	0	No	0.01	Param
Lithium (mg/l)	MW-8A	0.07019	n/a	5/28/2021	0.0201	No	51	0	No	0.01	Param
Lithium (mg/l)	MW-10	0.07019	n/a	5/28/2021	0.0365	No	51	0	No	0.01	Param
Lithium (mg/l)	MW-14	0.07019	n/a	5/28/2021	0.0315	No	51	0	No	0.01	Param
Molybdenum (mg/l)	MW-2A	0.005	n/a	5/28/2021	0.0025ND	No	51	100	n/a	0.0187	NP (NDs)
Molybdenum (mg/l)	**MW-8A**	**0.005**	**n/a**	**5/28/2021**	**0.00861**	**Yes**	**51**	**100**	**n/a**	**0.0187**	NP (NDs)
Molybdenum (mg/l)	MW-10	0.005	n/a	5/28/2021	0.0025ND	No	51	100	n/a	0.0187	NP (NDs)
Molybdenum (mg/l)	MW-14	0.005	n/a	5/28/2021	0.0025ND	No	51	100	n/a	0.0187	NP (NDs)
pH [Field] (su)	MW-2A	8.67	6.11	5/28/2021	6.44	No	56	0	n/a	0.0342	NP (normality)
pH [Field] (su)	MW-8A	8.67	6.11	5/28/2021	6.47	No	56	0	n/a	0.0342	NP (normality)
pH [Field] (su)	MW-10	8.67	6.11	5/28/2021	6.36	No	56	0	n/a	0.0342	NP (normality)
pH [Field] (su)	MW-14	8.67	6.11	5/28/2021	6.19	No	56	0	n/a	0.0342	NP (normality)
pH [Lab] (su)	MW-2A	8.29	6.56	5/28/2021	7.13	No	41	0	n/a	0.04601	NP (normality)
pH [Lab] (su)	MW-8A	8.29	6.56	5/28/2021	7.26	No	41	0	n/a	0.04601	NP (normality)
pH [Lab] (su)	MW-10	8.29	6.56	5/28/2021	7.19	No	41	0	n/a	0.04601	NP (normality)
pH [Lab] (su)	MW-14	8.29	6.56	5/28/2021	6.84	No	41	0	n/a	0.04601	NP (normality)
Selenium (mg/l)	MW-2A	0.0562	n/a	5/28/2021	0.001ND	No	45	60	n/a	0.02106	NP (NDs)
Selenium (mg/l)	MW-8A	0.0562	n/a	5/28/2021	0.001ND	No	45	60	n/a	0.02106	NP (NDs)

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR2 Printed 9/13/2021, 9:18 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Selenium (mg/l)	MW-10	0.0562	n/a	5/28/2021	0.001ND	No	45	60	n/a	0.02106	NP (NDs)
Selenium (mg/l)	MW-14	0.0562	n/a	5/28/2021	0.0547	No	45	60	n/a	0.02106	NP (NDs)
Sulfate (mg/l)	MW-2A	212.3	n/a	5/28/2021	72.7	No	48	0	No	0.01	Param
Sulfate (mg/l)	**MW-8A**	**212.3**	**n/a**	**5/28/2021**	**378**	**Yes**	**48**	**0**	**No**	**0.01**	Param
Sulfate (mg/l)	MW-10	212.3	n/a	5/28/2021	128	No	48	0	No	0.01	Param
Sulfate (mg/l)	**MW-14**	**212.3**	**n/a**	**5/28/2021**	**244**	**Yes**	**48**	**0**	**No**	**0.01**	Param

December 22, 2021

Ms. Ingrid Setzler
Kansas City Board of Public Utilities
300 N 65th Street
Kansas City, KS, 66102

Re: Statistical Evaluation of October 2021 Assessment Monitoring Data
Nearman Creek Power Station Bottom Ash Pond

Dear Ms. Setzler:

This letter presents the results of the statistical evaluation of analytical data from the October 2021 assessment monitoring event performed at the Nearman Creek Power Station Bottom Ash Pond (BA Pond) in accordance with the requirements of U.S. Environmental Protection Agency's *Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (40 Code of Federal Regulations [CFR] Part 257, Subpart D)*. This letter also presents a comparison of the October 2021 sampling results to groundwater protection standards (GWPSs) that were first established for the BA Pond in September of 2018. The GWPSs for the groundwater monitoring network are updated as additional data is collected. The GWPSs for the groundwater monitoring network were updated as part of the statistical evaluation completed for the October 2021 sampling event and are presented on Table 1 (Attachment A). A comparison of the October 2021 data to the updated GWPSs is presented on Table 2 (Attachment B). The statistical evaluation presented herein was performed in accordance with the *Update to Statistical Method for Evaluating Groundwater at Kansas City Board of Public Utilities Nearman Creek Power Station Bottom Ash Pond* dated September 13, 2018.

In October 2021, the BA Pond Monitoring Well Network was sampled for Appendix III and Appendix IV parameters per the requirements of 40 CFR §257.95(d)(1). This sampling event served as the second Semi-annual sampling event completed at the BA Pond in 2021. While this sampling event will be reported on as part of the 2021 Annual Groundwater Monitoring and Corrective Action Report, this letter presents the results of the statistical evaluation of the October 2021 assessment monitoring event for inclusion in the BA Pond Operating Record. GWPSs were developed in accordance with 40 CFR §257.95(h) which describes a GWPS as the higher value between a determined background concentration for a site and the established maximum concentration limit or the GWPS criteria for select Appendix IV parameters presented in 40 CFR §257.95(h)(2). While certain parameters were detected in October 2021 at concentrations above the calculated background limits included in Attachment C, none of the detected parameters were observed at concentrations above their respective GWPS. Attachment C of this letter contains the results of an Interwell Prediction Limit evaluation that was performed to compare the concentrations of Appendix III and Appendix IV parameters observed in October 2021 at downgradient monitoring wells MW-2A, MW-8A, MW-10, and MW-14 to prediction limits that were established using data collected from 2015 through October of 2021 for upgradient monitoring wells MW-3, MW-4, MW-13, MW-15, and MW-16. As presented on Attachment C, the following parameters were observed in samples collected from one or more downgradient monitoring wells in October 2021 at concentrations above their respective calculated background limit:

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

- Boron (MW-8A and MW-10)
- Dissolved Solids (MW-8A)
- Molybdenum (MW-8A)
- Sulfate (MW-8A)

Given that certain Appendix III and IV constituents were observed at concentrations above calculated background limits, and that none of the detected parameters exceeded their respective GWPSs, the BA Pond these results do not warrant a transition to detection monitoring per the requirements of 40 CFR §257.95(f).

If you have questions regarding the information presented herein, please contact the undersigned at samartin@burnsmcd.com or bhoye@burnsmcd.com.

Sincerely,

Mr. Scott A. Martin, PE
Professional Engineer

Mr. Brian R. Hoye, PG
Project Manager

BRH/sam

Attachments:

Attachment A – Table 1 – Summary of Groundwater Protection Standards
Attachment B – Table 2 – Summary of October 2021 Analytical Results
Attachment C – Sanitas ™ Statistical Output

Attachment A

Table 1
Summary of Groundwater Protection Standards
Kansas City Board of Public Utilities
Nearman Creek Power Station Bottom Ash Pond

Appendix IV Parameter	Units	Background*	MCL	§257.95(h)(2) Criteria	Groundwater Protection Standard
Arsenic	mg/L	0.035	0.010	--	0.035
Barium	mg/L	0.326	2	--	2
Fluoride	mg/L	0.584	4	--	4
Lithium	mg/L	0.0699	--	0.040	0.0699
Molybdenum	mg/L	0.005	--	0.100	0.100
Selenium	mg/L	0.0562	0.05	--	0.0562
Combined Radium 226 and 228**	pCi/L	3.268	5	--	5

Notes:

*Background concentrations were determined utilizing interwell prediction limits (Attachment C). Upgradient wells MW-3, MW-4, MW-13, MW-15 and MW-16 were used to determine these background concentrations. This included data ranging from October 2015 through October 2021.

**Combined radium is reported with an associated range. However, this range cannot be incorporated into statistical calculations as it varies per result and is not a standard value. Therefore, to maintain consistency in reporting these results, the reported laboratory concentration was used for the statistical analyses.

mg/L - milligrams per Liter

pCi/L - picocuries per Liter

MCL - Maximum Contaminant Level

Attachment B

Table 2
Summary of October 2021 Results
Kansas City Board of Public Utilities
Nearman Creek Power Station Bottom Ash Pond

Sample Location:			Calculated Background[1]	GWPS[2]	MW-2A	MW-3	MW-4	Dup-1	MW-8A	MW-10	MW-13	MW-14	MW-15	MW-16
Sample Date:					10/05/2021	10/05/2021	10/05/2021	10/05/2021	10/06/2021	10/05/2021	10/04/2021	10/06/2021	10/05/2021	10/04/2021
Laboratory ID(s):					L1414036-01/ L1414737-01	L1414036-02/ L1414737-02	L1414036-03/ L1414737-03	L1414036-06/ L1414737-06	L1414715-01/ L1414717-01	L1414036-04 L1414737-04	L1413321-01/ L1413325-01	L1414715-02/ L1414717-02	L1414036-05/ L1414737-05	L1413321-02 L1413325-02
All analytes excl. Radium/Radium only														
Note(s):								Dup of MW-4						
Analytical Method	**Analyte**	**Unit**												
Appendix III - Detection Monitoring														
6010D	Boron	mg/l	0.272	- -	0.2 U	0.2 U	0.2 U	0.2 U	**2.39**	**1.1**	0.2 U	0.2 U	0.2 U	0.2 U
6010D	Calcium	mg/l	246	- -	162	164	132	133	156	168	114	212	68.6	194
9056A	Chloride	mg/l	32.85	- -	10.7	7.31	12.4	12.3	25.5	12.3	18.6	15.9	19.2	5.51
9056A	Fluoride	mg/l	0.5844	4	0.242	0.21	0.194	0.194	0.356	0.151	0.318	0.178	0.384	0.15 U
9040C	pH	su	8.29	- -	7.47 J	7.22 J	7.51 J	7.56 J	7.42 J	7.36 J	7.35 J	7.29 J	7.89 J	7.71 J
In Situ	pH	su	8.67	- -	6.44	6.41	6.21	6.21	6.47	6.36	6.31	6.19	6.81	6.19
9056A	Sulfate	mg/l	213	- -	81.6	104	88	87.6	**395**	155	165	196	179	80.8
2540 C-2011	Total Dissolved Solids	mg/l	975.4	- -	614	655	539	541	**998**	748	564	934	504	697 J
Detected Appendix IV - Assessment Monitoring[3]														
6020B	Arsenic	mg/l	0.035	0.035	0.00312	0.002 U	0.002 U	0.002 U	0.0256	0.00321	0.0227	0.002 U	0.00667	0.0247
6010D	Barium	mg/l	0.326	2	0.161	0.134	0.104	0.105	0.17	0.105	0.237	0.121	0.105	0.238
9056A	Fluoride	mg/l	0.5844	4	0.242	0.21	0.194	0.194	0.356	0.151	0.318	0.178	0.384	0.15 U
6010D	Lithium	mg/l	0.0699	0.0699	0.0365	0.0463	0.0337	0.032	0.0431	0.045	0.0287	0.0337	0.056	0.0511
6010D	Molybdenum	mg/l	0.005	0.100	0.005 U	0.005 U	0.005 U	0.005 U	**0.00643 J+**	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6020B	Selenium	mg/l	0.0562	0.0562	0.002 U	0.002 U	0.00532	0.00519	0.002 U	0.00467	0.002 U	0.0294	0.002 U	0.002 U
Calculation 904/9320	Combined Radium	pCi/l	3.268	5	1.82 J	1.67 J	0.359 U	0.511 J	1.36 J	1.36 J	2.77	2.14 J	1.1 J	2.33 J

Notes

October 2021.

2 - GWPSs were developed in accordance with §257.95(h).

3 - Samples were analyzed for Appendix IV parameters which were detected at one or more monitoring wells during the sampling event conducted in accordance with §257.95(b).

Bold - Analyte detected above calculated background concentration.

No parameters were detected in wells located downgradient of the Bottom Ash Pond at a concentration greater than the GWPS.

GWPS - Groundwater Protection Standard

J (+/-) - estimated concentration (bias indicator [high +/low -])

mg/l - milligram per liter

pCi/L - picocurie per liter

su - standard unit

U - Non Detect at the identified concentration

Attachment C

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 12/10/2021, 11:14 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (mg/l)	MW-2A	0.035	n/a	10/5/2021	0.00312	No	61	54.1	n/a	0.01575	NP (NDs)
Arsenic (mg/l)	MW-8A	0.035	n/a	10/6/2021	0.0256	No	61	54.1	n/a	0.01575	NP (NDs)
Arsenic (mg/l)	MW-10	0.035	n/a	10/5/2021	0.00321	No	61	54.1	n/a	0.01575	NP (NDs)
Arsenic (mg/l)	MW-14	0.035	n/a	10/6/2021	0.001ND	No	61	54.1	n/a	0.01575	NP (NDs)
Barium (mg/l)	MW-2A	0.326	n/a	10/5/2021	0.161	No	55	0	x^(1/3)	0.01	Param
Barium (mg/l)	MW-8A	0.326	n/a	10/6/2021	0.17	No	55	0	x^(1/3)	0.01	Param
Barium (mg/l)	MW-10	0.326	n/a	10/5/2021	0.105	No	55	0	x^(1/3)	0.01	Param
Barium (mg/l)	MW-14	0.326	n/a	10/6/2021	0.121	No	55	0	x^(1/3)	0.01	Param
Boron (mg/l)	MW-2A	0.272	n/a	10/5/2021	0.1ND	No	54	81.48	n/a	0.01771	NP (NDs)
Boron (mg/l)	**MW-8A**	**0.272**	**n/a**	**10/6/2021**	**2.39**	**Yes**	**54**	**81.48**	**n/a**	**0.01771**	NP (NDs)
Boron (mg/l)	**MW-10**	**0.272**	**n/a**	**10/5/2021**	**1.1**	**Yes**	**54**	**81.48**	**n/a**	**0.01771**	NP (NDs)
Boron (mg/l)	MW-14	0.272	n/a	10/6/2021	0.1ND	No	54	81.48	n/a	0.01771	NP (NDs)
Calcium (mg/l)	MW-2A	246	n/a	10/5/2021	162	No	53	0	n/a	0.01803	NP (normality)
Calcium (mg/l)	MW-8A	246	n/a	10/6/2021	156	No	53	0	n/a	0.01803	NP (normality)
Calcium (mg/l)	MW-10	246	n/a	10/5/2021	168	No	53	0	n/a	0.01803	NP (normality)
Calcium (mg/l)	MW-14	246	n/a	10/6/2021	212	No	53	0	n/a	0.01803	NP (normality)
Chloride (mg/l)	MW-2A	32.85	n/a	10/5/2021	10.7	No	54	0	x^(1/3)	0.01	Param
Chloride (mg/l)	MW-8A	32.85	n/a	10/6/2021	25.5	No	54	0	x^(1/3)	0.01	Param
Chloride (mg/l)	MW-10	32.85	n/a	10/5/2021	12.3	No	54	0	x^(1/3)	0.01	Param
Chloride (mg/l)	MW-14	32.85	n/a	10/6/2021	15.9	No	54	0	x^(1/3)	0.01	Param
Combined Radium (pCi/l)	MW-2A	3.268	n/a	10/5/2021	1.82	No	49	2.041	sqrt(x)	0.01	Param
Combined Radium (pCi/l)	MW-8A	3.268	n/a	10/6/2021	1.36	No	49	2.041	sqrt(x)	0.01	Param
Combined Radium (pCi/l)	MW-10	3.268	n/a	10/5/2021	1.36	No	49	2.041	sqrt(x)	0.01	Param
Combined Radium (pCi/l)	MW-14	3.268	n/a	10/6/2021	2.14	No	49	2.041	sqrt(x)	0.01	Param
Dissolved Solids (mg/l)	MW-2A	975.4	n/a	10/5/2021	614	No	54	0	No	0.01	Param
Dissolved Solids (mg/l)	**MW-8A**	**975.4**	**n/a**	**10/6/2021**	**998**	**Yes**	**54**	**0**	**No**	**0.01**	Param
Dissolved Solids (mg/l)	MW-10	975.4	n/a	10/5/2021	748	No	54	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-14	975.4	n/a	10/6/2021	934	No	54	0	No	0.01	Param
Fluoride (mg/l)	MW-2A	0.5844	n/a	10/5/2021	0.242	No	56	8.929	ln(x)	0.01	Param
Fluoride (mg/l)	MW-8A	0.5844	n/a	10/6/2021	0.356	No	56	8.929	ln(x)	0.01	Param
Fluoride (mg/l)	MW-10	0.5844	n/a	10/5/2021	0.151	No	56	8.929	ln(x)	0.01	Param
Fluoride (mg/l)	MW-14	0.5844	n/a	10/6/2021	0.178	No	56	8.929	ln(x)	0.01	Param
Lithium (mg/l)	MW-2A	0.06992	n/a	10/5/2021	0.0365	No	56	0	No	0.01	Param
Lithium (mg/l)	MW-8A	0.06992	n/a	10/6/2021	0.0431	No	56	0	No	0.01	Param
Lithium (mg/l)	MW-10	0.06992	n/a	10/5/2021	0.045	No	56	0	No	0.01	Param
Lithium (mg/l)	MW-14	0.06992	n/a	10/6/2021	0.0337	No	56	0	No	0.01	Param
Molybdenum (mg/l)	MW-2A	0.005	n/a	10/5/2021	0.0025ND	No	56	100	n/a	0.0171	NP (NDs)
Molybdenum (mg/l)	**MW-8A**	**0.005**	**n/a**	**10/6/2021**	**0.00643**	**Yes**	**56**	**100**	**n/a**	**0.0171**	NP (NDs)
Molybdenum (mg/l)	MW-10	0.005	n/a	10/5/2021	0.0025ND	No	56	100	n/a	0.0171	NP (NDs)
Molybdenum (mg/l)	MW-14	0.005	n/a	10/6/2021	0.0025ND	No	56	100	n/a	0.0171	NP (NDs)
pH [Field] (su)	MW-2A	8.67	6.11	10/5/2021	6.44	No	56	0	n/a	0.0342	NP (normality)
pH [Field] (su)	MW-8A	8.67	6.11	10/6/2021	6.47	No	56	0	n/a	0.0342	NP (normality)
pH [Field] (su)	MW-10	8.67	6.11	10/5/2021	6.36	No	56	0	n/a	0.0342	NP (normality)
pH [Field] (su)	MW-14	8.67	6.11	10/6/2021	6.19	No	56	0	n/a	0.0342	NP (normality)
pH [Lab] (su)	MW-2A	8.29	6.56	10/5/2021	7.47	No	46	0	n/a	0.04126	NP (normality)
pH [Lab] (su)	MW-8A	8.29	6.56	10/6/2021	7.42	No	46	0	n/a	0.04126	NP (normality)
pH [Lab] (su)	MW-10	8.29	6.56	10/5/2021	7.36	No	46	0	n/a	0.04126	NP (normality)
pH [Lab] (su)	MW-14	8.29	6.56	10/6/2021	7.29	No	46	0	n/a	0.04126	NP (normality)
Selenium (mg/l)	MW-2A	0.0562	n/a	10/5/2021	0.001ND	No	50	62	n/a	0.01906	NP (NDs)
Selenium (mg/l)	MW-8A	0.0562	n/a	10/6/2021	0.001ND	No	50	62	n/a	0.01906	NP (NDs)

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 12/10/2021, 11:14 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Selenium (mg/l)	MW-10	0.0562	n/a	10/5/2021	0.00467	No	50	62	n/a	0.01906	NP (NDs)
Selenium (mg/l)	MW-14	0.0562	n/a	10/6/2021	0.0294	No	50	62	n/a	0.01906	NP (NDs)
Sulfate (mg/l)	MW-2A	213	n/a	10/5/2021	81.6	No	53	0	No	0.01	Param
Sulfate (mg/l)	**MW-8A**	**213**	**n/a**	**10/6/2021**	**395**	**Yes**	**53**	**0**	**No**	**0.01**	Param
Sulfate (mg/l)	MW-10	213	n/a	10/5/2021	155	No	53	0	No	0.01	Param
Sulfate (mg/l)	MW-14	213	n/a	10/6/2021	196	No	53	0	No	0.01	Param

APPENDIX B – GROUNDWATER SAMPLING FIELD DOCUMENTATION

5/27/21 C. BALKENBUSCH

WEATHER: CLOUDY, 70s, SE WIND 5-15

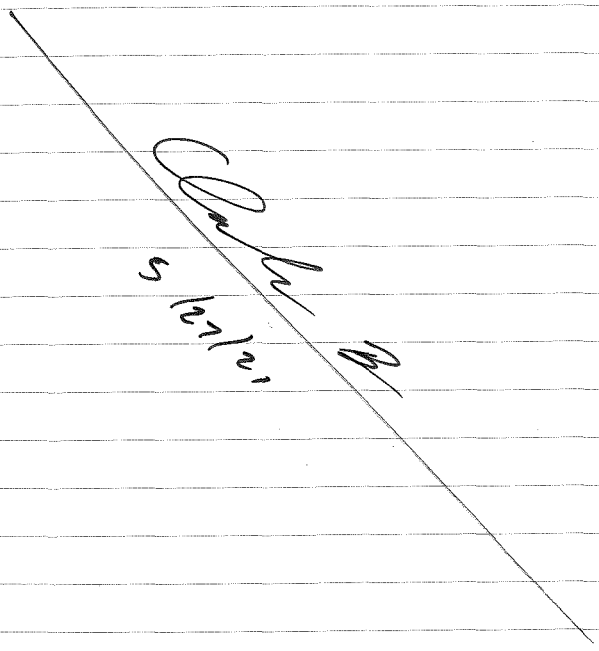
TASK: GW SAMPLING

PERSONNEL: CHUCK BALKENBUSCH

1500 SET UP ON MW-13

- MP-15 CONTROL UNIT MALFUNCTIONING CALL FIELD ENVIRONMENTAL EQUIP
- CONTROLLER BROKEN. FIELD TO SEND FOR A REPLACEMENT. PACK UP & SAMPLING WILL BEGIN TOMORROW A.M.

1630 OFFSITE



5/28/21 C. BALKENBUSCH

WEATHER: CLOUDY, 60-70s, W WIND 5-15

TASK: GW SAMPLING

PERSONNEL: CHUCK BALKENBUSCH

0610 ONSITE. CHECK IN

0615 MOBE TO WELLS. TRAIN BLOOMS ACCESS

0625 CALIBRATE EQUIPMENT

PH	4/4.25	7/7.18	10/9.95
COND	1.413/1.500		
TURB	0/0.04	10/10.02	

0655 TALK TO CHARLIE - GET ACCESS AGREEMENT TRACK

- SET UP ON MW-14

0717 ~~[illegible]~~ BEGIN PURGING MW-14 AT 250 ml/MIN

- DETAILS IN SAMPLING REPORT

0740 COLLECT MW-14/(GW01) FOR APPENDIX III & SELECT IV PARAMETERS

- MOBE TO MW-15

0803 BEGIN PURGE MW-15 @ 250 ml/MIN

- DETAILS IN SAMPLING REPORT

0825 COLLECT MW-15/(GW01) & MW-15/(GW01 MS/MSD) FOR APPENDIX III & SELECT IV

- MOBE TO MW-3

0924 BEGIN PURGING MW-3 AT 250 ml/MIN

- DETAILS IN SAMPLING REPORT

5/28/21 C. BALKENBUSCH

0945 COLLECT MW-3/(GW01) FOR APPENDIX III & SELECT III

- MOBE TO MW-2A

0958 BEGIN PURGING MW-2A AT 250 ml/MIN

- DETAILS IN SAMPLING REPORT

1025 COLLECT MW-2A/(GW01) FOR APPENDIX III & IV

- MOBE TO MW-10

1036 BEGIN PURGING MW-10 AT 250 ml/MIN

- DETAILS IN SAMPLING REPORT

1110 COLLECT MW-10/(GW01) FOR APPENDIX III & IV

- MOBE TO MW-8A

1133 BEGIN PURGING MW-8A AT 250 ml/MIN

- DETAILS IN SAMPLING REPORT

1225 COLLECT MW-8A/(GW01) & DUP-1/(GW01) FOR APPENDIX III & IV

- MOBE TO MW-13

1301 BEGIN PURGING MW-13 @ 250 ml/MIN

- DETAILS IN SAMPLING REPORT

1350 COLLECT MW-13/(GW01) FOR APPENDIX III & IV

- MOBE TO MW-16

1416 BEGIN PURGING MW-16 AT 250 ml/MIN

- DETAILS IN SAMPLING REPORT

5/28/21 C. Ballenberger

1450 Collect MW-16/GW01 for Appendix III & IV

- Mobe to MW-4

1512 Begin pumping MW-4 at 250 ml/min

- Details in sampling report

1540 Collect MW-4/GW01 for Appendix III & IV

1541 Pace Conzelle on-site

1545 - Relinquish 3 coolers

Sign out at Guard Shack

Monday October 4, 2021

Weather: AM: Clear, sunny, 50's-70's

PM: Clear, Sunny, 70's-80's

Personnel: Chris Heglund

Task: WLs + GW Sampling

0900 Arrive @ East Gaurd shack, check-in

0905 Meet Keith Brown + Tyler Bane

1020 Complete tour of site + MW locations

Begin WLs, Keith off-site, Tyler providing ~~MW~~ escort to MWs

Time	MW	WL
1020	MW-13	21.40
1029	MW-16	22.76
1044	MW-19	29.25
1054	MW-15	26.05
1106	MW-2A	23.36
1113	MW-3	25.61 = 25.61
1122	MW-4	22.16
1131	MW-10	21.38
1137	MW-8A	26.68

1155 Setup @ MW-13

1158 Calibrate: Hanna HI 98703

0.23/0.1 NTU, 100/100 NTU, 15.6/15 NTU

744/750 NTU

1206 Tyler off-site

5/28/21 C. Ballenbach

1450 Collect MW-16/GW01 for Appendix III & IV
- Mobe to MW-4

1512 Begin purging MW-4 at 250 ml/min
- Details in sampling report

1540 Collect MW-4/GW01 for Appendix III & IV

541 Pace Courier on-site

1545 - Relinquish 3 coolers
Sign out at Guard Shack

C. Hoglund 88777 10/4/21

Monday October 4, 2021

Weather: AM: Clear, sunny, 50's-70's
PM: Clear, Sunny, 70's-80's

Personnel: Chris Hoglund

Task: WLs & GW Sampling

0900 Arrive @ East Gaurd shack, check-in

0905 Meet Keith Brown & Tyler Bane

1020 Complete tour of site & MW locations
Begin WLs, Keith off-site, Tyler providing escort to MWs

Time	MW	WL
1020	MW-13	21.40
1029	MW-16	22.76
1044	MW-14	29.25
1054	MW-15	26.05
1106	MW-2A	23.36
1113	MW-3	25.61 = 25.61
1122	MW-4	22.16
1131	MW-10	21.38
1137	MW-8A	26.68

1155 Setup @ MW-13

1158 Calibrate: Hanna HI 98703
0.23/0.1 NTU, 100/100 NTU, 15.6/15 NTU
744/750 NTU

1206 Tyler off-site

1210 Calibrate Hanna HI 98194 multi-meter
ORP: 218.7/220 mV
Conductivity: 1490/1409 uS/cm
pH: 6.94/7.00, 3.90/4.00, 9.20/10.00
DO: 100.1/100 %
1230 Begin Purging MW-13
1408 Resolved setup issues with flow-through cell
1410 Start collecting field parameters.
1555 Collect MW-13/GW02 for Appx III + select Appx IV parameters.
1620 Setup @ MW-16
1626 start Purging MW-16
1720 Collect MW-16/GW02 for Appx III + select Appx IV
1740 Farmers still working in field leave gate open. off-site
1825 Fed-Ex one iced cooler to Pace National Mt. Juliet, TN lab. #531899497350

10/4/2021

Tuesday October 5, 2021
Weather: AM: 50's - 70's Clear, Partly Cloudy, calm
PM: 70's - Partly Cloudy - Overcast, Breezy 5-10
Personnel: Chris Heglund
Task: GW Sampling
0755 Check-in @ east security shed
0800 Arrive @ MW-10, setup
Calibrate Hanna HI 98194
ORP: 219.8/220.0, conductivity: 1.420/1.409 mS/cm
pH: 7.00/7.00, 4.01/4.00, 9.93/10.0
DO: 100.6/100.0 %
0830 Start Purging MW-10
0910 Collect MW-10/GW02 for Appx III, select Appx IV
0926 Setup @ MW-2A
0935 Begin Purging MW-2A
1005 Collect MW-2A/GW02 for Appx. III + select Appx IV.
1035 setup @ MW-3
1040 Begin purging MW-3
1115 Collect MW-3/GW02 for Appx III + select Appx IV
1135 setup at MW-4
1146 Begin purging MW-4
1315 Collect MW-4/GW02 + DUP-1/GW02 for Appx III + X select Appx IV

1405 Setup @ MW-15

1424 Start purging @ MW-15

1535 Collect MW-15/GW02 MS/GW02, & MSD/GW02
↳ Appx III + select Appx IV

1600 Coal railcars blocking usual exit, have security guard unlock gate on perimeter road to exit.

1725 Fed-Ex two (2) iced coolers to Pace National Mt. Juliet, TN.

Late Entry: 0820 Calibrate Hanna HI 98703 0.20/0.1 NTU, 100/100 NTU, 15.5/15.0 NTU 740/750 NTU.

10/5/2021

Invoice: Date : 16Sep21 Shipping : 0.00
Customer : PNKCMO Weight : 10 LBS Special : 0.00
Phone : (615)758-5858 COD : Handling : 0.00
SAT Del : N DV : 0.00 Total : 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 5300 4294 6570

Invoice: Date : 16Sep21 Shipping : 0.00
Customer : PNKCMO Weight : 10 LBS Special : 0.00
Phone : (615)758-5858 COD : Handling : 0.00
SAT Del : N DV : 0.00 Total : 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 5300 4294 6569

Wednesday October 6, 2021

Weather: AM: Overcast, 60's, Calm
PM:

Personnel: Chris Heglund

Task: GW Sampling

0800 Check-in @ East security gate

0810 Arrive @ MW-8A, setup
Calibrate Hanna HI 98194
ORP: 220/220 mV. cond.: 1.413/1.409 mS/cm
pH: 7.01/7.00, 4.05/4.00, 10.10/10.00
DO: 100.0/100%

0845 Calibrate Hanna HI 98703 Turbidity meter
0.21/0.1 NTU, 100/100 NTU, 15.3/15.0 NTU
745/750 NTU

0852 Begin Purging MW-8A

0940 Collect MW-8A for Appx III + select Appx IV

1012 Arrive @ MW-14, setup

1022 Begin Purging MW-14

1135 Collect MW-14/GW02 for Appx III + select Appx IV

1245 Off-site

1730 Return two (2) 20lb CO_2 cylinders @ Matheson in KC, MO.

1412 Return rental equip. to FEI Olathe, KS

CH

10/6/21 88777 C. Hoglund

1910 Fed-Ex one (1) iced cooler to Pace National in Mt. Juliet, TN.

CH

Invoice:
Customer : PNKCMO
Phone : (615)758-5858
SAT Del : N

Date : 16Sep21
Weight : 10 LBS
COD :
DV : 0.00

Shipping : 0.00
Special : 0.00
Handling : 0.00
Total : 0.00

Svce: PRIORITY OVERNIGHT
TRCK: 5300 4294 6558

10/6/21

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: Nearman Creek PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: Cloudy, 60s, W wind 5-15

WELL NUMBER: MW-2A

DEPTH TO WATER (ft): 21.90 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): _____ (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☐ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged ~~(gals)~~ L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0958	1	250	6.47	14.47	0.802	291	0.5	2.64	21.90
1003	1.25	250	6.46	14.49	0.803	18.2	-5.1	2.61	21.90
1008	2.5	250	6.39	14.45	0.802	7.69	-20.8	2.50	21.90
1013	3.75	250	6.40	14.51	0.802	1.46	-24.7	2.50	21.90
1018	5	250	6.43	14.51	0.803	2.10	-26.5	2.48	21.90
1023	6.25	250	6.44	14.50	0.803	2.50	-27.0	2.48	21.90

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ☐ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged ~~(gals)~~ L	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1025	6.75	6.44	14.50	0.803	2.50	-27.0	2.48		

Ferrous Iron (mg/L): —

FINAL DEPTH TO WATER (ft TOC): 21.90 TIME FINAL DEPTH TAKEN: 1033

SAMPLE ID: MW-2A(GW01 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III & IV

IDW TOTAL: 6.75 Water Quality Instrument Model Number: HI 98194

	NAME	SIGNATURE	DATE
PREPARED:	Chuck Bauenbusch	Chuck B	5/28/21
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: NEARMAN CREEK PID READING at WELL HEAD (ppm): –

PROJECT NUMBER: 88777 WEATHER: Cloudy, 60s, W wind 5-15

WELL NUMBER: MW-3

DEPTH TO WATER (ft): 24.61 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 4

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): _____ (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☒ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged ~~(gals)~~ L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0925	1	250	6.44	14.50	0.952	2.91	34.9	3.00	24.61
0930	1.25	250	6.44	14.54	0.957	2.77	46.1	2.91	24.61
0935	2.5	250	6.44	14.53	0.957	1.82	51.8	2.86	24.61
0940	3.75	250	6.43	14.54	0.956	1.93	53.6	2.84	24.61
0945	5	250	6.41	14.56	0.959	1.31	54.7	2.82	

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ☒ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged ~~(gals)~~ L	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0945	5	6.41	14.56	0.959	1.31	54.7	2.82	24.61	

Ferrous Iron (mg/L): –

FINAL DEPTH TO WATER (ft TOC): 24.61 TIME FINAL DEPTH TAKEN: 0954

SAMPLE ID: MW-3/GW01 SAMPLE ID FOR QC: –

PARAMETERS REQUESTED FOR ANALYSIS: APPENDIX III & IV

IDW TOTAL: 5 Water Quality Instrument Model Number: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chuck Balkenburgh	Chuck B	5/28/21
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: NEARMAN CREEK PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: CLOUDY, 60's, W WIND 5-15

WELL NUMBER: MW-4

DEPTH TO WATER (ft): 22.17 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 4

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): _____ (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☒ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged (~~gals~~) L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1512	1	250	6.37	14.25	0.763	5.81	-29.7	2.79	22.17
1517	1.25	250	6.26	14.22	0.762	4.60	-1.0	2.73	22.17
1522	2.5	250	6.23	14.23	0.761	1.65	23.2	2.72	22.17
1527	3.75	250	6.21	14.23	0.761	1.56	25.3	2.69	22.17
1532	5	250	6.22	14.25	0.759	1.42	27.8	2.66	22.17
1537	6.25	250	6.21	14.25	0.759	1.47	30.1	2.66	22.17

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ☒ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged (~~gals~~) L	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1540	7	6.21	14.25	0.759	1.47	30.1	2.66	22.17	—

Ferrous Iron (mg/L): —

FINAL DEPTH TO WATER (ft TOC): 22.17 TIME FINAL DEPTH TAKEN: 1549

SAMPLE ID: MW-4/GW01 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: APPENDIX III & IV

IDW TOTAL: 7 Water Quality Instrument Model Number: HI 98194

	NAME	SIGNATURE	DATE
PREPARED:	CHUCK BALKENBUSH	Chuck B	5/28/21
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: _____ PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: _____ WEATHER: _____

WELL NUMBER: MW-8A

DEPTH TO WATER (ft): 25.11 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): _____ (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☐ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged ~~(gals)~~ L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1133	1	~~250~~	6.46	15.97	1.344	71.8	-74.2	2.49	25.11
1138	1.25	250	6.46	15.98	1.343	30.0	-86.3	2.45	25.11
1143	2.5	250	6.46	16.01	1.361	7.17	-98.9	2.42	25.16
1148	3.75	250	6.46	16.05	1.332	5.16	-114.5	2.37	25.18
1153	~~5~~ 5.0	250	6.53	16.04	1.324	4.01	-118.7	2.37	25.18
1158	6.25	250	6.52	16.00	1.326	4.70	-119.0	2.37	25.18
1203	7.5	250	6.53	16.00	1.330	4.22	-119.1	2.37	25.18
1208	8.75	250	6.45	16.02	1.326	2.65	-120.2	2.37	25.18
1213	~~9~~ 10	250	6.45	16.01	1.328	2.91	-120.6	2.37	25.18
1218	11.25	250	6.46	16.01	1.325	2.57	-121.0	2.37	25.18
1223	12.5	250	6.47	16.01	1.325	2.10	-121.2	2.38	25.18

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ☒ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged ~~(gals)~~ L	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1225	13	6.47	16.01	1.325	2.10	-121.2	2.38	25.18	

Ferrous Iron (mg/L): _____

FINAL DEPTH TO WATER (ft TOC): 25.18 TIME FINAL DEPTH TAKEN: 1239

SAMPLE ID: MW-8A/GW01 SAMPLE ID FOR QC: DUP-1/GW01

PARAMETERS REQUESTED FOR ANALYSIS: APPENDIX ~~III~~ & IV

IDW TOTAL: 13 Water Quality Instrument Model Number: _____

	NAME	SIGNATURE	DATE
PREPARED:	CHUCK BAUERNFEIND	Chuck B	5/28/21
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: NEWMAN CREEK PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: CLOUDY, 60s, W WIND 5-15

WELL NUMBER: MW-16

DEPTH TO WATER (ft): 19.61 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): — (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☒ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged (gals) L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1037	I	250	6.40	14.49	1.065	719	-49.3	2.81	19.61
1042	1.25	250	6.12	14.45	1.072	38.8	-53.2	2.50	19.61
1047	2.5	250	6.16	14.49	1.074	9.19	-57.4	2.53	19.61
1052	3.75	250	6.29	14.41	1.077	6.76	-63.1	2.51	19.61
1057	5	250	6.32	14.37	1.078	4.91	-64.01	2.51	19.61
1102	6.25	250	6.36	14.38	1.077	3.45	-67.1	2.51	19.61
1107	7.5	250	6.36	14.37	1.078	2.86	-67.4	2.49	19.61

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ☐ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged (gals) L	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1110	8.25	6.36	14.37	1.078		-67.4	2.49	19.61	

Ferrous Iron (mg/L): —

FINAL DEPTH TO WATER (ft TOC): 19.61 TIME FINAL DEPTH TAKEN: 1118

SAMPLE ID: MW-16 (GW01) SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: APPENDIX III & IV

IDW TOTAL: 8.25 Water Quality Instrument Model Number: HI 98194

	NAME	SIGNATURE	DATE
PREPARED:	CHUCK BALKENBUSCH	Chuck B	5/28/21
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: NEARMAN CREEK PID READING at WELL HEAD (ppm): –

PROJECT NUMBER: 88777 WEATHER: CLOUDY, CO's, WINDY 5-15

WELL NUMBER: MW-13

DEPTH TO WATER (ft): 19.71 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): _____ (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☒ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged (~~gals~~) L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1302	1	250	6.10	14.48	0.883	172	-19.5	3.18	19.71
1307	1.25	250	6.16	14.43	0.872	148	-38.3	3.09	19.71
1312	2.5	250	6.18	14.40	0.868	98.7	-45.0	3.07	19.71
1319	3.75	250	6.25	14.25	0.851	6.16	-79.1	2.71	19.71
1322	5	250	6.26	14.30	0.848	28.1	-90.3	2.80	19.71
1327	6.25	250	6.26	14.24	0.842	14.3	-101.3	2.57	19.71
1332	7.5	250	6.29	14.23	0.842	8.2	-107.2	2.60	19.71
1337	8.25	250	6.29	14.23	0.842	4.81	-108.3	2.59	19.71
1342	9.5	250	6.30	14.21	0.841	4.16	-110.1	2.56	19.71
1347	10.25	250	6.31	14.22	0.841	3.88	-111.7	2.59	

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ☐ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged (~~gals~~) L	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1350	11	6.31	14.22	0.841	3.88	-111.7	2.59	19.71	

Ferrous Iron (mg/L): _____

FINAL DEPTH TO WATER (ft TOC): 19.71 TIME FINAL DEPTH TAKEN: 1400

SAMPLE ID: MW-13/GW01 SAMPLE ID FOR QC: –

PARAMETERS REQUESTED FOR ANALYSIS: APPENDIX III & IV

IDW TOTAL: 11 Water Quality Instrument Model Number: HI 98194

	NAME	SIGNATURE	DATE
PREPARED:	CHUCK BAUERNBUSCH	Chuck B	5/28/21
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: NEARMAN CREEK PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: Cloudy, 60s, W wind 5-15

WELL NUMBER: MW-14

DEPTH TO WATER (ft): 26.15 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): — (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☒ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged (~~gals~~) L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0717	1	250	6.20	15.11	1.412	13.8	102.7	3.30	26.15
0722	1.25	250	6.21	15.11	1.420	9.46	104.4	3.31	26.15
0727	2.5	250	6.20	15.10	1.419	4.81	106.2	3.29	26.15
0732	3.75	250	6.18	15.09	1.417	3.40	109.3	3.24	26.15
0737	5	250	6.19	15.08	1.419	2.15	114.9	3.26	26.15

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ☐ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged (~~gals~~)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0740	5.75	6.19	15.08	1.419	2.15	114.9	3.26	26.15	—

Ferrous Iron (mg/L): —

FINAL DEPTH TO WATER (ft TOC): 26.15 TIME FINAL DEPTH TAKEN: 0750

SAMPLE ID: MW-14/GW01 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: APPENDIX III & SELECT IV

IDW TOTAL: 5.75 Water Quality Instrument Model Number: HI 98194

	NAME	SIGNATURE	DATE
PREPARED:	CHUCK BAUERNFEIND	Chuck B	5/28/21
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: Nearman Creek PID READING at WELL HEAD (ppm): -

PROJECT NUMBER: 88777 WEATHER: Cloudy, 60s, W wind 5-15

WELL NUMBER: MW-15

DEPTH TO WATER (ft): 23.16 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): _____ (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☒ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged ~~(gals)~~ L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0804	1	250	6.74	8.57	0.701	12.4	-0.7	3.46	23.16
0809	1.25	250	6.84	8.27	0.710	9.79	-57.2	2.88	23.16
0814	2.5	250	6.84	8.21	0.715	4.62	-69.0	2.85	23.16
0819	3.25	250	6.80	8.20	0.717	4.55	-76.4	2.83	23.16
0824	4.5	25	6.81	8.17	0.720	4.22	-79.7	2.83	23.16
Continued on back (circle one) yes / no									

SAMPLING Equipment Used: ☐ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged ~~(gals)~~ L	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0825	4.75	6.81	8.17	0.720	4.22	-79.7	2.83	23.16	-

Ferrous Iron (mg/L): -

FINAL DEPTH TO WATER (ft TOC): 23.16 TIME FINAL DEPTH TAKEN: 0840

SAMPLE ID: MW-15/GW01 SAMPLE ID FOR QC: MW-15/GW01 MS/MSD

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III & IV

IDW TOTAL: 4.75 Water Quality Instrument Model Number: HI 98194

	NAME	SIGNATURE	DATE
PREPARED:	Conner Baldenhofer		5/28/21
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 5/28/21 SITE: NEARMAR PID READING at WELL HEAD (ppm): -

PROJECT NUMBER: 88777 WEATHER: Cloudy, 60s, W wind 5-15.

WELL NUMBER: MW-16

DEPTH TO WATER (ft): 22.17 TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

DEPTH TO TOP OF PUMP (ft): _____ DEPTH TO TOP OF YSI (ft): - (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: ☒ Dedicated Bladder Pump ☐ Nondedicated Bladder Pump ☐ Bailer ☐ Other _____

Time (24 hr)	Amount Purged ~~(gals)~~ L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1416	1	250	6.24	14.47	1.058	94.9	-102.5	2.74	22.17
1421	1.25	250	6.16	14.48	1.047	57.5	-101.8	2.65	22.17
1426	2.5	250	6.14	14.47	1.044	17.5	-101.9	2.62	22.17
1431	3.75	250	6.13	14.43	1.036	6.3	-104.0	2.58	22.17
1436	5	250	6.14	14.46	1.035	4.4	-105.2	2.56	22.17
1441	6.25	250	6.17	14.47	1.032	3.8	-108.9	2.51	22.17
1446	7.5	250	6.19	14.49	1.025		-110.1	2.50	22.17

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ☐ Same as above ☐ Other _____

Sample Time (24 hr)	Total Purged ~~(gals)~~ L	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1456	8.5	6.19	14.49	1.025		-110.1	2.50	22.17	

Ferrous Iron (mg/L): -

FINAL DEPTH TO WATER (ft TOC): 22.17 TIME FINAL DEPTH TAKEN: 1459

SAMPLE ID: MW-16/GW01 SAMPLE ID FOR QC: ←

PARAMETERS REQUESTED FOR ANALYSIS: APPENDIX III & IV

IDW TOTAL: _____ Water Quality Instrument Model Number: _____

	NAME	SIGNATURE	DATE
PREPARED:	CHUCK BAUERNFEIND	Chuck B	5/28/21
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/5/21 SITE: KCBPW Newman PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Clear, sunny, 60's, calm

WELL NUMBER: MW-2A DEPTH TO WATER (ft): 23.37

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0935	I	350	6.57	16.59	0.942	207	-5.3	3.49	23.37
0940	0.4	300	6.65	16.19	0.972	11.5	-17.1	0.42	23.37
0945	0.8	300	6.61	16.19	0.971	2.48	-25.1	0.38	23.37
0950	1.2	300	6.61	16.17	0.968	1.02	-32.2	0.38	23.37
0955	1.6	300	6.61	16.19	0.965	0.68	-36.8	0.39	23.37

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1005	1.6	6.61	16.19	0.965	0.68	-36.8	0.39	23.37	Clear

FINAL DEPTH TO WATER (ft TOC): 23.36 TIME FINAL DEPTH TAKEN: 1010

SAMPLE ID: MW-2A/6W02 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: Appx III + ~~sA's~~ Select Appx IV

IDW TOTAL: 1.6 FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ HANNA HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Hegland		10/5/21
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/5/21 SITE: KCBPU Newman PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Clear, sunny, 60's

WELL NUMBER: MW-3 DEPTH TO WATER (ft): 25.63

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 4"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1040	1	450	6.57	16.66	1.029	0.80	41.4	0.62	25.73
1045	0.46	350	6.31	16.53	1.029	0.44	52.6	0.60	25.73
1050	0.86	300	6.21	16.52	1.029	0.51	55.8	0.55	25.73
1055	1.26	300	6.22	16.55	1.027	0.59	54.1	0.45	25.73
1100	1.66	300	6.23	16.57	1.026	0.51	52.6	0.38	25.73
1105	2.06	300	6.25	16.60	1.024	0.39	50.1	0.33	25.73

Continued on back (circle one) yes / (no)

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1115	2.06	6.25	16.60	1.024	0.39	50.1	0.33	25.73	Clear

FINAL DEPTH TO WATER (ft TOC): 25.63 TIME FINAL DEPTH TAKEN: 1120

SAMPLE ID: MW-3/GW02 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: Aepx III + select Aepx IV

IDW TOTAL: 2.06 FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ Hanna HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Haglund		10/5/21
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/5/21 SITE: KCBPU Newman PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Partly Cloudy, 70's, calm

WELL NUMBER: MW-4 DEPTH TO WATER (ft): 22.17

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 4"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1146	I	350	7.17	19.05	0.803	1.37	54.1	5.56	22.18
1151	0.46	350	6.31	16.32	0.858	0.83	84.4	1.61	22.18
1156	0.92	350	6.27	16.21	0.855	0.70	84.8	1.69	22.18
1201	1.38	350	6.31	16.20	0.851	0.59	81.9	1.95	22.18
1206	1.84	350	6.35	16.17	0.848	0.46	79.5	1.87	22.18
	Recalibrate DO + values jumping around								
1226	1.84	350	6.20	16.61	0.852	0.59	71.4	1.65	22.18
1231	2.30	350	6.20	16.25	0.851	0.33	76.1	1.74	22.18
1236	2.76	350	6.26	16.10	0.849	0.27	75.6	1.57	22.18
1241	3.22	350	6.32	16.17	0.846	0.31	74.6	1.40	22.18
1246	3.68	350	6.35	16.16	0.845	0.17	74.7	1.36	22.18
1251	4.14	350	6.38	16.28	0.841	0.26	74.1	1.30	22.18

Continued on back (circle one) yes / (no)

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1315	4.14	6.38	16.28	0.841	0.26	~~74~~ 74.1	1.30	22.18	Clear

FINAL DEPTH TO WATER (ft TOC): 22.14 TIME FINAL DEPTH TAKEN: 1318

SAMPLE ID: MW-4/GW02 SAMPLE ID FOR QC: DUP-1/GW02

PARAMETERS REQUESTED FOR ANALYSIS: Appx III + select Appx IV

IDW TOTAL: 4.14 FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ Hanna HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Hoglund		10/5/21
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/6/2021 SITE: KCBPW Newman PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: _____

WELL NUMBER: MW-8A DEPTH TO WATER (ft): 26.44

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0852	I	400	6.54	17.87	1.420	405	-9.4	2.42	26.94
0857	0.4	300	6.16	17.19	1.442	45.3	-33.0	0.37	27.00
0902	0.8	300	6.22	17.17	1.444	21.2	-53.1	0.32	27.00
0907	1.2	300	6.32	17.15	1.443	9.59	-66.8	0.29	27.00
0912	1.6	300	6.37	17.15	1.443	5.66	-74.4	0.27	27.00
0917	2.0	300	6.41	17.15	1.442	4.37	-81.4	0.27	27.00
0922	2.4	300	6.45	17.15	1.441	3.16	-87.1	0.27	27.00
0927	2.8	300	6.47	17.16	1.439	2.84	-91.3	0.29	27.00
0932	3.2	300	6.49	17.15	1.438	2.49	-94.1	0.30	27.00

Continued on back (circle one) yes / (no)

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0940	3.2	6.49	17.15	1.438	2.49	-94.1	0.30	27.00	Clear

FINAL DEPTH TO WATER (ft TOC): 26.47 TIME FINAL DEPTH TAKEN: 0949

SAMPLE ID: MW-8A /GW02 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: Appx III + select Appx IV

IDW TOTAL: 3.2 FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ Hanna HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Hoglund		10/6/2021
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/5/21 SITE: ICCBPW Newman PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 8877 WEATHER: Clear, Sunny, 50's-60's, Calm

WELL NUMBER: MW-10 DEPTH TO WATER (ft): 21.41

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0830	1	500	6.08	16.41	1.158	388	80.4	0.64	21.45
0835	0.36	275	6.07	16.40	1.159	165	44.5	0.52	21.42
0840	0.72	275	6.18	16.39	1.157	14.8	16.3	0.47	21.42
0845	1.08	275	6.27	16.38	1.157	8.83	1.7	0.44	21.42
0900	1.44	275	6.34	16.39	1.155	5.38	-10.2	0.43	21.42
0905	1.80	275	6.39	16.39	1.154	3.82	-19.2	0.46	21.42
0910	2.16	275	6.42	16.38	1.153	4.42	-25.1	0.48	21.42

Continued on back (circle one) yes / (no)

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
910	2.16	6.42	16.38	1.153	4.42	-25.1	0.48	21.42	Clear

FINAL DEPTH TO WATER (ft TOC): 21.39 TIME FINAL DEPTH TAKEN: 0916

SAMPLE ID: MW-10/GW02 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: Appx III + ~~Ap~~ select Appx IV

IDW TOTAL: 2.16 FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ Hanna HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Hoglund		10/5/21
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/4/2021 SITE: KCBPW Neerman PID READING at WELL HEAD (ppm): N/A

PROJECT NUMBER: 88777 WEATHER: Clear, Sunny

WELL NUMBER: MW-13 DEPTH TO WATER (ft): 21.40

TOTAL DEPTH (ft): ~~24.46~~ WELL DIAMETER (inches): 2"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump ~~Bladder~~ System Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1408	I	125	6.29	18.87	0.864	53.1	-54.5	0.78	21.36
1421	3.38	250	6.53	17.05	0.840	18.5	-80.7	0.55	21.76
1426	3.64	250	6.61	17.04	0.835	14.8	-88.3	0.52	21.36
1431	3.90	250	6.65	16.94	0.831	11.9	-93.1	0.53	21.76
1436	4.16	250	6.70	16.97	0.826	11.3	-97.4	0.52	21.36
1441	4.42	250	6.76	16.92	0.814	10.6	-101.3	0.54	21.36
1446	4.68	250	6.79	16.96	0.811	9.83	-103.0	0.56	21.36
1451	4.94	250	6.82	16.84	0.807	9.89	-104.7	0.52	21.36
1456	5.20	250	6.84	16.92	0.802	9.79	-106.6	0.56	21.36
1501	5.46	250	6.87	16.95	0.793	9.61	-109.0	0.51	21.36
1506	5.72	250	6.89	16.89	0.785	8.70	-110.4	0.48	21.36
1511	5.98	250	6.89	16.83	0.782	7.84	-110.7	0.49	21.36
1516	6.24	250	6.90	16.91	0.778	6.93	-112.0	0.47	21.36
1521	6.50	250	6.92	16.90	0.773	6.16	-113.3	0.48	21.36

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1555	7.54	6.95	16.81	0.747	4.47	-116.2	0.49	21.36	Clear

FINAL DEPTH TO WATER (ft TOC): 21.40 TIME FINAL DEPTH TAKEN: 1610

SAMPLE ID: MW-13/GW02 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: Metals, Cl⁻, Fl, sulfate, TDS, pH, Radium 226

IDW TOTAL: 7.54 Gal FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ Hanna HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Hoglund		10/4/2021
REVIEWED:			

WELL NUMBER

MW-13

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1526	6.76	250	6.93	16.85	0.761	5.79	-114.2	0.47	21.36
1531	7.02	250	6.94	16.92	0.761	5.35	-115.1	0.46	21.36
1536	7.28	250	6.96	16.75	0.751	5.09	-115.8	0.48	21.36
1541	7.54	250	6.95	16.81	0.747	4.47	-116.2	0.49	21.36

COMMENTS

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/6/21 SITE: KCBPA Newman PID READING at WELL HEAD (ppm): N/A

PROJECT NUMBER: 88277 WEATHER: Overcast, 60's

WELL NUMBER: MW-14 DEPTH TO WATER (ft): 26.54

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1022	I	300	6.61	17.58	1.412	1.65	4.7	1.55	26.59
1027	0.4	300	6.16	16.97	1.400	0.67	27.2	0.43	26.59
1032	0.8	300	6.10	16.91	1.400	0.45	32.6	0.44	26.59
1037	1.2	300	6.12	16.89	1.400	0.32	34.2	0.51	26.59
1042	1.6	300	6.14	16.90	1.400	0.24	35.3	0.43	26.59
1047	2.0	300	6.16	16.89	1.400	0.24	37.3	0.37	26.59
1052	2.4	300	6.17	16.86	1.400	0.24	39.5	0.34	26.59
1057	2.8	300	6.19	16.87	1.401	0.32	41.5	0.32	26.59
1102	3.2	300	6.19	16.87	1.400	0.30	43.0	0.31	26.59
1107	3.6	300	6.21	16.84	1.400	0.31	44.9	0.29	26.59
1112	4.0	300	6.22	16.86	1.399	0.22	47.1	0.28	26.59
1117	4.4	300	6.22	16.87	1.397	0.22	47.4	0.28	26.59
1122	4.8	300	6.22	16.90	1.396	0.22	48.2	0.28	26.59

Continued on back (circle one) yes / (no)

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1135	4.8	6.22	16.90	1.396	0.22	48.2	0.28	26.59	Clear

FINAL DEPTH TO WATER (ft TOC): 26.54 TIME FINAL DEPTH TAKEN: 1144

SAMPLE ID: MW-14/GW02 SAMPLE ID FOR QC: N/A

PARAMETERS REQUESTED FOR ANALYSIS: Appx III + select Appx IV

IDW TOTAL: 4.8 FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ Hanna HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Hoglund	C Hoglund	10/6/2021
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/5/21 SITE: KCBPW Newman PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 08777 WEATHER: Partly Cloudy - Overcast, 70's

WELL NUMBER: MW-15 DEPTH TO WATER (ft): 25.99

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1424	I	300	7.71	20.18	0.781	1.59	44.3	6.68	25.99
1429	0.40	300	6.78	20.23	0.782	29.9	-7.9	0.54	25.99
1434	0.80	300	6.75	20.16	0.781	73.2	-38.3	0.36	25.99
1439	1.20	300	6.79	20.13	0.780	56.5	-51.8	0.30	25.99
1444	1.60	300	6.83	20.09	0.781	50.0	-56.5	0.29	25.99
1449	2.00	300	6.87	20.00	0.781	5.83	-63.6	0.32	25.99
1454	2.40	300	6.89	20.00	0.782	6.40	-70.6	0.30	25.99
1459 ~~1509~~	2.80	300	6.92	19.96	0.781	5.08	-75.7	0.30	25.99
1504	3.20	300	6.95	20.00	0.780	3.81	-79.8	0.29	25.99

Continued on back (circle one) yes (no)

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1535	3.2	6.95	20.00	0.780	3.81	-79.8	0.29	25.99	Clear

FINAL DEPTH TO WATER (ft TOC): 25.99 TIME FINAL DEPTH TAKEN: 1540

SAMPLE ID: MW-15 / GW02 SAMPLE ID FOR QC: MS + MSD

PARAMETERS REQUESTED FOR ANALYSIS: Appx. III + select Appx IV

IDW TOTAL: 3.20 FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ Hanna HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Hoglund		10/5/21
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10/4/21 SITE: _____ PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: _____

WELL NUMBER: MW-16 DEPTH TO WATER (ft): 22.74

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1628	I	500	6.70	16.80	1.084	127	-43.0	0.61	22.74
1633	0.43	325	6.67	16.68	1.084	40.2	-55.3	0.53	22.73
1638	0.86	325	6.74	16.54	1.082	23.2	-68.5	0.54	22.73
1643	1.29	325	6.83	16.57	1.079	15.1	-81.9	0.60	22.73
1648	1.72	325	6.88	16.45	1.076	7.38	-88.9	0.56	22.73
1653	2.15	325	6.92	16.48	1.072	5.58	-93.9	0.51	22.73
1658	2.58	325	6.95	16.49	1.066	4.44	-97.9	0.47	22.73
Continued on back (circle one) yes / no									

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1720	2.58	6.95	16.49	1.066	4.44	-97.9	0.47	22.73	Clear

FINAL DEPTH TO WATER (ft TOC): 22.74 TIME FINAL DEPTH TAKEN: 1723

SAMPLE ID: MW-16/GW02 SAMPLE ID FOR QC: NA

PARAMETERS REQUESTED FOR ANALYSIS: Apex III + select Apex IV

IDW TOTAL: 2.58 FLOW THROUGH CELL MAKE AND MODEL: ~~YSI 556 MPS~~ Hanna HI 98194

COMMENTS: _____

	NAME	SIGNATURE	DATE
PREPARED:	Chris Haglund		10/4/21
REVIEWED:			

APPENDIX C – ANALYTICAL REPORTS AND DATA VALIDATION

ANALYTICAL REPORT

June 17, 2021

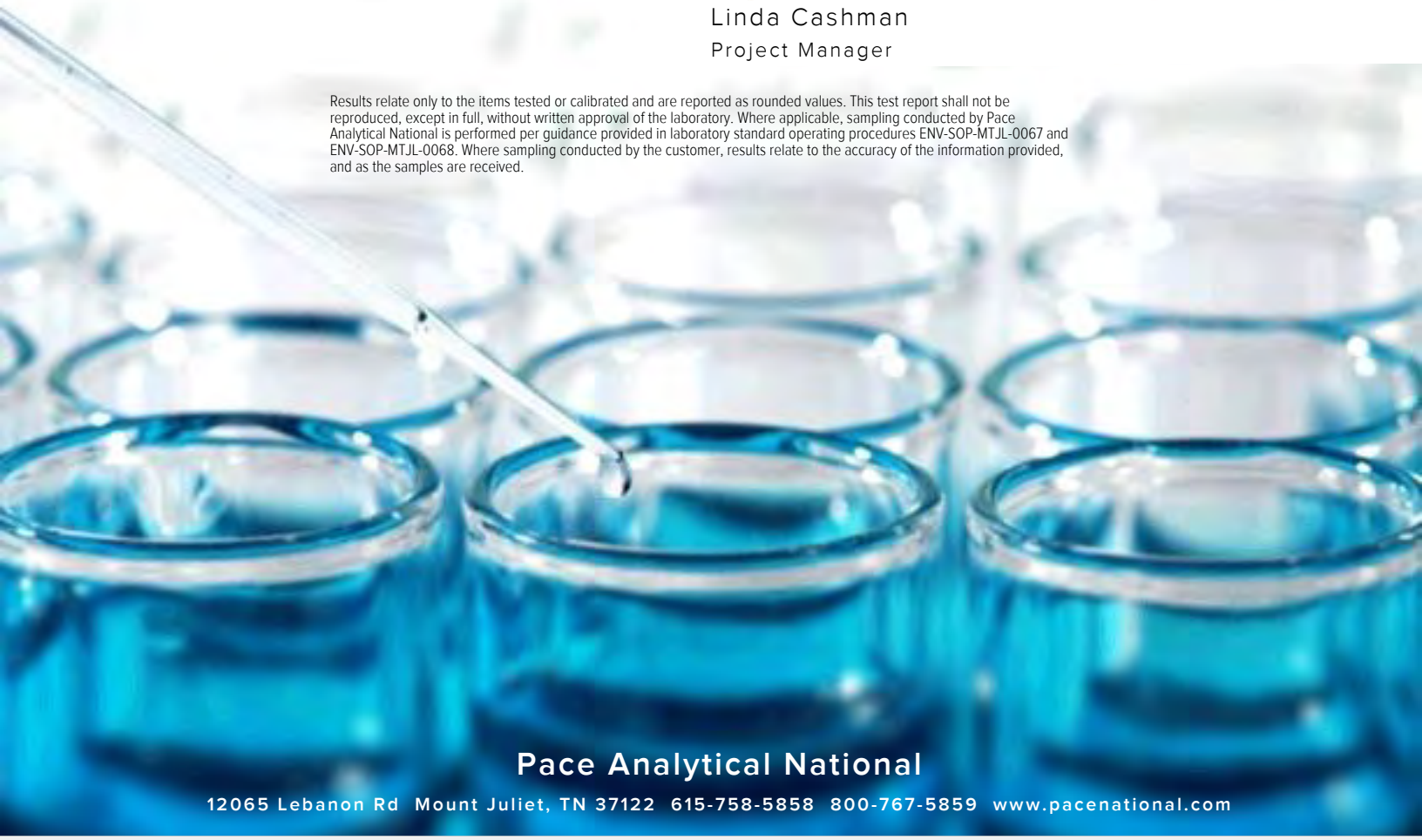
Kansas City Board of Public Utilities

Sample Delivery Group:	L1359630
Samples Received:	05/29/2021
Project Number:	KCBPU Nearman
Description:	GW-Creek Bottom Ash Pond

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

MW-2A L1359630-01 GW

Collected by	Collected date/time	Received date/time
CB	05/28/21 10:25	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682473	1	06/03/21 17:10	06/03/21 20:08	VRP	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680109	1	05/31/21 14:05	05/31/21 14:05	BJD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/10/21 21:37	06/10/21 21:37	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:33	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:27	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:24	JPD	Mt. Juliet, TN

MW-3 L1359630-02 GW

Collected by	Collected date/time	Received date/time
CB	05/28/21 09:45	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682176	1	06/03/21 14:03	06/03/21 15:15	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680109	1	05/31/21 14:05	05/31/21 14:05	BJD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/10/21 22:10	06/10/21 22:10	GB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	5	06/12/21 01:32	06/12/21 01:32	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:35	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:30	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:28	JPD	Mt. Juliet, TN

MW-4 L1359630-03 GW

Collected by	Collected date/time	Received date/time
CB	05/28/21 15:40	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682176	1	06/03/21 14:03	06/03/21 15:15	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680109	1	05/31/21 14:05	05/31/21 14:05	BJD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/10/21 22:43	06/10/21 22:43	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:37	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:33	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:31	JPD	Mt. Juliet, TN

MW-8A L1359630-04 GW

Collected by	Collected date/time	Received date/time
CB	05/28/21 12:25	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682176	1	06/03/21 14:03	06/03/21 15:15	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680558	1	06/01/21 12:25	06/01/21 12:25	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/10/21 22:59	06/10/21 22:59	GB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	5	06/10/21 23:49	06/10/21 23:49	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:39	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:35	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:34	JPD	Mt. Juliet, TN

MW-10 L1359630-05 GW

Collected by	Collected date/time	Received date/time
CB	05/28/21 11:10	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682176	1	06/03/21 14:03	06/03/21 15:15	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680558	1	06/01/21 12:25	06/01/21 12:25	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/11/21 00:05	06/11/21 00:05	GB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	5	06/11/21 00:22	06/11/21 00:22	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:41	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:38	CCE	Mt. Juliet, TN

MW-10 L1359630-05 GW

Collected by: CB | Collected date/time: 05/28/21 11:10 | Received date/time: 05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:47	LD	Mt. Juliet, TN

MW-13 L1359630-06 GW

Collected by: CB | Collected date/time: 05/28/21 13:50 | Received date/time: 05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682176	1	06/03/21 14:03	06/03/21 15:15	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680558	1	06/01/21 12:25	06/01/21 12:25	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/11/21 00:38	06/11/21 00:38	GB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	5	06/11/21 00:54	06/11/21 00:54	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:47	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:41	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:50	LD	Mt. Juliet, TN

MW-14 L1359630-07 GW

Collected by: CB | Collected date/time: 05/28/21 07:40 | Received date/time: 05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682473	1	06/03/21 17:10	06/03/21 20:08	VRP	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680558	1	06/01/21 12:25	06/01/21 12:25	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/11/21 01:11	06/11/21 01:11	GB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	5	06/11/21 01:27	06/11/21 01:27	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:49	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:43	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:54	LD	Mt. Juliet, TN

MW-15 L1359630-08 GW

Collected by: CB | Collected date/time: 05/28/21 08:25 | Received date/time: 05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682176	1	06/03/21 14:03	06/03/21 15:15	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680558	1	06/01/21 12:25	06/01/21 12:25	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/11/21 01:44	06/11/21 01:44	GB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	5	06/11/21 03:06	06/11/21 03:06	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:23	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/15/21 23:53	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:11	JPD	Mt. Juliet, TN

MW-16 L1359630-09 GW

Collected by: CB | Collected date/time: 05/28/21 14:50 | Received date/time: 05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682176	1	06/03/21 14:03	06/03/21 15:15	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680558	1	06/01/21 12:25	06/01/21 12:25	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/11/21 03:22	06/11/21 03:22	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:51	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:51	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 21:57	LD	Mt. Juliet, TN

DUP-1 L1359630-10 GW

Collected by	Collected date/time	Received date/time
CB	05/28/21 00:00	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1682176	1	06/03/21 14:03	06/03/21 15:15	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1680558	1	06/01/21 12:25	06/01/21 12:25	ARM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	1	06/11/21 03:55	06/11/21 03:55	GB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1686450	5	06/11/21 04:11	06/11/21 04:11	GB	Mt. Juliet, TN
Mercury by Method 7470A	WG1682589	1	06/04/21 09:54	06/06/21 02:53	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1688502	1	06/14/21 22:39	06/16/21 00:54	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1688534	1	06/16/21 16:33	06/16/21 22:00	LD	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Linda Cashman
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	512		10.0	1	06/03/2021 20:08	WG1682473

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.13	T8	1	05/31/2021 14:05	WG1680109

Sample Narrative:

L1359630-01 WG1680109: 7.13 at 20.9C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.7		1.00	1	06/10/2021 21:37	WG1686450
Fluoride	0.258		0.150	1	06/10/2021 21:37	WG1686450
Sulfate	72.7		5.00	1	06/10/2021 21:37	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:33	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.130		0.00500	1	06/16/2021 00:27	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:27	WG1688502
Boron	ND		0.200	1	06/16/2021 00:27	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:27	WG1688502
Calcium	144		1.00	1	06/16/2021 00:27	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:27	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:27	WG1688502
Lithium	0.0222		0.0150	1	06/16/2021 00:27	WG1688502
Molybdenum	ND		0.00500	1	06/16/2021 00:27	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:24	WG1688534
Arsenic	ND		0.00200	1	06/16/2021 21:24	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:24	WG1688534
Selenium	ND		0.00200	1	06/16/2021 21:24	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:24	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	621		13.3	1	06/03/2021 15:15	WG1682176

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.10	T8	1	05/31/2021 14:05	WG1680109

Sample Narrative:

L1359630-02 WG1680109: 7.1 at 20.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	6.80		1.00	1	06/10/2021 22:10	WG1686450
Fluoride	0.220		0.150	1	06/10/2021 22:10	WG1686450
Sulfate	104		25.0	5	06/12/2021 01:32	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:35	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.138		0.00500	1	06/16/2021 00:30	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:30	WG1688502
Boron	ND		0.200	1	06/16/2021 00:30	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:30	WG1688502
Calcium	170		1.00	1	06/16/2021 00:30	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:30	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:30	WG1688502
Lithium	0.0380		0.0150	1	06/16/2021 00:30	WG1688502
Molybdenum	ND		0.00500	1	06/16/2021 00:30	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:28	WG1688534
Arsenic	ND		0.00200	1	06/16/2021 21:28	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:28	WG1688534
Selenium	0.00207	B	0.00200	1	06/16/2021 21:28	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:28	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	483		10.0	1	06/03/2021 15:15	WG1682176

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.92	T8	1	05/31/2021 14:05	WG1680109

Sample Narrative:

L1359630-03 WG1680109: 6.92 at 20.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.3		1.00	1	06/10/2021 22:43	WG1686450
Fluoride	0.211		0.150	1	06/10/2021 22:43	WG1686450
Sulfate	71.4		5.00	1	06/10/2021 22:43	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:37	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0883		0.00500	1	06/16/2021 00:33	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:33	WG1688502
Boron	ND		0.200	1	06/16/2021 00:33	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:33	WG1688502
Calcium	131		1.00	1	06/16/2021 00:33	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:33	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:33	WG1688502
Lithium	0.0250		0.0150	1	06/16/2021 00:33	WG1688502
Molybdenum	ND		0.00500	1	06/16/2021 00:33	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:31	WG1688534
Arsenic	ND		0.00200	1	06/16/2021 21:31	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:31	WG1688534
Selenium	ND		0.00200	1	06/16/2021 21:31	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:31	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	942		20.0	1	06/03/2021 15:15	WG1682176

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.26	T8	1	06/01/2021 12:25	WG1680558

Sample Narrative:

L1359630-04 WG1680558: 7.26 at 22C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	24.7		1.00	1	06/10/2021 22:59	WG1686450
Fluoride	0.376		0.150	1	06/10/2021 22:59	WG1686450
Sulfate	378		25.0	5	06/10/2021 23:49	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:39	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.174		0.00500	1	06/16/2021 00:35	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:35	WG1688502
Boron	2.51		0.200	1	06/16/2021 00:35	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:35	WG1688502
Calcium	151		1.00	1	06/16/2021 00:35	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:35	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:35	WG1688502
Lithium	0.0201		0.0150	1	06/16/2021 00:35	WG1688502
Molybdenum	0.00861		0.00500	1	06/16/2021 00:35	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:34	WG1688534
Arsenic	0.0241		0.00200	1	06/16/2021 21:34	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:34	WG1688534
Selenium	ND		0.00200	1	06/16/2021 21:34	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:34	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	707		13.3	1	06/03/2021 15:15	WG1682176

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.19	T8	1	06/01/2021 12:25	WG1680558

Sample Narrative:

L1359630-05 WG1680558: 7.19 at 22C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	10.6		1.00	1	06/11/2021 00:05	WG1686450
Fluoride	0.197		0.150	1	06/11/2021 00:05	WG1686450
Sulfate	128		25.0	5	06/11/2021 00:22	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:41	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.121		0.00500	1	06/16/2021 00:38	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:38	WG1688502
Boron	0.890		0.200	1	06/16/2021 00:38	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:38	WG1688502
Calcium	175		1.00	1	06/16/2021 00:38	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:38	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:38	WG1688502
Lithium	0.0365		0.0150	1	06/16/2021 00:38	WG1688502
Molybdenum	ND		0.00500	1	06/16/2021 00:38	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:47	WG1688534
Arsenic	0.00763		0.00200	1	06/16/2021 21:47	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:47	WG1688534
Selenium	ND		0.00200	1	06/16/2021 21:47	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:47	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	542		10.0	1	06/03/2021 15:15	WG1682176

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.18	T8	1	06/01/2021 12:25	WG1680558

Sample Narrative:

L1359630-06 WG1680558: 7.18 at 21.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	16.7		1.00	1	06/11/2021 00:38	WG1686450
Fluoride	0.305		0.150	1	06/11/2021 00:38	WG1686450
Sulfate	143		25.0	5	06/11/2021 00:54	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:47	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.235		0.00500	1	06/16/2021 00:41	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:41	WG1688502
Boron	ND		0.200	1	06/16/2021 00:41	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:41	WG1688502
Calcium	114		1.00	1	06/16/2021 00:41	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:41	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:41	WG1688502
Lithium	0.0314		0.0150	1	06/16/2021 00:41	WG1688502
Molybdenum	ND		0.00500	1	06/16/2021 00:41	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:50	WG1688534
Arsenic	0.0195		0.00200	1	06/16/2021 21:50	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:50	WG1688534
Selenium	ND		0.00200	1	06/16/2021 21:50	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:50	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	984		20.0	1	06/03/2021 20:08	WG1682473

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.84	T8	1	06/01/2021 12:25	WG1680558

Sample Narrative:

L1359630-07 WG1680558: 6.84 at 21.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	16.7		1.00	1	06/11/2021 01:11	WG1686450
Fluoride	0.186		0.150	1	06/11/2021 01:11	WG1686450
Sulfate	244		25.0	5	06/11/2021 01:27	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:49	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.139		0.00500	1	06/16/2021 00:43	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:43	WG1688502
Boron	ND		0.200	1	06/16/2021 00:43	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:43	WG1688502
Calcium	245		1.00	1	06/16/2021 00:43	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:43	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:43	WG1688502
Lithium	0.0315		0.0150	1	06/16/2021 00:43	WG1688502
Molybdenum	ND		0.00500	1	06/16/2021 00:43	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:54	WG1688534
Arsenic	ND		0.00200	1	06/16/2021 21:54	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:54	WG1688534
Selenium	0.0547		0.00200	1	06/16/2021 21:54	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:54	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	481		10.0	1	06/03/2021 15:15	WG1682176

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.79	T8	1	06/01/2021 12:25	WG1680558

Sample Narrative:

L1359630-08 WG1680558: 7.79 at 22C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	21.6		1.00	1	06/11/2021 01:44	WG1686450
Fluoride	0.292		0.150	1	06/11/2021 01:44	WG1686450
Sulfate	170		25.0	5	06/11/2021 03:06	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:23	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0811	O1	0.00500	1	06/15/2021 23:53	WG1688502
Beryllium	ND		0.00200	1	06/15/2021 23:53	WG1688502
Boron	ND		0.200	1	06/15/2021 23:53	WG1688502
Cadmium	ND		0.00200	1	06/15/2021 23:53	WG1688502
Calcium	74.7	O1	1.00	1	06/15/2021 23:53	WG1688502
Chromium	ND		0.0100	1	06/15/2021 23:53	WG1688502
Cobalt	ND		0.0100	1	06/15/2021 23:53	WG1688502
Lithium	0.0408		0.0150	1	06/15/2021 23:53	WG1688502
Molybdenum	ND		0.00500	1	06/15/2021 23:53	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:11	WG1688534
Arsenic	0.00314		0.00200	1	06/16/2021 21:11	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:11	WG1688534
Selenium	ND		0.00200	1	06/16/2021 21:11	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:11	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	644		13.3	1	06/03/2021 15:15	WG1682176

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.97	T8	1	06/01/2021 12:25	WG1680558

Sample Narrative:

L1359630-09 WG1680558: 6.97 at 22C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	4.76		1.00	1	06/11/2021 03:22	WG1686450
Fluoride	0.150		0.150	1	06/11/2021 03:22	WG1686450
Sulfate	87.4		5.00	1	06/11/2021 03:22	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:51	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.200		0.00500	1	06/16/2021 00:51	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:51	WG1688502
Boron	ND		0.200	1	06/16/2021 00:51	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:51	WG1688502
Calcium	178		1.00	1	06/16/2021 00:51	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:51	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:51	WG1688502
Lithium	0.0477		0.0150	1	06/16/2021 00:51	WG1688502
Molybdenum	ND		0.00500	1	06/16/2021 00:51	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 21:57	WG1688534
Arsenic	0.0253		0.00200	1	06/16/2021 21:57	WG1688534
Lead	ND		0.00200	1	06/16/2021 21:57	WG1688534
Selenium	ND		0.00200	1	06/16/2021 21:57	WG1688534
Thallium	ND		0.00200	1	06/16/2021 21:57	WG1688534

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	944		20.0	1	06/03/2021 15:15	WG1682176

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.13	T8	1	06/01/2021 12:25	WG1680558

Sample Narrative:

L1359630-10 WG1680558: 7.13 at 22.1C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	24.7		1.00	1	06/11/2021 03:55	WG1686450
Fluoride	0.379		0.150	1	06/11/2021 03:55	WG1686450
Sulfate	381		25.0	5	06/11/2021 04:11	WG1686450

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/06/2021 02:53	WG1682589

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.175		0.00500	1	06/16/2021 00:54	WG1688502
Beryllium	ND		0.00200	1	06/16/2021 00:54	WG1688502
Boron	2.52		0.200	1	06/16/2021 00:54	WG1688502
Cadmium	ND		0.00200	1	06/16/2021 00:54	WG1688502
Calcium	152		1.00	1	06/16/2021 00:54	WG1688502
Chromium	ND		0.0100	1	06/16/2021 00:54	WG1688502
Cobalt	ND		0.0100	1	06/16/2021 00:54	WG1688502
Lithium	0.0204		0.0150	1	06/16/2021 00:54	WG1688502
Molybdenum	0.00771		0.00500	1	06/16/2021 00:54	WG1688502

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/16/2021 22:00	WG1688534
Arsenic	0.0250		0.00200	1	06/16/2021 22:00	WG1688534
Lead	ND		0.00200	1	06/16/2021 22:00	WG1688534
Selenium	ND		0.00200	1	06/16/2021 22:00	WG1688534
Thallium	ND		0.00200	1	06/16/2021 22:00	WG1688534

Method Blank (MB)

(MB) R3663570-1 06/03/21 15:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1359630-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1359630-04 06/03/21 15:15 • (DUP) R3663570-3 06/03/21 15:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	942	940	1	0.213		5

L1359630-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1359630-10 06/03/21 15:15 • (DUP) R3663570-4 06/03/21 15:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	944	934	1	1.06		5

Laboratory Control Sample (LCS)

(LCS) R3663570-2 06/03/21 15:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8660	98.4	77.4-123	

Method Blank (MB)

(MB) R3663575-1 06/03/21 20:08

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1359296-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1359296-05 06/03/21 20:08 • (DUP) R3663575-3 06/03/21 20:08

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	179	174	1	2.83		5

L1359630-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1359630-07 06/03/21 20:08 • (DUP) R3663575-4 06/03/21 20:08

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	984	974	1	1.02		5

Laboratory Control Sample (LCS)

(LCS) R3663575-2 06/03/21 20:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8450	96.0	77.4-123	

L1358802-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1358802-02 05/31/21 14:05 • (DUP) R3661340-2 05/31/21 14:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.64	7.67	1	0.392		1

Sample Narrative:

OS: 7.64 at 20.6C

DUP: 7.67 at 20.9C

L1359143-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1359143-05 05/31/21 14:05 • (DUP) R3661340-3 05/31/21 14:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.75	6.76	1	0.148		1

Sample Narrative:

OS: 6.75 at 21.1C

DUP: 6.76 at 21.1C

Laboratory Control Sample (LCS)

(LCS) R3661340-1 05/31/21 14:05

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.04 at 21C

L1359630-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1359630-08 06/01/21 12:25 • (DUP) R3661597-2 06/01/21 12:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.79	7.78	1	0.128		1

Sample Narrative:

OS: 7.79 at 22C

DUP: 7.78 at 22C

L1359696-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1359696-06 06/01/21 12:25 • (DUP) R3661597-3 06/01/21 12:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.76	8.78	1	0.228		1

Sample Narrative:

OS: 8.76 at 22.3C

DUP: 8.78 at 22.2C

Laboratory Control Sample (LCS)

(LCS) R3661597-1 06/01/21 12:25

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.08 at 21.7C

Method Blank (MB)

(MB) R3666381-1 06/10/21 18:55

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1359630-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1359630-02 06/10/21 22:10 • (DUP) R3666381-3 06/10/21 22:27

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	6.80	6.79	1	0.144		15
Fluoride	0.220	0.224	1	1.84		15

L1359696-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1359696-03 06/11/21 05:01 • (DUP) R3666381-6 06/11/21 05:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	62.0	62.0	1	0.105		15
Fluoride	ND	ND	1	19.6	P1	15
Sulfate	ND	ND	1	0.214		15

L1359630-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1359630-02 06/12/21 01:32 • (DUP) R3666381-8 06/12/21 01:48

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	104	104	5	0.254		15

Laboratory Control Sample (LCS)

(LCS) R3666381-2 06/10/21 19:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	40.3	101	80.0-120	
Fluoride	8.00	8.18	102	80.0-120	
Sulfate	40.0	40.7	102	80.0-120	

L1359630-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1359630-08 06/11/21 01:44 • (MS) R3666381-4 06/11/21 02:00 • (MSD) R3666381-5 06/11/21 02:16

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	21.6	71.1	72.1	98.9	101	1	80.0-120			1.44	15
Fluoride	5.00	0.292	5.20	5.30	98.2	100	1	80.0-120			1.85	15

L1359696-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1359696-03 06/11/21 05:01 • (MS) R3666381-7 06/11/21 05:33

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	62.0	110	95.1	1	80.0-120	E
Fluoride	5.00	ND	5.03	98.9	1	80.0-120	
Sulfate	50.0	ND	54.2	100	1	80.0-120	

Method Blank (MB)

(MB) R3663711-1 06/06/21 02:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.000100	0.000200

Laboratory Control Sample (LCS)

(LCS) R3663711-2 06/06/21 02:17

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00292	97.2	80.0-120	

L1359630-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1359630-08 06/06/21 02:23 • (MS) R3663711-3 06/06/21 02:25 • (MSD) R3663711-4 06/06/21 02:27

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00300	0.00290	99.9	96.8	1	75.0-125			3.14	20

Method Blank (MB)

(MB) R3667745-1 06/15/21 23:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000736	0.00500
Beryllium	U		0.000330	0.00200
Boron	U		0.0200	0.200
Cadmium	U		0.000479	0.00200
Calcium	U		0.0793	1.00
Chromium	U		0.00140	0.0100
Cobalt	U		0.000840	0.0100
Lithium	U		0.00485	0.0150
Molybdenum	U		0.00116	0.00500

Laboratory Control Sample (LCS)

(LCS) R3667745-2 06/15/21 23:50

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	1.03	103	80.0-120	
Beryllium	1.00	1.00	100	80.0-120	
Boron	1.00	1.00	100	80.0-120	
Cadmium	1.00	0.986	98.6	80.0-120	
Calcium	10.0	10.1	101	80.0-120	
Chromium	1.00	0.994	99.4	80.0-120	
Cobalt	1.00	1.00	100	80.0-120	
Lithium	1.00	0.989	98.9	80.0-120	
Molybdenum	1.00	1.06	106	80.0-120	

L1359630-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1359630-08 06/15/21 23:53 • (MS) R3667745-4 06/15/21 23:58 • (MSD) R3667745-5 06/16/21 00:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.0811	1.08	1.09	99.8	101	1	75.0-125			0.986	20
Beryllium	1.00	ND	0.970	0.986	97.0	98.6	1	75.0-125			1.66	20
Boron	1.00	ND	1.02	1.04	97.2	99.0	1	75.0-125			1.77	20
Cadmium	1.00	ND	0.984	1.00	98.4	100	1	75.0-125			1.68	20
Calcium	10.0	74.7	83.3	83.2	86.1	84.7	1	75.0-125			0.166	20
Chromium	1.00	ND	0.964	0.981	96.4	98.1	1	75.0-125			1.83	20
Cobalt	1.00	ND	0.989	1.01	98.9	101	1	75.0-125			1.94	20
Lithium	1.00	0.0408	0.999	1.02	95.8	97.7	1	75.0-125			1.86	20
Molybdenum	1.00	ND	1.04	1.06	104	106	1	75.0-125			1.66	20

Method Blank (MB)

(MB) R3668247-1 06/16/21 21:05

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony	U		0.00103	0.00400
Arsenic	U		0.000180	0.00200
Lead	U		0.000849	0.00200
Selenium	0.000399	J	0.000300	0.00200
Thallium	U		0.000121	0.00200

Laboratory Control Sample (LCS)

(LCS) R3668247-2 06/16/21 21:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	0.0500	0.0507	101	80.0-120	
Arsenic	0.0500	0.0479	95.9	80.0-120	
Lead	0.0500	0.0492	98.4	80.0-120	
Selenium	0.0500	0.0530	106	80.0-120	
Thallium	0.0500	0.0499	99.7	80.0-120	

L1359630-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1359630-08 06/16/21 21:11 • (MS) R3668247-4 06/16/21 21:18 • (MSD) R3668247-5 06/16/21 21:21

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	ND	0.0516	0.0515	103	103	1	75.0-125			0.277	20
Arsenic	0.0500	0.00314	0.0516	0.0512	97.0	96.1	1	75.0-125			0.863	20
Lead	0.0500	ND	0.0497	0.0496	99.4	99.2	1	75.0-125			0.196	20
Selenium	0.0500	ND	0.0536	0.0536	106	106	1	75.0-125			0.0980	20
Thallium	0.0500	ND	0.0499	0.0495	99.7	98.9	1	75.0-125			0.814	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Kansas City Board of Public Utilities
300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: Ingrid Setzler

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: GW-Creek Bottom Ash Pond

City/State Collected:

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project # KCBPU Nearman

Lab Project # KCKAN02-MW NEARMAN2

SDG # L1359630

B146

Acctnum: KCKAN02

Template: T109043

Prelogin: P848892

PM: 650 - Linda Cashman

PB: 5/21/21 MB

Shipped Via: FedEX Ground

Collected by (print): Chuck Balkenbusch

Site/Facility ID #

P.O. #

Collected by (signature): [signature]

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ✓

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres							Remarks	Sample # (lab only)
MW-2A		GW		5/28/21	1025	3	X	X	X								-01
MW-3		GW		5/28/21	0945	3	X	X	X								-02
MW-4		GW		5/28/21	1540	3	X	X	X								-03
MW-8A		GW		5/28/21	1225	3	X	X	X								-04
MW-10		GW		5/28/21	1110	3	X	X	X								-05
MW-13		GW		5/28/21	1350	3	X	X	X								-06
MW-14		GW		5/28/21	0740	3	X	X	X								-07
MW-15		GW		5/28/21	0825	3	X	X	X								-08
MW-16		GW		5/28/21	1450	3	X	X	X								-09
DUP-1		GW		5/28/21	—	3	X	X	X								-10

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP _Y _N
COC Signed/Accurate: ✓Y _N
Bottles arrive intact: ✓Y _N
Correct bottles used: ✓Y _N
Sufficient volume sent: ✓Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: ✓Y _N
RAD Screen <0.5 mR/hr: ✓Y _N

Samples returned via: __ UPS __ FedEx __ Courier ________

Tracking # 5016 1219 1924

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No (HCL / MeoH, TBR)	
[signature]	5/28/21	1545	[signature] 5-28-21 1547		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: AZOT °C 3.5+0=3.5 Bottles Received: 36	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) [signature]	Date: 05/29/21 Time: 09:30	Hold: Condition: NCF / OK

Company Name/Address:
Kansas City Board of Public Utilities
300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: **Ingrid Setzler**

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: GW-Creek Bottom Ash Pond

City/State Collected:

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project #: KCBPU Nearman

Lab Project #: KCKAN02-MW NEARMAN2

Collected by (print): Chuck Bauckenbusch

Site/Facility ID #

P.O. #

Collected by (signature): [signature]

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N___ Y ✓

SDG # L1359630

Table #

Acctnum: **KCKAN02**
Template: **T109043**
Prelogin: **P848892**
PM: 650 - Linda Cashman
PB: 5/21/21 MMB
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres								Remarks	Sample # (lab only)
~~DUP-2~~ (LB) NOT SAMPLED		~~GW~~				~~3~~	~~X~~	~~X~~	~~X~~									
MS		GW		5/28/21	0825	3	X	X	X								(MW-15)	-08
MS-D		GW		5/28/21	0825	3	X	X	X								(MW-15)	-08

Pres Chk (Metals): ✓

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # 5016 1219 1924

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP _Y _N
COC Signed/Accurate: ✓Y _N
Bottles arrive intact: ✓Y _N
Correct bottles used: ✓Y _N
Sufficient volume sent: ✓Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: ✓Y _N
RAD Screen <0.5 mR/hr: ✓Y _N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received:
[signature] Chuck B	5/28/21	1545	[signature] 5-28-21 1547	Yes / (No) HCL / MeoH TBR

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C	Bottles Received:	If preservation required by Login: Date/Time
				~~A20T~~ 3.5+0=3.5	36	

Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:	Hold:	Condition: NCF / (OK)
			[signature]	05/29/21	09:30		OK

ANALYTICAL REPORT

June 30, 2021

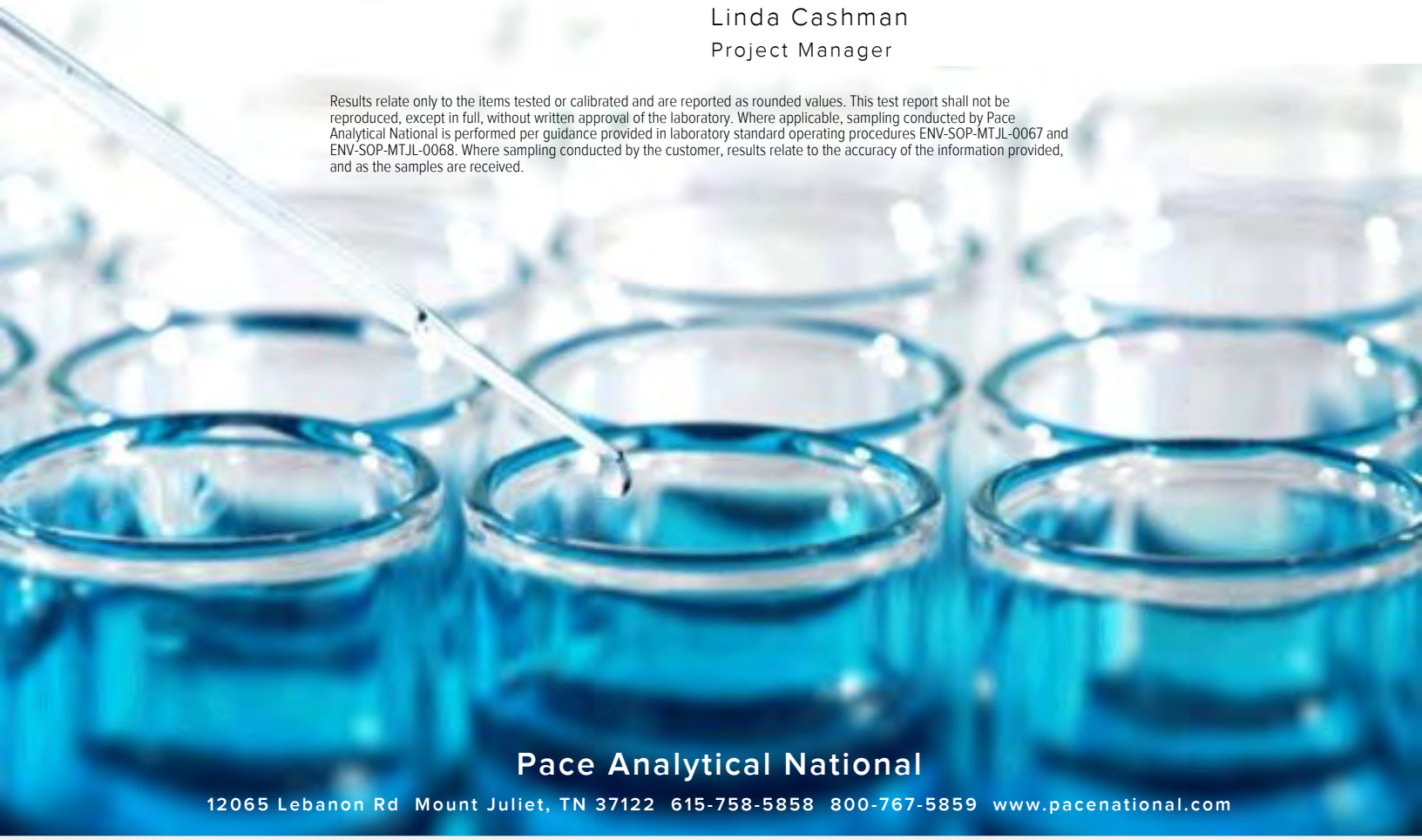
Kansas City Board of Public Utilities

Sample Delivery Group:	L1359620
Samples Received:	05/29/2021
Project Number:	62801 BPU Nearman
Description:	groundwater

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

MW-2A L1359620-01 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 10:45	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

MW-3 L1359620-02 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 09:45	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

MW-4 L1359620-03 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 15:40	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

MW-8A L1359620-04 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 12:25	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

MW-10 L1359620-05 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 11:10	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

MW-13 L1359620-06 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 13:50	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

MW-14 L1359620-07 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 07:40	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

MW-15 L1359620-08 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 08:25	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

MW-16 L1359620-09 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 14:50	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

DUP-1 L1359620-10 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/28/21 00:00	05/29/21 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1692854	1	06/22/21 11:44	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1684952	1	06/25/21 09:10	06/26/21 13:10	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1684952	1	06/25/21 09:10	06/25/21 15:20	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Linda Cashman
Project Manager

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.530	J	0.437	0.818	06/26/2021 13:10	WG1692854
(T) Barium	*103*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*96.8*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.583	J	0.602	1.1	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0532	U	0.165	0.285	06/25/2021 15:20	WG1684952
(T) Barium-133	*92.9*			*30.0-143*	*06/25/2021 15:20*	WG1684952

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.255	U	0.361	0.682	06/26/2021 13:10	WG1692854
(T) Barium	*100*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*95.7*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.442	J	0.569	0.963	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.186	J	0.208	0.281	06/25/2021 15:20	WG1684952
(T) Barium-133	*106*			*30.0-143*	*06/25/2021 15:20*	WG1684952

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.456	U	0.359	0.697	06/26/2021 13:10	WG1692854
(T) Barium	*98.3*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*95.6*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.271	U	0.567	0.926	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.271		0.208	0.229	06/25/2021 15:20	WG1684952
(T) Barium-133	*111*			*30.0-143*	*06/25/2021 15:20*	WG1684952

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.594	U	0.359	0.706	06/26/2021 13:10	WG1692854
(T) Barium	*94.6*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*90.6*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.413	J	0.594	0.879	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.413		0.235	0.173	06/25/2021 15:20	WG1684952
(T) Barium-133	*105*			*30.0-143*	*06/25/2021 15:20*	WG1684952

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.380	J	0.297	0.558	06/26/2021 13:10	WG1692854
(T) Barium	*97.7*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*98.0*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.705	J	0.506	0.754	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.326		0.209	0.196	06/25/2021 15:20	WG1684952
(T) Barium-133	*107*			*30.0-143*	*06/25/2021 15:20*	WG1684952

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.481	J	0.279	0.52	06/26/2021 13:10	WG1692854
(T) Barium	*102*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*96.3*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.618	J	0.433	0.723	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.137	J	0.154	0.203	06/25/2021 15:20	WG1684952
(T) Barium-133	*109*			*30.0-143*	*06/25/2021 15:20*	WG1684952

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.904		0.333	0.61	06/26/2021 13:10	WG1692854
(T) Barium	*103*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*91.1*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.04		0.469	0.776	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.139	J	0.136	0.166	06/25/2021 15:20	WG1684952
(T) Barium-133	*113*			*30.0-143*	*06/25/2021 15:20*	WG1684952

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.394	J	0.323	0.608	06/26/2021 13:10	WG1692854
(T) Barium	*106*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*94.1*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.465	J	0.541	0.946	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0711	U	0.218	0.338	06/25/2021 15:20	WG1684952
(T) Barium-133	*111*			*30.0-143*	*06/25/2021 15:20*	WG1684952

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.661		0.293	0.54	06/26/2021 13:10	WG1692854
(T) Barium	*96.3*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*96.1*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.938		0.506	0.774	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.277		0.213	0.234	06/25/2021 15:20	WG1684952
(T) Barium-133	*107*			*30.0-143*	*06/25/2021 15:20*	WG1684952

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.311	J	0.304	0.572	06/26/2021 13:10	WG1692854
(T) Barium	*97.8*			*62.0-143*	*06/26/2021 13:10*	WG1692854
(T) Yttrium	*100*			*79.0-136*	*06/26/2021 13:10*	WG1692854

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.567	J	0.528	0.856	06/26/2021 13:10	WG1684952

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.256	J	0.224	0.284	06/25/2021 15:20	WG1684952
(T) Barium-133	*110*			*30.0-143*	*06/25/2021 15:20*	WG1684952

Method Blank (MB)

(MB) R3673438-1 06/26/21 13:10

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	-0.275	U	0.479
(T) Barium	*93.3*		
(T) Yttrium	*97.7*		

L1359628-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1359628-01 06/26/21 13:10 • (DUP) R3673438-5 06/26/21 13:10

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	-0.535	-0.156	1	0.000	0.661	U	20	3
(T) Barium	*102*	*106*						
(T) Yttrium	*98.7*	*99.5*						

Laboratory Control Sample (LCS)

(LCS) R3673438-2 06/26/21 13:10

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.56	111	80.0-120	
(T) Barium			*109*		
(T) Yttrium			*91.2*		

L1359620-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1359620-08 06/26/21 13:10 • (MS) R3673438-3 06/26/21 13:10 • (MSD) R3673438-4 06/26/21 13:10

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.394	9.48	9.04	90.8	86.5	1	70.0-130			4.72		20
(T) Barium		*106*			*108*	*101*							
(T) Yttrium		*94.1*			*94.4*	*99.6*							

Method Blank (MB)

(MB) R3673395-1 06/25/21 15:20

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.0214	J	0.0434
(T) Barium-133	*95.3*		

Laboratory Control Sample (LCS)

(LCS) R3673395-2 06/25/21 15:20

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	4.54	90.5	80.0-120	
(T) Barium-133			*105*		

L1359620-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1359620-08 06/25/21 15:20 • (MS) R3673395-3 06/25/21 15:20 • (MSD) R3673395-4 06/25/21 15:20

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	0.0711	18.4	17.1	91.3	84.6	1	75.0-125			7.60		20
(T) Barium-133		*111*			*97.5*	*102*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
Attn: Ellen Bouse
300 N 65th Street
Kansas City, KS 66102

Pres Chk

Report to: **Ingrid Setzler**

Email To: **isetzler@bpu.com;kbrown@bpu.com;bhoye@b**

Project Description: **groundwater**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **913-573-9806**

Client Project # **62801 BPU Nearman**

Lab Project # **KCKAN02-MW NEARMAN**

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Tota Rad,RA226,RA228 1L-HDPE-Add HNO3	Remarks	Sample # (lab only)
MW-2A		NPW		5/28/21	1045	2	X		-01
MW-3		NPW		5/28/21	0995	2	X		-02
MW-4		NPW		5/28/21	1540	2	X		-03
MW-8A		NPW		5/28/21	1225	2	X		-04
MW-10		NPW		5/28/21	1110	2	X		-05
MW-13		NPW		5/28/21	1350	2	X		-06
MW-14		NPW		5/28/21	0740	2	X		-07
MW-15		NPW		5/28/21	0825	2	X		-08
MW-16		NPW		5/28/21	1450	2	X		-09
DUP-1		NPW		5/28/21	—	2	X		-10

Chain of Custody Page ___ of ___

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1359620

Table #

Acctnum: **KCKAN02**

Template: **T150051**

Prelogin: **P848891**

PM: **650 - Linda Cashman**

PB: 5/21/21 MW

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR
Clark B	5/28/21	1545	Alan Nelson 5-28-21 1547	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.5-0-3.5 °C Bottles Received: 24
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 5/29/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Company Name/Address:
Kansas City Board of Public Utilities
300 N 65th Street
Kansas City, KS 66102

Billing Information:
Attn: Ellen Bouse
300 N 65th Street
Kansas City, KS 66102

Pres Chk

Report to: **Ingrid Setzler**

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: **groundwater**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **913-573-9806**

Client Project # **62801 BPU Nearman**

Lab Project # **KCKAN02-MW NEARMAN**

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Analysis / Container / Preservative: Tota Rad,RA226,RA228 1L-HDPE-Add HNO3	Remarks	Sample # (lab only)
DUP-2		NPW				~~2~~	X		
MS		NPW		5/28/21	0825	2	X	(MW-15)	-08
MS-D		NPW		5/28/21	0825	2	X	(MW-15	-08

Chain of Custody Page ___ of ___

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # U359620

Table #

Acctnum: **KCKAN02**

Template: **T150051**

Prelogin: **P848891**

PM: **650 - Linda Cashman**

PB: 5/21/21 MG

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other _____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

	Date:	Time:	
Relinquished by : (Signature)	5/28/21	1545	Received by: (Signature) 5-28-21 1547
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 3.5 °C 3.5 Bottles Received: 24

If preservation required by Login: Date/Time

Date: 5/29/21 Time: 0930

Hold:

Condition: NCF / OK

ANALYTICAL REPORT

October 29, 2021

Kansas City Board of Public Utilities

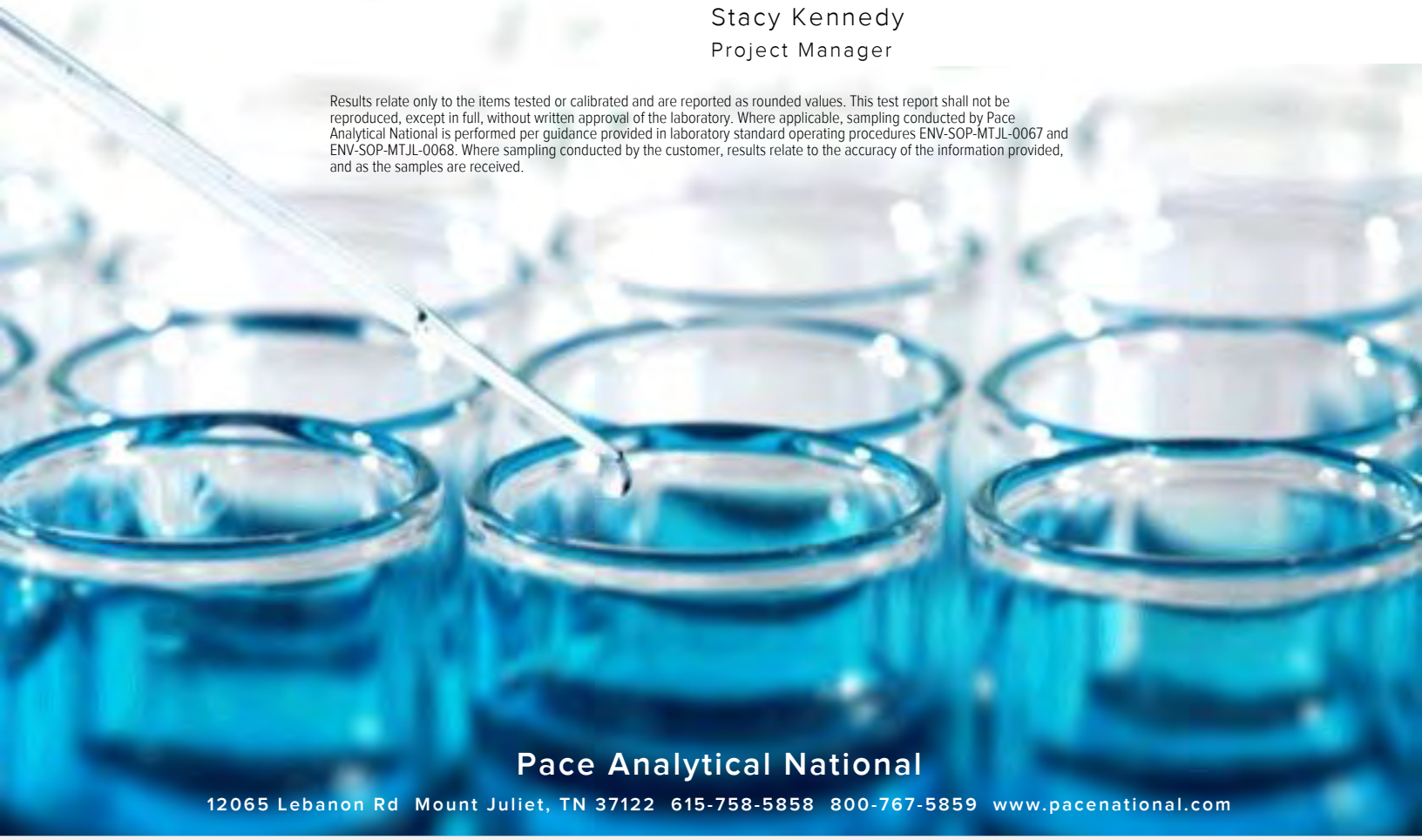
Sample Delivery Group:	L1413321
Samples Received:	10/05/2021
Project Number:	KCBPU Nearman
Description:	Groundwater Monitoring

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Stacy Kennedy
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SAMPLE SUMMARY

MW-13/GW02 L1413321-01 GW

Collected by: Chris Hoglund
Collected date/time: 10/04/21 15:55
Received date/time: 10/05/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1753499	1	10/07/21 21:32	10/07/21 22:49	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1758669	.2	10/18/21 07:44	10/18/21 07:44	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755082	1	10/11/21 23:50	10/11/21 23:50	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755082	5	10/12/21 00:01	10/12/21 00:01	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755553	1	10/14/21 04:27	10/15/21 03:25	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1755210	1	10/12/21 16:46	10/13/21 12:33	LAT	Mt. Juliet, TN

MW-16/GW02 L1413321-02 GW

Collected by: Chris Hoglund
Collected date/time: 10/04/21 17:20
Received date/time: 10/05/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1753497	1	10/07/21 20:17	10/07/21 21:28	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1765222	.2	10/28/21 16:38	10/28/21 16:38	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755082	1	10/12/21 00:13	10/12/21 00:13	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755553	1	10/14/21 04:27	10/15/21 03:28	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1755210	1	10/12/21 16:46	10/13/21 12:36	LAT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Stacy Kennedy
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	564		10.0	1	10/07/2021 22:49	WG1753499

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.35	T8	.2	10/18/2021 07:44	WG1758669

Sample Narrative:

L1413321-01 WG1758669: 7.35 at 20.34 C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	18.6		1.00	1	10/11/2021 23:50	WG1755082
Fluoride	0.318		0.150	1	10/11/2021 23:50	WG1755082
Sulfate	165		25.0	5	10/12/2021 00:01	WG1755082

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.237		0.00500	1	10/15/2021 03:25	WG1755553
Boron	ND		0.200	1	10/15/2021 03:25	WG1755553
Calcium	114		1.00	1	10/15/2021 03:25	WG1755553
Lithium	0.0287		0.0150	1	10/15/2021 03:25	WG1755553
Molybdenum	ND		0.00500	1	10/15/2021 03:25	WG1755553

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	0.0227		0.00200	1	10/13/2021 12:33	WG1755210
Selenium	ND		0.00200	1	10/13/2021 12:33	WG1755210

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	697		13.3	1	10/07/2021 21:28	WG1753497

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.71	T8	.2	10/28/2021 16:38	WG1765222

Sample Narrative:

L1413321-02 WG1765222: 7.71 @ 19.36C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	5.51		1.00	1	10/12/2021 00:13	WG1755082
Fluoride	ND		0.150	1	10/12/2021 00:13	WG1755082
Sulfate	80.8		5.00	1	10/12/2021 00:13	WG1755082

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.238		0.00500	1	10/15/2021 03:28	WG1755553
Boron	ND		0.200	1	10/15/2021 03:28	WG1755553
Calcium	194		1.00	1	10/15/2021 03:28	WG1755553
Lithium	0.0511		0.0150	1	10/15/2021 03:28	WG1755553
Molybdenum	ND		0.00500	1	10/15/2021 03:28	WG1755553

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	0.0247		0.00200	1	10/13/2021 12:36	WG1755210
Selenium	ND		0.00200	1	10/13/2021 12:36	WG1755210

Method Blank (MB)

(MB) R3714869-1 10/07/21 21:28

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1413163-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1413163-01 10/07/21 21:28 • (DUP) R3714869-3 10/07/21 21:28

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	745	745	1	0.000		5

L1413321-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1413321-02 10/07/21 21:28 • (DUP) R3714869-4 10/07/21 21:28

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	697	ND	1	200	J3	5

Laboratory Control Sample (LCS)

(LCS) R3714869-2 10/07/21 21:28

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8730	99.2	77.4-123	

Method Blank (MB)

(MB) R3714922-1 10/07/21 22:49

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1413080-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1413080-01 10/07/21 22:49 • (DUP) R3714922-3 10/07/21 22:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	908	903	1	0.589		5

L1414278-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1414278-11 10/07/21 22:49 • (DUP) R3714922-4 10/07/21 22:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	869	849	1	2.33		5

Laboratory Control Sample (LCS)

(LCS) R3714922-2 10/07/21 22:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8760	99.5	77.4-123	

Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3717760-2 10/18/21 07:32

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
		su		%		%
pH		7.26	.2	0.138		1

Sample Narrative:

DUP: 7.26 at 20.40 C

L1414716-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1414716-01 10/18/21 08:40 • (DUP) R3717760-3 10/18/21 08:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	5.76	5.78	.2	0.347		1

Sample Narrative:

OS: 5.76 at 20.41 C

DUP: 5.78 at 20.48 C

Laboratory Control Sample (LCS)

(LCS) R3717760-1 10/18/21 07:19

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.97	99.7	99.0-101	

Sample Narrative:

LCS: 9.97 at 20.33 C

L1419096-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1419096-01 10/28/21 17:06 • (DUP) R3722833-2 10/28/21 17:13

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	8.11	8.13	.2	0.246		1

Sample Narrative:

OS: 8.11 @ 18.29C

DUP: 8.13 @ 18.21C

L1419543-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1419543-01 10/28/21 18:21 • (DUP) R3722833-3 10/28/21 18:27

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	9.99	9.97	.2	0.200		1

Sample Narrative:

OS: 9.99 @ 18.95C

DUP: 9.97 @ 18.98C

Laboratory Control Sample (LCS)

(LCS) R3722833-1 10/28/21 16:33

Analyte	Spike Amount su	LCS Result su	LCS Rec. %	Rec. Limits %	LCS Qualifier
pH	10.0	9.94	99.4	99.0-101	

Sample Narrative:

LCS: 9.94 @ 19.60C

Method Blank (MB)

(MB) R3715211-1 10/11/21 18:00

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1413075-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1413075-01 10/11/21 20:01 • (DUP) R3715211-3 10/11/21 20:12

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	2.16	2.18	1	0.935		15

L1413474-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1413474-01 10/12/21 00:36 • (DUP) R3715211-6 10/12/21 00:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	5.39	5.39	1	0.0761		15
Fluoride	ND	ND	1	0.000		15
Sulfate	40.1	39.9	1	0.529		15

Laboratory Control Sample (LCS)

(LCS) R3715211-2 10/11/21 18:12

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.7	99.4	80.0-120	
Fluoride	8.00	7.87	98.4	80.0-120	
Sulfate	40.0	40.2	101	80.0-120	

L1413075-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1413075-01 10/11/21 20:01 • (MS) R3715211-4 10/11/21 20:24 • (MSD) R3715211-5 10/11/21 20:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	5.00	2.16	7.14	7.22	99.6	101	1	80.0-120			1.12	15

L1413474-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1413474-01 10/12/21 00:36 • (MS) R3715211-7 10/12/21 00:59

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	5.39	54.5	98.3	1	80.0-120	
Fluoride	5.00	ND	5.01	100	1	80.0-120	
Sulfate	50.0	40.1	87.4	94.6	1	80.0-120	

Method Blank (MB)

(MB) R3716707-1 10/15/21 03:10

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000736	0.00500
Boron	0.0240	J	0.0200	0.200
Calcium	U		0.0793	1.00
Lithium	U		0.00485	0.0150
Molybdenum	U		0.00116	0.00500

Laboratory Control Sample (LCS)

(LCS) R3716707-2 10/15/21 03:13

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	1.03	103	80.0-120	
Boron	1.00	1.00	100	80.0-120	
Calcium	10.0	9.94	99.4	80.0-120	
Lithium	1.00	0.993	99.3	80.0-120	
Molybdenum	1.00	1.02	102	80.0-120	

L1413604-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1413604-01 10/15/21 03:15 • (MS) R3716707-4 10/15/21 03:20 • (MSD) R3716707-5 10/15/21 03:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.300	1.30	1.30	100	100	1	75.0-125			0.0237	20
Boron	1.00	ND	1.02	1.02	97.9	97.6	1	75.0-125			0.280	20
Calcium	10.0	46.2	55.6	55.7	93.9	95.2	1	75.0-125			0.241	20
Lithium	1.00	ND	0.985	0.986	98.5	98.6	1	75.0-125			0.0958	20
Molybdenum	1.00	0.00501	1.03	1.02	102	102	1	75.0-125			0.202	20

Method Blank (MB)

(MB) R3715913-1 10/13/21 11:26

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.000180	0.00200
Selenium	U		0.000300	0.00200

Laboratory Control Sample (LCS)

(LCS) R3715913-2 10/13/21 11:29

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	0.0500	0.0497	99.4	80.0-120	
Selenium	0.0500	0.0479	95.7	80.0-120	

L1413586-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1413586-04 10/13/21 11:32 • (MS) R3715913-4 10/13/21 11:39 • (MSD) R3715913-5 10/13/21 11:42

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	0.0500	0.0163	0.0636	0.0625	94.6	92.4	1	75.0-125			1.77	20
Selenium	0.0500	ND	0.0548	0.0516	110	103	1	75.0-125			5.94	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
T8	Sample(s) received past/too close to holding time expiration.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Report to:
Ingrid Setzler

Email To:
isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description:
Groundwater Monitoring

City/State Collected: Kansas City, KS

Please Circle: PT MT CT ET

Phone: **913-573-9806**

Client Project #
KCBPU Nearman

Lab Project #
KCKAN02-MW NEARMAN2

Collected by (print):
CHRIS HOGLUND

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed
Standard TAT

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Radium-226	Remarks	Sample # (lab only)
MW-2A		GW				3	X	X	X			
MW-3		GW				3	X	X	X			
MW-4		GW				3	X	X	X			
MW-8A		GW				3	X	X	X			
MW-10		GW				3	X	X	X			
MW-13 /GW02	Grab	GW	—	10/4/21	1555	3	X	X	X	X		-01
MW-14		GW				3	X	X	X			
MW-15		GW				3	X	X	X			
MW-16 /GW02	Grab	GW	—	10/4/21	1720	3	X	X	X	X		-02
DUP-1		GW				3	X	X	X			

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 5318 9949 7530

Trip Blank Received: Yes / No
0 HCL / MeoH
TBR

Temp: Above 3.0+0=3.0 Bottles Received: 10

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
CHRIS HOGLUND (Bmad)	10/4/21	1830	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Date: 10/05/21 Time: 9:45

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Chain of Custody Page 1 of 1

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

L1413321

B148

Acctnum: **KCKAN02**
Template: **T159295**
Prelogin: **P877514**
PM: **650 - Linda Cashman**
PB: CR 9/29/21
Shipped Via: **FedEX Ground**

ANALYTICAL REPORT

November 03, 2021

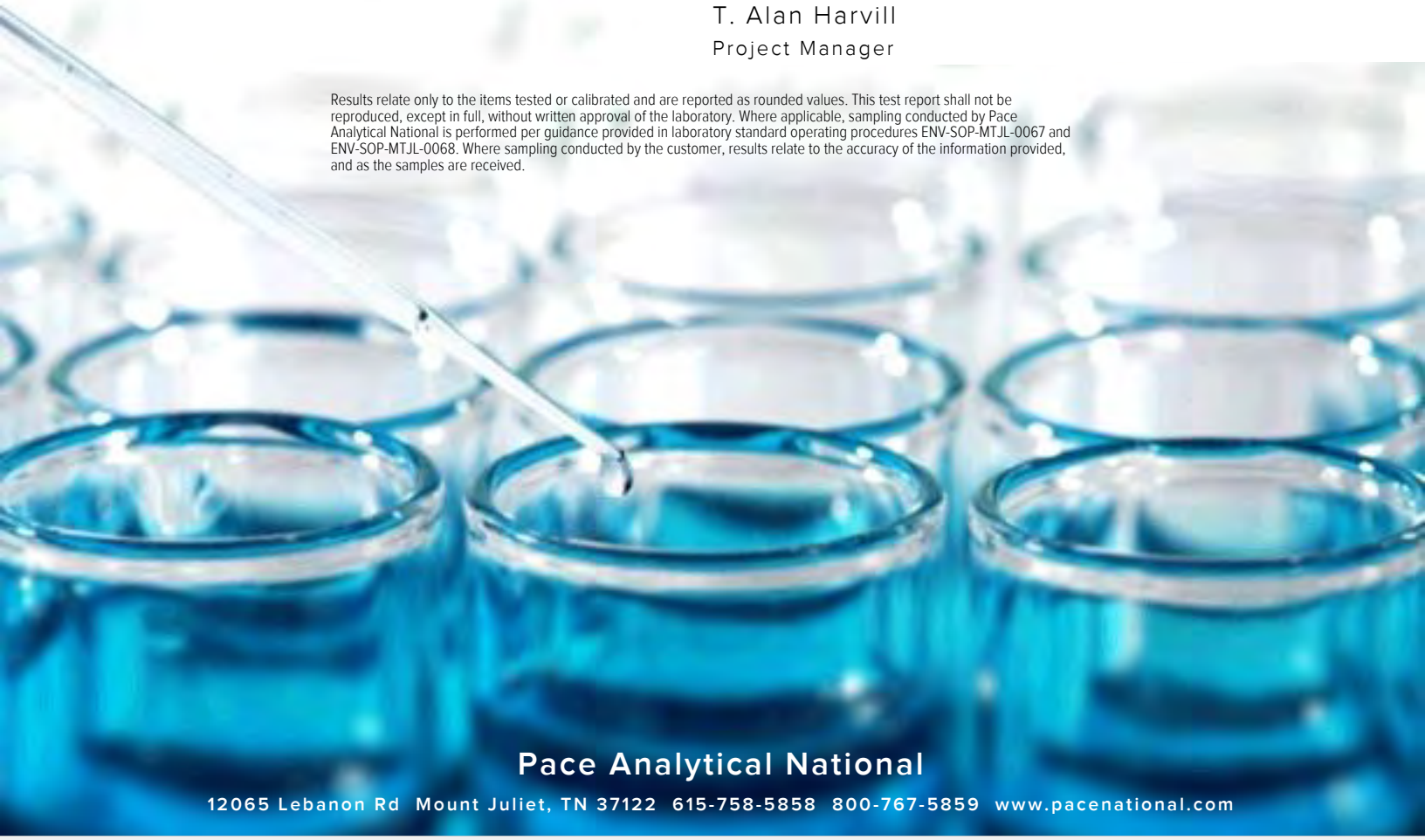
Kansas City Board of Public Utilities

Sample Delivery Group:	L1413325
Samples Received:	10/05/2021
Project Number:	KCBPU Nearman Ck
Description:	Groundwater Monitoring

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

T. Alan Harvill
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

MW-13/GW02 L1413325-01 Non-Potable Water

Collected by: Chris Hoglund
Collected date/time: 10/04/21 15:55
Received date/time: 10/05/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758751	1	11/01/21 10:08	11/01/21 14:54	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758751	1	11/01/21 10:08	11/01/21 14:54	RGT	Mt. Juliet, TN

MW-16/GW02 L1413325-02 Non-Potable Water

Collected by: Chris Hoglund
Collected date/time: 10/04/21 17:20
Received date/time: 10/05/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758751	1	11/01/21 10:08	11/01/21 16:30	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758751	1	11/01/21 10:08	11/01/21 14:54	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

T. Alan Harvill
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.42		0.326	0.565	11/01/2021 12:30	WG1761435
(T) Barium	*95.1*			*62.0-143*	*11/01/2021 12:30*	WG1761435
(T) Yttrium	*93.2*			*79.0-136*	*11/01/2021 12:30*	WG1761435

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.77		0.840	0.856	11/01/2021 14:54	WG1758751

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.36		0.514	0.291	11/01/2021 14:54	WG1758751
(T) Barium-133	*98.5*			*30.0-143*	*11/01/2021 14:54*	WG1758751

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	2.07		0.425	0.786	11/01/2021 16:30	WG1763163
(T) Barium	*97.1*			*62.0-143*	*11/01/2021 16:30*	WG1763163
(T) Yttrium	*95.7*			*79.0-136*	*11/01/2021 16:30*	WG1763163

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.33		0.645	1.01	11/01/2021 16:30	WG1758751

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.255		0.220	0.221	11/01/2021 14:54	WG1758751
(T) Barium-133	*95.8*			*30.0-143*	*11/01/2021 14:54*	WG1758751

Method Blank (MB)

(MB) R3724382-1 11/01/21 12:30

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	0.0113	U	0.261	0.488
(T) Barium	*96.1*		*96.1*	
(T) Yttrium	*92.6*		*92.6*	

L1413276-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1413276-04 11/01/21 12:30 • (DUP) R3724382-5 11/01/21 12:30

Analyte	Original Result pCi/l	Original Uncertainty + / -	DUP Result pCi/l	DUP Uncertainty + / -	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.71	0.476	0.670	0.889	1	87.1	1.03	U	20	3
(T) Barium	*102*		*103*	*103*						
(T) Yttrium	*95.4*		*92.7*	*92.7*						

Laboratory Control Sample (LCS)

(LCS) R3724382-2 11/01/21 12:30

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.82	116	80.0-120	
(T) Barium			*106*		
(T) Yttrium			*94.4*		

L1413325-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1413325-01 11/01/21 12:30 • (MS) R3724382-3 11/01/21 12:30 • (MSD) R3724382-4 11/01/21 12:30

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	16.7	1.42	20.9	20.0	117	111	1	70.0-130			4.69		20
(T) Barium		*95.1*			*95.7*	*101*							
(T) Yttrium		*93.2*			*97.0*	*89.6*							

Method Blank (MB)

(MB) R3724396-1 11/01/21 16:30

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	0.000	U	0.221	0.442
(T) Barium	*98.2*		*98.2*	
(T) Yttrium	*104*		*104*	

L1414126-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1414126-01 11/01/21 16:30 • (DUP) R3724396-5 11/01/21 16:30

Analyte	Original Result pCi/l	Original Uncertainty + / -	DUP Result pCi/l	DUP Uncertainty + / -	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.64	0.302	1.45	0.810	1	12.2	0.219	J	20	3
(T) Barium	*92.5*		*107*	*107*						
(T) Yttrium	*101*		*96.7*	*96.7*						

Laboratory Control Sample (LCS)

(LCS) R3724396-2 11/01/21 16:30

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.54	90.9	80.0-120	
(T) Barium			*93.6*		
(T) Yttrium			*109*		

L1414123-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414123-01 11/01/21 16:30 • (MS) R3724396-3 11/01/21 16:30 • (MSD) R3724396-4 11/01/21 16:30

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	16.7	1.37	21.4	20.2	120	113	1	70.0-130			6.01		20
(T) Barium		*100*			*105*	*102*							
(T) Yttrium		*97.7*			*107*	*94.4*							

Method Blank (MB)

(MB) R3724431-1 11/01/21 14:54

Analyte	MB Result	MB Qualifier	MB Uncertainty	MB MDA
	pCi/l		+ / -	pCi/l
Radium-226	0.0124	U	0.0377	0.0718
(T) Barium-133	*96.9*		*96.9*	

L1418944-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1418944-01 11/01/21 14:54 • (DUP) R3724431-5 11/01/21 14:54

Analyte	Original Result	Original Uncertainty	DUP Result	DUP Uncertainty	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	+ / -		%			%	
Radium-226	6.84	1.04	8.65	1.26	1	23.4	1.11		20	3
(T) Barium-133	*97.9*		*99.8*	*99.8*						

Laboratory Control Sample (LCS)

(LCS) R3724431-2 11/01/21 14:54

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-226	5.02	4.70	93.7	80.0-120	
(T) Barium-133			*100*		

L1414105-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414105-01 11/01/21 14:54 • (MS) R3724431-3 11/01/21 14:54 • (MSD) R3724431-4 11/01/21 14:54

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.1	0.0620	19.3	19.8	95.9	98.1	1	75.0-125			2.30		20
(T) Barium-133		*100*			*99.7*	*102*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Report to:
Ingrid Setzler

Email To:
isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description:
Groundwater Monitoring

City/State Collected: Kansas City, KS

Please Circle: PT MT CT ET

Phone: **913-573-9806**

Client Project #
KCBPU Nearman

Lab Project #
KCKAN02-MW NEARMAN2

Collected by (print):
CHRIS HOGLUND

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: Standard TAT

No. of Cntrs

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Radium-226	Remarks	Sample # (lab only)
MW-2A		GW				3	X	X	X			
MW-3		GW				3	X	X	X			
MW-4		GW				3	X	X	X			
MW-8A		GW				3	X	X	X			
MW-10		GW				3	X	X	X			
MW-13 /GW02	Grab	GW	—	10/4/21	1555	3	X	X	X	X		-01
MW-14		GW				3	X	X	X			
MW-15		GW				3	X	X	X			-02
MW-16 /GW02	Grab	GW	—	10/4/21	1720	3	X	X	X	X		
DUP-1		GW				3	X	X	X			

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 5318 9949 7530

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: Therm 3.0+0=3.0 Bottles Received: 10

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
CHRIS HOGLUND (BMoH)	10/4/21	1830	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			10/05/21 9:45

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Chain of Custody Page 1 of 1

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

WO# 10413525
B148

Acctnum: KCKAN02
Template: T159295
Prelogin: P877514
PM: 650 - Linda Cashman
PB: CK 9/29/21
Shipped Via: FedEX Ground

ANALYTICAL REPORT

October 15, 2021

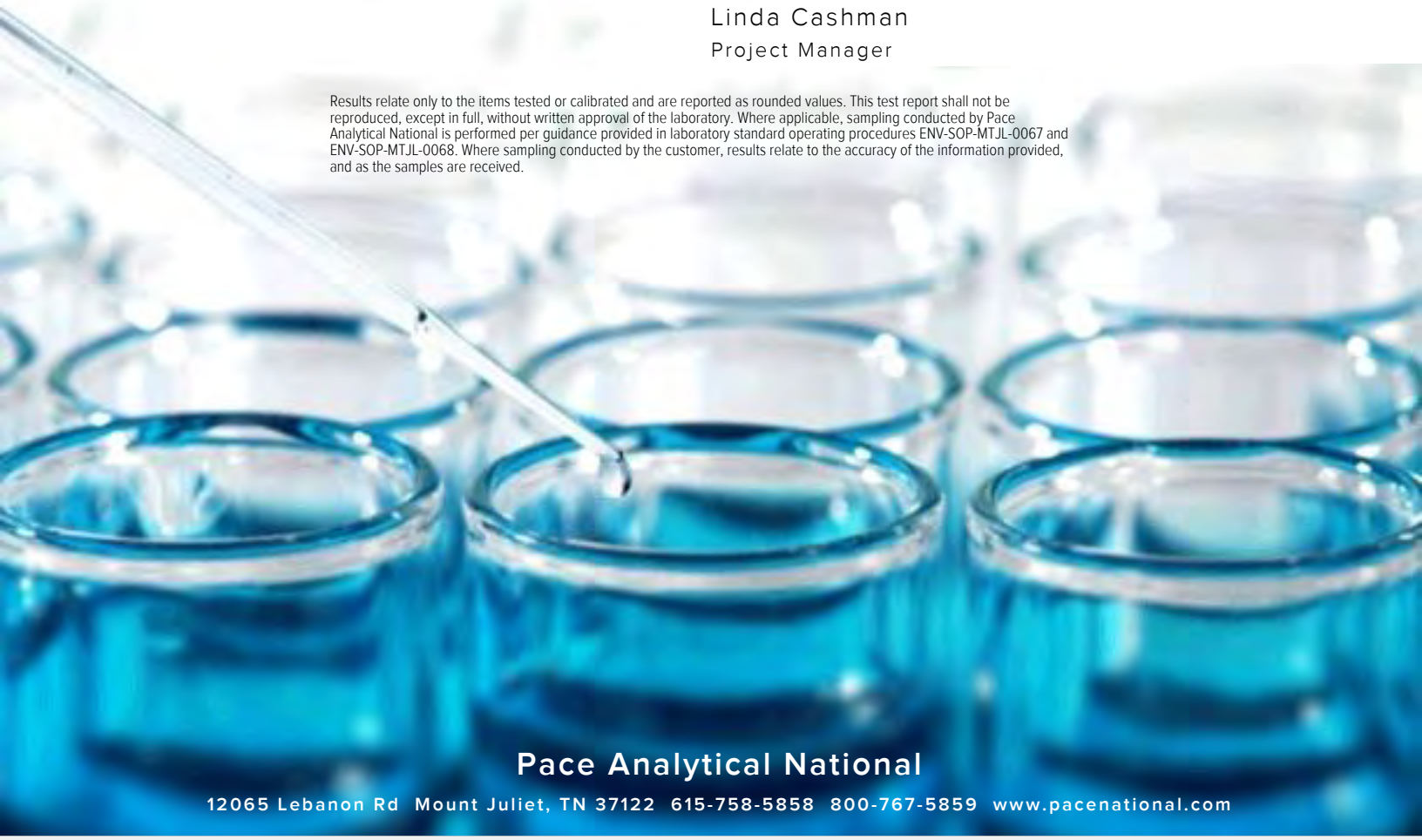
Kansas City Board of Public Utilities

Sample Delivery Group:	L1414036
Samples Received:	10/06/2021
Project Number:	KCBPU Nearman
Description:	Groundwater Monitoring

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

MW-2A/ GW02 L1414036-01 GW

Collected by: Chris Hoglund | Collected date/time: 10/05/21 10:05 | Received date/time: 10/06/21 12:55

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1753499	1	10/07/21 21:32	10/07/21 22:49	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1757291	1	10/14/21 17:00	10/14/21 17:00	AW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755152	1	10/12/21 04:52	10/12/21 04:52	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755538	1	10/13/21 06:49	10/15/21 02:40	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1756333	1	10/13/21 12:17	10/13/21 16:34	JPD	Mt. Juliet, TN

MW-3/ GW02 L1414036-02 GW

Collected by: Chris Hoglund | Collected date/time: 10/05/21 11:15 | Received date/time: 10/06/21 12:55

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1753499	1	10/07/21 21:32	10/07/21 22:49	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1757291	1	10/14/21 17:00	10/14/21 17:00	AW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755152	1	10/12/21 05:25	10/12/21 05:25	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755152	5	10/12/21 05:41	10/12/21 05:41	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755538	1	10/13/21 06:49	10/15/21 02:43	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1756333	1	10/13/21 12:17	10/13/21 16:37	JPD	Mt. Juliet, TN

MW-4/ GW02 L1414036-03 GW

Collected by: Chris Hoglund | Collected date/time: 10/05/21 13:15 | Received date/time: 10/06/21 12:55

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1753499	1	10/07/21 21:32	10/07/21 22:49	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1757291	1	10/14/21 17:00	10/14/21 17:00	AW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755152	1	10/12/21 05:58	10/12/21 05:58	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755538	1	10/13/21 06:49	10/15/21 02:46	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1756333	1	10/13/21 12:17	10/13/21 16:41	JPD	Mt. Juliet, TN

MW-10/ GW02 L1414036-04 GW

Collected by: Chris Hoglund | Collected date/time: 10/05/21 09:10 | Received date/time: 10/06/21 12:55

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1753499	1	10/07/21 21:32	10/07/21 22:49	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1757291	1	10/14/21 17:00	10/14/21 17:00	AW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755514	1	10/13/21 02:26	10/13/21 02:26	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755514	5	10/13/21 02:43	10/13/21 02:43	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755538	1	10/13/21 06:49	10/15/21 02:49	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1756333	1	10/13/21 12:17	10/13/21 16:44	JPD	Mt. Juliet, TN

MW-15/ GW02 L1414036-05 GW

Collected by: Chris Hoglund | Collected date/time: 10/05/21 15:35 | Received date/time: 10/06/21 12:55

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1753908	1	10/08/21 13:36	10/09/21 12:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1757291	1	10/14/21 17:00	10/14/21 17:00	AW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755514	1	10/13/21 02:59	10/13/21 02:59	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755514	5	10/13/21 04:21	10/13/21 04:21	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755538	1	10/13/21 06:49	10/15/21 02:00	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1756333	1	10/13/21 12:17	10/13/21 15:44	JPD	Mt. Juliet, TN

DUP-1/ GW02 L1414036-06 GW

Collected by: Chris Hoglund
Collected date/time: 10/05/21 00:00
Received date/time: 10/06/21 12:55

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1753908	1	10/08/21 13:36	10/09/21 12:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1757291	1	10/14/21 17:00	10/14/21 17:00	AW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1755514	1	10/13/21 04:38	10/13/21 04:38	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755538	1	10/13/21 06:49	10/15/21 02:52	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1756333	1	10/13/21 12:17	10/13/21 16:48	JPD	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Linda Cashman
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	614		10.0	1	10/07/2021 22:49	WG1753499

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.47	T8	1	10/14/2021 17:00	WG1757291

Sample Narrative:

L1414036-01 WG1757291: 7.47 at 20C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	10.7		1.00	1	10/12/2021 04:52	WG1755152
Fluoride	0.242		0.150	1	10/12/2021 04:52	WG1755152
Sulfate	81.6		5.00	1	10/12/2021 04:52	WG1755152

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.161		0.00500	1	10/15/2021 02:40	WG1755538
Boron	ND		0.200	1	10/15/2021 02:40	WG1755538
Calcium	162		1.00	1	10/15/2021 02:40	WG1755538
Lithium	0.0365	B	0.0150	1	10/15/2021 02:40	WG1755538
Molybdenum	ND		0.00500	1	10/15/2021 02:40	WG1755538

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	0.00312		0.00200	1	10/13/2021 16:34	WG1756333
Selenium	ND		0.00200	1	10/13/2021 16:34	WG1756333

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	655		13.3	1	10/07/2021 22:49	WG1753499

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.22	T8	1	10/14/2021 17:00	WG1757291

Sample Narrative:

L1414036-02 WG1757291: 7.22 at 20.2C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	7.31		1.00	1	10/12/2021 05:25	WG1755152
Fluoride	0.210		0.150	1	10/12/2021 05:25	WG1755152
Sulfate	104		25.0	5	10/12/2021 05:41	WG1755152

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.134		0.00500	1	10/15/2021 02:43	WG1755538
Boron	ND		0.200	1	10/15/2021 02:43	WG1755538
Calcium	164		1.00	1	10/15/2021 02:43	WG1755538
Lithium	0.0463	B	0.0150	1	10/15/2021 02:43	WG1755538
Molybdenum	ND		0.00500	1	10/15/2021 02:43	WG1755538

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	ND		0.00200	1	10/13/2021 16:37	WG1756333
Selenium	ND		0.00200	1	10/13/2021 16:37	WG1756333

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	539		10.0	1	10/07/2021 22:49	WG1753499

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.51	T8	1	10/14/2021 17:00	WG1757291

Sample Narrative:

L1414036-03 WG1757291: 7.51 at 20.1C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.4		1.00	1	10/12/2021 05:58	WG1755152
Fluoride	0.194		0.150	1	10/12/2021 05:58	WG1755152
Sulfate	88.0		5.00	1	10/12/2021 05:58	WG1755152

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.104		0.00500	1	10/15/2021 02:46	WG1755538
Boron	ND		0.200	1	10/15/2021 02:46	WG1755538
Calcium	132		1.00	1	10/15/2021 02:46	WG1755538
Lithium	0.0337	B	0.0150	1	10/15/2021 02:46	WG1755538
Molybdenum	ND		0.00500	1	10/15/2021 02:46	WG1755538

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	ND		0.00200	1	10/13/2021 16:41	WG1756333
Selenium	0.00532		0.00200	1	10/13/2021 16:41	WG1756333

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	748		13.3	1	10/07/2021 22:49	WG1753499

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.36	T8	1	10/14/2021 17:00	WG1757291

Sample Narrative:

L1414036-04 WG1757291: 7.36 at 20.1C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.3		1.00	1	10/13/2021 02:26	WG1755514
Fluoride	0.151		0.150	1	10/13/2021 02:26	WG1755514
Sulfate	155		25.0	5	10/13/2021 02:43	WG1755514

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.105		0.00500	1	10/15/2021 02:49	WG1755538
Boron	1.10		0.200	1	10/15/2021 02:49	WG1755538
Calcium	168		1.00	1	10/15/2021 02:49	WG1755538
Lithium	0.0450	B	0.0150	1	10/15/2021 02:49	WG1755538
Molybdenum	ND		0.00500	1	10/15/2021 02:49	WG1755538

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	0.00321		0.00200	1	10/13/2021 16:44	WG1756333
Selenium	0.00467		0.00200	1	10/13/2021 16:44	WG1756333

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	504		10.0	1	10/09/2021 12:11	WG1753908

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.89	T8	1	10/14/2021 17:00	WG1757291

Sample Narrative:

L1414036-05 WG1757291: 7.89 at 19.9C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	19.2		1.00	1	10/13/2021 02:59	WG1755514
Fluoride	0.384		0.150	1	10/13/2021 02:59	WG1755514
Sulfate	179		25.0	5	10/13/2021 04:21	WG1755514

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.105	O1	0.00500	1	10/15/2021 02:00	WG1755538
Boron	ND		0.200	1	10/15/2021 02:00	WG1755538
Calcium	68.6		1.00	1	10/15/2021 02:00	WG1755538
Lithium	0.0560		0.0150	1	10/15/2021 02:00	WG1755538
Molybdenum	ND		0.00500	1	10/15/2021 02:00	WG1755538

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	0.00667		0.00200	1	10/13/2021 15:44	WG1756333
Selenium	ND		0.00200	1	10/13/2021 15:44	WG1756333

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	541		10.0	1	10/09/2021 12:11	WG1753908

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.56	T8	1	10/14/2021 17:00	WG1757291

Sample Narrative:

L1414036-06 WG1757291: 7.56 at 19.9C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.3		1.00	1	10/13/2021 04:38	WG1755514
Fluoride	0.194		0.150	1	10/13/2021 04:38	WG1755514
Sulfate	87.6		5.00	1	10/13/2021 04:38	WG1755514

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.105		0.00500	1	10/15/2021 02:52	WG1755538
Boron	ND		0.200	1	10/15/2021 02:52	WG1755538
Calcium	133		1.00	1	10/15/2021 02:52	WG1755538
Lithium	0.0320	B	0.0150	1	10/15/2021 02:52	WG1755538
Molybdenum	ND		0.00500	1	10/15/2021 02:52	WG1755538

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	ND		0.00200	1	10/13/2021 16:48	WG1756333
Selenium	0.00519		0.00200	1	10/13/2021 16:48	WG1756333

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3714922-1 10/07/21 22:49

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1413080-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1413080-01 10/07/21 22:49 • (DUP) R3714922-3 10/07/21 22:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	908	903	1	0.589		5

L1414278-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1414278-11 10/07/21 22:49 • (DUP) R3714922-4 10/07/21 22:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	869	849	1	2.33		5

Laboratory Control Sample (LCS)

(LCS) R3714922-2 10/07/21 22:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8760	99.5	77.4-123	

Method Blank (MB)

(MB) R3715440-1 10/09/21 12:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1413747-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1413747-02 10/09/21 12:11 • (DUP) R3715440-3 10/09/21 12:11

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	747	747	1	0.000		5

L1414295-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1414295-08 10/09/21 12:11 • (DUP) R3715440-4 10/09/21 12:11

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1050	1050	1	0.572		5

Laboratory Control Sample (LCS)

(LCS) R3715440-2 10/09/21 12:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8630	98.1	77.4-123	

L1413801-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1413801-02 10/14/21 17:00 • (DUP) R3716579-2 10/14/21 17:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.01	7.00	1	0.143		1

Sample Narrative:

OS: 7.01 at 18.7C

DUP: 7 at 19.2C

L1414036-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1414036-05 10/14/21 17:00 • (DUP) R3716579-3 10/14/21 17:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.89	7.90	1	0.127		1

Sample Narrative:

OS: 7.89 at 19.9C

DUP: 7.9 at 20.4C

Laboratory Control Sample (LCS)

(LCS) R3716579-1 10/14/21 17:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.05 at 20.9C

Method Blank (MB)

(MB) R3715205-1 10/11/21 19:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1414007-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1414007-04 10/11/21 22:35 • (DUP) R3715205-3 10/11/21 22:51

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	3.42	3.39	1	0.962		15
Fluoride	ND	ND	1	2.82		15
Sulfate	ND	ND	1	3.35		15

L1414007-12 Original Sample (OS) • Duplicate (DUP)

(OS) L1414007-12 10/12/21 02:08 • (DUP) R3715205-6 10/12/21 02:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	46.9	46.8	1	0.118		15
Fluoride	ND	ND	1	0.827		15
Sulfate	ND	ND	1	2.53		15

Laboratory Control Sample (LCS)

(LCS) R3715205-2 10/11/21 19:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.5	98.8	80.0-120	
Fluoride	8.00	8.25	103	80.0-120	
Sulfate	40.0	39.5	98.9	80.0-120	

L1414007-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414007-09 10/12/21 00:46 • (MS) R3715205-4 10/12/21 01:02 • (MSD) R3715205-5 10/12/21 01:19

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	23.8	70.9	71.2	94.1	94.7	1	80.0-120			0.363	15
Fluoride	5.00	ND	4.73	4.78	92.2	93.1	1	80.0-120			0.959	15
Sulfate	50.0	ND	48.6	48.7	93.1	93.3	1	80.0-120			0.256	15

L1414007-12 Original Sample (OS) • Matrix Spike (MS)

(OS) L1414007-12 10/12/21 02:08 • (MS) R3715205-7 10/12/21 02:41

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	46.9	93.9	94.0	1	80.0-120	
Fluoride	5.00	ND	4.84	94.9	1	80.0-120	
Sulfate	50.0	ND	49.6	96.7	1	80.0-120	

Method Blank (MB)

(MB) R3715910-1 10/13/21 00:57

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1414096-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1414096-01 10/13/21 05:10 • (DUP) R3715910-5 10/13/21 05:27

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	8.67	8.61	1	0.714		15
Fluoride	ND	ND	1	3.97		15
Sulfate	ND	ND	1	2.35		15

L1414358-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1414358-03 10/13/21 12:54 • (DUP) R3715910-8 10/13/21 13:10

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	27.8	27.8	1	0.0277		15
Fluoride	0.283	0.285	1	0.739		15
Sulfate	ND	ND	1	2.53		15

Laboratory Control Sample (LCS)

(LCS) R3715910-2 10/13/21 01:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.5	98.8	80.0-120	
Fluoride	8.00	8.26	103	80.0-120	
Sulfate	40.0	39.7	99.1	80.0-120	

L1414036-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414036-05 10/13/21 02:59 • (MS) R3715910-3 10/13/21 03:15 • (MSD) R3715910-4 10/13/21 03:32

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	19.2	64.7	64.5	90.9	90.6	1	80.0-120			0.276	15
Fluoride	5.00	0.384	4.77	4.79	87.6	88.1	1	80.0-120			0.452	15
Sulfate	50.0	181	221	221	79.6	79.3	1	80.0-120	E J6	E J6	0.0492	15

L1414358-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1414358-05 10/13/21 09:49 • (MS) R3715910-7 10/13/21 10:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	13.4	61.5	96.2	1	80.0-120	
Fluoride	5.00	ND	4.74	92.6	1	80.0-120	
Sulfate	50.0	11.2	60.2	98.0	1	80.0-120	

Method Blank (MB)

(MB) R3716744-1 10/15/21 01:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	0.000753		0.000736	0.00500
Boron	U		0.0200	0.200
Calcium	U		0.0793	1.00
Lithium	0.00530	J	0.00485	0.0150
Molybdenum	U		0.00116	0.00500

Laboratory Control Sample (LCS)

(LCS) R3716744-2 10/15/21 01:57

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	0.979	97.9	80.0-120	
Boron	1.00	0.960	96.0	80.0-120	
Calcium	10.0	9.65	96.5	80.0-120	
Lithium	1.00	0.968	96.8	80.0-120	
Molybdenum	1.00	0.989	98.9	80.0-120	

L1414036-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414036-05 10/15/21 02:00 • (MS) R3716744-4 10/15/21 02:05 • (MSD) R3716744-5 10/15/21 02:08

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.105	1.05	1.09	94.6	98.3	1	75.0-125			3.45	20
Boron	1.00	ND	1.11	1.15	94.4	99.3	1	75.0-125			4.37	20
Calcium	10.0	68.6	77.3	77.4	87.0	87.8	1	75.0-125			0.0975	20
Lithium	1.00	0.0560	1.01	1.05	95.5	99.1	1	75.0-125			3.55	20
Molybdenum	1.00	ND	0.999	1.02	99.7	102	1	75.0-125			1.80	20

L1414420-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414420-03 10/15/21 02:11 • (MS) R3716744-6 10/15/21 02:14 • (MSD) R3716744-7 10/15/21 02:16

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	ND	0.995	0.985	99.1	98.1	1	75.0-125			1.01	20
Boron	1.00	ND	0.964	0.966	96.4	96.6	1	75.0-125			0.161	20
Calcium	10.0	26.6	36.0	36.1	94.1	94.5	1	75.0-125			0.118	20
Lithium	1.00	ND	0.988	0.980	97.7	96.9	1	75.0-125			0.760	20
Molybdenum	1.00	ND	1.01	0.998	101	99.8	1	75.0-125			1.27	20

Method Blank (MB)

(MB) R3716076-1 10/13/21 15:37

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.000180	0.00200
Selenium	U		0.000300	0.00200

Laboratory Control Sample (LCS)

(LCS) R3716076-2 10/13/21 15:41

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	0.0500	0.0486	97.2	80.0-120	
Selenium	0.0500	0.0476	95.3	80.0-120	

L1414036-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414036-05 10/13/21 15:44 • (MS) R3716076-4 10/13/21 15:51 • (MSD) R3716076-5 10/13/21 15:54

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	0.0500	0.00667	0.0562	0.0524	99.0	91.5	1	75.0-125			6.91	20
Selenium	0.0500	ND	0.0514	0.0513	102	101	1	75.0-125			0.206	20

L1414420-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414420-03 10/13/21 15:58 • (MS) R3716076-6 10/13/21 16:01 • (MSD) R3716076-7 10/13/21 16:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	0.0500		0.0497	0.0445	98.9	88.6	1	75.0-125			10.9	20
Selenium	0.0500		0.0490	0.0447	98.1	89.4	1	75.0-125			9.21	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Kansas City Board of Public Utilities
300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Report to:
Ingrid Setzler

Email To:
isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: Groundwater Monitoring
City/State Collected: Kansas City, KS
Please Circle: PT MT (CT) ET

Phone: 913-573-9806
Client Project # KCBPU Nearman
Lab Project # KCKAN02-MW NEARMAN2

Collected by (print): Chris Hoglund
Site/Facility ID #
P.O. #

Collected by (signature): [signature]
Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #
Date Results Needed: Standard TAT

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace Analytical
2 coolers

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1414036
A146
Acctnum: KCKAN02
Template: T159295
Prelogin: P878407
PM: 650 - Linda Cashman
PB:
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Total Rad, Rad 226, Rad 228	Remarks	Sample # (lab only)
MW-2A /GW02	Grab	GW	–	10/5/21	1005	4	X	X	X	X		-01
MW-3 /GW02	Grab	GW	–	10/5/21	1115	4	X	X	X	X		-02
MW-4 /GW02	Grab	GW	–	10/5/21	1315	4	X	X	X	X		-03
MW-8A		GW				3	X	X	X			
MW-10 /GW02	Grab	GW	–	10/5/21	0910	4	X	X	X	X		-04
MW-13		GW				3	X	X	X			
MW-14		GW				3	X	X	X			
MW-15 /GW02	Grab	GW	–	10/5/21	1535	4	X	X	X	X		-05
MW-16		GW				3	X	X	X			
DUP-1 /GW02	Grab	GW	–	10/5/21	—	4	X	X	X	X		-06

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR
[signature] CHRIS HOGLUND (BMCD)	10/5/21	1725		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NGA °C 4.6+0=4.6 Bottles Received: 28
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) [signature]	Date: 10/6/21 Time: 0945

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Company Name/Address:
Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Report to:
Ingrid Setzler

Email To:
isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description:
Groundwater Monitoring

City/State Collected: Kansas City, KS

Please Circle: PT MT (CT) ET

Phone: **913-573-9806**

Client Project #
KCBPU Nearman

Lab Project #
KCKAN02-MW NEARMAN2

Collected by (print):
Chris Hoglund

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed
Standard TAT

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Total Rad, Ra226, Ra228							Remarks	Sample # (lab only)
		GW				3	X	X	X									
MS /GW02	Grab	GW	—	10/5/21	1535	4	X	X	X	X								-05
MS-D /GW02	Grab	GW	—	10/5/21	1535	4	X	X	X	X								-05

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace Analytical®
2 coolers
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1475036

Table #

Acctnum: **KCKAN02**
Template: **T159295**
Prelogin: **P878407**
PM: **650 - Linda Cashman**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Chris Hoglund (CHRIS HOGLUND)	10/5/21	1725	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Marilyn Mu

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 4.6+0=4.6 °C Bottles Received: 28

Date: 10/6/21 Time: 0945

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

L1414036

Tracking Numbers		Temperature
5300 4294 6569		4.6 ± 0 = 4.6
		--

ANALYTICAL REPORT

October 25, 2021

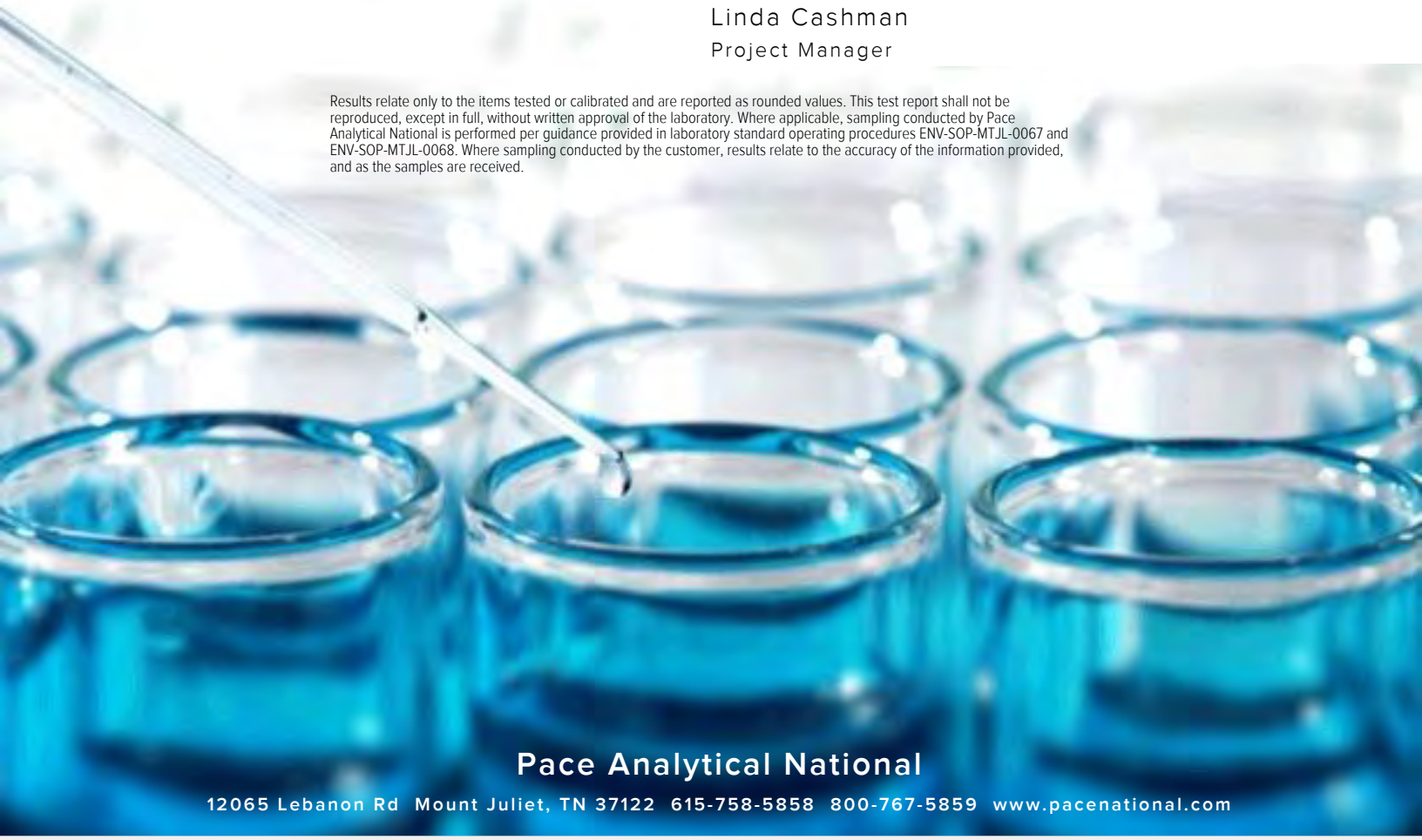
Kansas City Board of Public Utilities

Sample Delivery Group:	L1414715
Samples Received:	10/07/2021
Project Number:	KCBPU Nearman
Description:	Groundwater Monitoring

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

MW-8A/GW02 L1414715-01 GW

Collected by: Chris Hoglund
Collected date/time: 10/06/21 09:40
Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1755931	1	10/12/21 19:55	10/12/21 22:39	BRG	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1762042	1	10/24/21 23:50	10/24/21 23:50	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1756367	1	10/15/21 02:40	10/15/21 02:40	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1756367	5	10/15/21 02:58	10/15/21 02:58	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755561	1	10/19/21 12:39	10/20/21 02:51	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755561	1	10/19/21 12:39	10/20/21 07:42	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1759999	1	10/20/21 13:25	10/20/21 20:11	LD	Mt. Juliet, TN

MW-14/GW02 L1414715-02 GW

Collected by: Chris Hoglund
Collected date/time: 10/06/21 11:35
Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1755931	1	10/12/21 19:55	10/12/21 22:39	BRG	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1762042	1	10/24/21 23:50	10/24/21 23:50	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1756367	1	10/15/21 03:16	10/15/21 03:16	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1756367	5	10/15/21 03:34	10/15/21 03:34	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755561	1	10/19/21 12:39	10/20/21 02:54	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1755561	1	10/19/21 12:39	10/20/21 07:45	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1759999	1	10/20/21 13:25	10/20/21 20:14	LD	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Linda Cashman
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	998		20.0	1	10/12/2021 22:39	WG1755931

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.42	T8	1	10/24/2021 23:50	WG1762042

Sample Narrative:

L1414715-01 WG1762042: 7.42 at 20.3C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	25.5		1.00	1	10/15/2021 02:40	WG1756367
Fluoride	0.356		0.150	1	10/15/2021 02:40	WG1756367
Sulfate	395		25.0	5	10/15/2021 02:58	WG1756367

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.170		0.00500	1	10/20/2021 07:42	WG1755561
Boron	2.39		0.200	1	10/20/2021 02:51	WG1755561
Calcium	156		1.00	1	10/20/2021 02:51	WG1755561
Lithium	0.0431		0.0150	1	10/20/2021 02:51	WG1755561
Molybdenum	0.00643	B	0.00500	1	10/20/2021 02:51	WG1755561

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	0.0256		0.00200	1	10/20/2021 20:11	WG1759999
Selenium	ND		0.00200	1	10/20/2021 20:11	WG1759999

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	934		20.0	1	10/12/2021 22:39	WG1755931

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.29	T8	1	10/24/2021 23:50	WG1762042

Sample Narrative:

L1414715-02 WG1762042: 7.29 at 20.1C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	15.9		1.00	1	10/15/2021 03:16	WG1756367
Fluoride	0.178		0.150	1	10/15/2021 03:16	WG1756367
Sulfate	196		25.0	5	10/15/2021 03:34	WG1756367

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.121		0.00500	1	10/20/2021 07:45	WG1755561
Boron	ND		0.200	1	10/20/2021 02:54	WG1755561
Calcium	212		1.00	1	10/20/2021 02:54	WG1755561
Lithium	0.0337		0.0150	1	10/20/2021 02:54	WG1755561
Molybdenum	ND		0.00500	1	10/20/2021 02:54	WG1755561

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	ND		0.00200	1	10/20/2021 20:14	WG1759999
Selenium	0.0294		0.00200	1	10/20/2021 20:14	WG1759999

Method Blank (MB)

(MB) R3717325-1 10/12/21 22:39

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1414715-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1414715-01 10/12/21 22:39 • (DUP) R3717325-3 10/12/21 22:39

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	998	1010	1	1.20		5

L1414715-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1414715-02 10/12/21 22:39 • (DUP) R3717325-4 10/12/21 22:39

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	934	934	1	0.000		5

Laboratory Control Sample (LCS)

(LCS) R3717325-2 10/12/21 22:39

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8640	98.2	77.4-123	

L1414744-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1414744-01 10/24/21 23:50 • (DUP) R3720654-2 10/24/21 23:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	4.27	4.24	1	0.705		1

Sample Narrative:

OS: 4.27 at 20C

DUP: 4.24 at 20.1C

L1415138-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1415138-01 10/24/21 23:50 • (DUP) R3720654-3 10/24/21 23:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.14	8.15	1	0.123		1

Sample Narrative:

OS: 8.14 at 20.1C

DUP: 8.15 at 20.2C

Laboratory Control Sample (LCS)

(LCS) R3720654-1 10/24/21 23:50

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 20.3C

Method Blank (MB)

(MB) R3718036-1 10/14/21 16:33

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3718036-5 10/14/21 23:58

Analyte	Original Result	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride		62.5	1	0.0720		15
Fluoride		ND	1	0.713		15

Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3718036-6 10/15/21 05:03

Analyte	Original Result	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride		42.8	1	0.259		15
Fluoride		0.388	1	0.257		15
Sulfate		23.9	1	0.151		15

Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3718036-8 10/18/21 19:29

Analyte	Original Result	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate		157	5	0.652		15

Laboratory Control Sample (LCS)

(LCS) R3718036-2 10/14/21 16:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.6	99.1	80.0-120	
Fluoride	8.00	8.22	103	80.0-120	
Sulfate	40.0	40.0	100	80.0-120	

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) • (MS) R3718036-3 10/14/21 22:47 • (MSD) R3718036-4 10/14/21 23:05

Analyte	Spike Amount mg/l	Original Result	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0		110	110	95.8	96.0	1	80.0-120	E	E	0.0816	15
Fluoride	5.00		5.05	5.06	99.0	99.0	1	80.0-120			0.0673	15
Sulfate	50.0		206	206	89.2	88.4	1	80.0-120	E	E	0.193	15

Original Sample (OS) • Matrix Spike (MS)

(OS) • (MS) R3718036-7 10/15/21 05:21

Analyte	Spike Amount mg/l	Original Result	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0		91.9	98.1	1	80.0-120	
Fluoride	5.00		5.52	103	1	80.0-120	
Sulfate	50.0		74.9	102	1	80.0-120	

Method Blank (MB)

(MB) R3718752-1 10/20/21 03:02

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0200	0.200
Calcium	0.242	J	0.0793	1.00
Lithium	U		0.00485	0.0150
Molybdenum	0.00149	J	0.00116	0.00500

Method Blank (MB)

(MB) R3718752-7 10/20/21 07:39

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000736	0.00500

Laboratory Control Sample (LCS)

(LCS) R3718752-2 10/20/21 03:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	0.993	99.3	80.0-120	
Boron	1.00	0.959	95.9	80.0-120	
Calcium	10.0	10.0	100	80.0-120	
Lithium	1.00	0.996	99.6	80.0-120	
Molybdenum	1.00	0.977	97.7	80.0-120	

L1414007-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414007-03 10/20/21 03:07 • (MS) R3718752-4 10/20/21 03:12 • (MSD) R3718752-6 10/20/21 03:15

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.0586	0.998	0.993	93.9	93.4	1	75.0-125			0.477	20
Boron	1.00	1.95	2.84	2.83	88.5	88.2	1	75.0-125			0.114	20
Calcium	10.0	93.8	102	101	79.2	75.6	1	75.0-125			0.355	20
Lithium	1.00	ND	1.06	1.05	105	105	1	75.0-125			0.524	20
Molybdenum	1.00	ND	0.959	0.966	95.7	96.4	1	75.0-125			0.711	20

Method Blank (MB)

(MB) R3719159-1 10/20/21 19:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.000180	0.00200
Selenium	U		0.000300	0.00200

Laboratory Control Sample (LCS)

(LCS) R3719159-2 10/20/21 19:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	0.0500	0.0470	94.0	80.0-120	
Selenium	0.0500	0.0490	98.0	80.0-120	

L1414612-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414612-11 10/20/21 19:50 • (MS) R3719159-4 10/20/21 19:57 • (MSD) R3719159-5 10/20/21 20:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	0.0500	ND	0.0479	0.0481	95.1	95.6	1	75.0-125			0.453	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
T8	Sample(s) received past/too close to holding time expiration.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Kansas City Board of Public Utilities
300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: **Ingrid Setzler**

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: **Groundwater Monitoring**

City/State Collected: Kansas City, KS

Please Circle: PT MT (CT) ET

Phone: **913-573-9806**

Client Project #: **KCBPU Nearman**

Lab Project #: **KCKAN02-MW NEARMAN2**

SDG # L1414715
B201

Collected by (print): CHRIS HOGLUND

Site/Facility ID #

P.O. #

Acctnum: **KCKAN02**
Template: **T159295**
Prelogin: **P878407**
PM: **650 - Linda Cashman**
PB:
Shipped Via: **FedEX Ground**

Collected by (signature): [signature]
Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STANDARD TAT

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Total Radium, Rad 226, Rad 228	Remarks	Sample # (lab only)
MW-2A		GW				3	X	X	X			
MW-3		GW				3	X	X	X			
MW-4		GW				3	X	X	X			
MW-8A /GW02	Grab	GW	—	10/6/21	0940	~~3~~ 45	X	X	X	X		-01
MW-10		GW				3	X	X	X			
MW-13		GW				3	X	X	X			
MW-14 /GW02	Grab	GW	—	10/6/21	1135	~~3~~ 45	X	X	X	X		-02
MW-15		GW				3	X	X	X			
MW-16		GW				3	X	X	X			
DUP-1		GW				3	X	X	X			

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ___

Remarks:

pH ___ Temp ___
Flow ___ Other ___

Samples returned via: ___ UPS X FedEx ___ Courier ___

Tracking # 5300 4294 4558

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No (HCL / MeoH, TBR)	
[signature] (Bmcd)	10/6/21	1910			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: A3ot .2+0=.2 °C; Bottles Received: 10	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) [signature]	Date: 10/07/21 Time: 9:00	Hold: Condition: NCF / (OK)

ANALYTICAL REPORT

November 09, 2021

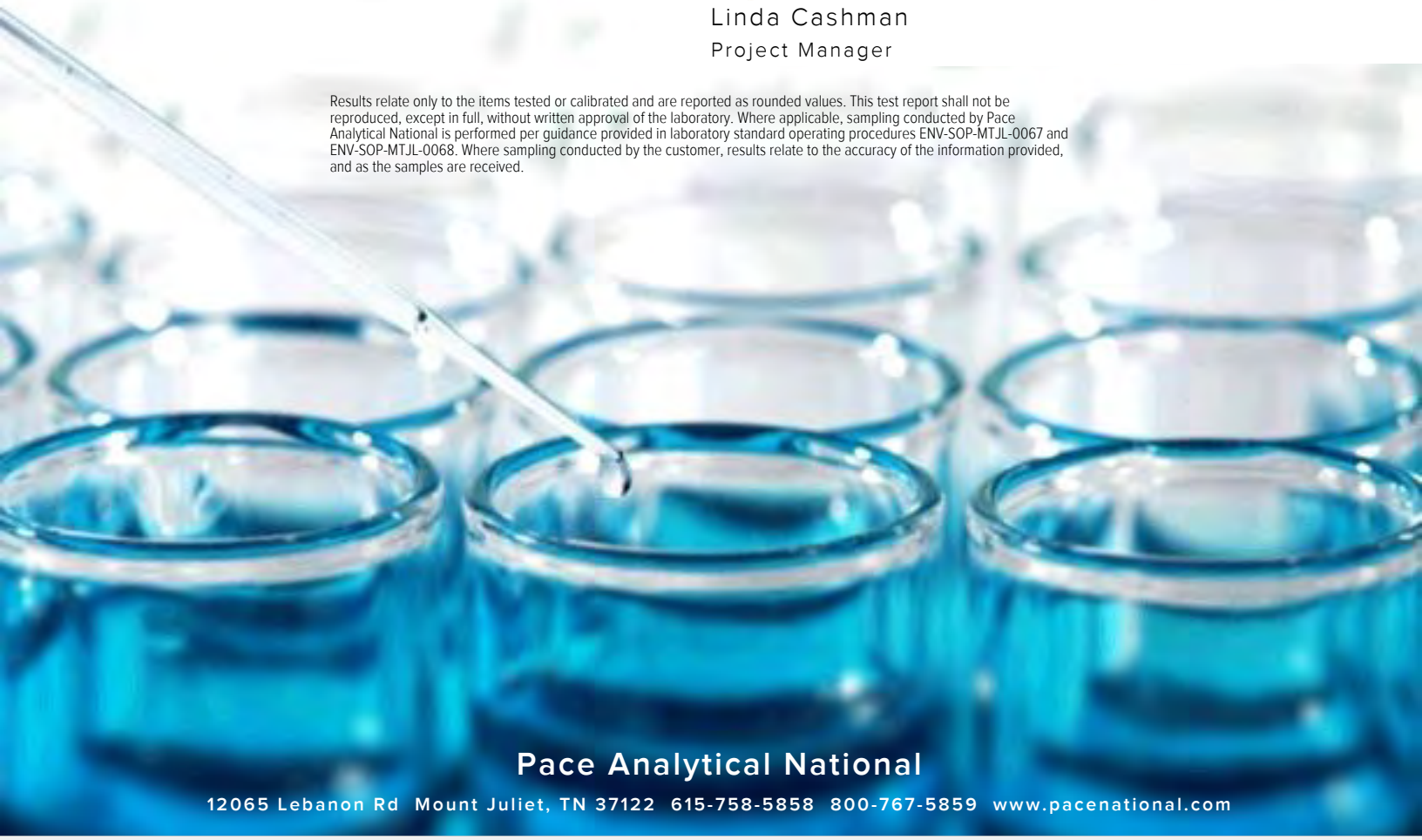
Kansas City Board of Public Utilities

Sample Delivery Group:	L1414717
Samples Received:	10/07/2021
Project Number:	KCBPU Nearman Ck
Description:	Groundwater Monitoring

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

MW8A/GW02 L1414717-01 Non-Potable Water

Collected by: Chris Hoglund
Collected date/time: 10/06/21 09:40
Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758754	1	11/01/21 10:12	11/02/21 16:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758754	1	11/01/21 10:12	11/02/21 14:23	RGT	Mt. Juliet, TN

MW14/GW02 L1414717-02 Non-Potable Water

Collected by: Chris Hoglund
Collected date/time: 10/06/21 11:35
Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758754	1	11/01/21 10:12	11/02/21 16:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758754	1	11/01/21 10:12	11/02/21 14:23	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Linda Cashman
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.21		0.323	0.584	11/02/2021 16:00	WG1763164
(T) Barium	*91.7*			*62.0-143*	*11/02/2021 16:00*	WG1763164
(T) Yttrium	*97.5*			*79.0-136*	*11/02/2021 16:00*	WG1763164

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.36		0.511	0.842	11/02/2021 16:00	WG1758754

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.154	J	0.188	0.258	11/02/2021 14:23	WG1758754
(T) Barium-133	*92.9*			*30.0-143*	*11/02/2021 14:23*	WG1758754

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.10		0.302	0.508	11/02/2021 16:00	WG1763164
(T) Barium	*93.9*			*62.0-143*	*11/02/2021 16:00*	WG1763164
(T) Yttrium	*94.4*			*79.0-136*	*11/02/2021 16:00*	WG1763164

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	2.14		0.448	0.786	11/02/2021 16:00	WG1758754

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0482	U	0.146	0.278	11/02/2021 14:23	WG1758754
(T) Barium-133	*102*			*30.0-143*	*11/02/2021 14:23*	WG1758754

Method Blank (MB)

(MB) R3725014-1 11/02/21 16:00

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	0.497		0.244	0.458
(T) Barium	*95.3*		*95.3*	
(T) Yttrium	*104*		*104*	

L1414737-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1414737-02 11/02/21 16:00 • (DUP) R3725014-5 11/02/21 16:00

Analyte	Original Result pCi/l	Original Uncertainty + / -	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty + / -	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.55	0.313	0.555	0.162	0.803	0.555	1	162	1.61	U	20	3
(T) Barium	*95.9*			*96.9*	*96.9*							
(T) Yttrium	*109*			*101*	*101*							

Laboratory Control Sample (LCS)

(LCS) R3725014-2 11/02/21 16:00

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.46	109	80.0-120	
(T) Barium			*102*		
(T) Yttrium			*92.7*		

L1414737-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414737-05 11/02/21 16:00 • (MS) R3725014-3 11/02/21 16:00 • (MSD) R3725014-4 11/02/21 16:00

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	16.7	1.10	20.4	21.4	115	122	1	70.0-130			4.98		20
(T) Barium		*98.4*			*103*	*96.1*							
(T) Yttrium		*96.5*			*89.6*	*98.6*							

Method Blank (MB)

(MB) R3724961-1 11/02/21 13:00

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / -	MB MDA pCi/l
Radium-226	0.00325	U	0.0142	0.0283
(T) Barium-133	*96.9*		*96.9*	

Laboratory Control Sample (LCS)

(LCS) R3724961-2 11/02/21 14:23

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.87	117	80.0-120	
(T) Barium-133			*91.1*		

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:

300 N 65th St
Kansas City, KS 66102

Pres Chk

Report to:
Ingrid Setzler

Email To:
isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description:
Groundwater Monitoring

City/State Collected: Kansas City, KS

Please Circle: PT MT CT ET

Phone: **913-573-9806**

Client Project #
KCBPU Nearman

Lab Project #
KCKAN02-MW NEARMAN2

Collected by (print):
CHRIS HOGLUND

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed
STANDARD TAT

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Total Radium, Rad 226, Rad 228							Remarks	Sample # (lab only)
							N V		N V									
MW-2A		GW				3	X	X	X									
MW-3		GW				3	X	X	X									
MW-4		GW				3	X	X	X									
MW-8A /GW02	Grab	GW	—	10/6/21	0940	3	X	X	X	X								-01
MW-10		GW				3	X	X	X									
MW-13		GW				3	X	X	X									
MW-14 /GW02	Grab	GW	—	10/6/21	1135	3	X	X	X	X								-02
MW-15		GW				3	X	X	X									
MW-16		GW				3	X	X	X									
DUP-1		GW				3	X	X	X									

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1414717
B201

Acctnum: **KCKAN02**
Template: **T159295**
Prelogin: **P878407**
PM: **650 - Linda Cashman**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 5300 4294 6554

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		X N
Bottles arrive intact:		X N
Correct bottles used:		X N
Sufficient volume sent:		X N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		X N
RAD Screen <0.5 mR/hr:		X N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
CHRIS HOGLUND (BNCO)	10/6/21	1910		0
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: .2 °C Bottles Received: 10
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 10/07/21 Time: 9:00

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

ANALYTICAL REPORT

November 09, 2021

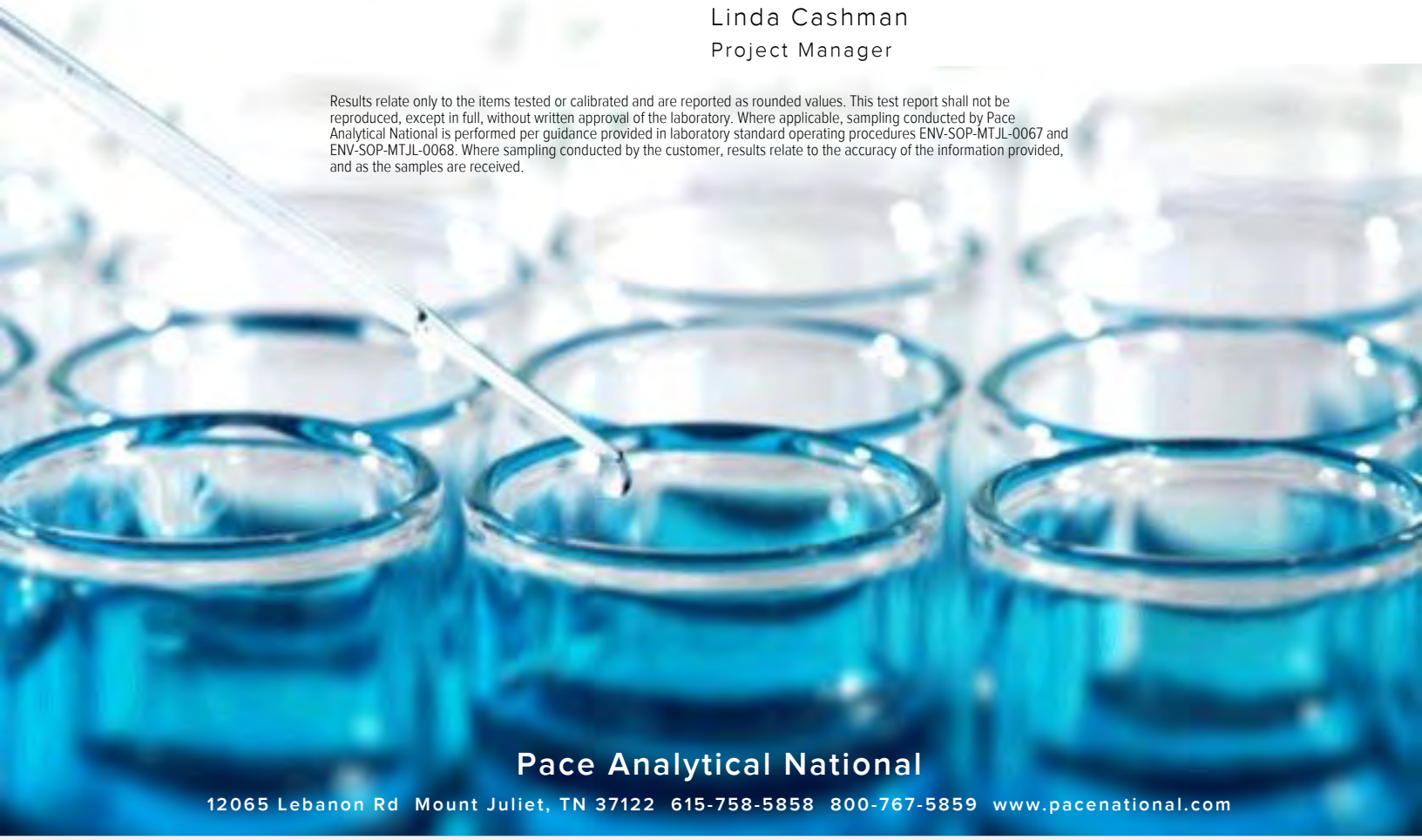
Kansas City Board of Public Utilities

Sample Delivery Group:	L1414737
Samples Received:	10/07/2021
Project Number:	KCBPU Nearman Ck
Description:	Groundwater Monitoring

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

MW-2A/GW02 L1414737-01 Non-Potable Water

Collected by: Chris Hoglund | Collected date/time: 10/05/21 10:05 | Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758754	1	11/01/21 10:12	11/02/21 16:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758754	1	11/01/21 10:12	11/02/21 14:23	RGT	Mt. Juliet, TN

MW-3/GW02 L1414737-02 Non-Potable Water

Collected by: Chris Hoglund | Collected date/time: 10/05/21 11:15 | Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758754	1	11/01/21 10:12	11/02/21 16:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758754	1	11/01/21 10:12	11/02/21 14:23	RGT	Mt. Juliet, TN

MW-4/GW02 L1414737-03 Non-Potable Water

Collected by: Chris Hoglund | Collected date/time: 10/05/21 13:15 | Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758754	1	11/01/21 10:12	11/02/21 16:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758754	1	11/01/21 10:12	11/02/21 14:23	RGT	Mt. Juliet, TN

MW-10/GW02 L1414737-04 Non-Potable Water

Collected by: Chris Hoglund | Collected date/time: 10/05/21 09:10 | Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758754	1	11/01/21 10:12	11/02/21 16:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758754	1	11/01/21 10:12	11/02/21 14:23	RGT	Mt. Juliet, TN

MW-15/GW02 L1414737-05 Non-Potable Water

Collected by: Chris Hoglund | Collected date/time: 10/05/21 15:35 | Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758754	1	11/01/21 10:12	11/02/21 16:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758754	1	11/01/21 10:12	11/02/21 14:23	RGT	Mt. Juliet, TN

DUP-1/GW02 L1414737-06 Non-Potable Water

Collected by: Chris Hoglund | Collected date/time: 10/05/21 00:00 | Received date/time: 10/07/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method Calculation	WG1758754	1	11/01/21 10:12	11/02/21 16:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1758754	1	11/01/21 10:12	11/02/21 14:23	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Linda Cashman
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.56		0.352	0.63	11/02/2021 16:00	WG1763164
(T) Barium	*92.6*			*62.0-143*	*11/02/2021 16:00*	WG1763164
(T) Yttrium	*99.5*			*79.0-136*	*11/02/2021 16:00*	WG1763164

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.82		0.567	0.823	11/02/2021 16:00	WG1758754

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.258		0.215	0.193	11/02/2021 14:23	WG1758754
(T) Barium-133	*95.1*			*30.0-143*	*11/02/2021 14:23*	WG1758754

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.55		0.313	0.555	11/02/2021 16:00	WG1763164
(T) Barium	*95.9*			*62.0-143*	*11/02/2021 16:00*	WG1763164
(T) Yttrium	*109*			*79.0-136*	*11/02/2021 16:00*	WG1763164

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.67		0.506	0.852	11/02/2021 16:00	WG1758754

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.121	J	0.193	0.297	11/02/2021 14:23	WG1758754
(T) Barium-133	*92.4*			*30.0-143*	*11/02/2021 14:23*	WG1758754

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.303	U	0.344	0.66	11/02/2021 16:00	WG1763164
(T) Barium	*101*			*62.0-143*	*11/02/2021 16:00*	WG1763164
(T) Yttrium	*103*			*79.0-136*	*11/02/2021 16:00*	WG1763164

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.359	U	0.489	0.931	11/02/2021 16:00	WG1758754

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0559	U	0.145	0.271	11/02/2021 14:23	WG1758754
(T) Barium-133	*94.8*			*30.0-143*	*11/02/2021 14:23*	WG1758754

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.36		0.458	0.842	11/02/2021 16:00	WG1763164
(T) Barium	*95.1*			*62.0-143*	*11/02/2021 16:00*	WG1763164
(T) Yttrium	*105*			*79.0-136*	*11/02/2021 16:00*	WG1763164

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.36		0.599	1.18	11/02/2021 16:00	WG1758754

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	-0.00251	U	0.141	0.333	11/02/2021 14:23	WG1758754
(T) Barium-133	*94.3*			*30.0-143*	*11/02/2021 14:23*	WG1758754

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.10		0.332	0.606	11/02/2021 16:00	WG1763164
(T) Barium	*98.4*			*62.0-143*	*11/02/2021 16:00*	WG1763164
(T) Yttrium	*96.5*			*79.0-136*	*11/02/2021 16:00*	WG1763164

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.10		0.418	0.912	11/02/2021 16:00	WG1758754

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	-0.0379	U	0.0858	0.306	11/02/2021 14:23	WG1758754
(T) Barium-133	*93.7*			*30.0-143*	*11/02/2021 14:23*	WG1758754

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.293	U	0.375	0.717	11/02/2021 16:00	WG1763164
(T) Barium	*90.7*			*62.0-143*	*11/02/2021 16:00*	WG1763164
(T) Yttrium	*96.2*			*79.0-136*	*11/02/2021 16:00*	WG1763164

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.511	J	0.584	0.945	11/02/2021 16:00	WG1758754

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.217	J	0.209	0.228	11/02/2021 14:23	WG1758754
(T) Barium-133	*92.6*			*30.0-143*	*11/02/2021 14:23*	WG1758754

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3725014-1 11/02/21 16:00

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	0.497		0.244	0.458
(T) Barium	*95.3*		*95.3*	
(T) Yttrium	*104*		*104*	

L1414737-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1414737-02 11/02/21 16:00 • (DUP) R3725014-5 11/02/21 16:00

Analyte	Original Result pCi/l	Original Uncertainty + / -	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty + / -	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.55	0.313	0.555	0.162	0.803	0.555	1	162	1.61	U	20	3
(T) Barium	*95.9*			*96.9*	*96.9*							
(T) Yttrium	*109*			*101*	*101*							

Laboratory Control Sample (LCS)

(LCS) R3725014-2 11/02/21 16:00

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.46	109	80.0-120	
(T) Barium			*102*		
(T) Yttrium			*92.7*		

L1414737-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414737-05 11/02/21 16:00 • (MS) R3725014-3 11/02/21 16:00 • (MSD) R3725014-4 11/02/21 16:00

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	16.7	1.10	20.4	21.4	115	122	1	70.0-130			4.98		20
(T) Barium		*98.4*			*103*	*96.1*							
(T) Yttrium		*96.5*			*89.6*	*98.6*							

Method Blank (MB)

(MB) R3724961-1 11/02/21 13:00

Analyte	MB Result	MB Qualifier	MB Uncertainty	MB MDA
	pCi/l		+ / -	pCi/l
Radium-226	0.00325	U	0.0142	0.0283
(T) Barium-133	*96.9*		*96.9*	

L1414765-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1414765-01 11/02/21 14:23 • (DUP) R3724961-5 11/02/21 14:23

Analyte	Original Result	Original Uncertainty	Original MDA	DUP Result	DUP Uncertainty	DUP MDA	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	+ / -	pCi/l		%			%	
Radium-226	8.02	1.18	0.259	8.75	1.17	0.259	1	8.67	0.437		20	3
(T) Barium-133	*89.0*			*98.5*	*98.5*							

Laboratory Control Sample (LCS)

(LCS) R3724961-2 11/02/21 14:23

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-226	5.02	5.87	117	80.0-120	
(T) Barium-133			*91.1*		

L1414737-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414737-05 11/02/21 14:23 • (MS) R3724961-3 11/02/21 14:23 • (MSD) R3724961-4 11/02/21 14:23

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.1	-0.0379	21.0	18.4	104	91.5	1	75.0-125			13.0		20
(T) Barium-133		*93.7*			*94.1*	*96.2*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Report to:
Ingrid Setzler

Email To:
isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description:
Groundwater Monitoring

City/State Collected: Kansas City, KS

Please Circle: PT MT (CT) ET

Phone: **913-573-9806**

Client Project #
KCBPU Nearman

Lab Project #
KCKAN02-MW NEARMAN2

Collected by (print):
Chris Hoglund

Site/Facility ID #

P.O. #

Collected by (signature):
CHoglund

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed
Standard TAT

Quote #

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Total Radium, Ra 226, Ra 228							Remarks	Sample # (lab only)
		GW				~~4~~ 3	X	X	X	X								
MS /GW02	Grab	GW	-	10/5/21	1535	~~4~~ 3	X	X	X	X								-05
MS-D /GW02	Grab	GW	-	10/5/21	1535	~~4~~ 3	X	X	X	X								-05
MW-2A / GW02	Grab	GW	-	10/5/21	1005	4	X	X	X	X								-01
MW-3 / GW02	Grab	GW	-	10/5/21	1115	4	X	X	X	X								-02
MW-4/GW02	Grab	GW	-	10/5/21	1315	4	X	X	X	X								-03
MW-10 / GW02	Grab	GW	-	10/5/21	0910	4	X	X	X	X								-04
MW-15 / GW02	Grab	GW	-	10/5/21	1530	4	X	X	X	X								-05
DUP-1 / GW02	Grab	GW	-	10/5/21		4	X	X	X	X								-06

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical®
2 coolers
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1414737
B208

Acctnum: **KCKAN02**
Template: **T159295**
Prelogin: **P877514**
PM: **650 - Linda Cashman**
PB: **8 9/29/21**
Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 5300 4294 0570

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
CHoglund (BMLD) Chris Hogl	10/5/21	1725		0	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.6 °C Bottles Received: 16	
				2.0-1=1.9	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 10/07/21 Time: 9:00	Hold: Condition: NCF / OK

APPENDIX D – CERTIFICATE OF CLOSURE BY REMOVAL

Kansas City Board of Public Utilities
Nearman Creek Power Station
Bottom Ash Pond

CLOSURE BY REMOVAL OF COAL COMBUSTION RESIDUALS CERTIFICATION

The final rule for the regulation and management of Coal Combustion Residuals (CCR) was published by the United States Environmental Protection Agency (USEPA) in 40 CFR §257 and §261 (herein referred to as the Final Rule) on April 17, 2015. The Final Rule applies to the CCR surface impoundment known as Bottom Ash Pond at the Nearman Creek Power Station, located at 4240 N 55th Street, Kansas City, Kansas, 66104.

CCR removal activities were completed on June 23, 2020 under the Kansas Department of Environment and Health approved construction quality assurance plan and requirements under the CCR Rule. Groundwater monitoring conducted in May 2021 and October 2021 confirmed that concentrations of constituents listed in 40 CFR 257, Appendix IV did not exceed their respective groundwater protection standards established pursuant to 40 CFR §257.95(h). I hereby certify, as a Professional Engineer in the State of Kansas that closure of the Bottom Ash Pond has been completed in accordance with 40 CFR §257.102(c).

Dec 23 2021 4:30 PM

Scott A. Martin, P.E.
Kansas License #24713
License Renewal Date: April 30, 2023

Date: 12/23/2021

BURNS McDONNELL

CREATE AMAZING.

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com