



2020 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 02/5/2021



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prepared for

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Kansas City, Kansas

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prepared by

Burns & McDonnell Kansas City, Missouri

TABLE OF CONTENTS

Page No.

1.0	EXEC	CUTIVE SUMMARY1-1
2.0	INTR 2.1 2.2	ODUCTION2-1Purpose and Scope2-1Overview2-1
3.0	GRO 3.1 3.2	UNDWATER MONITORING ACTIVITIES AND RESULTS
4.0	STAT	TISTICAL ANALYSIS
5.0	ACC	OUNT OF VOLUNTARY CORRECTIVE ACTIONS COMPLETED
6.0	CER	TIFICATIONS AND NOTIFICATIONS TO THE OPERATING RECORD6-1
7.0	KEY	ACTIVITIES FOR THE UPCOMING YEAR
8.0	REFE	ERENCES
APPE	RES ENDIX ENDIX	A – STATISTICAL EVALUATION B – GROUNDWATER SAMPLING FIELD DOCUMENTATION C – ANALYTICAL REPORTS AND DATA VALIDATION

LIST OF TABLES

Table No. <u>Title</u>

- 3-1 Monitoring Well Gauging Data May 29, 2020
- 3-2 Monitoring Well Gauging Data October 30, 2020
- 3-3 Summary of Analytical Results October 2015 through December 2020 Sampling Events

LIST OF FIGURES

Figure No. Title

- 2-1 Site Location
- 3-1 Monitoring Well Locations
- 3-2 May 29, 2020 Potentiometric Surface Map
- 3-3 Oct. 30, 2020 Potentiometric Surface Map

Abbreviation

LIST OF ABBREVIATIONS

Term/Phrase/Name

2020 reduced list of Appendix IV parameters BA Pond BPU CCR CCR Final Rule	Appendix IV parameters that were detected during the May 2020 sampling event Bottom Ash Pond Kansas City Board of Public Utilities Coal Combustion Residuals <i>Hazardous and Solid Waste Management System; Disposal of Coal</i> <i>Combustion Residuals (CCR) from Electric Utilities; Final Rule</i> , dated
Cell 1	April 17, 2015, amended July 30, 2018
	Nearman Creek Power Station Bottom Ash Pond
CFR	Code of Federal Regulations
Groundwater Monitoring	Groundwater Monitoring Plan for the Nearman Creek Power Station
Program	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, respectfully. Traditionally, 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; and USEPA, 2020) (CCR Final Rule), BPU is required to submit an Annual Groundwater Monitoring and Corrective Action Report. This document serves as the 2020 Annual Groundwater Monitoring and Corrective Action Report and is the fourth Annual Groundwater Monitoring and Corrective Action Report prepared for the Nearman Creek Power Station BA Pond in accordance with the CCR Final Rule.

In 2020, 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. BPU is currently assessing whether the elevated arsenic concentrations at Monitoring Well MW-8A are a result of a source other than the CCR unit in accordance with 40 CFR 257.95. This assessment will be completed by March 18, 2021, 90 days from December 18, 2020.

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 toward the Missouri River per the *Bottom Ash Pond CQA Plan* (Burns & McDonnell, 2020a).

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; and USEPA, 2020) at the BA Pond located at BPU's NCPS. This Report has been prepared to provide an account of groundwater monitoring activities performed in 2020 in support of BPU's compliance with the Final Rule. These activities were performed in general accordance with the *Groundwater Monitoring Plan for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2016a) (Groundwater Monitoring Program) and the *Sampling and Analysis Plan for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2016b) (SAP) and included the following:

- Statistical evaluation of groundwater data for samples collected from 2015 through 2020.
- Continued assessment monitoring program 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.

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 fourth 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 2021.
- 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

On January 1, 2020, the BA Pond was in assessment monitoring. Prior to 2020, a total of 9 detection monitoring events and 4 assessment monitoring events had been performed at the BA Pond. These events were reported on in the 2017 Annual Groundwater Monitoring and Corrective Action Study Report (Burns & McDonnell, 2018a), the 2018 Annual Groundwater Monitoring and Corrective Action Study Report (Burns & McDonnell, 2019a), and the 2019 Annual Groundwater Monitoring and Corrective Action Study Action Report for the Nearman Creek Power Station Bottom Ash Pond (Burns & McDonnell, 2020b).

In 2020, 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 accordance with the Groundwater Monitoring Program.

- May 2020 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 11, 2020 *Notification Regarding Groundwater Protection Standards* (Burns & McDonnell, 2020b), indicated that none of the parameters listed in Appendix IV of 40 CFR 257.95 were detected at concentrations above their respective GWPSs.
- October 2020 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 that were detected during the May 2020 sampling event (herein after referred to as the "2020 reduced list of Appendix IV parameters", which includes: arsenic, barium, fluoride, lithium, molybdenum, selenium, radium). 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, which was completed on December 18, 2020, is summarized in Appendix A of this Report, indicated that arsenic detected in Monitoring Well MW-8A was greater than its respective GWPS. Arsenic was detected at a concentration of 0.0373 mg/L on October 19, 2020. A verification sample was collected on December 8, 2020 to assess an atypical oxidation-reduction potential (ORP) reading that was observed and an elevated arsenic result detected at Monitoring Well MW-8A during the October 2020 sampling event. The arsenic concentration detected during the verification event was 0.0352 mg/L. With the exception of arsenic, the statistical evaluation indicated that none of the parameters listed in Appendix IV of 40 CFR 257.95 were detected at concentrations above their respective GWPSs. As described in Section 4.0, and in accordance with 40 CFR 257.96(g)(3), BPU is currently evaluating the arsenic detection at Monitoring Well MW-8A.

3.2 Groundwater Sampling Activities

During the 2020 sampling events identified in Section 3.1, the depth to groundwater was gauged during the May and October sampling events using a decontaminated water level meter. Measured water levels used to develop the piezometric surface contours presented on Figures 3-2 and 3-3. The measured depth to groundwater and calculated water level elevations for each event are presented on Tables 3-1 and 3-2. Prior to groundwater sample collection, the wells were purged using low-flow sampling pumps until stabilization criteria had been met and the turbidity was below 5 Nephelometric Turbidity Units (NTUs). Once groundwater 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. 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 analysis. No issues were encountered during the sampling events performed at the BA Pond in 2020. Monitoring well sampling forms for each of the groundwater monitoring events are presented in Appendix B. Analytical data are summarized in Table 3-3, copies of laboratory analytical data packages are included in Appendix C. Laboratory data was validated in accordance with the SAP and all data are considered suitable for reporting as qualified. Copies of data validation reports are provided in Appendix C. None of the detected parameters from the May sampling event exceeded their respective GWPS. However, as mentioned in Section 3.1, arsenic in Monitoring Well MW-8A was detected above its respective GWPS during the October 2020 sampling event. A summary of May and October 2020 sampling results are presented in Table 3-3.

As presented on Figure 3-2, the primary groundwater gradients observed during the May 2020 sampling event are to the south and east, toward the BA Pond. This is a departure from historical groundwater

monitoring events where groundwater gradients were observed to the northwest. The groundwater gradient observed at the BA Pond during the October 2020 sampling event was to the northwest, toward Monitoring Well 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 . These temporary reversals have been attributed to fluctuating river stage.

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 December 8, 2020 was completed on July 03, 2020 and December 18, 2020, within 90 days following analysis of the samples collected during the May 2020 and October 2020 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 2020 Sampling Event	October 2020 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)

Arsenic was detected above the GWPS at MW-8A during the October 2020 sampling event and is considered an SSI. In accordance with 40 CFR 257.95(g)(3), when an Appendix IV constituent is detected at a level greater than the GWPS one of the following measures must be taken within 90 days:

- 1. Initiate an assessment of corrective measures as required by 40 CFR 257.96; or
- 2. Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

BPU is currently assessing whether a source other than the CCR unit may have resulted in elevated arsenic concentrations at MW-8A, or if the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. After a preliminary assessment of sampling procedures, laboratory reports, aquifer geochemistry and data trends, the elevated arsenic result is likely a result of natural variation in the aquifer as indicated by:

• Further statistical analysis of the October 2020 GWPS exceedance for arsenic at MW-8A suggests that the SSI, while above the calculated GWPS for the BA Pond, is within the range of natural variability when calculated using historical data for MW-8A;

- Deviations from normal groundwater flow at the BA Pond were observed in May 2020, indicating groundwater was flowing from locations near the Missouri River towards the BA Pond. As a result, MW-8A was likely receiving groundwater from locations not monitored by upgradient wells for some portion of 2020. This may have resulted in influences to the groundwater chemistry at MW-8A that were not observed at the upgradient wells used to calculate the GWPS;
- The ORP measurement observed for MW-8A during the October 2020 sampling was the lowest reading recorded since the groundwater monitoring program was initiated in 2015 and suggests a shift in groundwater chemistry towards greater reducing conditions. Reducing aquifer conditions have been known to promote the mobilization of naturally occurring arsenic (Höhn et al., 2006) and can account for increases in dissolved phase arsenic results in groundwater samples. The timing of this shift to greater reducing conditions aligns with the 2019 flooding of the Missouri River when river water was pooled and recharged to the aquifer at locations near MW-8A, but not other upgradient wells. The timing of this shift in ORP and the absence of a documented release of CCR suggest the elevated concentrations are a result of natural events and not a release of CCR to groundwater. Furthermore, a reduction in sulfate was observed at MW-8A following the 2019 flood which aligns with a shift to a more reducing environment as sulfate would be reduced to sulfide (Jones and Ingle, 2005).

Results of this assessment will be reported under separate cover, as specified in 40 CFR 257.95(g)(3), no later than 90 days from December 18, 2020 when the SSI was identified.

4-2

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 KDHEapproved *Bottom Ash Pond CQA Plan* (Burns & McDonnell, 2020a). The following is a discussion of the voluntary closure activities completed during the 2020 reporting period:

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 toward the Missouri River 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.

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:

- 2019 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond (Burns & McDonnell, 2020c)
- Documentation of the measurements of the groundwater monitoring wells, as required by 257.91(e)(1).
- Copies of analytical data reports as required by the CCR groundwater monitoring program.
- GWPSs
- Statistical Evaluation of May 2020 Assessment Monitoring Data Nearman Creak Power Station Bottom Ash Pond (Burns & McDonnell, 2020d)
- Notification Regarding Groundwater Protection Standards (Burns & McDonnell, 2020c)

7.0 KEY ACTIVITIES FOR THE UPCOMING YEAR

Groundwater monitoring and statistical assessments are expected to be performed in 2021 as required by the BA Pond assessment monitoring program. BPU will complete the Alternate Source Demonstration described in Section 4.0 by March 18, 2021 to meet the requirements of 40 CFR 257.95 (g)(3).

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.
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- Burns & McDonnell, 2020d. Statistical Evaluation of May 2020 Assessment Monitoring Data. September 11.
- Höhn, R., Isenbeck-Schröter, M., Kent, D.B., Davis, J.A., Jakobsen, R., Jann, S., Niedan, V., Scholz, C., Stadler, S., Tretner, A., 2006. *Tracer test with As(V) under variable redox* conditions controlling arsenic transport in the presence of elevated ferrous iron concentrations. Journal of Contaminant Hydrology 88 36-54.
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 40 CFR Part 257, Federal Registrar, Vol. 83, No. 146, July 30. <u>https://www.federalre</u> gister.gov/documents/2018/07/30/2018-16262/hazardous-and-solid-waste-management-systemdisposal-of-coal-combustion-residuals-from-electric-utilities.
- USEPA, 2020. 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-wastemanagement-system-disposal-of-coal-combustion-residuals-from-electric

TABLES

Table 3-1 Monitoring Well Gauging Data - May 29, 2020 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	5/29/2020	747.86	31.68	31.74	15.54	732.32
MW-3	5/29/2020	750.44	34.70	34.50	18.70	731.74
MW-4	5/29/2020	746.90	31.75	31.98	15.63	731.27
MW-8A	5/29/2020	750.10	35.17	35.32	18.62	731.48
MW-10	5/29/2020	745.25	29.50	29.62	13.00	732.25
MW-13	5/29/2020	747.81	33.48	33.45	12.59	735.22
MW-14	5/29/2020	749.18	33.27	33.30	16.43	732.75
MW-15	5/29/2020	752.88	32.70	32.80	15.15	737.73
MW-16	5/29/2020	748.43	32.59	32.65	16.71	731.72

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

Table 3-2 Monitoring Well Gauging Data - October 30, 2020 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	10/30/2020	747.86	31.68	31.52	22.82	725.04
MW-3	10/30/2020	750.44	34.70	34.55	25.10	725.34
MW-4	10/30/2020	746.90	31.75	31.71	21.72	725.18
MW-8A	10/30/2020	750.10	35.17	35.10	26.23	723.87
MW-10	10/30/2020	745.25	29.50	29.42	20.85	724.40
MW-13	10/30/2020	747.81	33.48	33.28	20.98	726.83
MW-14	10/30/2020	749.18	33.27	33.10	28.63	720.55
MW-15	10/30/2020	752.88	32.70	32.56	26.08	726.80
MW-16	10/30/2020	748.43	32.59	32.45	22.30	726.13

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

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

					Sample Location Sample Date	MW-3 10/29/2015	MW-3 1/27/2016	MW-3 4/27/2016	MW-3 7/25/2016	MW-3 10/25/2016	MW-3 1/24/2017	MW-3 4/24/2017	MW-3 7/25/2017	MW-3 9/14/2017
Analytical Method	Analyte	Unit	Calculated		ASD									
Appendix III - Detection I	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³									
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	0.486			0.158	0.125	0.139	0.1 U	0.138	0.176	0.136	0.141	0.157
9040C	рН	su	6.56 - 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	рН	su	6.31 - 8.60			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	950.2			717	749	771	845	697	831	715	827	733
Appendix IV - Assessme	nt 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	0.354	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	0.588	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	0.0712	0.0712		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	4.17	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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

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

3 = Calculated background limit for arsenic as calculated as part of 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

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

					Sample Location Sample Date	MW-3 3/8/2018	MW-3 6/4/2018	MW-3 10/2/2018	MW-3 11/20/2018	MW-3 7/1/2019	MW-3 11/26/2019	MW-3 5/27/2020	MW-3 10/19/2020
Analytical Method	Analyte	Unit	Calculated		ASD								
Appendix III - Detection I	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³		1		I	I			1
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
6010B	Calcium	mg/l	246		-	NS	215	207	NS	136	181	153	198
9056MOD	Chloride	mg/l	32.67		-	NS	5.74	7.13	NS	7.37	7.35	9.33	6.91
9056MOD	Fluoride	mg/l	0.486		-	NS	0.173 J+	0.186	NS	0.218	0.180	0.191	0.178
9040C	рН	su	6.56 - 8.29			NS	6.94 J	6.83 J	NS	7.23 J	6.84 J	7.09 J	6.97 J
In Situ	рН	su	6.31 - 8.60		-	6.45	7.18	6.66	6.6	6.74	6.74	6.3	6.65
9056MOD	Sulfate	mg/l	213.5		-	NS	137	136	NS	66.9	93.4	106	117
2540 C-2011	Total Dissolved Solids	mg/l	950.2			NS	788	747	NS	506	638	609	737
Appendix IV - Assessme	nt Monitoring												
6010B/6020	Antimony	mg/l				0.002 U	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U
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
6010B	Barium	mg/l	0.354	2	-	0.164	0.159	0.163	NS	0.162	0.183	0.151	0.17
6010B	Beryllium	mg/l				0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l			-	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l				0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l				0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4		0.134	0.173 J+	0.186	NS	0.218	0.18	0.191	0.178
6010B/6020	Lead	mg/l			-	0.002 U	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708		0.0608	0.0606	0.0481	NS	0.0239	0.0462	0.0421	0.0521
7470A	Mercury	mg/l				0.0002 U	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U
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
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
6010B/6020	Thallium	mg/l				0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	-	1.06	1.62	0.555 J	NS	2.07	1.01	1.19	0.118

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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

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3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

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J = Result qualified as estimated

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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

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

					Sample Location Sample Date	MW-4 10/30/2015	MW-4 1/27/2016	MW-4 4/27/2016	MW-4 7/25/2016	MW-4 10/25/2016	MW-4 1/24/2017	MW-4 4/24/2017	MW-4 7/26/2017	MW-4 9/14/2017
Analytical Method	Analyte	Unit	Calculated		ASD									
Appendix III - Detection I	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³									
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	0.486			0.112	0.12	0.108	0.104	0.131	0.172	0.119	0.135	0.148 J-
9040C	рН	su	6.56 - 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	рН	su	6.31 - 8.60			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	950.2			780	736	755	683	837	774	840	736	732
Appendix IV - Assessme	nt 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	0.354	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	0.588	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	0.0712	0.0708		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	4.17	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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

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

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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

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

					Sample Location Sample Date	MW-4 3/8/2018	MW-4 6/4/2018	MW-4 10/2/2018	MW-4 11/20/2018	MW-4 7/2/2019	MW-4 11/26/2019	MW-4 5/27/2020	MW-4 10/19/2020
Analytical Method	Analyte	Unit	Calculated		ASD								
Appendix III - Detection N	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³								
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
6010B	Calcium	mg/l	246		-	NS	214 O1 V	176	NS	89.9	128	125	122
9056MOD	Chloride	mg/l	32.67		-	NS	3.59	1.95	NS	8.22	6.94	7.45	9.94
9056MOD	Fluoride	mg/l	0.486		-	NS	0.156 J+	0.177	NS	0.314	0.235	0.15 U	0.175
9040C	рН	su	6.56 - 8.29			NS	6.93 J	6.91 J	NS	7.56 J	7.10 J	7.41 J	7.23 J
In Situ	pН	su	6.31 - 8.60		-	6.68	6.94	6.80	6.7	7.29	6.9	6.35	6.85
9056MOD	Sulfate	mg/l	213.5		-	NS	116	87	NS	64.1	59.7	36.3	66.5
2540 C-2011	Total Dissolved Solids	mg/l	950.2			NS	741	619	NS	358	481	488	478
Appendix IV - Assessme	nt Monitoring												
6010B/6020	Antimony	mg/l				0.002 U	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 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
6010B	Barium	mg/l	0.354	2	-	0.135	0.134	0.121	NS	0.112	0.134	0.14	0.118
6010B	Beryllium	mg/l			-	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l				0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l			-	0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l	-		-	0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	-	0.132	0.156 J+	0.177	NS	0.314	0.235	0.15 U	0.175
6010B/6020	Lead	mg/l				0.002 U	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708	-	0.0458	0.051	0.0304	NS	0.0177	0.0265	0.0281	0.034
7470A	Mercury	mg/l			-	0.0002 U	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U
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
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
6010B/6020	Thallium	mg/l			-	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	-	0.168	0.876	0.186 J	NS	1.66 J	0.115	0.0763	2.34

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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

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3 = Calculated background limit for arsenic as calculated as part of 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

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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)

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U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

Summary of Analytical Results October 2015 through December 2020 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		ASD		Duplico	ate Pair					Duplico	nte Pair	Duplico	ate Pair
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³											
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	0.486			0.129	0.159	0.154	0.158	0.114	0.13	0.187	0.181	0.191	0.189	0.192
9040C	рН	su	6.56 - 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	рН	su	6.31 - 8.60			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	950.2			852	811	783	848	865	616	734	508	478	512	506
Appendix IV - Assessme	nt 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	0.354	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				
9056MOD	Fluoride	mg/l	0.588	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	0.0712	0.0708		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	4.17	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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

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

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U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

				:	Sample Location Sample Date	MW-2A 9/14/2017	DUP-1 9/14/2017	MW-2A 3/8/2018	MW-2A 6/4/2018	MW-2A 10/1 & 10/3/2018	MW-2A 11/20/2018	MW-2A 7/1/2019	DUP-1 7/1/2019	MW-2A 11/26/2019	DUP-1 11/26/2019	MW-2A 5/27/2020	MW-2A 10/19/2020
Analytical Method	Analyte	Unit	Calculated		ASD	Duplico	ate Pair					Duplico	ate Pair	Duplico	te Pair		
Appendix III - Detection I	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³												
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	0.2 U	0.221
6010B	Calcium	mg/l	246			155	155	NS	156	163	NS	127 V	127	122	123	137	168 V
9056MOD	Chloride	mg/l	32.67			6.26	6.33	NS	4.34	5.12	NS	8.82	8.96	14.0	13.9	14	12.7
9056MOD	Fluoride	mg/l	0.486			0.186	0.181	NS	0.274 J+	0.208	NS	0.23	0.229	0.274	0.271	0.278	0.234
9040C	рН	su	6.56 - 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	7.73 J	7.14 J
In Situ	рН	su	6.31 - 8.60			6.8	6.8	6.39	6.81	6.80	6.7	6.85	6.85	7.01	7.01	6.38	6.79
9056MOD	Sulfate	mg/l	213.5			89	89.6	NS	53.8	68.5	NS	86.3	87.2	108	109	110	113
2540 C-2011	Total Dissolved Solids	mg/l	950.2			571	568	NS	537	580	NS	462	462	471	436	545	622
Appendix IV - Assessme	ent 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	0.004 U	0.004 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	0.0042	0.00289
6010B	Barium	mg/l	0.354	2		0.116	0.115	0.184	0.147	0.157	NS	0.11	0.107	0.116	0.115	0.143	0.171
6010B	Beryllium	mg/l				0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l				0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS	0.002 U	0.002 U
6010B	Chromium	mg/l				0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l				0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4		0.186	0.181	0.166	0.274 J+	0.208	NS	0.23	0.229	0.274	0.271	0.278	0.234
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	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708		0.0294	0.0298	0.0372	0.0352	0.027	NS	0.0204	0.0202	0.0205	0.0223	0.0172	0.0302
7470A	Mercury	mg/l				0.0002 U	0.0002 U	0.0002 U	NS	NS	NS	0.0002 U	0.0002 U	NS	NS	0.0002	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	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	0.01 U	NS	NS	NS	0.002 U	0.002 U	0.01 U	0.01 U	0.002 U	0.002 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	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	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	1.06	0.727

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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

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

3 = Calculated background limit for arsenic as calculated as part of 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

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

					Sample Location Sample Date	MW-8A 10/29/2015	DUP-1A 10/29/2015	MW-8A 1/27/2016	MW-8A 4/28/2016	DUP-2 4/28/2016	MW-8A 7/25/2016	MW-8A 10/25/2016	MW-8A 1/23/2017	MW-8A 4/24/2017	MW-8A 7/25/2017	MW-8A 9/14/2017
Analytical Method	Analyte	Unit	Calculated		ASD	Duplico	nte Pair		Duplic	ate Pair						
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³											
6010B	Boron	mg/l	0.272			2.37	2.38	2.48	2.61	2.67	2.66	2.29	2.38	2.26	2.4	2.27
6010B	Calcium	mg/l	246			186	185	168	186	182	204	156	146	126	161	153
9056MOD	Chloride	mg/l	32.67			26.5	30.3	30.4	30.2	30.1	29.3	30.3	26.9	29.6	28.9	28.4
9056MOD	Fluoride	mg/l	0.486			0.54	0.318	0.267	0.339	0.339	0.292	0.355	0.413	0.37	0.325	0.268
9040C	рН	su	6.56 - 8.29			6.94 J	6.97 J	7.04 J	6.93 J	6.88 J	6.78 J	7.97 J	6.72 J	6.91 J	6.88 J	6.89 J
In Situ	рН	su	6.31 - 8.60			6.94	6.94	6.9	6.75	6.75	6.56	6.92	6.88	6.86	6.73	6.74
9056MOD	Sulfate	mg/l	213.5			491	598	471	520	522	453	412	386	383	477	380
2540 C-2011	Total Dissolved Solids	mg/l	950.2			1180	1130	1060	1170	1170	1190	1040	935	880	1020	1000
Appendix IV - Assessme	nt 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	0.012	0.0132	0.0127	0.0308	0.0299	0.0122	0.0134	0.0156	0.0232	0.0145	0.0144
6010B	Barium	mg/l	0.354	2		0.073	0.0738	0.0635	0.0937	0.0924	0.0624	0.0473	0.0524	0.0565	0.0539	0.0541
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				0.01 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
9056MOD	Fluoride	mg/l	0.588	4		0.54	0.318	0.267	0.339	0.339	0.292	0.355	0.413	0.37	0.325	0.268
6010B/6020	Lead	mg/l				0.005 U	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
6010B	Lithium	mg/l	0.0712	0.0708		0.0243	0.0242	0.0309	0.0298	0.0298	0.0368	0.0316	0.0268	0.0275	0.0201	0.0269
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	0.00584	0.00591	0.005 U	0.005 U	0.00623	0.00685	0.00569	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562		0.01 U	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
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	4.17	5		0.36	0.298	1.44	0.673	0.127	1.45	1.11	0.536	1.07 J	NS	0.980 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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

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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)

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su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-8A	DUP-1	MW-8A	DUP-1	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A
					Sample Date	3/8/2018	3/8/2018	6/4/2018	6/4/2018	10/1 & 10/3/2018	11/20/2018	7/1/2019	11/26/2019	5/27/2020	10/19/2020	12/8/2020
Analytical Method	Analyte	Unit	Calculated	•	ASD	Duplice	ate Pair	Duplico	ate Pair							
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³											
6010B	Boron	mg/l	0.272			NS	NS	2.44	2.47	2.31	NS	1.06	2.09 O1	2.24	2.66	NS
6010B	Calcium	mg/l	246			NS	NS	129	129	122	NS	105	115 O1	99.8	160	NS
9056MOD	Chloride	mg/l	32.67			NS	NS	25.7	25.5	26.2	NS	21.0	27.0	27.2	23.9	NS
9056MOD	Fluoride	mg/l	0.486			NS	NS	0.453 J+	0.441 J+	0.394	NS	0.251	0.329	0.428	0.357	NS
9040C	рН	su	6.56 - 8.29			NS	NS	6.97 J	6.98 J	6.95 J	NS	7.25 J	7.11 J	7.64 J	7.17 J	NS
In Situ	рН	su	6.31 - 8.60		-	6.91	6.91	6.86	6.86	6.86	6.6	7.14	7.07	6.62	6.9	NS
9056MOD	Sulfate	mg/l	213.5			NS	NS	353	360	419	NS	223	324	285	353	NS
2540 C-2011	Total Dissolved Solids	mg/l	950.2			NS	NS	853	881	920	NS	636	787	689	953	NS
Appendix IV - Assessme	nt Monitoring															
6010B/6020	Antimony	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	NS
6020	Arsenic	mg/l	0.035	0.035	0.035	0.0206	0.021	0.0204	0.0195	0.0278	0.0183	0.0128	0.0266	0.0197	0.0373	0.0354
6010B	Barium	mg/l	0.354	2		0.0657	0.065	0.0559	0.0548	0.0602	NS	0.201	0.176 O1	0.147	0.194	NS
6010B	Beryllium	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS
6010B	Cadmium	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS
6010B	Chromium	mg/l				0.01 U	0.01 U	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	NS
6010B	Cobalt	mg/l				0.01 U	0.01 U	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	NS
9056MOD	Fluoride	mg/l	0.588	4		0.348	0.347	0.453 J+	0.441 J+	0.394	NS	0.251	0.329	0.428	0.357	NS
6010B/6020	Lead	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U	NS
6010B	Lithium	mg/l	0.0712	0.0708		0.029	0.0281	0.0262	0.031	0.0174	NS	0.0277	0.0188	0.0195	0.0281	NS
7470A	Mercury	mg/l			-	0.0002 U	0.0002 U	NS	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U	NS
6010B	Molybdenum	mg/l	0.005	0.100		0.00833	0.00816	0.00865	0.00876	0.00967	NS	0.00524	0.00953	0.0111	0.0105	NS
6010B/6020	Selenium	mg/l	0.0562	0.0562		0.01 U	0.01 U	NS	NS	NS	NS	0.002 U	0.01 U	0.002 U	0.002 U	NS
6010B/6020	Thallium	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5		0.628	0.308	1.61	1.54	0.589 J	NS	0.107 J	0.491	0.0386	0.919	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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

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

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

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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

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

					Sample Location Sample Date	MW-10 10/29/2015	MW-10 1/27/2016	MW-10 4/27/2016	DUP-1 4/27/2016	MW-10 7/25/2016	DUP-1 7/25/2016	MW-10 10/26/2016	DUP-1 10/26/2016	MW-10 1/23/2017	MW-10 4/24/2017	MW-10 7/25/2017	MW-10 9/14/2017
Analytical Method	Analyte	Unit	Calculated		ASD	10/25/2015	1/2//2010		nte Pair	1123/2010	1123/2010		ate Pair	1/23/2017	4/24/2017	1125/2011	5/14/2011
Appendix III - Detection Monitoring			Background Limit ¹	GWPS ²	Background Limit ³		1			I	I						
6010B	Boron	mg/l	0.272			1.08	0.907	1.35	1.35	1.05	1.04	1.04	0.2 U	1.29	1.24	1.29	1.19
6010B	Calcium	mg/l	246			217	213	179	178	218	217	217	221	191	157	193	195
9056MOD	Chloride	mg/l	32.67			30.2	17	21.9	21.8	20.4	20.4	18	46.3	23.2	21.6	26	22.6
9056MOD	Fluoride	mg/l	0.486			0.327	0.104	0.125	0.105	0.125	0.1 U	0.111	0.101	0.183	0.161	0.143	0.144
9040C	рН	su	6.56 - 8.29			6.82 J	6.89 J	6.92 J	6.96 J	6.73 J	6.78 J	7.02 J	7.46 J	6.86 J	7.01 J	6.88 J	6.82 J
In Situ	рН	su	6.31 - 8.60			7.03	7.1	6.5	6.5	6.66	6.66	6.7	6.7	6.78	6.87	6.7	6.64
9056MOD	Sulfate	mg/l	213.5			623	227	220	226	223	217	228	75	238	193	280	258
2540 C-2011	Total Dissolved Solids	mg/l	950.2			1130	916	797	820	905	903	911	739	845	709	852	880
Appendix IV - Assessme	nt 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	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.00743	0.00489	0.0135	0.0115	0.00519	0.00536	0.00351	0.00365	0.0107	0.0143	0.00612	0.00635
6010B	Barium	mg/l	0.354	2		0.183	0.106	0.0871	0.0857	0.0875	0.0875	0.0825	0.082	0.0897	0.088	0.0748	0.0705
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	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	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	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	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4		0.327	0.104	0.125	0.105	0.125	0.1 U	0.111	0.11	0.183	0.161	0.143	0.144
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	0.002 U
6010B	Lithium	mg/l	0.0712	0.0708		0.0501	0.0571	0.045	0.0446	0.0549	0.0545	0.0578	0.0571	0.0494	0.0399	0.0376	0.0495
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	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	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	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	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5		0.442	2.32	1.77	1.16	0.550 J	0.520 J	0.877 J	0.603 J	0.253	0.848 J	NS	1.10 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 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.
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- 3 = Calculated background limit for arsenic as calculated as part of 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)

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U* = Qualified as non detect during data validation process

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

				S	Sample Location Sample Date	MW-10 3/8/2018	MW-10 6/4/2018	MW-10 10/1 & 10/3/2018	DUP-1 10/1 &10/3/2018	MW-10 11/20/2018	DUP 11/20/2018	MW-10 7/1/2019	MW-10 11/26/2019	MW-10 5/27/2020	DUP-1 5/27/2020	MW-10 10/19/2020	DUP-1 10/19/20
Analytical Method	Analyte	Unit	Calculated					Duplic	ate Pair					Duplico	ite Pair	Duplica	ate Pair
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³												
6010B	Boron	mg/l	0.272			NS	1.5	1.22	1.23	NS	NS	0.2 U	1.36	1.17	1.14	1.22	1.2
6010B	Calcium	mg/l	246			NS	168	179	179	NS	NS	101	198	173	173	168	170
9056MOD	Chloride	mg/l	32.67			NS	19.6	18.6	18.7	NS	NS	11.3	16.3	9.86	9.87	12.2	12.1
9056MOD	Fluoride	mg/l	0.486			NS	0.235 J+	0.219	0.217	NS	NS	0.26	0.146	0.162	0.162	0.167	0.168
9040C	рН	su	6.56 - 8.29			NS	6.94 J	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	рН	su	6.31 - 8.60			6.41	6.61	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			NS	214	234	232	NS	NS	104	180	138	138	143	144
2540 C-2011	Total Dissolved Solids	mg/l	950.2			NS	748	822	808	NS	NS	441	832	761	751	752	736
Appendix IV - Assessme	ent Monitoring																
6010B/6020	Antimony	mg/l				0.002 U	NS	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	0.0158	0.0126	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	0.354	2		0.0993	0.107	0.129	0.128	NS	NS	0.0725	0.138	0.129	0.128	0.116	0.116
6010B	Beryllium	mg/l				0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l				0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l				0.01 U	NS	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l				0.01 U	NS	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4		0.164	0.235 J+	0.219	0.217	NS	NS	0.26	0.146	0.162	0.162	0.167	0.168
6010B/6020	Lead	mg/l				0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708		0.0418	0.0445	0.0281	0.0286	NS	NS	0.0165	0.0483	0.04	0.0367	0.0446	0.0412
7470A	Mercury	mg/l				0.0002 U	NS	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	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		0.01 U	NS	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				0.002 U	NS	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	4.17	5	-	0.102	1.18	0.35 J	0.35	NS	NS	0.414	2.06	0.213	0.808	1.26	0.888

Notes:

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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

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

					Sample Location Sample Date	MW-13 10/1/2018	MW-13 11/19/2018	MW-13 7/2/2019	MW-13 11/26/2019	MW-13 5/28/2020	MW-13 10/19/2020	MW-14 10/1/2018	MW-14 11/19/2018	MW-14 7/2/2019	MW-14 11/26/2019	MW-14 5/27/2020	MW-14 10/19/2020
Analytical Method	Analyte Monitoring	Unit	Calculated Background Limit ¹	GWPS ²	ASD Background Limit ³												
6010B	Boron	mg/l	0.272			0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246			95	NS	90.9	115	125	181	200	NS	114	130	200	218
9056MOD	Chloride	mg/l	32.67			19.5	NS	22.1	21.3	20.2	20.6	21.5	NS	10.5	12.9	22.1	16
9056MOD	Fluoride	mg/l	0.486			0.38	NS	0.317	0.405	0.375	0.294	0.208	NS	0.231	0.265	0.22	0.199
9040C	рН	su	6.56 - 8.29			7.1 J	NS	7.08 J	7.08 J	7.40 J	6.94	6.7 J	NS	7.21 J	7.11 J	7.12 J	6.83 J
In Situ	рН	su	6.31 - 8.60			8.67	6.979	6.79	7.01	6.45	6.77	6.7	6.804	6.93	6.94	6.49	6.59
9056MOD	Sulfate	mg/l	213.5			155	NS	154	165	146	92.4	221	NS	82	121	253	181
2540 C-2011	Total Dissolved Solids	mg/l	950.2			542	NS	520	580	637 J4	704	839	NS	490	533	915	882
Appendix IV - Assessme	ent Monitoring				· · · · · · · · · · · · · · · · · · ·					•		•					
6010B/6020	Antimony	mg/l				NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.0252	0.024	0.00957	0.0201	0.024	0.0303	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/l	0.354	2		0.205	NS	0.235	0.251	0.285	0.354	0.0765	NS	0.074	0.0864	0.129	0.138
6010B	Beryllium	mg/l				NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l				NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l				NS	NS	0.01 U	NS	0.01 U	0.01 U	NS	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l				NS	NS	0.01 U	NS	0.01 U	0.01 U	NS	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4		0.38	NS	0.317	0.405	0.375	0.294	0.208	NS	0.231	0.265	0.22	0.199
6010B/6020	Lead	mg/l				NS	NS	0.002 U	NS	0.005 U	0.005 U	NS	NS	0.002 U	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708		0.0296	NS	0.0314	0.0358	0.0336	0.0356	0.0297	NS	0.015 U	0.0154	0.0273	0.0287
7470A	Mercury	mg/l				NS	NS	0.0002 U	NS	0.0002	0.0002 U	NS	NS	0.0002 U	NS	0.0002	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100		0.005 U	NS	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		NS	NS	0.002 U	0.01 U	0.002 U	0.002 U	NS	NS	0.002 U	0.01 U	0.002 U	0.0118
6010B/6020	Thallium	mg/l				NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5		0.765 J	NS	1.18 J	0.546	0.776	3.19	0.138 J	NS	0.69 J	0.107	1.26	1.51

Notes:

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

Bold = Concentration exceeds respective GWPS

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- 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

Summary of Analytical Results October 2015 through December 2020 Sampling Events Kansas City Board of Public Utilities Nearman Creak Power Station Bottom Ash Pond

				:	Sample Location Sample Date	MW-15 10/1/2018	MW-15 11/19/2018	MW-15 7/1/2019	MW-15 11/26/2019	MW-15 5/27/2020	MW-15 10/20/2020	MW-16 11/19/2018	MW-16 7/1/2019	MW-16 11/25/2019	MW-16 5/28/2020	MW-16 5/28/2020
Analytical Method	Analyte	Unit	Calculated		ASD											
Appendix III - Detection I	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³											
6010B	Boron	mg/l	0.272			0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	NS	0.217	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246			78.3	NS	88	71.4	78.8	82.6	NS	246	224	183	231 V
9056MOD	Chloride	mg/l	32.67			16.4	NS	17.4	13.9	20.8	21.4	NS	2.54	4.01	11.7	35.4
9056MOD	Fluoride	mg/l	0.486			0.462	NS	0.282	0.486	0.208	0.424	NS	0.155	0.136	0.15 U	0.15 U
9040C	рН	su	6.56 - 8.29			7.45 J	NS	7.71 J	7.45 J	7.80 J	7.71	NS	6.76 J	6.76 J	6.88 J	6.84 J
In Situ	рН	su	6.31 - 8.60		-	6.9	6.878	7.55	7.34	7.88	7.28	6.863	6.58	6.8	6.58	6.57
9056MOD	Sulfate	mg/l	213.5			194	NS	164	162	218	211	NS	172	123	121	115
2540 C-2011	Total Dissolved Solids	mg/l	950.2			505	NS	496	452	521	560	NS	942	784	747 J4	821
Appendix IV - Assessme	nt Monitoring															
6010B/6020	Antimony	mg/l				NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	NS	0.002 U	0.002 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.00482	0.00509	0.00324	0.0104	0.00227	0.00488	0.035	0.0341	0.0342	0.0305	0.0313
6010B	Barium	mg/l	0.354	2		0.107	NS	0.097	0.103	0.0977	0.114	NS	0.259	0.257	0.245	0.298
6010B	Beryllium	mg/l				NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l				NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l				NS	NS	0.01 U	NS	0.01 U	0.01 U	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l				NS	NS	0.01 U	NS	0.01 U	0.01 U	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4		0.462	NS	0.282	0.486	0.208	0.424	NS	0.155	0.136	0.15 U	0.15 U
6010B/6020	Lead	mg/l				NS	NS	0.002 U	NS	0.005 U	0.005 U	NS	0.002 U	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708		0.0428	NS	0.0295	0.0414	0.0405	0.0526	NS	0.0635	0.0646	0.0594	0.0596
7470A	Mercury	mg/l				NS	NS	0.0002 U	NS	0.0002	0.0002 U	NS	0.0002 U	NS	0.0002	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100		0.005 U	NS	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		NS	NS	0.002 U	0.01 U	0.002 U	0.002 U	NS	0.002 U	0.01 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l				NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5		1.35 J	NS	0.219 J	0.398	0.859	0.234	NS	1.69 J	0.995	0.198	2.49

Notes:

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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)

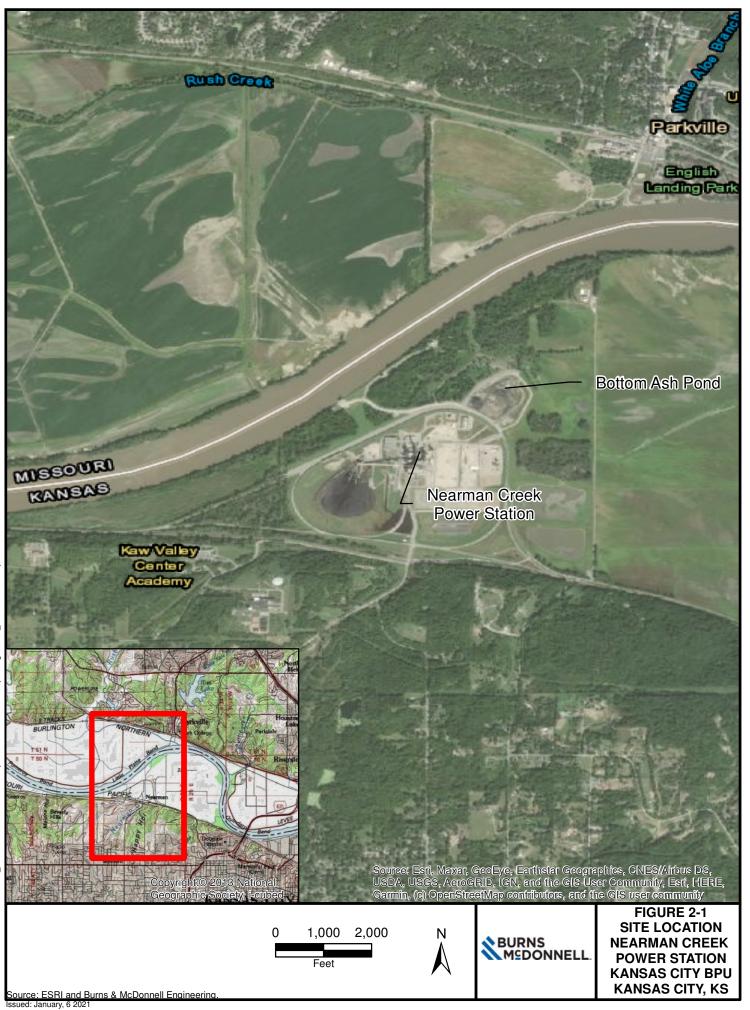
pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

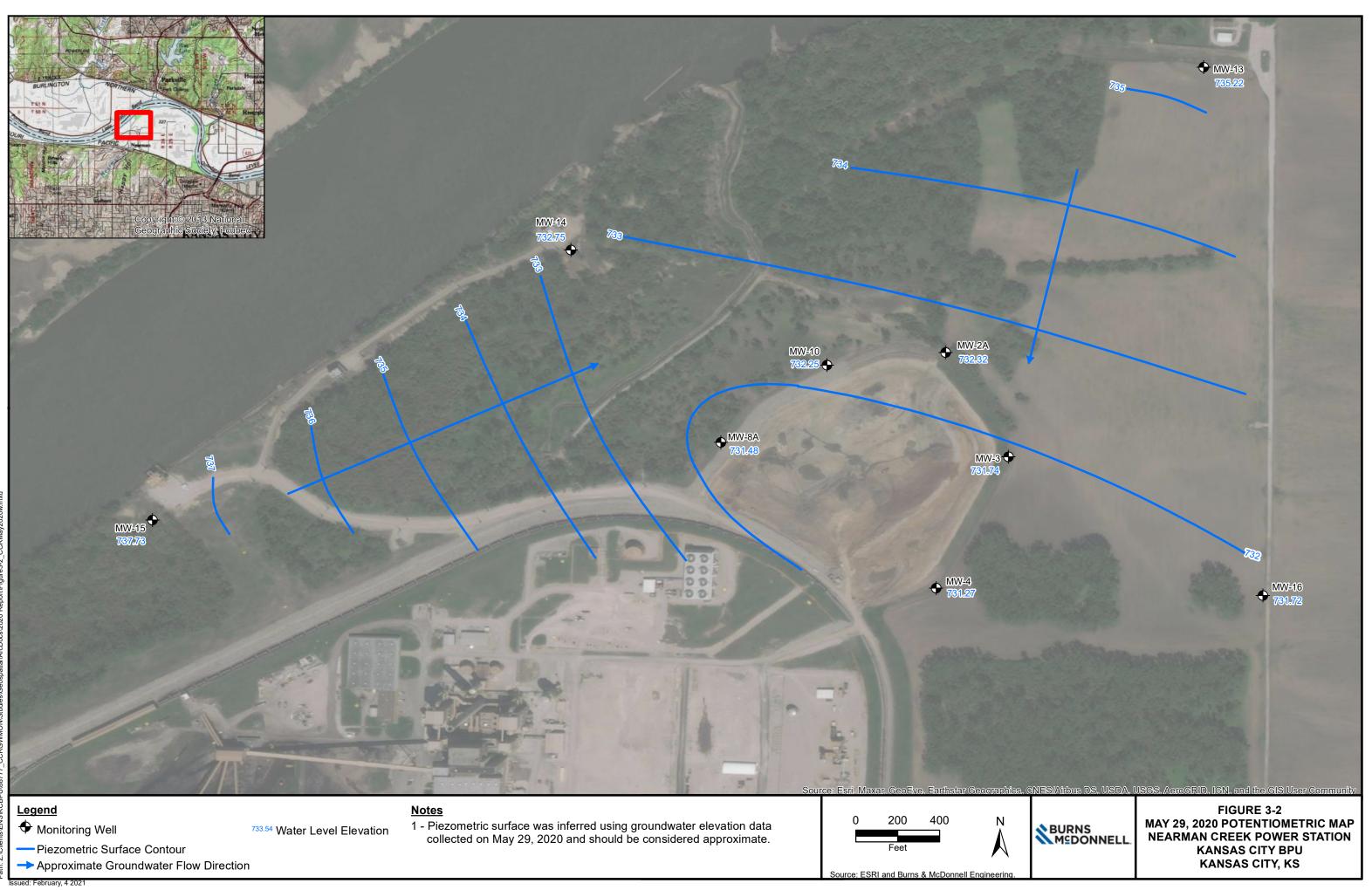
U* = Qualified as non detect during data validation process

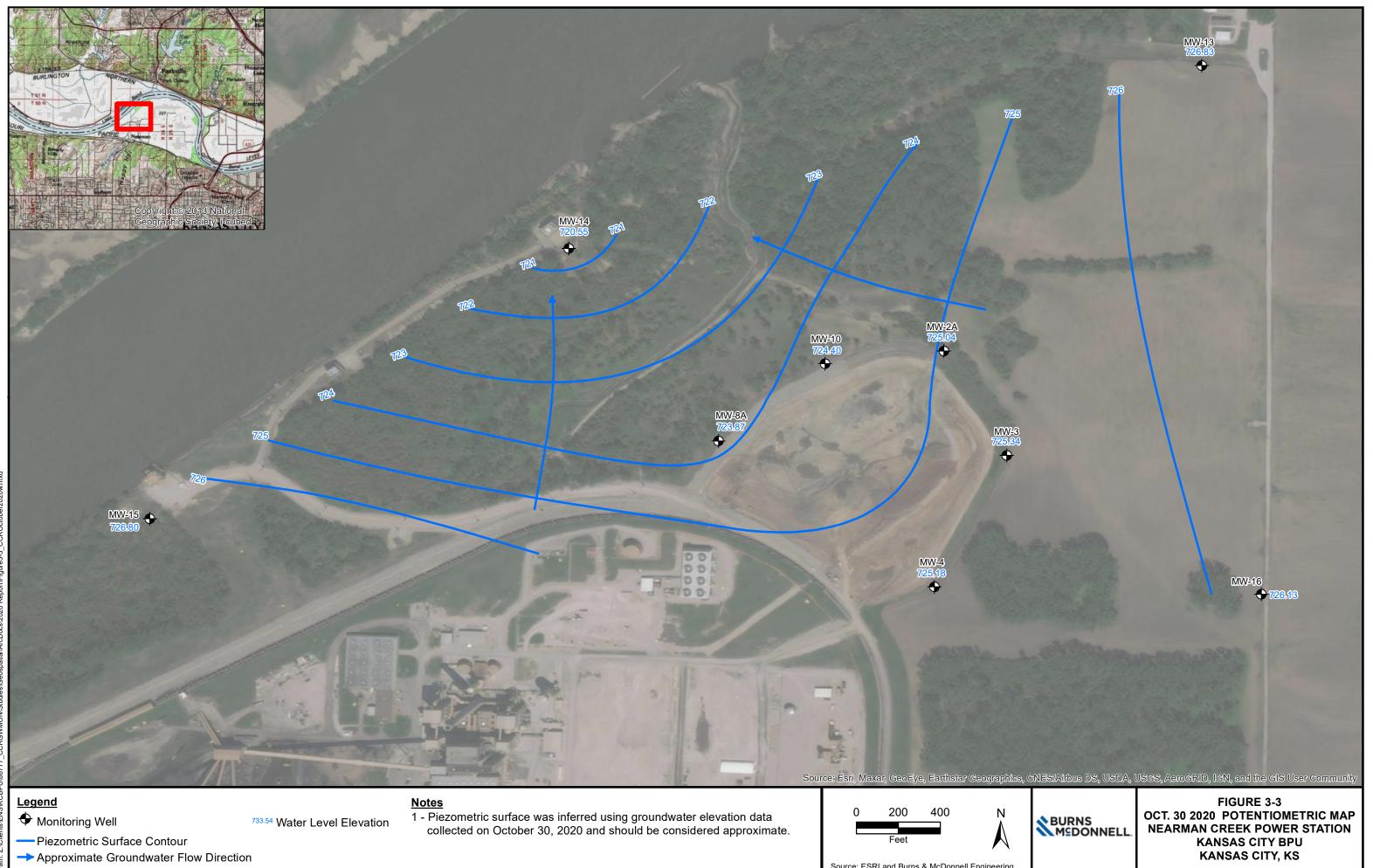
FIGURES





Source: ESRI and Burns & McDonnell Engineering





Source: ESRI and Burns & McDonnell Engineering

ssued: February, 4 2021

APPENDIX A – STATISTICAL EVALUATION

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 8/7/2020, 11:28 AM

		BPU C	lient: Burns & Mci	Jonneli Data:	BPU_Groundwa	ater_CC	R Pfi	1160 8/7/20	J20, 11:28 AM		
<u>Constituent</u>	Well	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	Method
Arsenic (mg/l)	MW-2A	0.035	n/a	5/27/2020	0.0042	No	46	58.7	n/a	0.02063	NP (NDs)
Arsenic (mg/l)	MW-8A	0.035	n/a	5/27/2020	0.0197	No	46	58.7	n/a	0.02063	NP (NDs)
Arsenic (mg/l)	MW-10	0.035	n/a	5/27/2020	0.001ND	No	46	58.7	n/a	0.02063	NP (NDs)
Arsenic (mg/l)	MW-14	0.035	n/a	5/27/2020	0.001ND	No	46	58.7	n/a	0.02063	NP (NDs)
Barium (mg/l)	MW-2A	0.3006	n/a	5/27/2020	0.143	No	41	0	ln(x)	0.01	Param
Barium (mg/l)	MW-8A	0.3006	n/a	5/27/2020	0.147	No	41	0	ln(x)	0.01	Param
Barium (mg/l)	MW-10	0.3006	n/a	5/27/2020	0.129	No	41	0	ln(x)	0.01	Param
Barium (mg/l)	MW-14	0.3006	n/a	5/27/2020	0.129	No	41	0	ln(x)	0.01	Param
Boron (mg/l)	MW-2A	0.272	n/a	5/27/2020	0.1ND	No	39	74.36	n/a	0.02411	NP (NDs)
Boron (mg/l)	MW-8A	0.272	n/a	5/27/2020	2.24	Yes	39	74.36	n/a	0.02411	NP (NDs)
Boron (mg/l)	MW-10	0.272	n/a	5/27/2020	1.17	Yes	39	74.36	n/a	0.02411	NP (NDs)
Boron (mg/l)	MW-14	0.272	n/a	5/27/2020	0.1ND	No	39	74.36	n/a	0.02411	NP (NDs)
Calcium (mg/l)	MW-2A	246	n/a	5/27/2020	137	No	38	0	n/a	0.02471	NP (normality)
Calcium (mg/l)	MW-8A	246	n/a	5/27/2020	99.8	No	38	0	n/a	0.02471	NP (normality)
Calcium (mg/l)	MW-10	246	n/a	5/27/2020	173	No	38	0	n/a	0.02471	NP (normality)
Calcium (mg/l)	MW-14	246	n/a	5/27/2020	200	No	38	0	n/a	0.02471	NP (normality)
CHLORIDE (mg/l)	MW-2A	27.8	n/a	5/27/2020	14	No	39	0	x^(1/3)	0.01	Param
CHLORIDE (mg/l)	MW-8A	27.8	n/a	5/27/2020	27.2	No	39	0	x^(1/3)	0.01	Param
CHLORIDE (mg/l)	MW-10	27.8	n/a	5/27/2020	9.86	No	39	0	x^(1/3)	0.01	Param
CHLORIDE (mg/l)	MW-14	27.8	n/a	5/27/2020	22.1	No	39	0	x^(1/3)	0.01	Param
Combined Radium (pCi/I)	MW-2A	3.187	n/a	5/27/2020	1.06	No	39	0	sqrt(x)	0.01	Param
Combined Radium (pCi/I)	MW-8A	3.187	n/a	5/27/2020	0.0386	No	39	0	sqrt(x)	0.01	Param
Combined Radium (pCi/I)	MW-10	3.187	n/a	5/27/2020	0.213	No	39	0	sqrt(x)	0.01	Param
Combined Radium (pCi/I)	MW-14	3.187	n/a	5/27/2020	1.26	No	39	0	sqrt(x)	0.01	Param
Dissolved Solids (mg/l)	MW-2A	1012	n/a	5/27/2020	545	No	39	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-8A	1012	n/a	5/27/2020	689	No	39	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-10	1012	n/a	5/27/2020	761	No	39	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-14	1012	n/a	5/27/2020	915	No	39	0	No	0.01	Param
Fluoride (mg/l)	MW-2A	0.486	n/a	5/27/2020	0.278	No	41	7.317	n/a	0.023	NP (normality)
Fluoride (mg/l)	MW-8A	0.486	n/a	5/27/2020	0.428	No	41	7.317	n/a	0.023	NP (normality)
Fluoride (mg/l)	MW-10	0.486	n/a	5/27/2020	0.162	No	41	7.317	n/a	0.023	NP (normality)
Fluoride (mg/l)	MW-14	0.486	n/a	5/27/2020	0.22	No	41	7.317	n/a	0.023	NP (normality)
Lithium (mg/l)	MW-2A	0.0712	n/a	5/27/2020	0.0172	No	41	0	No	0.01	Param
Lithium (mg/l)	MW-8A	0.0712	n/a	5/27/2020	0.0195	No	41	0	No	0.01	Param
Lithium (mg/l)	MW-10	0.0712	n/a	5/27/2020	0.04	No	41	0	No	0.01	Param
Lithium (mg/l)	MW-14	0.0712	n/a	5/27/2020	0.0273	No	41	0	No	0.01	Param
Molybdenum (mg/l)	MW-2A	0.005	n/a	5/27/2020	0.0025ND	No	41	100	n/a	0.023	NP (NDs)
Molybdenum (mg/l)	MW-8A	0.005	n/a	5/27/2020	0.0111	Yes	41	100	n/a	0.023	NP (NDs)
Molybdenum (mg/l)	MW-10	0.005	n/a	5/27/2020	0.0025ND	No	41	100	n/a	0.023	NP (NDs)
Molybdenum (mg/l)	MW-14	0.005	n/a	5/27/2020	0.0025ND	No	41	100	n/a	0.023	NP (NDs)
pH [Field] (su)	MW-2A	8.577	6.306	5/27/2020	6.386	No	46	0	n/a	0.04126	NP (normality) Deseas
pH [Field] (su)	MW-8A	8.577	6.306	5/27/2020	6.626	No	46	0	n/a	0.04126	NP (normality) Deseas
pH [Field] (su)	MW-10*	8.577	6.306	5/27/2020	6.256	Yes	46	0	n/a	0.04126	NP (normality) Deseas
pH [Field] (su)	MW-14	8.577	6.306	5/27/2020	6.496	No	46	0	n/a	0.04126	NP (normality) Deseas
pH [Lab] (su)	MW-2A	8.29	6.56	5/27/2020	7.73	No	31	0	n/a	0.05977	NP (normality)
pH [Lab] (su)	MW-8A	8.29	6.56	5/27/2020	7.64	No	31	0	n/a	0.05977	NP (normality)
pH [Lab] (su)	MW-10	8.29	6.56	5/27/2020	6.99	No	31	0	n/a	0.05977	NP (normality)
pH [Lab] (su)	MW-14	8.29	6.56	5/27/2020	7.12	No	31	0	n/a	0.05977	NP (normality)
Sulfate (mg/l)	MW-2A	209.6	n/a	5/27/2020	110	No	38	0	No	0.01	Param
Sulfate (mg/l)	MW-8A	209.6	n/a	5/27/2020	285	Yes	38	0	No	0.01	Param

		BPU CI	ient: Burns & McD	onnell Data: I	BPU_Groundw	ater_CC	R Pri	nted 8/7/20	20, 11:28 AM		
<u>Constituent</u>	Well	Upper Lim.	Lower Lim.	<u>Date</u>	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	Method
Sulfate (mg/l)	MW-10	209.6	n/a	5/27/2020	138	No	38	0	No	0.01	Param
Sulfate (mg/l)	MW-14	209.6	n/a	5/27/2020	253	Yes	38	0	No	0.01	Param

* While the pH [Field] result for MW-10 are presented in bold, this result does exceed the upper confidence limit calculated for pH. Furthermore, pH was also analyzed by a fixed laboratory and that result is within the upper and lower confidence limit presented above. As a result, this result was not considered a statistically significant increase above the calculated background limit.

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 8/7/2020, 11:30 AM

Constituent	Well	Upper Lim.	Lower Lim.	<u>Date</u>	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	Method
Selenium (mg/l)	MW-2A	0.06757	n/a	5/27/2020	0.01520	No	35	57.14	n/a	0.02669	NP (NDs) Deseas
Selenium (mg/l)	MW-8A	0.06757	n/a	5/27/2020	0.01520	No	35	57.14	n/a	0.02669	NP (NDs) Deseas
Selenium (mg/l)	MW-10	0.06757	n/a	5/27/2020	0.01520	No	35	57.14	n/a	0.02669	NP (NDs) Deseas
Selenium (mg/l)	MW-14	0.06757	n/a	5/27/2020	0.01520	No	35	57.14	n/a	0.02669	NP (NDs) Deseas

Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_GW_CCR Printed 12/18/2020, 11:20 AM

• · · · ·				_	а. bi 0_0w_0			12/10/2020	,		
Constituent	<u>Well</u>	<u>Upper Lim.</u>	Lower Lim.	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>		<u>Transform</u>	<u>Alpha</u>	Method
Arsenic (mg/l)	MW-2A	0.035	n/a	10/19/2020	0.00289	No	51	56.86	n/a	0.0187	NP Inter (NDs)
Arsenic (mg/l)	MW-8A	0.035	n/a	10/19/2020	0.0373	Yes	51	56.86	n/a	0.0187	NP Inter (NDs)
Arsenic (mg/l)	MW-10	0.035	n/a	10/19/2020	0.00461	No	51	56.86	n/a	0.0187	NP Inter (NDs)
Arsenic (mg/l)	MW-14	0.035	n/a	10/19/2020	0.002ND	No	51	56.86	n/a	0.0187	NP Inter (NDs)
Barium (mg/l)	MW-2A	0.354	n/a	10/19/2020	0.171	No	46	0	n/a	0.02063	NP Inter (normality)
Barium (mg/l)	MW-8A	0.354	n/a	10/19/2020	0.194	No	46	0	n/a	0.02063	NP Inter (normality)
Barium (mg/l)	MW-10	0.354	n/a	10/19/2020	0.116	No	46	0	n/a	0.02063	NP Inter (normality)
Barium (mg/l)	MW-14	0.354	n/a	10/19/2020	0.138	No	46	0	n/a	0.02063	NP Inter (normality)
Boron (mg/l)	MW-2A	0.272	n/a	10/19/2020	0.221	No	44	77.27	n/a	0.02152	NP Inter (NDs)
Boron (mg/l)	MW-8A	0.272	n/a	10/19/2020	2.66	Yes	44	77.27	n/a	0.02152	NP Inter (NDs)
Boron (mg/l)	MW-10	0.272	n/a	10/19/2020	1.22	Yes	44	77.27	n/a	0.02152	NP Inter (NDs)
Boron (mg/l)	MW-14	0.272	n/a	10/19/2020	0.2ND	No	44	77.27	n/a	0.02152	NP Inter (NDs)
Calcium (mg/l)	MW-2A	246	n/a	10/19/2020	168	No	43	0	n/a	0.02199	NP Inter (normality)
Calcium (mg/l)	MW-8A	246	n/a	10/19/2020	160	No	43	0	n/a	0.02199	NP Inter (normality)
Calcium (mg/l)	MW-10	246	n/a	10/19/2020	168	No	43	0	n/a	0.02199	NP Inter (normality)
Calcium (mg/l)	MW-14	246	n/a	10/19/2020	218	No	43	0	n/a	0.02199	NP Inter (normality)
CHLORIDE (mg/l)	MW-2A	32.67	n/a	10/19/2020	12.7	No	44	0	x^(1/3)	0.01	Param Inter
CHLORIDE (mg/l)	MW-8A	32.67	n/a	10/19/2020	23.9	No	44	0	x^(1/3)	0.01	Param Inter
CHLORIDE (mg/l)	MW-10	32.67	n/a	10/19/2020	12.2	No	44	0	x^(1/3)	0.01	Param Inter
CHLORIDE (mg/l)	MW-14	32.67	n/a	10/19/2020	16	No	44	0	x^(1/3)	0.01	Param Inter
Combined Radium (pCi/I)	MW-2A	4.171	n/a	10/19/2020	0.727	No	44	0	x^(1/3)	0.01	Param Inter
Combined Radium (pCi/I)	MW-8A	4.171	n/a	10/19/2020	0.919	No	44	0	x^(1/3)	0.01	Param Inter
Combined Radium (pCi/I)	MW-10	4.171	n/a	10/19/2020	1.26	No	44	0	x^(1/3)	0.01	Param Inter
Combined Radium (pCi/I)	MW-14	4.171	n/a	10/19/2020	1.51	No	44	0	x^(1/3)	0.01	Param Inter
Dissolved Solids (mg/l)	MW-2A	950.2	n/a	10/19/2020	622	No	44	0	x^2	0.01	Param Inter
Dissolved Solids (mg/l)	MW-8A	950.2	n/a	10/19/2020	953	Yes	44	0	x^2	0.01	Param Inter
Dissolved Solids (mg/l)	MW-10	950.2	n/a	10/19/2020	752	No	44	0	x^2	0.01	Param Inter
Dissolved Solids (mg/l)	MW-14	950.2	n/a	10/19/2020	882	No	44	0	x^2	0.01	Param Inter
Fluoride (mg/l)	MW-2A	0.486	n/a	10/19/2020	0.234	No	46	8.696	n/a	0.02063	NP Inter (normality)
Fluoride (mg/l)	MW-8A	0.486	n/a	10/19/2020	0.357	No	46	8.696	n/a	0.02063	NP Inter (normality)
Fluoride (mg/l)	MW-10	0.486	n/a	10/19/2020	0.167	No	46	8.696	n/a	0.02063	NP Inter (normality)
Fluoride (mg/l)	MW-14	0.486	n/a	10/19/2020	0.199	No	46	8.696	n/a	0.02063	NP Inter (normality)
Lithium (mg/l)	MW-2A	0.0712	n/a	10/19/2020	0.0302	No	46	0	No	0.01	Param Inter
Lithium (mg/l)	MW-8A	0.0712	n/a	10/19/2020	0.0281	No	46	0	No	0.01	Param Inter
Lithium (mg/l)	MW-10	0.0712	n/a	10/19/2020	0.0446	No	46	0	No	0.01	Param Inter
Lithium (mg/l)	MW-14	0.0712	n/a	10/19/2020	0.0287	No	46	0	No	0.01	Param Inter
Molybdenum (mg/l)	MW-2A	0.005	n/a	10/19/2020	0.005ND	No	46	100	n/a	0.02063	NP Inter (NDs)
Molybdenum (mg/l)	MW-8A	0.005	n/a	10/19/2020	0.0105	Yes	46	100	n/a	0.02063	NP Inter (NDs)
Molybdenum (mg/l)	MW-10	0.005	n/a	10/19/2020	0.005ND	No	46	100	n/a	0.02063	NP Inter (NDs)
Molybdenum (mg/l)	MW-14	0.005	n/a	10/19/2020	0.005ND	No	46	100	n/a	0.02063	NP Inter (NDs)
pH [Field] (su)	MW-2A	8.604	6.305	10/19/2020	6.724	No	51	0	n/a	0.0374	NP Inter (normality)
pH [Field] (su)	MW-8A	8.604	6.305	10/19/2020	6.834	No	51	0	n/a	0.0374	NP Inter (normality)
pH [Field] (su)	MW-10	8.604	6.305	10/19/2020	6.634	No	51	0	n/a	0.0374	NP Inter (normality)
pH [Field] (su)	MW-14	8.604	6.305	10/19/2020	6.524	No	51	0	n/a	0.0374	NP Inter (normality)
pH [Lab] (su)	MW-2A	8.29	6.56	10/19/2020	7.14	No	36	0	n/a	0.05199	NP Inter (normality)
pH [Lab] (su)	MW-8A	8.29	6.56	10/19/2020	7.17	No	36	0	n/a	0.05199	NP Inter (normality)
pH [Lab] (su)	MW-10	8.29	6.56	10/19/2020	7.42	No	36	0	n/a	0.05199	NP Inter (normality)
pH [Lab] (su)	MW-14	8.29	6.56	10/19/2020	6.83	No	36	0	n/a	0.05199	NP Inter (normality)
Selenium (mg/l)	MW-2A	0.0562	n/a	10/19/2020	0.002ND	No	40	57.5	n/a	0.02355	NP Inter (NDs)
Selenium (mg/l)	MW-8A	0.0562	n/a	10/19/2020	0.002ND	No	40	57.5	n/a	0.02355	NP Inter (NDs)

Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_GW_CCR Printed 12/18/2020, 11:20 AM

<u>Constituent</u>	Well	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	Transform	<u>Alpha</u>	Method
Selenium (mg/l)	MW-10	0.0562	n/a	10/19/2020	0.002ND	No	40	57.5	n/a	0.02355	NP Inter (NDs)
Selenium (mg/l)	MW-14	0.0562	n/a	10/19/2020	0.0118	No	40	57.5	n/a	0.02355	NP Inter (NDs)
Sulfate (mg/l)	MW-2A	213.5	n/a	10/19/2020	113	No	43	0	No	0.01	Param Inter
Sulfate (mg/l)	MW-8A	213.5	n/a	10/19/2020	353	Yes	43	0	No	0.01	Param Inter
Sulfate (mg/l)	MW-10	213.5	n/a	10/19/2020	143	No	43	0	No	0.01	Param Inter
Sulfate (mg/l)	MW-14	213.5	n/a	10/19/2020	181	No	43	0	No	0.01	Param Inter

APPENDIX B – GROUNDWATER SAMPLING FIELD DOCUMENTATION

Balling \$ 5-27.20 \$\$777 5-27-22 82777 Bolling 1100 sort year mu 20 we - Re 23 Oto: Allive ensite, calibable equipment 1440 collect mw-201600 YS2 AH 4.0 17.0110.0 for App II & select I up sometime Cal ; 1,409 00: 100% 1500 seef up to gure & sample MW-> wi . 19.39 SUP: 237.5 , 1001 1540 Collect MW-3/6WDI/ Lor Tuiddity 10.0, 1000 App. Il a select IU parenters also set up at MW-15 1610 Set up A Missie We de, 16 WL-17,25 1 1645 Collect [MW-4/GWO]] Sur 0805 Air hose leaking affeithe to field " an to get new ner App II + select IV parameters. 1710 K.Bolling Officite assa Arrive at Sirdd 1130 Buy ice For costema 0930 Boell onsite resome musis 1018 collect (MW-1576WD1 MS/his) for Approx II + Soleri II promotion '106 set up at NW-14 WC 16.23 1-31-15-27-22 1130 Collect Thu-14/ Guess For Appendic (4) 4 select JU pornviters. This set up at into the MW-84 WL - 19,73 1240 Collect MW- 8A/GWED For Agp. IT + Sclat IL formeters izes set up at MU-13 WC - 14.01 1330 contact (MU- 1016 Wil) DUP-1/6001 All II a Soled av Prymins

Part on and we a Bollin 18 18 to 5 ંદ્રવચ 5-28-20 onss America ensile at mus-13 finan but municipany WARE 445, Glauph ME yourse WE- 1312 Conserved Tearran Alternises 0500 calibrate examinat 450 pH 410 (7.0110.0 16191 Boy - Initianity - Chairman Print the same things the a cond 1,409 16 J. H. Menty, and OR1: 2373 161: 237.51737.3 PO: 100% tubilly 9.97 110.0 HALL BELLER AND AND 99.4/100.0 Constantion So Has Departs in OSIS Bash Punsie MU-13 *** Aude: seems to be a matternet applie from a state to and good with the with the section in ponp at MW-13 5 French at the particular states of the OTS cisc wirect min-13/6wall for 0 850; (olicui ML-BA ILLOE for ADP. # + w- 610 TE APA II + School IU Primalan 0900: Meet Porce ut get a bor a delivered bother wis 1020 sett up of Mus-16, wi-16189 04 5 Set up @ MW-10 1055 Collect (NW-10/6WOL) U420. begin purging ML- 10 ser App ID & Schet ID polandaus 0955: Loker MW-10/buoz + Dup-1/mon for 1. The Kellinguish samples to fall without App. The of select up. I. 1300 prive at the office. 1025: Set up @ mur-2n (Ly light - Light) 1030: Boin punging mu an 1100: Callect mw-2010-2, Bonsinso for Non-ZIX 12 125: Set ye mu.3 1130: Bogin preying Mar 3 1205 : Collect min. 3 (0402 for Age. TH - sulce . Ap. Th 1215: Set up e mu-4

Hermon 1 10-2000 Hermon 38772 82447 10-14-20 Took: UW monitoring 1200 Bain purging mun wenter: 40 =, 5-10 -ph 200, oncors 1250: Collect ML - 4/Lunez for App. II + Bor Apr IL Reconnel: Jonnthan Hermansen 1320: Sit up e- MW-13 0630: Willistate exciption 1330' Begin purging MW-13 15 15: Collect MW-13/6NOZ For App TH + Sel Age B 2H: 4-0/4 7,0/7 10.0/10 White 1. 409 1. 409 1535 Setupe MW-16 100: 100.000 1540 Begin purging mu-16 1615 Collect MW-16/6412 for App. II & rel. Apr. 12 . ORP: 277.5 Trups 8. 37 10 10.43/10 1635: Set up @ MW-M 1640 . Bayin purging MW-14 0770: Deput tor SP4 building 1713 " lollect MW-14/6WOZ for App. II + sul App. OB00: Mut R. Myer to pick up quip. 17:0: Ilcan up torginice tor next day's von 0830: Acres @ Warmer creek & deale in wight 0 840: Set up @ MW-5 1775: 04:5.12 0850: begin progra MH-15 0920 : Wheet MUI-15/6002 to App. TI A sol. TD. 0930: Offorte to animation father Hunge 10.20.70

te numer -3177 December of 2000 Turn: MIN-SA GIN Sumple henne lets, Smohs, andly daily fascinel: Jonthin themanson 1230 Acres on-site & Meet T. Ens BPM 1235: 14110 the Chipment and put the standing from the stand of the stand th 1305 Byin Frigin MW- 24 1500. (cilled (mw-3A) for Arsenic by 6010 +6020 1310, 6FFS. 20 12.8-20

DATE:	5-27-	Zo SITE	: KCBPU			PID READIN	NG at WELL H	HEAD (ppm)	: <u>NA</u>
PROJECT	5				Clard				
WELL NU		 MW-1		WEATHER	1	7 14		-	
DEF	DEPTH '	TO WATER (ft) AL DEPTH (ft): OF PUMP (ft):	167	3	DEPTH TC	AMETER (inches) TOP OF YSI (ft) DO measuremen	:	-	
<u>PURGING</u> CASING VC Equipment L	Ga	CULATION: Water Column allons per foot Other	-	_	Gallons p	er Casing Volume	:		
Time	Amount Purged	Flow Rate		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to
(24 hr)	L	(ml/min)	pH	(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	Water (ft TOC)
1115	.I. 1.5	300	6.73	16.29	1. (8)	2.70	-24.9	1.36	16.24
1120	4.5	300	6.54	16:28	1.272	1.20	-13.3	0.85	16.20
130	6	300	6.49	16.3)	1.271	0.46	-10,9 -8,4	0,76	16.26
SAMPLING		Equips	nont llood:	A-Airas 2	additional page	🗌 Yes 🗶 No			
		Equipr			Bladder Pump				
Sample Time	Total Purged	pН	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to Water	
(24 hr)	(Liters)		(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)	Obs.
1130	6	6:49	16.31	11271	046	- 814	0.76	1676	
ERROUS IRC	ом: <u>1</u>	<u>1 A/</u>	ng/L						
INAL DEPTH			16.24		TIME FINAL D	EPTH TAKEN:	1115		
SAMPLE ID: N	NW-44/	600)				LE ID FOR QC:			
		ED FOR ANAL	1010.	BTEX] PAHs	<u> </u>		
				RCRA 8 METALS Others	5] Cyanide			
W TOTAL:	245	N .	Flow	Through Cell N	lodel Number: _	556			
		NAME		1	SIGNATURE			DATE	
	K	evin Bolling			-151	\wedge	5-	27-2	0
				_					

FIELD GROUNDWATER SAMPLING DATA FORM

DATE		F	ELD GRC	UNDWATE	R SAMPLING	DATA FORM			
DATE:	5-27	-ZU SITE	E: KCBPU				NG at WELL I	LEAD (nom)	. NA
PROJECT	NUMBER:	58777			-			HEAD (ppm)	: <u>NA</u>
WELL NU	JMBER:	MW-1		VVEATHER	Masky	elony 4	~80		
	DEPTH	TO WATER (ft)	177	~					
DEr				ـد		AMETER (inches TOP OF YSI (ft)			
PURGING	TH TO TOP	OF PUMP (ft):	30			DO measuremen		_	
	LUME CAL			-		e e measuremen	(()		
	Height of	Water Column							
Equipment L	G	allons per foot			Gallons pe	er Casing Volume	9:		
Equipment (Jsed:	Other		-					
Time	Amount								
(24 hr)	Purged	Flow Rate (ml/min)	рН	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to
6938	L T		1710	(C)	い.09之 (mS/cm)	(NTUs)	(mV)	(mg/L)	Water (ft TOC)
0943	1.5	06 <u>5</u> 06 <u>5</u>	7.68	12.51	++2.3	35	69.7	11.57	17.25
0948	3	320	1.72	9.96	0.786	181	527	3.56	17.25
0953	4,5	302	7.43	9.71	28510	19.2	75.5	3.05	17.25
1003	6	300	7.65	9.92	0.785	8.11	40.9	2.81 2.52	17,25
1005	7.5	300	7.94	9.96	0.785	1012Y	26.7	2.41	75.25
1013	105	300	195	9.91	0.785	3.63	9.0	2.38	17.27
1014	12	300	7,88	9.94	0.784	3.01 2.86	9.0	2.25	17.25
		0.00				2.36	6.4	2.23	17.24
l									
				Continued on	additional page	□ Yes 口子No			
SAMPLING		Equipn	nent Used:	Nondedicated	Bladder Pump				
Sample	Total		Temp	Conductivity	Turbidity	0.55		Donth to	
Time	Purged	pН	(C)	(mS/cm)		ORP	D.O.	Depth to Water	
(24 hr)	(Liters)		(0)	(mo/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)	Obs.
1015	17	7.89	994	0,784	7,86	6.4			
FERROUS IRC	DN: N	NA n	ng/L			01-1	2.23	75.75	_
FINAL DEPTH	TO WATER	(ft TOC):	17,25		TIME FINAL D	EPTH TAKEN:	1050		
SAMPLE ID:	mw-1	2			SAMP	LE ID FOR QC:	MW-15	1	
	DEQUEOT			BTEX	_	-	MIN-1	5 Mar	2
PARAMETERS	REQUEST	ED FOR ANAL	1010.] PAHs] Cyanide			1
] Others	, _				
IDW TOTAL:	3 3		Flow	Through Cell N	lodel Number:	556			
		NAME		24	SIGNATURE		5	DATE	
	V	evin Bolling		1~	-12,	A	20.0	DATE	
PREPARED:	K	CVIII DOIIIIIB			2106		5.	27-20	2
REVIEWED:									

DATE:		FI	ELD GRO	UNDWATE	R SAMPLING	DATA FORM			
DATE:	5-27.	てム SITE	: KCBPU				C at MELL		
PROJECT	NUMBER:	88777			-		G at WELL H	IEAD (ppm):	NA
WELL NU	MBER:	munu	-	WEATHER:	Pt su	ong 75	5	_	
	DEPTH	TO WATER (ft).	1. 1]				
DEC	101	AL DEDTU (A).				METER (inches)	2	2	
PURGING	TH TO TOP	OF PUMP (ft):		-	(for downhole i	TOP OF YSI (ft): DO measurement		5 	
CASING VC	LUME CAL			-		50 measurement)		
	Height of	Water Column:	-						
Equipment L	G	allons per foot:	د	.	Gallons pe	er Casing Volume			
	Joed.	Other		-					
Time	Amount	Eleve D. J	1						
(24 hr)	Purged L	Flow Rate (ml/min)	pН	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to
1310	t	300	(.70	(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	Water (ft TOC)
1315	1.5	300	6.27	14.84	11/22	22.9	-26.0	1.05	14.04
1325	3	300	(1.23	14,71	1.132	16.2	-20.9	0.89	(4.04
1336	4.5	300	6,24	14.65	1.12%	10.1	-17.8	080	14.04
	7.4	300	6.25	11.72	1.126	4.3	-142	0.6.1	14,0-1
				Continued on	additional page	Yes No			
SAMPLING		Equipr	nent Used [.]		Bladder Pump				
Connel				T	blauder Pump				
Sample	Total Purged		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to	
Time	(Liters)	рН	(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	Water	Obs.
(24 hr) くうろわ	6	6-24	14.72	1.171		N 6	12 S.	(ft TOC)	003.
	•	anana a		1.176	ካ. ን	-12.3	067	14.04	_
FERROUS IR	ON:	<u>NA</u> <u>I</u>	mg/L						
FINAL DEPTH	TO WATE	R (ft TOC):	14.0-1		TIME FINAL D	DEPTH TAKEN:	17		
SAMPLE ID:	M()-10				SAME		155 +10	15	
					0, 101	LE ID FOR QC:	DUP-1	16001	
PARAMETER	S REQUEST	FED FOR ANAL			C	PAHs			
				RCRA 8 METAL Others	s [Cyanide			
				-					
IDW TOTAL:	1.5		Flow	Through Cell	Model Number:	550			
		NAME			SIGNATURE				
		Kevin Bolling		í	- 1			DATE	
REPARED:		Kevin boling			12/1		5.	-27-7	
			,						

		F	IELD GRO	OUNDWATE	R SAMPLING	G DATA FO	RM		
DATE:	5-27-	-20 SITI	E: KCBPU				ADING at WELI	HEAD (ppm). NA
PROJECT	NUMBER:	56777			- D-+			L HEAD (PPH	Ŋ. <u>NA</u>
WELL NU	MBER:	MW-ZA		WEATHER	<u> </u>	lourly 7) P		
	DEPTH	TO WATER (ft)	. 16 20			AMETED "			
DEP	TOT	AL DEPTH (A)	1-1-0			AMETER (inc D TOP OF YSI			
PURGING	10100	OF PUMP (ft)		_	(for downhole				
CASING VO	LUME CALC	ULATION:							
	Height of	Water Column	:		College				
Equipment U	Ga Sed:	allons per foot	:		Gallons p	er Casing Volu	ime:		
		Other			_				
Time	Amount	Flow Rate							
(24 hr)	Purged L	(ml/min)	pН	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to
1420	I	300	6.30	(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	Water (ft TOC)
1425	1.5	300	6.32	15.29	0.823	23.7		141	1632
1470	3	300	4.31	14.97	0.820	16.1	8. y 9.0	1.43	16 40
1490	4.5	300	6.31	1-194	0.49	4.77	9.0	1.27	16 78
<u></u> ^	7.5	390	6-3613	8 14.97	0.819	3.96	5.7	1.17	1648
		1							
				Continued on	additional page	🗌 Yes 🗌 No			
SAMPLING		Equipr	nent Used:		Bladder Pump				
Sample	Total		Temp	Conductivity					
Time	Purged	pН	51.505 (S.C. 8)		Turbidity	ORP	D.O.	Depth to	
(24 hr)	(Liters)		(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	Water (ft TOC)	Obs.
1440	le	6.38	14.97	0, 519	3.96	5.7			
FERROUS IRC	ON: I	NA r	ng/L			<u> </u>	117	16,49	-
FINAL DEPTH									
	io malen	(11100). –	16-48		TIME FINAL D	EPTH TAKEN	1500		
SAMPLE ID:	mw	- 2A/G	wo1		SAMPI	LE ID FOR QC	× —		
PARAMETERS	REQUEST	ED FOR ANAL	YSIS:	BTEX		PAHs	-		
				RCRA 8 METAL		Cyanide		0.00	
				Others					
IDW TOTAL:	2		Flow 1	⁻ hrough Cell N	lodel Number:	6.2.			
		NAME		- <u>g</u> ., co., i		225	-		
		NAME		0	SIGNATURE			DATE	
PREPARED:	K	evin Bolling		4	B		- 5	2-1-5	7~
								-1-1	γ)
The hast of the			1.00						

DATE:	5-27-2	SITE:	ксври			PID READI	NG at WELL	HEAD (ppm): <u>NA</u>
- PROJECT NU		88777		WEATHER:	Soft C	long 780			
WELL NUM	1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 - 1992 -	nw SA			C C				
MEEL NOM			973		WELL DIA	AMETER (inches): 2		
	TOTAL	DEPTH (ft):	1.13			TOP OF YSI (ft)			
DEPTH	H TO TOP O	F PUMP (ft):				DO measuremen			
PURGING				•	(101 001111010 1				
CASING VOLU	JME CALCU	JLATION:							
	Height of W	ater Column:			Gallons pe	er Casing Volume	e :		
		lons per foot:		-					
Equipment Us	ed:	Other							
	A							1	Depth to
Time	Amount Purged	Flow Rate	pН	Temp	Conductivity	Turbidity	ORP	D.O.	Water
(24 hr)	L	(ml/min)	pri	(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)
1215	I	300	671	16,18	1.012	45.11	27,8	0.97	19.84
1220	1.5	200	6.61	16.02	0.984	22.4	6.4	0.65	19.89
1275	3	300	6.64	16,12	0,985	13,6	-2.8	0.61	1990
1230	4.5	3000	6.67	15.98	0.991	8.2	-10.6	0.60	19.90
1235	6	302	6.63	15,94	0.990	5.9	-14.0	0.54	19.90
1240	75	320	6.62	15.97	0.991	4.8	-27.1	0.56	19.90
						1			
				đ. –					
				Continued on	additional page	🗌 Yes 🗌 No			
L		Envio	ment Llood:		d Bladder Pump				
SAMPLING		Equip	ment Oseu.	Nondedicated					
Sample	Total		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to	
Time	Purged	pН	(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)	Obs.
(24 hr)	(Liters)		x <i>y</i>	N 797			((11100)	
1740	7.5	6.67	15.97	0991	4.4	-23.1	0.54	19.90	
FERROUS IR		NA	mg/L						
			3 8 2 27 535				17-1		
FINAL DEPTI	H TO WATE	R (ft TOC):	19.90	-	TIME FINAL L	DEPTH TAKEN:	1288		KM
SAMPLE ID:	WACD-TO	76001	MW-8A,	160001	SAMF	LE ID FOR QC:	DUP	1 Hours	PAR
				BTEX		PAHs .			
PARAMETER	RS REQUES	TED FOR ANA	L 1010.	RCRA 8 META		Cyanide			
				Others		10			
				-	Madal Num				
IDW TOTAL:	294		Flow	V Inrough Cell	Model Number:				
		NAME		/	SIGNATURE	23		DATE	
				L-	Left	•	¢-	27-20)
PREPARED:		Kevin Bolling							
REVIEWED:									

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: STE: KCBPU PID READING at WELL F PROJECT NUMBER: ST77 WEATHER: Mushy class, SO WELL NUMBER: Mushy class, SO SO DEPTH TO WATER (ft): IG.39 WELL DIAMETER (inches): 2 DEPTH TO TOP OF PUMP (ft): DEPTH TO TOP OF YSI (ft): 2 DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)	HEAD (ppm): 	NA
WEALL NUMBER: MADE Control of the c	-	
WELL NUMBER: Mu-3 DEPTH TO WATER (ft): I9.39 TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft): DEPTH TO TOP OF PUMP (ft): (for downhole D0 measurement)	-	
TOTAL DEPTH (ft):	-	
TOTAL DEPTH (ft):	-	
DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)	_	
CASING VOLUME CALCULATION:		
Height of Mater Orl		
Gallons per foot: Gallons per Casing Volume:		
Equipment Used: Other		
Time Amount Flow Pote		Dopth to
Purged ridwinate pH Temp Conductivity Turbidity ORP	D.O.	Depth to Water
(C) (mS/cm) (NTUs) (mV)	(mg/L)	(ft TOC)
1510 I 300 6162 16.45 0.883 62.5 -9.7 1515 1.5 300 6.2 1551 0.897 351 127	1.44	19.44
1512	1,43	19.29
1525 4 - 700 /	1.43	19.44
1530 6 300 6.28 15.69 0.599 8.4 17.8	1.33	19.441
1535 7.5 300 6,27 15,76 0.818 6.2 18,7	1.31	19,40
1540 800 300 6.30 15.73 0,897 4.5 20,0	1.27	19.44
Continued on additional page Yes No SAMPLING Equipment Used: Nondedicated Bladder Pump		
SAMPLING Equipment Used: Nondedicated Bladder Pump		
Sample Total Temp Conductivity Turbidity ORP D.O.	Depth to	
TimePurged (Liters)pH(C)(mS/cm)(NTUs)(mV)(mV)(mg/L)	Water	Obs.
(24 hr) (24 hr)	(ft TOC)	0.03.
1546 90 6.30 15.73 0.814 415 20.0 1.27	19,44	
ERROUS IRON: <u>NA</u> mg/L		
INAL DEPTH TO WATER (# TOC): (1. YL) TIME FINAL DEPTH TAKEN:		
100	-	
AMPLE ID: SAMPLE ID FOR QC:		
ARAMETERS REQUESTED FOR ANALYSIS: BTEX		
RCRA 8 METALS Cyanide		
□ Others		
W TOTAL: 25 Flow Through Cell Model Number: 506		<i>6</i> ,
NAME SIGNATURE		
REPARED: Kevin Bolling	DATE	
	27.	62
	_	

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	NA Depth to
WELL NUMBER: $M_{A,J} = Y$ DEPTH TO WATER (ft): $i (J) b$ WELL DIAMETER (inches): 2 DEPTH TO TOP OF PUMP (ft): DEPTH TO TOP OF PUMP (ft): DEPTH TO TOP OF YSI (ft): 2 DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement) DEPTH TO TOP OF YSI (ft): 2 PURGING CASING VOLUME CALCULATION: Gallons per foot: Gallons per Casing Volume: Gallons per foot: Other Gallons (mV) (mV) (mV) Time Amount pH Temp Conductivity Turbidity ORP D.O. (24 hr) L Other (C) (mS/cm) (NTUs) (mV) (mg/L) 16 2C Z 320:0 $(., \& L)$ $(. G)$ $(. MS/cm)$ $(. MV)$ $(. my/L)$ 16 2C L S $(. G)$ $(. MS/cm)$ $(. MV)$ $(. my/L)$ 16 2C L S $(. G)$ $(. MV)$ $(. MV)$ $(. MV)$ $(. my/L)$ 16 2C L S $(. G)$ $(. G)$ $(. MV)$ $(. MV)$ $(. MV)$ $(. MV)$ $(. MV)$ $(. M$	Depth to
WELL NUMBER: $\mathcal{M}_{\mathcal{M}_{\mathcal{A}}} - \mathcal{A}_{\mathcal{A}}$ WELL DIAMETER (inches):2DEPTH TO WATER (ft): $(\mathbf{L}) \mathbf{b}$ WELL DIAMETER (inches):2TOTAL DEPTH (ft):DEPTH TO TOP OF PUMP (ft):DEPTH TO TOP OF YSI (ft):DEPTH TO TOP OF PUMP (ft):(for downhole DO measurement)PURGINGGallons per foot:Gallons per Casing Volume:Gallons per foot:Gallons per foot:Gallons per Casing Volume:Equipment Used:Other(ft):(mV) (mg/L)16 CO \mathcal{I} SD-C($\mathcal{L}_{\mathcal{A}}$ 16 CO \mathcal{I} SD-C($\mathcal{L}_{\mathcal{A}}$ (24 hr)LFlow Rate (ml/min)pHTemp (C)Conductivity (mS/cm)Turbidity 	Depth to
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth to
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth to
URGING CASING VOLUME CALCULATION: Gallons per foot: Gallons per Casing Volume: Gallons per foot: Time Amount PH Temp Conductivity Turbidity ORP D.O. (24 hr) L Other (C) (mS/cm) (NTUs) (mV) (mg/L) 16 CO D 3 colspan="2">Gallons per Casing Volume: (24 hr) L PH Temp Conductivity Turbidity ORP D.O. 16 CO D Gallons per Casing Volume: (mg/L) 16/C (C) (ms/cm) (my/L) (mg/L) 16 CO D Gallons per Casing Volume: Gallons per Casing Volume: Gallons per Casing Volume: Gallons per Casing Volume: 16 CO D Goldon 15 (coldon 15 (coldon 16 (coldon 16 (coldon 16	Depth to
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth to
Gallons per foot:Equipment Used:OtherTimeAmount PurgedFlow Rate (ml/min)pHTemp (C)ConductivityTurbidityORPD.O. $(24 hr)$ L (ml/min) pHTemp (C)ConductivityTurbidityORPD.O. $16 7 \odot$ J $30 \odot$ $(J_1 \otimes Z)$ $(J_1 \otimes Z)$ $(MTUs)$ (mV)(mg/L) $16 7 \odot$ J $30 \odot$ $(J_1 \otimes Z)$ $(J_2 \otimes Z)$ $(J_1 \otimes Z)$ $(J_1 \otimes Z)$ $(J_2 \otimes Z)$ $16 2 \odot$ J $30 \odot$ $(J_1 \otimes Z)$ $(J_2 \otimes Z)$ $(J_1 \otimes Z)$ $(J_1 \otimes Z)$ $(J_1 \otimes Z)$ $16 2 \odot$ J $30 \odot$ $(J_1 \otimes Z)$ $16 2 \odot$ J $30 \odot$ $(J_1 \otimes Z)$ $16 2 \odot$ J $30 \odot$ $(J_1 \otimes Z)$ $16 3 \odot$ J $30 \odot$ $(J_1 \otimes Z)$ $16 3 \odot$ J $30 \odot$ $(J_1 \otimes Z)$ $16 3 \odot$ JJ $J_2 \otimes Z$ $(J_1 \otimes Z)$ $(J_1 \otimes Z)$ $(J_1 \otimes Z)$ $(J_1 \otimes Z)$ $16 4 (G)$ JJJJJJJJJ $16 4 (G)$ JJJJJJJJ $I6 4 (G)$ JJJ	Depth to
Equipment Used:OtherTimeAmount Purged (24 hr)Flow Rate (ml/min)pHTempConductivityTurbidityORPD.O.16 20 \mathcal{I} 3200 $(\downarrow_1 \otimes \mathcal{C})$ (C)(mS/cm)(NTUs)(mV)(mg/L)16 20 \mathcal{I} 3200 $(\downarrow_1 \otimes \mathcal{C})$ 0.8[01 \pounds_1 .1]16.123.2716 20 \mathcal{I} 3200 $(\downarrow_1 \otimes \mathcal{C})$ 0.5[01 \pounds_1 .1]16.123.2716 20 \mathcal{I} 3200 $(\downarrow_1 \otimes \mathcal{C})$ 0.5[01 \pounds_1 .1]16.123.2716 20 \mathcal{I} 3200 $(\downarrow_1 \otimes \mathcal{C})$ 0.5[01 \pounds_1 .1]16.123.2716 21Le3200 $(\downarrow_1 \otimes \mathcal{C})$ 0.5[01 \pounds_1 .1]16.123.2716 32 3 3200 $(\downarrow_1 \otimes \mathcal{C})$ 0.7[50]18.111/6.123.2716 333200 $(\downarrow_1 \otimes \mathcal{C})$ 0.7[50] $(\downarrow_1 \mathcal{C})$ 1.7[8]1.7[8]16 333200 $(\downarrow_1 \otimes \mathcal{C})$ 14.1670.7[50] $(\downarrow_1 \mathcal{C})$ 1.7[8]16 323000 $(\downarrow_1 \otimes \mathcal{C})$ 15.570.7[50] $(\downarrow_1 \mathcal{C})$ 1.4[6]16 40111111116 41111111116 42111111116 42111111116 421111111116 43<	Depth to
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth to
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Depth to
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Water
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(ft TOC)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	16.19
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	16.71
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	16.2
	16.2
	16.20
Image: Continued on additional page Yes No	
Image: Continued on additional page Yes No	
Image: Sector of the sector	
Continued on additional page Yes No	
Continued on additional page Yes No	
Continued on additional page Yes No	
AMPLING Equipment Used: Nondedicated Bladder Pump	
Equipment oscel. Nondedicated Bladder Pump	
Sample Total Temp Conductivity Turbidity ORP D.O. Depth to	
TimePurged (Liters)pH(C)(mS/cm)(NTUs)(mV)Water (mg/L)Water (ft TOC)	Obs.
(24 hr) (1	
1645 7.5 6.35 15.59 0.753 4.62 49.1 1.46 16.21	
ERROUS IRON: <u>NA mg/L</u>	
INAL DEPTH TO WATER (ft TOC): 16.71 TIME FINAL DEPTH TAKEN: 1705	
AMPLE ID: NW-L/GWO SAMPLE ID FOR QC:	
ARAMETERS REQUESTED FOR ANALYSIS: BTEX DAHS	
Cyanide RCRA 8 METALS Cyanide Others	
W TOTAL: Flow Through Cell Model Number:	
NAME SIGNATURE	-
REPARED: Kevin Bolling	-
1 5 - 5 - 17	-
VIEWED:	- 82

DATE:	5-28	1885 (AMC)	E: KCBPU		SAMPLING	PID READIN	G at WELL H	IEAD (ppm):	NA
PROJECT	NUMBER:	8877	ι	WEATHER:	- _ ((())				
WELL N	UMBER:	Mw-1-		WEATHER.		466 R.	aun_	5	
	DEPTH	TO WATER (ft)	: 13.1-	1	J WELL DIA	METER (inches)	: 2		
DE	TOT	AL DEPTH (ft)		_	DEPTH TO	TOP OF YSI (ft):		-	
PURGING	PTH TO TOP	OF PUMP (ft)		_	(for downhole I	DO measurement)		
	OLUME CALC	CULATION:							
		Water Column			Gallons pe	er Casing Volume			
Equipment		allons per foot Other	:	- Y					
		other							
Time	Amount	Flow Rate	-	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to
(24 hr)	Purged L	(ml/min)	pH	(C)	100000 (10000) - 10000		2.5237.57	10000000000000000000000000000000000000	Water
0845	I	200	6.06	15.17	(mS/cm) 0,913	(NTUs) 374	(mV) -2578	(mg/L)	(ft TOC) リろ、(て
8850	1	2005	6.02	15.14	0.911	675	-4117	1.16	13.12
0855	2	700	6.25	15119	0,910	408	-55.2	0,99	13.12
0900	3	202	6,43	15.31	0.915	301	-69,2	0,94	13.12
0910	5	200	6,31	15.21	0.911	72.7	-71.2	0,95	13.12
0911-	4	200	6,26	15.16	0.909	39.6	-719	0.73	13.12
0920	7	200	6.39	15.24	0909	31,1	-82.0	0.68	13.12
6930	9	7000 200	6.42	15.26	0.909	28,6	- 95.1	0.61	13.12
0935-	10	200	6.49	15.27	0.904	19.2	-90,2	82.0	13.12
0940	1	700	6,44	15.12	0,909	10,6	- 88.0	0.61	13.12
0945	12	203	6.44	15.09	0.909	7.1	- 89,2	0.54	13,12
0950	13	200	6.45	15.07	0 .908	41,9	-90.4	0.54	51,21
				Continued on	additional page	🗌 Yes 🗌 No			
SAMPLING		Equipr	nent Used:	Nendedicated	l Bladder Pump				
Sample	Total		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to	[
Time	Purged	pН	(C)	(mS/cm)	(NTUs)	(mV)		Water	Obs.
(24 hr)	(Liters)		(0)	(110/011)	((1100))	(((()))	(mg/L)	(ft TOC)	
0950	13	6.45	15.04	0.908	4.9	-90.4	0.54	13.12	12
ERROUS IRC	<u>1</u> :NC	<u>IA 1</u>	mg/L						
INAL DEPTH	TO WATER	(ft TOC):	13.12		TIME FINAL D	DEPTH TAKEN:	10/1		
SAMPLE ID:	mult	13/600	51			LE ID FOR QC:	_	-	
				BTEX	-	DATE			
PARAMETERS	REQUEST	D FOR ANAL	1010.	RCRA 8 METAL] PAHs] Cyanide			
] Others					-
OW TOTAL:	3.550		Flow	Through Cell I	Model Number:	536			
ued: 1979/01771		NAME		977. 1	SIGNATURE		-	DATE	
	K	evin Bolling		C	\sim	an	5-2	65 - 23	
REPARED:	K							0	
	5								

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DATE:		F		OUNDWATE	R SAMPLIN	G DATA FOR	RM		
DATE.	5-29	S-ZO SIT	E: KCBPU			PID REA	DING at WEL	L HEAD (ppn	n): NA
PROJECT	NUMBER:	1		WEATHER	· / 15 /	70	<u>،</u> د	+	
WELL N		MW-	TO		7	y 70	1 500	Terw sh	aver.
TUNGING	РТН ТО ТОР	TO WATER (ft) TAL DEPTH (ft) P OF PUMP (ft)	. 11 0	2	DEPTH T	DIAMETER (inch O TOP OF YSI (DO measurem	ft):	_	
CASING Vo	G	CULATION: f Water Columr Gallons per foot Other): ::	_	Gallons p	per Casing Volur	ne:		
Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pН	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to Water
1030	7	300	7.60	(C) (4.38	(mS/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)
1035	1.5	300	6,48	14,22	0,988	51.5	=45.1	1.10	16.89
10-10	3	300	6,43	14,28	0,986	7.21	-47.1	0.61	16.94
1075	4,5	300	0.57	ルハフマ	0.983	4.86	-58.0	0.55	16.94
1055	7.5-	300	6.58	14,22	0.981	21.07	-411	0,19	16.911
		320	0.75	19,21	0.981	3.81	-61,8	0.52	16.94
				Continued on a	additional page	Yes KNo			
AMPLING		Equipm		N on dedicated					
	T		-	Hondealeated					
Sample	Total		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to	
Time	Purged	рН	(C)	(mS/cm)	(NTUs)	(mV)	1.10-0.200-0.200	Water	Obs.
(24 hr)	(Liters)				((110)	(mg/L)	(ft TOC)	ODS.
055	7.5	6.55	11, 21	0.981	3.51	-61.8	0.52	16.94	
RROUS IRC	DN: <u>N</u>	IA m	ng/L					0.17	
NAL DEPTH	TO WATER		6.94		TIME FINAL D	EPTH TAKEN:	11 .5		
MPLE ID:	mw.	16/6001				LE ID FOR QC:			
RAMETERS		D FOR ANALY	010.] BTEX		PAHs			
				RCRA 8 METALS Others		Cyanide			
V TOTAL:	Zije		Flow T	hrough Cell Mo	odel Number:	555			
		NAME		1 .	SIGNATURE			DATE	
	Ке	evin Bolling		K	$>$ \mathcal{K}	il	5	- 28-7	دن
IEWED:									

DATE											
DATE:	PID READING at WELL HEAD (pprin). WA										
	5	88777)	WEATHER:	Clad	4 74					
WELL NUM		MW-14				1		-			
DEPT	DEPTH TO TOTAI	D WATER (ft): DEPTH (ft): DF PUMP (ft):		• 1	DEPTH TO	METER (inches) TOP OF YSI (ft): 00 measurement		-			
PURGING				1	,	e measurement	/				
CASING VOL	UME CALCU	JLATION:									
	Height of V	Vater Column:			Gallons pe	r Casing Volume	0				
		lons per foot:		•9							
Equipment Us	sed:	Other		• (.							
Time	Amount Purged	Flow Rate	pН	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to Water		
(24 hr)	L	(ml/min)	F 23	(C)	(mS/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)		
1110	.L	300	7.37	16.29	1. (8/	2.70	-24.9	1.36			
1115	1.5	300	6.73	16.30	1,268	1.94	-18.0	0.94	1624		
1120	2	300	Gisy	16,28	1.274	1.20	-13.3	0.85	16.74		
1.25	4.5	300	(0.5)	16:32	1.273	0.51	-10,9	0.81	16.20		
130	6	300	6.49	16.3)	1.271	0.46	-8.4		16.26		
	25			21		0.10	014	0,76	16.26		
						/					
				Continued on	odditional						
L				Oct i (ust	additional page	🗌 Yes 💢 No					
SAMPLING		Equip	ment Used:	Nondedicate	d Bladder Pump						
Sample	Total		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to			
Time	Purged	pН	(C)	(mS/cm)	(NTUs)			Water			
(24 hr)	(Liters)		(0)	(mo/om)	(1105)	(mV)	(mg/L)	(ft TOC)	Obs.		
1130	(0	6.49	16.31	1,271	0.411	- 814	0.76	11 -			
FERROUS IF	RON:	NA	mg/L			0; [1676			
FINAL DEPT	H TO WATE										
		10 X X X X	16.24	•		DEPTH TAKEN:	11115	2 0			
SAMPLE ID:	MW-44	101000			SAME	PLE ID FOR QC:	-				
		(C.)		_							
PARAMETER	RS REQUES	TED FOR ANA	LYSIS:	BTEX	C	PAHs					
				CRCRA 8 META	ls [Cyanide					
IDW TOTAL:	2 yr	7	Flow	/ Through Cell	Model Number:	555					
		NAME			SIGNATURE			DATE			
PREPARED:		Kevin Bolling			2015	n	5-	-27-7	in		
REVIEWED:											

FIELD GROUNDWATER SAMPLING DATA FORM

· Fl	IELD	GROUND	-WATER	SAMPL	ING F	REPORT
------	------	--------	--------	-------	-------	--------

3.1												
DATE:	10-19-20	SITE:	KCBPU	- Nearman	PID READING	at WELL HE	AD (ppm):					
PROJEC		R: <u>88777</u>	V	EATHER:	40=, 5 meh	NE, OVU	cent					
WELL N					EPTH TO WAT							
			٦	L	EPTH TO WAT	=R (II):	2.76					
r	WW-2A			TAL DEPTH (f	t):	WELL DIAM	ETER (inche	s): ə				
PURGIN	G		10	//i= == · · · · ·	/							
CASING	VOLUME	CALCULATIC	N: ft	of water X	gallons/ = foot	total gallon	s/casing volu	ume				
				in casing	22000		NU					
Equipme	nt Used: 2	edicated Blac	Ider Pump	Nondedicate	ed Bladder Pump	Bailer C	other		-			
Time	Amount Purged	Flow Rate	pН	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to Water			
(24 hr)	(gals)	(ml/min)	p.,	(C)	(mmhos/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)			
630	-	300	6.85	1250	6.822	22.7	-32.4	4.17	22.41			
635	0.40	300	6.80	12.99	0.889	11.4	-216	1.20	22.46			
1040	0.80	300	6.80	13,17	0.905	8.66	-19.7	0.42	22.46			
1045 1.20 200 6.79 13.19 0.907 2.51 -23.5 0.27 22.46												
	1050 1.60 360 6.79 13.24 0.905 1.56 -28.2 0.18 22.46											
1055	2.00	300	6.79	13.25	0.900	1.63	-31.4	0.17	22.46			
	L		Co	ontinued on ba	ck (circle one) y	es /m			L			
L												
SAMPLI	NG	Equipme	nt Used: S	ame as above	Other							
Sample	Tota	al	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to				
Time	Purge		(C)	(mmhos/cm)		(mV)	(mg/L)	Water (ft TOC)	Obs.			
(24 hr)	2	· 6.79	13.25	0.900	1.67	-31.4	0.17	22.44	5			
	and the second se				TIME FINAL DE	PTH TAKEN						
					ID FOR QC:							
					dix III and sele		IV paramet	ters				
FERRO	US IRON (m	ng/L):		IDW TC	TAL: 2.00							
METER	MODEL No	.: YSI 556 N	IPS									
CHECK	ED FLOW T	HROUGH CE	LL FOR L	EAKS: R C	OMMENTS:	NIA						
0.12-	•											
NAME SIGNATURE DATE												
	PREPARED: Jonathan Hermanson Atra- Auron 20-19-20											
				U								
REVIEW	/ED:					and the second						

			FIELD G	ROUND-W	ATER SAMPL	ING REPO	DRT				
	6-19-20	SITE	KCBPU	- Nearman	PID READING	at WELL HE	AD (ppm):				
	18 I. I. I.		W	EATHER:	405 Smph	NE, OUL	E.C.V-				
WELL N											
I			7	C	EPTH TO WATE	ER (ft):	4.73				
W	w-3							~			
PURGIN	G		TO	FAL DEPTH (f	it):	WELL DIAM	ETER (inche	s): <u> </u>	-		
		CALCULATIC	DN:ft	of water X In casing	gallons/ = foot	total gallor	ns/casing volu	ume			
Equipme	nt Used: P	edicated Bla	dder Pump	> Nondedicate	ed Bladder Pump	Bailer C	Other				
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)		
1130	-	300	6.65	13.48	1.077	2.96	-66.7	2.48	24.78.0		
1135	0.40	300	6.64	13.50	1.045	2.04	-77.9	1.61	24.12A		
1140	0.80	300	6.64	13.53	1.064	637	-94.8	0.67	24.92		
1145	1.20	300	6.64	13.49	1.063	1.44	- 113.1	0.57	24.92		
1150	1150 1.60 300 6.65 13.56 1.056 1.65 -135.8 0.52 24.92										
1155	2.00	300	6.65	13.58	1.051	1.51	-146.0	0.47	24:12		
1200	2.40	300	6.65	13.54	1.048	1.13	-139.5	0.49	24.12		
			Ca	ontinued on ba	ack (circle one) y	res / m					
SAMPLIN	NG	Equipme	ent Used:	Same as abov	e Other						
Sample Time (24 hr)	Tota Purge (gals	ed pH s)	Temp (C)	Conductivity (mmhos/cm		ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.		
1205	2.40	6.65	13.59	1.848	443	-139.5	0,49	24.92	-		
SAMPLE	10: mh	1-316WD	L	SAMPLE	TIME FINAL DI ID FOR QC: adix III and sele						
FERROL	IS IRON (m	na/L): —	-	IDW TO	DTAL: 2.4	0 121					
		.: YSI 556 1									
				EAKS: Dr C	OMMENTS:	NIA					
		NAME		S	GIGNATURE		5 m.	DATE			
PREPAR	PREPARED: Jonathan Hermanson Juta Juran 10-19:23										
REVIEW	/ED:			· · · · · · · · · · · · · · · · · · ·	<u></u>						

18	FIELD GF	ROUND-WA	TER SAMPL	ING REPO	RT						
DATE: W-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm):											
PROJECT NUMBER: 88777 WEATHER: 405, 5 mph DE, OVYCASH											
WELL NUMBER											
	DEPTH TO WATER (ft): 21.57										
MW-41											
TOTAL DEPTH (ft): WELL DIAMETER (inches): PURGING											
CASING VOLUME CALCULATION: ft of water Xgallons/ =total gallons/casing volume											
		in casing	foot		5						
Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other											
Time (24 hr)Amount Purged (aale)Flow Rate (ml/min)pHTemp (C)Conductivity (mmhos/cm)Turbidity (NTUs)ORP (mV)D.O. (mg/L)Depth to Water (ft TOC)											
(24 hr) (gals) (mi/min) (C) (mimos/cm) (NTOS) (mV) (mg/2) (ft TOC)											
1225 0.40 300 6.86 13.84 0.707 1.72 -130,7 3.93 21.57											
1225 0.40 300 6.86 13.83 0.402 1.74 -141.1 1.43 21.51 1230 0.80 300 6.85 13.87 0.701 1.72 -134.9 1.21 71.51											
1235 1.20 300 6.85 13.88 0. 700 1.44 -1353 1.13 21.51											
1240 1.60 300 6.85 13.92 0.699 1.21 -134.1 1.02 21.51											
1245 2.00 300 6.85 13.95 0.699 6.69 -130.9. 0.96 21.51											
							+				
l	Co	ontinued on ba	ck (circle one) y	res / no			1				
SAMPLING Equipme		Same as above									
SAMPLING Equipme	ent osed. C	anie as above) ourier —								
Sample Total Time Purged pH (24 hr) (gals)	Temp (C)	Conductivity (mmhos/cm)		.ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.				
1250 1160 6.85	5 13.92	0.699	0.69	-130.9	0.96						
FINAL DEPTH TO WATER (ft TO	DC): 21	.51	TIME FINAL DI	EPTH TAKEN	1: 1250						
SAMPLE ID: MW-4/6000	2	SAMPLE	ID FOR QC:	-	ř.						
PARAMETERS REQUESTED FO						ters					
FERROUS IRON (mg/L):	_	IDW TC	DTAL: 2.0	ogal	_						
METER MODEL No .: YSI 556 M	MPS										
CHECKED FLOW THROUGH C	CHECKED FLOW THROUGH CELL FOR LEAKS: 区 COMMENTS: 心(ケ										
NAME SIGNATURE DATE											
PREPARED: Jonathan Hermanson Anton Jumm 10-14-20											
REVIEWED:											

		24 1	FIELD GI	ROUND-W	ATER SAMPL	ING REPO	DRT				
DATE: 10-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm):											
WELL NU											
			-	E	DEPTH TO WAT	ER (ft): _2	5.92				
now	-BA							-			
Line -			ТОТ	AL DEPTH (ft):	WELL DIAM	ETER (inche	s):	2		
PURGING											
CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot											
Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other											
Amount Depth to											
Time Purged Flow Rate pH Temp Conductivity Turbidity ORP D.O. Water (24 br) Purged (ml/min) pH (C) (mmbos/cm) (NTUs) (mV) (mg/L) (#TOC)											
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$											
		300				95.7	-79.8	1.18	26.10		
0800 0.40 300 6.94 14.00 1.249 95.7 -79.8 1.18 66.10 0805 6.80 300 6.94 14.05 1.256 52.5 -94.5 0.60 26.18											
0810 1.20 300 6.94 14.28 1.264 25.9 -105.9 0.50 26.26											
0815 1.60 300 6.93 14.47 1.268 13.4 -119.9 0.45 26.29											
	7.00	300	692	14.49	1.270	14.83	-178.7		26.29		
6825		300	6.92	14.49	1.271	15.4	-134.1	0.41	26.29		
083.	2.80	300	6.91	14.47	1.272	13.25	-138.0	0.32	76.29		
0835	3.20	500	6.91	14.44	1.272	6.37	-141.7	0.24	26.29		
			Co	ontinued on ba	ack (circle one)	D/no					
SAMPLIN	IG	Equipme	ent Used: S	ame as abov	Other			;			
Sample			Temp	Conductivity	/ Turbidity	ORP	D.O.	Depth to	Oha		
Time (24 hr)	Purge (gals		(C)	(mmhos/cm		(mV)	(mg/L)	Water (ft TOC)	Obs.		
0850	4.00	6.90	1454	1.272	4.48	-131.5	0.21	2629	-		
FINAL DE	PTH TO V	VATER (ft TC	DC): 26.	24	TIME FINAL DI	EPTH TAKEN	0850				
	ID: MW				ID FOR QC:						
					ndix III and sele		IV parame	ters			
PARAME	IERS KEU	202312013			DTAL: _ U.so						
					JIAL		-				
		: YSI 556 N							~		
CHECKED FLOW THROUGH CELL FOR LEAKS: 🖸 COMMENTS: NA											
NAME SIGNATURE DATE											
PREPAR	ED: Jona	than Herm	anson		In three		10	-19-20	2		
REVIEW	ED:			[

WELL NUMBER

MW-8A

1

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0840		300	6-91	14,51	1.772	-1306.19	-130,6	0.23	26.29
0845		300	6.90	14.54	1.272	4.48	-131.90	15.0	26.79
- UTP									
						1			
	N.				20				
					·.		· · · ·		
		<u>2</u>							
				4.1		11			
									1000
				9					
							1		

COMMENTS

FIELD	GROUND-WAT	ER SAMPLING	REPORT
	*		

DATE: 1	0-19-2	SITE	KCBPU	- Nearman	PID READING	at WELL HE	EAD (ppm):	_				
PROJEC	TNUMBE	R: <u>88777</u>	V	/EATHER:	10s, 10mph	NE, 60	weash					
WELL N	UMBER				CDTU TO WAT	5D (A) 7	() (()					
[100		,	7	U	EPTH TO WAT	ER (II):	0.40					
L Ir	W-10]		t):		ETER (inch	as). 2				
PURGIN	G		10	IAL DEFIN	9	WELL DIAM		337. <u> </u>	_			
CASING	VOLUME	CALCULATIC	DN:ft	of water X	gallons/ =	_total gallor	ns/casing vo	lume				
				in casing	foot							
Equipme	nt Used: 2	edicated Blad	dder Pump	Nondedicate	d Bladder Pum	b Bailer C	Other					
Time	Amount	Flow Rate	1	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to			
(24 hr)	Purged (gals)	(ml/min)	pH	(C)	(mmhos/cm)	(NTUs)	(mV)	(mg/L)	Water (ft TOC)			
0920	300	300	674	13.90	1.024	47.8	23.2	3.94	20 40			
0975	040	300	6.70	13.94	1.028	40.8	23.1	1.42	20.40			
0430	0.80	300	672	14.06	1.027	24.1	16.0	0.55	2040			
0435	1,20	300	6.71	14.08	1.026	19.9	- 7. 1	0.39	20.40			
0940	0940 1.60 300 6.70 14.05 1.026 12.6 -13,9 0.38 2040											
0945	2.00	360	6.70	14.07	1.000	622	-13.3	0.26	20.46			
\$953	2.40	710	6.70	14.09	1.026	2.40	-15.0	0.24	20.40			
	L	L	Co	ontinued on ba	ck (circle one) y	es / ho		L	1			
SAMPLIN	NG	Equipme	ent Used: 🤇	ame as above	Other							
Sample	Tota		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to	0			
Time (24 hr)	Purge (gals	Second Second Second	(C)	(mmhos/cm)		(mV)	(mg/L)	Water (ft TOC)	Obs.			
0955	2.00	o 6.70	14.09	1.020	2.40	-15.0	0.24	20.40	-			
		NATER (# TO		40	TIME FINAL DE	PTH TAKEN	095	5				
					dix III and selec		IV parame	ters				
FERROU	S IRON (m	ng/L):	~	IDW TO	TAL:4	0	-					
METER N	ODEL No.	: YSI 556 M	IPS									
CHECKĘ	D FLOW T	HROUGH CE	LL FOR LE	AKS: 🗶 CC	MMENTS: N	IA						
				2								
		NAME		SI	GNATURE			DATE				
PREPAR	ED: Jona	than Herma	inson	Liter	rthomas		10-1	4-20				
				0								
REVIEW	EU;											

			÷	FIELD GI	ROUND-WA	TER SAMPL	ING REPO	ORT			
DATE:	10-19-20	5	SITE:	KCBPU	- Nearman	PID READING	at WELL HE	AD (ppm):	_		
PROJEC	TNUMBER	R: 8	88777	W	EATHER	Yos, Smp	N. DW	cent			
WELL N		_									
m	w-13			DEPTH TO WATER (ft). 20.81							
PURGIN	G			TOT	TAL DEPTH (f):	WELL DIAM	ETER (inches	s)	-	
		CALC	ULATIO	N ft	of water X in casing	gallons/ = foot	total gallor	ns/casing volu	ime		
Equipme	ont Used: D	edica	ited Blad	der Pump	Nondedicate	d Bladder Pump	b Bailer (Other		-	
Time (24 hr)	Amount Purged (gals)		рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)		
1330	-	30	00	6.78	13.98	1.029	Crist	-88 4	1.448	20.81	
1335	0.40	3	00	6.79	14.05	1.073	euro -	-1123	0.47	2031	
1340	2.80	3	DG	6,79	14.02	1.079	48.2	-1254	0.24	2081	
1345	1.20	3	DD	6.79	14.06	1.078	38.7	-130.5	0.18	2081	
1360	1.60	J	00	6.79	14.10	1.078	26.6	-137.2	0 16	20.81	
1355	2.00	3	00	6.79	14.15	1.077	19.5	-138.7	0.13	20.01	
14160	2.40	3	00	6,78	14.15	1.077	17.1	-140.8	0.12	20.81	
1405	2.90	3	00	6.73	14.16	1,075	14.5	-143.5	0.14	2081	
1410	3,20	3	00	6.78	14.14	1.676	12.3	-145.6	0.11	20 81	
				Co	ontinued on ba	ck (circle one)	/ no				
SAMPLIN	NG	E	Equipme	nt Used: S	Same as above	Other					
Sample Time (24 hr)	Tota Purge (gals	ed	pН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.	
515	8.00		6.77	14.03	1.065	4,94	-125.2	0.09	20.9	-	
FINAL D	EPTH TO V		1	c): <u>20.</u> 8	ι	TIME FINAL D	EPTH TAKE	N: 15 15			
SAMPLE	ID: MW	-13	6002		SAMPLE	ID FOR QC:	-				
	TERS REC		1.411			dix III and sele			ters		
FERROL	IS IRON (m	ng/L):		-	IDW TO	TAL: 8.00	ga)				
METER I	MODEL No	<u>: Y</u>	SI 556 N	IPS			-				
CHECKED FLOW THROUGH CELL FOR LEAKS: A COMMENTS: ALA											
		1	AME		<u>S</u>	IGNATURE			DATE		
PREPARED: Jonathan Hermanson Atu Lunan 10- 19-20											

REVIEWED:

WELL NUMBER

Mw-13

ì

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1415	3.60	300	6.78	14.11	1.075	19.1	-145.2	0.09	20-81
1420	4.00	300	6.78	14.06	1.073	228	-145-6	010	2081
1425	4.40	300	6.78	14.06	1.072	19.0	- 144.1	012	20 81
1430	4.80	300	6.80	14.12	1,070	15.0	- 141.7	0.11	30.81
1435	5.20	300	6.78	14.11	1,070	14.58	- 111).6	0.11	20.87
1440	5.60	300	6,78	14.06	1.068	10.82	-140.1	0.09	20.81
1445	6.00	300	6.78	14.09	1.072	11.62	-1209	0.09	2081
1450	6.40	300	6.78	14.11	1.071	9.87	-119.3	0.10	20.81
1455	6.80	300	6.78	14.12	1.069	8.96	-114.7	0.09	20.81
1500	7.20	300	6.77	14.07	1.068	7.02	-120.7	0.08	20 21
1505	7.60	300	6.77	14.07	1.067	6.00	-123.1	6.07	20.81
1510	8.00	300	6.77	14.03	1.065	4.94	-125.2	0.04	20 81
									,
	1			-	2				
						•			

COMMENTS

DATE:)	0.14 20	SITE:	KCBPU	- Nearman	PID READING	at WELL HE	AD (ppm);	~	
					403, no w		115 CO. C. M. M.		
WELL N			_		DEPTH TO WAT				
m	5-14		1					5	
PURGIN	6		то	TAL DEPTH (ft):	WELL DIAM	ETER (inche	es): _Z	-
		CALCULATIC	DN:ft	of water X	gallons/ = foot	total gallor	ns/casing vol	lume	
Equipme	nt Used: D	edicated Blad	ider Pungp		ed Bladder Pum	p Bailer C	Other		÷
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1640	-	300	6.82	15.29	1.107	6.09	7.0	5.39	25.78
1645	0.40	300	6.62	15.47	1,183	4.15	35.8	1.85	2578
1650	0.80	300	6.60	15.64	1.199	1.75	47.1	0.7.2	25.73
1655	1.20	300	6.60	15.68	1.204	1.22	52.6	0.34	25.78
1700	1.60	300	6.60	15.69	1.205	1,03	55.7	0.24	25.78
1705	2.00	300	6.59	15,73	1.205	0.66	56.4	0,20	25 78
								1	1
		L	C	ontinued on b	ack (circle one)	les / 6	l	1	1
SAMPLIN	<u>1G</u>	Equipme	ent Used:	Same as abou	P Other				
Sample Time (24 hr)	Tota Purge (gals	ed pH s)	Temp (C)	Conductivit (mmhos/cm		ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1710	2.00	659	15.73	1.205	0.66	56.4	0.20	15.78	~
					TIME FINAL D				
					ndix III and sele			eters	
FERROU	IS IRON (m	ng/L):	4	IDW T	OTAL: 200	gal			
		.: YSI 556 M				0			
CHECKĘ	D FLOW T	HROUGH CI	ELL FOR L	EAKS: 🕅 (COMMENTS:) 0			
		NAME			SIGNATURE			DATE	
PREPAR	ED: Jon	athan Herm	anson	Ata	11		10-10	-	
REVIEW	20. Marks				····				

FIELD GROUND-WATER SAMPLING REPORT

		×	FIELD GI	ROUND-WA	TER SAMPL	ING REPO	RT		
DATE:	مح SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm):								
PROJEC	T NUMBER	R: 88777	WEATHER: 405, Smph W, pricest						
WELL NU					-) (
			1	D	EPTH TO WATE	ER (ft): <u>26.0</u>	12		
m	W-15): \		TER (inches	1	
PURGIN	G		101	AL DEFIN (II)· \	WELL DIANE			-10
CASING	VOLUME (CALCULATIO	N: ft	of water X in casing	_gallons/ = foot	total gallon:	s/casing volu	ime	
Equipme	nt Used: D	edicated Blad	der Pump	Rondedicate	d Bladder Pump	Bailer O	ther		-
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0850	-	300	6.92	17.39	0.763	6.03	-83.8	5.40	26.42
0355	0 40	300	7.27	18.81	0.788	36.3	-90.6	0.93	26.42
0400	6.80	300	7.29	18.69	0.793	22.1	-87.0	0.49	26.42
0905	1.20	300	7.28	18.62	0.293	11.1	-83.2	0.43	26.42
0910	1,60	300	7.28	18.66	0-794	5.29	- 85.8	0.34	26.42
8915	2.00	320	7.28	(8.69	0-794	4.89	- 85.4	0.32	26.42
									1
									1
			Co	ontinued on ba	ck (circle one) y	res / 60			
SAMPLIN	<u>1G</u>	Equipme	nt Used:	Same as above	Other				
Sample Time (24 hr)	Tota Purge (gals	ed pH	Temp (C)	Conductivity (mmhos/cm)		ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0920	2.00	728	18.69	0. 994	4.89	-85.4	0.32	26.42	-
FINAL DE	EPTH TO V	VATER (ft TO	C): 26-	42	TIME FINAL DE	EPTH TAKEN	: 092	9	
		N-5/6W			ID FOR QC:				
PARAME	TERS REC	QUESTED FO	R ANALYS	SIS: Appen	dix III and sele	ct Appendix	IV parame	ters	
FERROU	IS IRON (m	ng/L):	~	IDW TO	TAL:	ng~(
		.: YSI 556 M				Ū			
CHECKĘ	D FLOW T	HROUGH CE	LL FOR LE	EAKS: 🕅 CO	OMMENTS:	AIR			
		NAME		<u>s</u>	IGNATURE			DATE	
PREPAR	ED: Jona	athan Herma	inson	JM	m flunan	```] e	1.20-20	<u> </u>
REVIEW	ED:			V					

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FIELD GROUND-WATER SAMPLING REPORT										
DATE:	10-10-22	,	SITE:	KCBPU	- Nearman	PID READING	at WELL HE	AD (ppm):		
PROJEC	PROJECT NUMBER: 88777 WEATHER: 405, Smph N, oucest									
	WELL NUMBER									
DEPTH TO WATER (ft): 22,05										
MW-16										
TOTAL DEPTH (ft): WELL DIAMETER (inches): _<										
CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot										
Equipme	ent Used: D	edibat	ed Blac	Ider Pump	Nondedicat	ed Bladder Pump	b Bailer C	other		-
Time (24 hr)	Amount Purged		/ Rate /min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water
1535	(gals)	30		6.62	13,59	1,150	45.4	-62.4	2.14	(ft TOC)
1540	0.40	30		6.61	13.81		27.9	-79.1	1.06	22.05
1545	0.93	30		6.60	13.83	1.208	14.6	-90.4	0.72	22.05
1550	1.20		00	6.59	13.85	1.210	11.4	- 89.7	0.64	22.05
1555	1.60			6.59	13.85	1.215	7.83	-93.0	0.53	22.05
1600	2.00	300		6.59	13.84	1.216	6.56	- 99.3	0.54	22.05
1605	2.40	300		6.59	13.86	1.216	5.80	-101.3	0.52	22.05
1610	2.80	30		6.59	13.89	1.215	4.11	-103.1	0.80	22.05
									L	
L				CC	ontinued on ba	ack (circle one) y	es / m		and the same stars	
SAMPLIN	NG	E	quipme	nt Used: S	Same as about	Other				
Sample Time (24 hr)			Temp (C)	Conductivity (mmhos/cm) (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.	
1615	2.80		6.59	13.89	1.215	4.11	-103.1	0.50	22.05	-
FINAL D	EPTH TO V	VATE	R (ft TC	c): <u>22</u>	.05	TIME FINAL D	EPTH TAKEN	1:_1615		
SAMPLE	ID: MW	-16/	6402		SAMPLE	ID FOR QC:				
PARAME	ETERS REC	QUES.	TED FC	R ANALYS	SIS: Appen	ndix III and sele	ct Appendix	IV parame	eters	
FERROL	JS IRON (m	ig/L): _			IDW TO	OTAL: 2.80	gal_	_		
METER I	MODEL No.	:_YS	I 556 N	IPS						
CHECKE	D FLOW T	HROL	JGH CE	ELL FOR LE	EAKS: 🎦 C	COMMENTS:	VIA			
			AME			SIGNATURE			DATE	
PREPAR	RED: Jona	than	Herma	inson		an Homm			12.20	
REVIEWED:										

2007	FIELD GROUND-WATER SAMPLING REPORT										
DATE:	2-08-20	SITE	KIBPH-	Azeriman	PID READING	at WELL HE	EAD (ppm):				
DATE: 12-08-20 SITE: K(BPh- Neuman PID READING at WELL HEAD (ppm):											
WELL N			······ ·					J			
	OWBER			Ē	DEPTH TO WAT	ER (ft): <u>2</u>	7.25				
m	N-8A					c					
			то	TAL DEPTH (f	it):	WELL DIAN	IETER (inche	s):			
PURGING TOTAL DEPTH (ft): WELL DIAMETER (inches):											
CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot											
Equipme	ent Used: R	edicated Bla	dder Pump	Nondedicate	ed Bladder Pump	o Bailer (Other		_		
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)		
1305	-	300	6.51	16.03	1.36-1	47	-15.7	2.65	27.25		
1310	0.40	300	6.74	15.93	1.330	16	-27.7	1.33	27:36		
1315	0.00	300	6.78	15.56	1.311	7	-103.5	1.13	27.95		
1320	1.20	300	6.78	15.85	1.309	3.47	- 110.5	1.03	27.515		
1325	1.60	300	6.81	15.95	1.307	2.96	-121.2	0.29	27.45		
13:30	2.00	300	6.84	15.35	1.304	2.18	-127.4	0.81	27.45		
1335	2.40	300	6.88 15.81		1.298	0.33	=132.7	0.74	27.95		
1340	2.80	300	6.88	15,79	1,291	0.49	-134.4		27.45		
1345	3.20	300	6.88	15.79	1.386 ck (circle one) Ø	0.63	-135.7	6.67	27.95		
L				onunded on ba	CK (CITCLE OTIE) Q	10					
SAMPLI	NG	Equipme	nt Used:	Same as above	e Other	4					
Sample Time (24 hr)	Tota Purge (gals	d pH	Temp (C)	Conductivity (mmhos/cm)		ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.		
1500	3.80		15.76	1.255	0.28	-135.6	0.42	27.95	~		
FINAL DI	EPTH TO W	VATER (ft TO	c): 27.	95	TIME FINAL DE	EPTH TAKEN	1: 1455				
SAMPLE	10: MW-	P8		SAMPLE	ID FOR QC:	<u> </u>					
PARAME	TERS REC	UESTED FC	R ANALYS	SIS: Acsen	ic by	6010 3	6020				
FERROL	JS IRON (m	g/L):		IDW TO	TAL:		-				
METER	FERROUS IRON (mg/L): IDW TOTAL:										
CHECKED FLOW THROUGH CELL FOR LEAKS: COMMENTS: N (A											
	CONNICTION THROUGH CELL FOR LEARS. KI CONNICTION.										
NAME SIGNATURE DATE											
OPEDAD	ED: Jon	15		At.	1		100-0	8.20	<u>8</u>		
		Inn rein	VNU2EN	- from	Mumit						
REVIEW	ED:			V							

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WELL NUMBER

MW-8A

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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)
1350	3.60	300	6.88	15.77	1.282	0.02	- 36.6	6.64	27.95
1355	4.00	300	6.82	15.75	1.280	0.96	-1372	0.61	27.95
1400	4.40	300	6.89	15.72	1.275	0.02	-137.5	0.58	27 95
1405	4.20	300	6.90	15.67	1.271	0.04	- 137.6	6.55	27.45
1410	5.20	300	6.90	15.67	1.268	0.19	-137.3	0.53	27.95
14115	5.60	300	6.90	15.67	1,266	6.47	- 137.4	0.52	27.45
1420	6,00	300	6.90	15.66	1.264	0.26	-136.7	0.50	77.95
1425	6.40	300	6.90	15.67	1.261	0.02	-137.0	0.49	37.95
1430	6.80	300	6.91	15.67	1,259	5.07	- 136.7	0.48	27.95
1435	120	500	6.011	15.69	1.260	41.29	-136.6	0.45	27.95
	7.60	300	6.92	15.68	1.257	1.74	- 136.4	0.44	27.95
14145	8.00	300	6.92	15.72	1.256	0.20	- 134.8	0.44	27.95
1450	8.40	300	6.92	15.76	1.256	0.419	- 135.4	0.43	27.95
1455	8.30	300	6.87	15.76	1.255	0.38	-1356	0.42	27.95
							4		
				35	2 ·				
						-			
			•	. *					

COMMENTS

I.

APPENDIX C – ANALYTICAL REPORTS AND DATA VALIDATION



ANALYTICAL REPORT

Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description: L1223308 05/29/2020 KCBPU Nearman GW-Creek Bottom Ash Pond

Report To:

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

Entire Report Reviewed By:

Linde Cashman

Linda Cashman 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.

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1223308 DATE/TIME: 06/15/20 17:36 PAGE: 1 of 30

TABLE OF CONTENTS

*

Sc

Cp: Cover Page	1						
Tc: Table of Contents	2						
Ss: Sample Summary	3						
Cn: Case Narrative							
Sr: Sample Results	7						
MW-2A/GW01 L1223308-01	7						
MW-3/GW-01 L1223308-02	8						
MW-4/GW-01 L1223308-03	9						
MW-8A/GW-01 L1223308-04	10						
MW-10/GW-01 L1223308-05	11						
MW-13/GW-01 L1223308-06	12						
MW-14/GW-01 L1223308-07	13						
MW-15/GW-01 L1223308-08	14						
MW-16/GW-01 L1223308-09	15						
DUP-1/GW-01 L1223308-10	16						
Qc: Quality Control Summary	17						
Gravimetric Analysis by Method 2540 C-2011	17						
Wet Chemistry by Method 9040C	19						
Wet Chemistry by Method 9056A	22						
Mercury by Method 7470A	24						
Metals (ICP) by Method 6010B	25						
Metals (ICPMS) by Method 6020	27						
GI: Glossary of Terms	28						
Al: Accreditations & Locations	29						
Sc: Sample Chain of Custody	30						

SDG: L1223308

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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	SAMPLES		/IAR I		UNE L	LAD. NATIONW
MW-2A/GW01 L1223308-01 GW			Collected by Kevin Bolling	Collected date/time 05/27/20 14:40	Received da 05/29/20 09	
Nethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Net Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, TN
Vet Chemistry by Method 9056A	WG1484939	1	06/01/20 20:43	06/01/20 20:43	ELN	Mt. Juliet, TN
Net Chemistry by Method 9056A	WG1484939	5	06/02/20 10:58	06/02/20 10:58	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:06	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484995	1	06/02/20 13:17	06/03/20 20:21	EL	Mt. Juliet, TN
Aetals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:48	LAT	Mt. Juliet, TN
MW-3/GW-01 L1223308-02 GW			Collected by Kevin Bolling	Collected date/time 05/27/20 15:40	Received da 05/29/20 09	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
revinetric Applysic by Mathed 2540.0 2044	W04405070	4	date/time	date/time		M4 1
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Net Chemistry by Method 9040C	WG1484441	1	05/30/20 12:00	05/30/20 12:00	KPS	Mt. Juliet, TN
Vet Chemistry by Method 9056A	WG1484939	1	06/01/20 21:19	06/01/20 21:19	ELN	Mt. Juliet, TN
Net Chemistry by Method 9056A	WG1484939	5	06/02/20 11:33	06/02/20 11:33	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:08	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:51	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:51	LAT	Mt. Juliet, TN
			Collected by	Collected date/time		
MW-4/GW-01 L1223308-03 GW			Kevin Bolling	05/27/20 16:45	05/29/20 09	1:00
fethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Vet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, TN
Vet Chemistry by Method 9056A	WG1484939	1	06/01/20 21:37	06/01/20 21:37	ELN	Mt. Juliet, TN
Arcury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:10	TCT	Mt. Juliet, TN
Aetals (ICP) by Method 6010B	WG14844996	1	06/02/20 09:53	06/03/20 17:53	EL	Mt. Juliet, TN
Vetals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:55	LAT	Mt. Juliet, TN
			Collected by Kevin Bolling	Collected date/time 05/27/20 12:40	Received da 05/29/20 09	
MW-8A/GW-01 L1223308-04 GW	Batch	Dilution	Preparation	Analysis	Analyst	Location
		Dilution	date/time	date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Vet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, TN
Vet Chemistry by Method 9056A	WG1484939	1	06/01/20 21:55	06/01/20 21:55	ELN	Mt. Juliet, TN
Vet Chemistry by Method 9056A	WG1484939	5	06/02/20 11:51	06/02/20 11:51	ELN	Mt. Juliet, TN
Iercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:18	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:56	EL	Mt. Juliet, TN
Aetals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:58	LAT	Mt. Juliet, TN
MW-10/GW-01 L1223308-05 GW			Collected by Kevin Bolling	Collected date/time 05/27/20 13:30	Received da 05/29/20 09	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Vet Chemistry by Method 9040C	WG1484440	1	06/01/20 18:00	06/01/20 18:00	JIC	Mt. Juliet, TN
Vet Chemistry by Method 9056A	WG1484939	1	06/01/20 22:13	06/01/20 22:13	ELN	Mt. Juliet, TN
Vet Chemistry by Method 9056A	WG1484939	5	06/01/20 23:52	06/01/20 23:52	ELN	Mt. Juliet, TN
Vercury by Method 7470A	WG14844555 WG1484474	1	06/01/20 20:42	06/02/20 19:20	TCT	Mt. Juliet, TN
ACCOUNT:	PROJECT:		SDG:	DAT	E/TIME:	

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

MW-10/GW-01 L1223308-05 GW			Collected by Kevin Bolling	Collected date/time 05/27/20 13:30	Received da 05/29/20 09	
fethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Netals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:59	EL	Mt. Juliet, TI
letals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:17	LAT	Mt. Juliet, TI
MW-13/GW-01 L1223308-06 GW			Collected by Kevin Bolling	Collected date/time 05/28/20 09:50	Received da 05/29/20 09	
Aethod	Batch	Dilution	Preparation	Analysis	Analyst	Location
	Baterr	Dilution	date/time	date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1486263	1	06/04/20 15:58	06/04/20 16:34	TH	Mt. Juliet, T
Vet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, T
Vet Chemistry by Method 9056A	WG1484939	1	06/02/20 00:09	06/02/20 00:09	ELN	Mt. Juliet, T
Vet Chemistry by Method 9056A	WG1484939	5	06/02/20 00:27	06/02/20 00:27	ELN	Mt. Juliet, T
Nercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:22	TCT	Mt. Juliet, T
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 18:06	EL	Mt. Juliet, T
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:20	LAT	Mt. Juliet, T
			Collected by	Collected date/time	Received da	te/time
WW-14/GW-01 L1223308-07 GW			Kevin Bolling	05/27/20 11:30	05/29/20 09	9:00
<i>M</i> ethod	Batch	Dilution	Preparation	Analysis	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	date/time 06/03/20 18:13	date/time 06/03/20 20:06	MMF	Mt. Juliet, T
Vet Chemistry by Method 9040C	WG1484441	1	05/30/20 12:00	05/30/20 12:00	KPS	Mt. Juliet, 1
Vet Chemistry by Method 9056A	WG1484939	1	06/02/20 00:45	06/02/20 00:45	ELN	Mt. Juliet, T
Vet Chemistry by Method 9056A	WG1484939	5	06/02/20 01:03	06/02/20 01:03	ELN	Mt. Juliet, T
Vercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:24	TCT	Mt. Juliet, T
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 18:09	EL	Mt. Juliet, T
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:24	LAT	Mt. Juliet, T
			Collected by	Collected date/time	Received da	te/time
MW-15/GW-01 L1223308-08 GW			Kevin Bolling	05/27/20 10:18	05/29/20 09):00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, T
Vet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, T
Vet Chemistry by Method 9056A	WG1484939	1	06/02/20 01:21	06/02/20 01:21	ELN	Mt. Juliet, T
Vet Chemistry by Method 9056A	WG1484939	5	06/02/20 02:15	06/02/20 02:15	ELN	Mt. Juliet, T
Aercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:00	TCT	Mt. Juliet, T
Aetals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:40	EL	Mt. Juliet, T
letais (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:34	LAT	Mt. Juliet, T
			Collected by	Collected date/time	Received da	te/time
WW-16/GW-01 L1223308-09 GW			Kevin Bolling	05/28/20 10:55	05/29/20 09	
Aethod	Batch	Dilution	Preparation	Analysis	Analyst	Location
	W0100005		date/time	date/time	T 11	NA1 1 11 1 7
Gravimetric Analysis by Method 2540 C-2011	WG1486263	1	06/04/20 15:58	06/04/20 16:34	TH	Mt. Juliet, T
Vet Chemistry by Method 9040C	WG1484441	1	05/30/20 12:00	05/30/20 12:00	KPS	Mt. Juliet, T
Vet Chemistry by Method 9056A	WG1484939	1	06/02/20 02:32	06/02/20 02:32	ELN	Mt. Juliet, T
Vet Chemistry by Method 9056A	WG1484939	5	06/02/20 12:09	06/02/20 12:09	ELN	Mt. Juliet, T
Aercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:25	TCT	Mt. Juliet, T
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 18:12	EL	Mt. Juliet, T
Ietals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:27	LAT	Mt. Juliet, T

ACCOUNT: Kansas City Board of Public Utilities

PROJECT: KCBPU Nearman

SDG: L1223308

DATE/TIME: 06/15/20 17:36 PAGE: 4 of 30

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SAMPLE SUMMARY

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			Collected by	Collected date/time	Received da	te/time
DUP-1/GW-01 L1223308-10 GW	Kevin Bolling	olling 05/27/20 00:00 05/29/20 09:00				
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1484441	1	05/30/20 12:00	05/30/20 12:00	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/02/20 03:44	06/02/20 03:44	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 12:27	06/02/20 12:27	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:27	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 18:15	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:30	LAT	Mt. Juliet, TN

SDG: L1223308

CASE NARRATIVE

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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.

inde Cashman

Linda Cashman Project Manager

SDG: L1223308 D 06 PAGE: 6 of 30

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	545		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	7.73	<u>T8</u>	1	06/04/2020 18:26	WG1485691

Sample Narrative:

L1223308-01 WG1485691: 7.73 at 22.5C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	14.0		1.00	1	06/01/2020 20:43	WG1484939
Fluoride	0.278		0.150	1	06/01/2020 20:43	WG1484939
Sulfate	110		25.0	5	06/02/2020 10:58	WG1484939

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:06	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.143		0.00500	1	06/03/2020 20:21	WG1484995
Beryllium	ND		0.00200	1	06/03/2020 20:21	WG1484995
Boron	ND		0.200	1	06/03/2020 20:21	WG1484995
Cadmium	ND		0.00200	1	06/03/2020 20:21	WG1484995
Calcium	137		1.00	1	06/03/2020 20:21	WG1484995
Chromium	ND		0.0100	1	06/03/2020 20:21	WG1484995
Cobalt	ND		0.0100	1	06/03/2020 20:21	WG1484995
Lithium	0.0172		0.0150	1	06/03/2020 20:21	WG1484995
Molybdenum	ND		0.00500	1	06/03/2020 20:21	WG1484995

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:48	WG1485005
Arsenic	0.00420		0.00200	1	06/02/2020 12:48	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:48	WG1485005
Selenium	ND		0.00200	1	06/02/2020 12:48	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:48	WG1485005

SDG: L1223308

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	609		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	SU			date / time	
рН	7.09	<u>T8</u>	1	05/30/2020 12:00	WG1484441

Sample Narrative:

L1223308-02 WG1484441: 7.09 at 20.8C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	9.33		1.00	1	06/01/2020 21:19	WG1484939
Fluoride	0.191		0.150	1	06/01/2020 21:19	WG1484939
Sulfate	106		25.0	5	06/02/2020 11:33	WG1484939

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:08	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.151		0.00500	1	06/03/2020 17:51	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:51	WG1484996
Boron	ND		0.200	1	06/03/2020 17:51	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:51	WG1484996
Calcium	153		1.00	1	06/03/2020 17:51	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:51	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:51	WG1484996
Lithium	0.0421		0.0150	1	06/03/2020 17:51	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 17:51	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:51	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 12:51	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:51	WG1485005
Selenium	ND		0.00200	1	06/02/2020 12:51	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:51	WG1485005

SDG: L1223308

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	488		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	SU			date / time	
рН	7.41	<u>T8</u>	1	06/04/2020 18:26	WG1485691

Sample Narrative:

L1223308-03 WG1485691: 7.41 at 22.4C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	7.45		1.00	1	06/01/2020 21:37	<u>WG1484939</u>
Fluoride	ND		0.150	1	06/01/2020 21:37	<u>WG1484939</u>
Sulfate	36.3		5.00	1	06/01/2020 21:37	WG1484939

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:10	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	—
Barium	0.140		0.00500	1	06/03/2020 17:53	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:53	WG1484996
Boron	ND		0.200	1	06/03/2020 17:53	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:53	WG1484996
Calcium	125		1.00	1	06/03/2020 17:53	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:53	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:53	WG1484996
Lithium	0.0281		0.0150	1	06/03/2020 17:53	<u>WG1484996</u>
Molybdenum	ND		0.00500	1	06/03/2020 17:53	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:55	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 12:55	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:55	WG1485005
Selenium	0.00289		0.00200	1	06/02/2020 12:55	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:55	WG1485005

SDG: L1223308

SAMPLE RESULTS - 04 L1223308

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	689		13.3	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Wet Chemistry by Metho	od 9040C					3 - 55
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	su			date / time		
рН	7.64	<u>T8</u>	1	06/04/2020 18:26	WG1485691	

Sample Narrative:

L1223308-04 WG1485691: 7.64 at 22.7C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	27.2		1.00	1	06/01/2020 21:55	WG1484939
Fluoride	0.428		0.150	1	06/01/2020 21:55	WG1484939
Sulfate	285		25.0	5	06/02/2020 11:51	WG1484939

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:18	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.147		0.00500	1	06/03/2020 17:56	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:56	WG1484996
Boron	2.24		0.200	1	06/03/2020 17:56	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:56	WG1484996
Calcium	99.8		1.00	1	06/03/2020 17:56	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:56	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:56	WG1484996
Lithium	0.0195		0.0150	1	06/03/2020 17:56	WG1484996
Molybdenum	0.0111		0.00500	1	06/03/2020 17:56	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:58	WG1485005
Arsenic	0.0197		0.00200	1	06/02/2020 12:58	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:58	WG1485005
Selenium	ND		0.00200	1	06/02/2020 12:58	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:58	WG1485005

SDG: L1223308

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	761		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	6.99	<u>T8</u>	1	06/01/2020 18:00	WG1484440

Sample Narrative:

L1223308-05 WG1484440: 6.99 at 21.1C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	9.86		1.00	1	06/01/2020 22:13	WG1484939
Fluoride	0.162		0.150	1	06/01/2020 22:13	WG1484939
Sulfate	138		25.0	5	06/01/2020 23:52	WG1484939

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:20	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.129		0.00500	1	06/03/2020 17:59	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:59	WG1484996
Boron	1.17		0.200	1	06/03/2020 17:59	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:59	WG1484996
Calcium	173		1.00	1	06/03/2020 17:59	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:59	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:59	<u>WG1484996</u>
Lithium	0.0400		0.0150	1	06/03/2020 17:59	<u>WG1484996</u>
Molybdenum	ND		0.00500	1	06/03/2020 17:59	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:17	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 13:17	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:17	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:17	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:17	WG1485005

SDG: L1223308

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	637	<u>J4</u>	10.0	1	06/04/2020 16:34	<u>WG1486263</u>

Sample Narrative:

L1223308-06 WG1486263: reran OOH confirmed initial results

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch	5
Analyte	SU			date / time		ິSr
рН	7.40	<u>T8</u>	1	06/04/2020 18:26	WG1485691	

Sample Narrative:

L1223308-06 WG1485691: 7.4 at 22.4C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	°AL
Analyte	mg/l		mg/l		date / time		
Chloride	20.2		1.00	1	06/02/2020 00:09	WG1484939	⁹ SC
Fluoride	0.375		0.150	1	06/02/2020 00:09	WG1484939	50
Sulfate	146		25.0	5	06/02/2020 00:27	WG1484939	

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:22	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.285		0.00500	1	06/03/2020 18:06	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 18:06	WG1484996
Boron	ND		0.200	1	06/03/2020 18:06	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 18:06	WG1484996
Calcium	125		1.00	1	06/03/2020 18:06	WG1484996
Chromium	ND		0.0100	1	06/03/2020 18:06	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 18:06	WG1484996
Lithium	0.0336		0.0150	1	06/03/2020 18:06	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 18:06	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:20	WG1485005
Arsenic	0.0240		0.00200	1	06/02/2020 13:20	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:20	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:20	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:20	WG1485005

PROJECT: KCBPU Nearman SDG: L1223308 DATE/TIME: 06/15/20 17:36

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	915		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	SU			date / time	
рН	7.12	<u>T8</u>	1	05/30/2020 12:00	WG1484441

Sample Narrative:

L1223308-07 WG1484441: 7.12 at 21C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	22.1		1.00	1	06/02/2020 00:45	WG1484939
Fluoride	0.220		0.150	1	06/02/2020 00:45	WG1484939
Sulfate	253		25.0	5	06/02/2020 01:03	WG1484939

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:24	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.129		0.00500	1	06/03/2020 18:09	<u>WG1484996</u>
Beryllium	ND		0.00200	1	06/03/2020 18:09	WG1484996
Boron	ND		0.200	1	06/03/2020 18:09	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 18:09	WG1484996
Calcium	200		1.00	1	06/03/2020 18:09	WG1484996
Chromium	ND		0.0100	1	06/03/2020 18:09	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 18:09	WG1484996
Lithium	0.0273		0.0150	1	06/03/2020 18:09	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 18:09	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:24	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 13:24	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:24	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:24	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:24	WG1485005

SDG: L1223308 DATE/TIME: 06/15/20 17:36

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	521		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	7.80	<u>T8</u>	1	06/04/2020 18:26	WG1485691

Sample Narrative:

L1223308-08 WG1485691: 7.8 at 22.2C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	20.8		1.00	1	06/02/2020 01:21	WG1484939
Fluoride	0.208		0.150	1	06/02/2020 01:21	WG1484939
Sulfate	218		25.0	5	06/02/2020 02:15	WG1484939

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:00	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0977		0.00500	1	06/03/2020 17:40	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:40	WG1484996
Boron	ND		0.200	1	06/03/2020 17:40	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:40	WG1484996
Calcium	78.8		1.00	1	06/03/2020 17:40	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:40	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:40	WG1484996
Lithium	0.0405		0.0150	1	06/03/2020 17:40	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 17:40	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:34	WG1485005
Arsenic	0.00227		0.00200	1	06/02/2020 12:34	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:34	WG1485005
Selenium	ND		0.00200	1	06/02/2020 12:34	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:34	WG1485005

SDG: L1223308 DATE/TIME: 06/15/20 17:36

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	747	J4	13.3	1	06/04/2020 16:34	WG1486263

Sample Narrative:

L1223308-09 WG1486263: Reran OOH confirmed initial results

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch	5
Analyte	su			date / time		ँSr
рН	6.88	<u>T8</u>	1	05/30/2020 12:00	WG1484441	

Sample Narrative:

L1223308-09 WG1484441: 6.88 at 20.7C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/l		mg/l		date / time		
Chloride	11.7		1.00	1	06/02/2020 02:32	WG1484939	⁹ SC
Fluoride	ND		0.150	1	06/02/2020 02:32	WG1484939	50
Sulfate	121		25.0	5	06/02/2020 12:09	WG1484939	

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:25	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.245		0.00500	1	06/03/2020 18:12	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 18:12	WG1484996
Boron	ND		0.200	1	06/03/2020 18:12	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 18:12	WG1484996
Calcium	183		1.00	1	06/03/2020 18:12	WG1484996
Chromium	ND		0.0100	1	06/03/2020 18:12	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 18:12	WG1484996
Lithium	0.0594		0.0150	1	06/03/2020 18:12	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 18:12	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:27	WG1485005
Arsenic	0.0305		0.00200	1	06/02/2020 13:27	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:27	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:27	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:27	WG1485005

PROJECT: KCBPU Nearman SDG: L1223308 DATE/TIME: 06/15/20 17:36

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	751		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	7.06	<u>T8</u>	1	05/30/2020 12:00	WG1484441

Sample Narrative:

L1223308-10 WG1484441: 7.06 at 20.8C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	9.87		1.00	1	06/02/2020 03:44	WG1484939
Fluoride	0.162		0.150	1	06/02/2020 03:44	WG1484939
Sulfate	138		25.0	5	06/02/2020 12:27	WG1484939

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:27	WG1484474

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.128		0.00500	1	06/03/2020 18:15	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 18:15	WG1484996
Boron	1.14		0.200	1	06/03/2020 18:15	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 18:15	WG1484996
Calcium	173		1.00	1	06/03/2020 18:15	WG1484996
Chromium	ND		0.0100	1	06/03/2020 18:15	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 18:15	WG1484996
Lithium	0.0367		0.0150	1	06/03/2020 18:15	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 18:15	WG1484996

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:30	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 13:30	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:30	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:30	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:30	WG1485005

SDG: L1223308

Gravimetric Analysis by Method 2540 C-2011

QUALITY CONTROL SUMMARY <u>L1223308-01,02,03,04,05,07,08,10</u>

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Method Blank (MB)

(MB) R3535409-1 0	6/03/20 20:06			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L1222537-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1222537-01 06/03/2	20 20:06 • (DU	P) R3535409-	-3 06/03/2	20 20:06		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	307	299	1	2.64		5

Laboratory Control Sample (LCS)

(LCS) R3535409-2 06	6/03/20 20:06				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Quali
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8730	99.2	85.0-115	

SDG: L1223308 DATE/TIME: 06/15/20 17:36

PAGE: 17 of 30

Gravimetric Analysis by Method 2540 C-2011

QUALITY CONTROL SUMMARY

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Method Blank (MB)

(MB) R3535527-1 06	6/04/20 16:34			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L1223187-17 Original Sample (OS) • Duplicate (DUP)

(OS) L1223187-17 06/04/2	20 16:34 • (DUP)	R3535527-3	06/04/20	16:34		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	539	544	1	0.923		5

Laboratory Control Sample (LCS)

(LCS) R3535527-2 0	6/04/20 16:34				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	6840	77.7	85.0-115	<u>J4</u>

SDG: L1223308 DATE/TIME: 06/15/20 17:36

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Wet Chemistry by Method 9040C

QUALITY CONTROL SUMMARY

L1222554-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1222554-01 06/01/	5) L1222554-01 06/01/20 18:00 • (DUP) R3533880-2 06/01/20 18:00									
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits				
Analyte	su	SU		%		%				
рН	6.38	6.34	1	0.629		1				

Sample Narrative:

OS: 6.38 at 20.3C

DUP: 6.34 at 21.2C

L1223308-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1223308-05 06/01	DS) L1223308-05 06/01/20 18:00 • (DUP) R3533880-3 06/01/20 18:00								
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits			
Analyte	SU	su		%		%			
рН	6.99	7.00	1	0.143		1			

Sample Narrative:

OS: 6.99 at 21.1C

DUP: 7 at 21C

Laboratory Control Sample (LCS)

(LCS) R3533880-1 06/01/	.CS) R3533880-1 06/01/20 18:00								
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier				
Analyte	su	su	%	%					
рН	10.0	10.0	100	99.0-101					

Sample Narrative:

LCS: 10.02 at 20.4C

Wet Chemistry by Method 9040C

QUALITY CONTROL SUMMARY

ONE LAB. NATIONWIDE.

L1222550-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1222550-01	05/30/20 12:00	• (DUP) R3533373-2	05/30/20 12:00
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	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	P RPD its	
Analyte	SU	su		%			
pН	7.64	7.61	1	0.393			

Sample Narrative:

OS: 7.64 at 21.9C

DUP: 7.61 at 21.6C

L1223308-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1223308-10 05/30/20 12:00 • (DUP) R3533373-3 05/30/20 12:00

Sample Narrative:

OS: 7.06 at 20.8C

DUP: 7.07 at 20.6C

Laboratory Control Sample (LCS)

(LCS) R3533373-1 05/30/2	.CS) R3533373-1 05/30/20 12:00								
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier				
Analyte	su	SU	%	%					
pН	10.0	9.99	99.9	99.0-101					

Sample Narrative:

LCS: 9.99 at 21.1C

Wet Chemistry by Method 9040C

QUALITY CONTROL SUMMARY

ONE LAB. NATIONWIDE.

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L1223242-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1223242-04 06/04/20 18:26 • (DUP) R3535206-2 06/04/20 18:26

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	7.71	7.73	1	0.259		1

Sample Narrative:

OS: 7.71 at 22.6C

DUP: 7.73 at 22.5C

L1223534-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1223534-02 06/04/	S) L1223534-02 06/04/20 18:26 • (DUP) R3535206-3 06/04/20 18:26									
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits				
Analyte	su	su		%		%				
рН	<1	<1	1	0.000		1				

Sample Narrative:

OS: 0.75 at 22.6C DUP: 0.74 at 22.7C

Laboratory Control Sample (LCS)

(LCS) R3535206-1 06/04	(LCS) R3535206-1 06/04/20 18:26								
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier				
Analyte	su	su	%	%					
рН	10.0	9.99	99.9	99.0-101					

Sample Narrative:

LCS: 9.99 at 21.9C

ACCOUNT:
Kansas City Board of Public Utilities

PROJECT: KCBPU Nearman SDG: L1223308 DATE/TIME: 06/15/20 17:36 PAGE: 21 of 30

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1223308-01,02,03,04,05,06,07,08,09,10

ONE LAB. NATIONWIDE.

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Method Blank (MB)

(MB) R3534169-1	06/01/20 12:38

	20 12:00			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1223308-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1223308-01 06/01	1/20 20:43 • (DUP	P) R3534169-3	06/01/20	21:01		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	14.0	13.9	1	0.669		15
Fluoride	0.278	0.276	1	0.686		15

L1223358-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1223358-07 06/02/	20 06:07 • (DU	P) R3534169-0	6 06/02/2	20 07:01		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	ND	ND	1	0.204		15
Fluoride	0.326	0.326	1	0.184		15
Sulfate	ND	ND	1	1.66		15

L1223308-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1223308-01 06/02	2/20 10:58 • (DUI	P) R3534169-8	3 06/02/2	0 11:15		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Sulfate	110	109	5	1.14		15

Laboratory Control Sample (LCS)

01/20 12:56				
Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
mg/l	mg/l	%	%	
40.0	40.1	100	80.0-120	
8.00	8.09	101	80.0-120	
40.0	40.8	102	80.0-120	
	Spike Amount mg/l 40.0 8.00	Spike Amount LCS Result mg/l mg/l 40.0 40.1 8.00 8.09	Spike Amount LCS Result mg/l LCS Rec. 40.0 40.1 100 8.00 8.09 101	Spike Amount LCS Result LCS Rec. Rec. Limits mg/l mg/l % % 40.0 40.1 100 80.0-120 8.00 8.09 101 80.0-120

ACCOUNT: PROJECT: Kansas City Board of Public Utilities KCBPU Nearman

DATE/TIME: 06/15/20 17:36

PAGE: 22 of 30 Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1223308-01,02,03,04,05,06,07,08,09,10

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L1223308-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223308-08 06/02/	/20 01:21 • (MS)	R3534169-4 C	6/02/20 01:39	9 • (MSD) R353	4169-5 06/02/	/20 01:57						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Chloride	50.0	20.8	67.7	68.2	93.9	94.8	1	80.0-120			0.660	15
Fluoride	5.00	0.208	4.97	5.00	95.3	95.9	1	80.0-120			0.596	15
Sulfate	50.0	207	242	242	69.9	70.7	1	80.0-120	EV	EV	0.165	15

L1223358-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1223358-07 06/02	2/20 06:07 • (MS	5) R3534169-7	06/02/20 07	:19			
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/l	mg/l	mg/l	%		%	
Chloride	50.0	ND	50.6	100	1	80.0-120	
Fluoride	5.00	0.326	5.32	99.8	1	80.0-120	
Sulfate	50.0	ND	51.0	100	1	80.0-120	

DATE/TIME: 06/15/20 17:36

Mercury by Method 7470A

QUALITY CONTROL SUMMARY L1223308-01,02,03,04,05,06,07,08,09,10

Qc

Method Blank (MB)

(MB) R3534343-1 0	6/02/20 18:56						
	MB Result	MB Qualifier	MB MDL	MB RDL			
Analyte	mg/l		mg/l	mg/l			
Mercury	U		0.000100	0.000200			

Laboratory Control Sample (LCS)

(LCS) R3534343-2 06/02	2/20 18:58				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Mercury	0.00300	0.00324	108	80.0-120	

L1223308-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223308-08 06/02	/20 19:00 • (MS) R3534343-3	06/02/20 19:0	2 • (MSD) R353	84343-4 06/02	2/20 19:04						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.00300	ND	0.00313	0.00310	104	103	1	75.0-125			1.26	20

SDG: L1223308 DATE/TIME: 06/15/20 17:36 **PAGE:** 24 of 30

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R3534781-1	06/03/20 19:06

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Barium	U		0.000895	0.00500
Beryllium	U		0.000460	0.00200
Boron	U		0.0254	0.200
Cadmium	U		0.000563	0.00200
Calcium	U		0.389	1.00
Chromium	U		0.00500	0.0100
Cobalt	U		0.000807	0.0100
Lithium	U		0.00574	0.0150
Molybdenum	0.00193	J	0.00104	0.00500

Laboratory Control Sample (LCS)

(LCS) R3534781-2 06/0	(LCS) R3534781-2 06/03/20 19:08							
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier			
Analyte	mg/l	mg/l	%	%				
Barium	1.00	0.988	98.8	80.0-120				
Beryllium	1.00	0.994	99.4	80.0-120				
Boron	1.00	1.00	100	80.0-120				
Cadmium	1.00	0.964	96.4	80.0-120				
Calcium	10.0	9.98	99.8	80.0-120				
Chromium	1.00	0.969	96.9	80.0-120				
Cobalt	1.00	0.992	99.2	80.0-120				
Lithium	1.00	0.964	96.4	80.0-120				
Molybdenum	1.00	0.990	99.0	80.0-120				

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

,	Spike Amount Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits	
Analyte	mg/l	mg/l	mg/l	%	%	2	%			%	%	
Barium	1.00	1.07	1.07	96.6	96.9	1	75.0-125			0.267	20	
Beryllium	1.00	0.990	0.993	99.0	99.3	1	75.0-125			0.301	20	
Boron	1.00	1.01	1.01	98.0	98.3	1	75.0-125			0.297	20	
Cadmium	1.00	0.962	0.962	96.2	96.2	1	75.0-125			0.0267	20	
Calcium	10.0	82.1	82.5	82.3	86.7	1	75.0-125			0.529	20	
Chromium	1.00	0.972	0.962	97.2	96.2	1	75.0-125			1.02	20	
Cobalt	1.00	0.989	0.995	98.9	99.5	1	75.0-125			0.547	20	
Lithium	1.00	0.954	0.956	94.4	94.7	1	75.0-125			0.263	20	
Molybdenum	1.00	0.990	0.995	98.7	99.2	1	75.0-125			0.498	20	
	ACCOUNT:		PRC	JECT:			SDG:		DATE	TIME:		PAGE:

Kansas City Board of Public Utilities

KCBPU Nearman

L1223308

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY L1223308-02,03,04,05,06,07,08,09,10

Method Blank (MB)

(MB) R3534780-1	06/03/20 17:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Barium	U		0.000895	0.00500
Beryllium	U		0.000460	0.00200
Boron	U		0.0254	0.200
Cadmium	U		0.000563	0.00200
Calcium	U		0.389	1.00
Chromium	U		0.00500	0.0100
Cobalt	U		0.000807	0.0100
Lithium	U		0.00574	0.0150
Molybdenum	U		0.00104	0.00500

Laboratory Control Sample (LCS)

(LCS) R3534780-2 06/03/20 17:38								
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier			
Analyte	mg/l	mg/l	%	%				
Barium	1.00	0.983	98.3	80.0-120				
Beryllium	1.00	0.989	98.9	80.0-120				
Boron	1.00	0.999	99.9	80.0-120				
Cadmium	1.00	0.963	96.3	80.0-120				
Calcium	10.0	9.93	99.3	80.0-120				
Chromium	1.00	0.964	96.4	80.0-120				
Cobalt	1.00	0.987	98.7	80.0-120				
Lithium	1.00	0.958	95.8	80.0-120				
Molybdenum	1.00	0.993	99.3	80.0-120				

L1223308-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

mg/l 0.0977 ND ND ND	mg/l 1.08 0.990 1.04 0.980	mg/l 1.07 0.982 1.03	% 97.8 99.0 99.7	% 96.9 98.2	1	% 75.0-125 75.0-125			% 0.793	% 20	
ND ND	0.990 1.04	0.982	99.0	98.2	1 1						
ND	1.04				1	75.0-125			0 700		
		1.03	99.7	00 5					0.782	20	
ND	0.000			98.5	1	75.0-125			1.17	20	
	0.960	0.970	98.0	97.0	1	75.0-125			1.00	20	
78.8	86.4	86.6	76.7	78.8	1	75.0-125			0.248	20	
ND	0.980	0.962	98.0	96.2	1	75.0-125			1.83	20	
ND	1.00	0.996	100	99.6	1	75.0-125			0.892	20	
0.0405	0.981	0.976	94.0	93.5	1	75.0-125			0.505	20	
ND	1.01	0.997	101	99.4	1	75.0-125			1.09	20	
	0.0405	0.0405 0.981	0.0405 0.981 0.976 ND 1.01 0.997	0.0405 0.981 0.976 94.0	0.0405 0.981 0.976 94.0 93.5 ND 1.01 0.997 101 99.4	0.0405 0.981 0.976 94.0 93.5 1 ND 1.01 0.997 101 99.4 1	0.0405 0.981 0.976 94.0 93.5 1 75.0-125 ND 1.01 0.997 101 99.4 1 75.0-125	0.0405 0.981 0.976 94.0 93.5 1 75.0-125 ND 1.01 0.997 101 99.4 1 75.0-125	0.0405 0.981 0.976 94.0 93.5 1 75.0-125 ND 1.01 0.997 101 99.4 1 75.0-125	0.0405 0.981 0.976 94.0 93.5 1 75.0-125 0.505 ND 1.01 0.997 101 99.4 1 75.0-125 1.09	0.0405 0.981 0.976 94.0 93.5 1 75.0-125 0.505 20 ND 1.01 0.997 101 99.4 1 75.0-125 1.09 20

Kansas City Board of Public Utilities

KCBPU Nearman

L1223308

06/15/20 17:36

PAGE: 26 of 30

Metals (ICPMS) by Method 6020

QUALITY CONTROL SUMMARY L1223308-01,02,03,04,05,06,07,08,09,10

Method Blank (MB)

(MB) R3534175-1 06/02/20 12:28

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Antimony	U		0.00132	0.00400
Arsenic	U		0.000735	0.00200
Lead	U		0.00249	0.00500
Selenium	U		0.000657	0.00200
Thallium	U		0.000460	0.00200

Laboratory Control Sample (LCS)

(LCS) R3534175-2	_CS) R3534175-2 06/02/20 12:31								
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier				
Analyte	mg/l	mg/l	%	%					
Antimony	0.0500	0.0492	98.5	80.0-120					
Arsenic	0.0500	0.0511	102	80.0-120					
Lead	0.0500	0.0500	100	80.0-120					
Selenium	0.0500	0.0457	91.4	80.0-120					
Thallium	0.0500	0.0491	98.3	80.0-120					

L1223308-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223308-08 06/02/20 12:34 • (MS) R3534175-4 06/02/20 12:41 • (MSD) R3534175-5 06/02/20 12:45												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony	0.0500	ND	0.0501	0.0494	100	98.9	1	75.0-125			1.37	20
Arsenic	0.0500	0.00227	0.0514	0.0514	98.3	98.2	1	75.0-125			0.124	20
Lead	0.0500	ND	0.0496	0.0495	99.2	99.1	1	75.0-125			0.118	20
Selenium	0.0500	ND	0.0470	0.0473	94.0	94.5	1	75.0-125			0.553	20
Thallium	0.0500	ND	0.0487	0.0486	97.4	97.3	1	75.0-125			0.107	20

DATE/TIME: 06/15/20 17:36

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

Analytereported.DilutionIf the sample matrix contains an standard, or if concentrations of laboratory can accurately repor result reported has already beeLimitsThese are the target % recovery for the method and analyte beir duplicated within these ranges.Original SampleThe non-spiked sample in the p sample. The Original Sample mQualifierThis column provides a letter ar reported. If a Qualifier is presen potentially a discussion of possResult(Below Detectable Levels). The (Method Detection Limit) or RDL or report for this analyte.Uncertainty (Radiochemistry)Confidence level of 2 sigma.Quality Control Summary (Qc)This section of the report include analytical methods to assist in e being performed on your sampleSample Chain of Custody (Sc)This section of your report will p	
Rec.Recovery.RPDRelative Percent Difference.SDGSample Delivery Group.UNot detected at the Reporting LAnalyteThe name of the particular com reported.DilutionIf the sample matrix contains an standard, or if concentrations of laboratory can accurately repor result reported has already beeLimitsThese are the target % recover for the method and analyte bein duplicated within these ranges.Original SampleThe non-spiked sample in the p sample. The Original Sample mQualifierThis column provides a letter ar reported. If a Qualifier is presen potentially a discussion of possResult(Below Detectable Levels). The (Method Detection Limit) or RDL or report for this analyte.Uncertainty (Radiochemistry)Confidence level of 2 sigma.Quality Control Summary (Qc)This section of the report includ analytical methods to assist in e being performed on your sampleSample Chain of Custody (Sc)This section of your report will performed on your report or report for the time of collect	.imit (or MDL where applicable).
RPDRelative Percent Difference.SDGSample Delivery Group.UNot detected at the Reporting LAnalyteThe name of the particular com reported.DilutionIf the sample matrix contains an standard, or if concentrations of laboratory can accurately repor result reported has already beeLimitsThese are the target % recoven for the method and analyte beir duplicated within these ranges.Original SampleThe non-spiked sample in the p sample. The Original SampleQualifierThis column provides a letter ar reported. If a Qualifier is presen potentially a discussion of possResult(Below Detectable Levels). The (Method Detection Limit) or RDL or report for this analyte.Uncertainty (Radiochemistry)Confidence level of 2 sigma.Quality Control Summary (Qc)This section of the report include analytical methods to assist in e being performed on your sampleSample Chain of Custody (Sc)This section of your report will performed on your report samples from the time of collect	
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Dilutionstandard, or if concentrations of laboratory can accurately repor result reported has already beeLimitsThese are the target % recover for the method and analyte beir duplicated within these ranges.Original SampleThe non-spiked sample in the p sample. The Original Sample mQualifierThis column provides a letter ar reported. If a Qualifier is presen potentially a discussion of possResult(Below Detectable Levels). The (Method Detection Limit) or RDL or report for this analyte.Uncertainty (Radiochemistry)Confidence level of 2 sigma.Quality Control Summary (Qc)This section of the report include analytical methods to assist in e being performed on your sampleSample Chain of Custody (Sc)This is the document created in date of collection, the person collection chain of custody also document samples from the time of collection	pound or analysis performed. Some Analyses and Methods will have multiple analytes
Limitsfor the method and analyte beinduplicated within these ranges.Original SampleThe non-spiked sample in the presample. The Original Sample method and analyte beinduplicated within these ranges.QualifierThe non-spiked sample in the presence of the original Sample method. If a Qualifier is presented of a Qualifier is presented of the actual analytical final result no measurable result returned for (Below Detectable Levels). The (Method Detection Limit) or RDL or report for this analyte.Uncertainty (Radiochemistry)Confidence level of 2 sigma.Case Narrative (Cn)A brief discussion about the inclust observed either at sample recere be a section in the Case Narration of the report incluid analytical methods to assist in e being performed on your sampleQuality Control Sample Chain of Custody (Sc)This is the document created in date of collection, the person conclusion of used yalso document samples from the time of collection.	interfering material, the sample preparation volume or weight values differ from the fanalytes in the sample are higher than the highest limit of concentration that the t, the sample may be diluted for analysis. If a value different than 1 is used in this field, the encorrected for this factor.
Original Samplesample. The Original Sample inQualifierThis column provides a letter ar reported. If a Qualifier is presen potentially a discussion of possResultThe actual analytical final result no measurable result returned f (Below Detectable Levels). The (Method Detection Limit) or RDL or report for this analyte.Uncertainty (Radiochemistry)Confidence level of 2 sigma.Quality Control Summary (Qc)A brief discussion about the inc observed either at sample rece be a section in the Case Narrati being performed on your sampleSample Chain of Custody (Sc)This is the document created in date of collection, the person co chain of custody also document samples from the time of collection	y ranges or % difference value that the laboratory has historically determined as normal ng reported. Successful QC Sample analysis will target all analytes recovered or
Qualifierreported. If a Qualifier is present potentially a discussion of possResultThe actual analytical final result no measurable result returned f (Below Detectable Levels). The 	orep batch used to determine the Relative Percent Difference (RPD) from a quality control ay not be included within the reported SDG.
Resultno measurable result returned f (Below Detectable Levels). The (Method Detection Limit) or RDL or report for this analyte.Uncertainty (Radiochemistry)Confidence level of 2 sigma.Case Narrative (Cn)A brief discussion about the inc observed either at sample rece be a section in the Case NarratiQuality Control Summary (Qc)This section of the report includ analytical methods to assist in e being performed on your sampleSample Chain of Custody (Sc)This section of your report will perform the time of collect	nd/or number designation that corresponds to additional information concerning the result it, a definition per Qualifier is provided within the Glossary and Definitions page and ible implications of the Qualifier in the Case Narrative if applicable.
(Radiochemistry) Confidence level of 2 signal. Case Narrative (Cn) A brief discussion about the inclust observed either at sample receive a section in the Case Narration. Quality Control Summary (Qc) This section of the report include analytical methods to assist in either and some performed on your sample. Sample Chain of Custody (Sc) This is the document created in date of collection, the person conclusion of used y also document samples from the time of collection.	(corrected for any sample specific characteristics) reported for your sample. If there was for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" information in the results column should always be accompanied by either an MDL . (Reporting Detection Limit) that defines the lowest value that the laboratory could detect
Case Narrative (Cn)observed either at sample rece be a section in the Case NarratiQuality Control Summary (Qc)This section of the report includ analytical methods to assist in e being performed on your sampleSample Chain of Custody (Sc)This is the document created in date of collection, the person co chain of custody also document samples from the time of collect This section of your report will p	
Guality Control analytical methods to assist in e being performed on your sample in performed on your sample. Sample Chain of Custody (Sc) This is the document created in date of collection, the person conclusion of custody also document samples from the time of collection. This section of your report will performed on your report will performed on your samples.	luded sample results, including a discussion of any non-conformances to protocol ipt by the laboratory from the field or during the analytical process. If present, there will ive to discuss the meaning of any data qualifiers used in the report.
Sample Chain of Custody (Sc) date of collection, the person co chain of custody also document samples from the time of collect This section of your report will p	les the results of the laboratory quality control analyses required by procedure or evaluating the validity of the results reported for your samples. These analyses are not les typically, but on laboratory generated material.
	the field when your samples were initially collected. This is used to verify the time and ollecting the samples, and the analyses that the laboratory is requested to perform. This ts all persons (excluding commercial shippers) that have had control or possession of the tion until delivery to the laboratory for analysis.
	provide the results of all testing performed on your samples. These results are provided d by the analyses performed on each sample. The header line of each analysis section for ame and method number for the analysis reported.
Sample Summary (Ss) This section of the Analytical Retimes of preparation and/or ana	eport defines the specific analyses performed for each sample ID, including the dates and lysis.

Qualifier	Description
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.
J4	The associated batch QC was outside the established quality control range for accuracy.
Т8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

PROJECT: KCBPU Nearman SDG: L1223308 DATE/TIME: 06/15/20 17:36

PAGE: 28 of 30

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

State Accreditations

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia ¹	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
lowa	364
Kansas	E-10277
Kentucky ¹⁶	90010
Kentucky ²	16
Louisiana	AI30792
Louisiana ¹	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086

Nebraska	NE-OS-15-05					
Nevada	TN-03-2002-34					
New Hampshire	2975					
New Jersey–NELAP	TN002					
New Mexico ¹	n/a					
New York	11742					
North Carolina	Env375					
North Carolina ¹	DW21704					
North Carolina ³	41					
North Dakota	R-140					
Ohio-VAP	CL0069					
Oklahoma	9915					
Oregon	TN200002					
Pennsylvania	68-02979					
Rhode Island	LAO00356					
South Carolina	84004					
South Dakota	n/a					
Tennessee ¹⁴	2006					
Texas	T104704245-18-15					
Texas ⁵	LAB0152					
Utah	TN00003					
Vermont	VT2006					
Virginia	460132					
Washington	C847					
West Virginia	233					
Wisconsin	9980939910					
Wyoming	Δ2Ι Δ					

Third Party Federal Accreditations

101.1 100.17005	4404.04		10.0700
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

Our Locations

Kansas City Board of Public Utilities

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



KCBPU Nearman

L1223308



06/15/20 17:36

Kansas City Board of Pul 300 N 65th Street	olic Utilit	ties	Billing Information: 300 N 65th St			Pres Chk					Containe	er / Preservat				Chain of Cu	2	Page of nalytical *
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			Email To: isetzler@b	l To: ler@bpu.com;kbrown@bpu.com;bhoye@												12065 Leban Mount Juliet Phone: 615-	, TN 3712	
Project Description: GW-Creek Bottom Ash Pond	City/State Collected:			Please Circla: PT MT CT ET			res	4								Phone: 800- Fax: 615-758	1-5859	
Phone: 913-573-9806	Client Project		Lab Project # KCKAN02-MW NEARMAI			AN2	-NoP	m VV	res							SDG #	U1 C18	4
Collected by (print): Kewin Balling	Site/Facility II	D#	P.O. #			T	5mlHDPE-NoPres	E-HNO	E-NoPres							Acctnum:		
Collected by (signature):	Same D	Lab MUST Be ay Five ay 5 Da	Day y (Rad Only)	ay			12	250mlHDPE-HNO3	250mlHDPE-							Template Prelogin: PM: 650 -	P768	452
Immediately Packed on Ice N Y	Two Da	y 10 D Day	ay (Rad Only)	Standos	ATAF	No. of	Sulfate		pH 2				E.		1	PB:	C	415
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	CI, FI,	Metals	TDS,							Remar		IEX Ground
MW-2A/GWOI		GW		5-27-20	1440	3	X	x	X				1					د م
MW-3/60001		GW		5-27-20	1540	3	X	x	X	7.00								- 02
MW-4/GWOI		GW		5-27-20	1645	3	X	X	X	21447			-		Sec. 19		12	- 03
MW-8A 1 6 WO1		GW		5-27-20	1240	3	X	X	X	Sec. 1		120-20			1. Second			- 0
MW-10 / 6-001		GW		5-27-20	1330	3	X	X	X	S. Arres			C.S.	R	and the second			- (
MW-13 / GWO/		GW		5-28-20	6950	3	X	X	X				1					
MW-14 / 6401		GW		5-27-20	1130	3	X	X	X		1572							r (
MW-15 / GWOI MS/MSD		GW		5-27-20	1018	98	X	X	X									5
MW-16/ GWO/		GW		5-28-20	1055	3	X	X	X	616				2		1	1	-0
DUP-1 / 6W0/		GW		5-27-20	-	3	X	x	X						a Maria	1		<
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay							ČŔ.		рН		Temp		COC S:	eal Pr igned/.	le Receip esent/Int Accurate:	act: .	NP Y	
WW - WasteWater DW - Drinking Water Sam	nples returned			Trackir	ng #					Flow_	1 M 1	Other		Correc	ct bot	ive intac tles used volume se If Appli	nt:	
Relinguished by : (Signature)	1	 ite: S = Z8-	Time	58 Receiv	ed by: (Signat	ure)				Trip Blank	Receive	d: Yes / No HCL / M TBR		Presen	rvatio	adspace: n Correct <0.5 mR/h		$xed: \underbrace{\overset{Y}{\overset{Y}{\overset{N}}}_{Y} \underbrace{\overset{N}{\overset{N}{\overset{N}}}_{Y} \underbrace{\overset{N}}{\overset{N}{\overset{N}{\overset{N}}{\overset{N}{\overset{N}{\overset{N}{\overset{N}{\overset{N}{\overset{N}{\overset{N}}{\overset{N}{\overset{N}{\overset{N}}}}}}}}}$
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Relinquished by : (Signature)	Da	te:	Time:		ed for lab by:	(Signate	ure)	7.		Date: 5/29	170	Time: 9:0	0	Hold:				Condition: NCF / OK

Memorandum



Date:	July 8, 2020
То:	Brian Hoye
From:	Kortney Blaufuss
Re:	Quality Assurance/Quality Control (QA/QC) Review of Analytical Data Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas Nearman Creek Power Station Bottom Ash Pond – May 2020 Project No. 88777

Groundwater samples were collected for analysis of assessment monitoring parameters at the Nearman Creek Power Station Bottom Ash Pond at the Kansas City Board of Public Utilities (BPU) site in Kansas City, Kansas. These samples were collected May 27 through 28, 2020. All noted samples were submitted to Pace Analytical National Center for Testing & Innovation of Mount Juliet, Tennessee (Pace National) (formerly known as ESC Lab Sciences) for analysis by one or more of the following methods:

Parameters	Analytical Method
Metals	SW-846 6010B/6020
Mercury	SW-846 7470A
Chloride, Fluoride, Sulfate	SW-846 9056A
Dissolved Solids	SM 2540 C-2011
pН	SW-846 9040C
Radium 226 and 228 ² (Combined)	SM 7500 Ra B M (radium-226)
	EPA 904.0 (radium-228)

Notes:

¹Metals performed by SW-846 6010B include barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lithium, and molybdenum. Metals performed by SW-846 6020 include antimony, arsenic, lead, selenium, and thallium. ²Project reporting requirements per the Sampling and Analysis Plan are for a combined radium-226/radium-228 concentration. These were measured separately, and the combined result was calculated and reported by the laboratory.

A Stage I data review was performed for Quality Assurance (QA)/Quality Control (QC) results in association with the samples collected to evaluate the results for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in the guidelines presented in *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI) (USEPA, 2017). Any data qualifiers added during the course of this review are presented on Table 1.

- 1. <u>Chain-of-Custody (COC)</u> The relinquished and received signatures, times, and dates on the COCs were present.
- 2. <u>Requested Analyses Completed</u> All analyses were completed as requested for the appropriate parameters for the May groundwater sampling event.
 - It should be noted that selenium was analyzed under the SW-846 6020 method for the May 2020 sampling event, and analyzed under SW-846 6010B for previous sampling events. As such, for statistical purposes the reporting limits for selenium were averaged. There are no statistically significant data points for selenium, and impact to the data negligible.

Memorandum (continued)



July 8, 2020 Page 2

3. <u>Holding Times</u> – The lab flagged all pH results for this sampling event with an "T8" to indicate the sample was received too close to the holding time expiration/past holding time for analysis. All reported pH results for these samples should be considered estimated (J). Note, the pH was also measured in the field and would provide a more accurate measurement as they are recorded on-site at the time of sample collection.

With the above exception, all other samples were extracted and/or analyzed within their respective holding time.

- 4. <u>Sample Preservation</u> All samples were received by the laboratory below the recommended 2 to 6 degrees Celsius (°C) sample preservation temperature range. Because no samples were received frozen, all were considered viable.
- 5. <u>Laboratory Method Blanks</u> Method blanks were reviewed to determine the potential for sample cross contamination due to handling within the laboratory. With the following exceptions, no detections of target analytes were noted in the method blanks:
 - Molybdenum (0.00193 J mg/L) was detected in the method blank in batch WG1484995. The associated sample was nondetect for molybdenum. As such, cross-contamination was not a concern, and no data qualifiers were added.
 - Radium-226 (-0.00564 pCi/L) and radium-228 (0.862 pCi/L) were detected in the method blanks in batches WG1496885 and WG1492751, respectively. Because the radium-226 detection exhibited a negative result, it was considered non detect. Historical data shows radium (226 and/or 228) has been detected above the reporting limit in more than one sampling event, and there is also a level of uncertainty in radium results that is not typically addressed or relevant information provided for this scope of work. Rather than qualifying all samples nondetect (U) based on these method blank concentrations, as these data will be used for statistical analyses, the samples were qualified as follows:
 - All of the samples had detections with an associated uncertainty at or near the radium-228 method blank concentration. Because this fraction was used to report the combined radium concentration, all combined radium results were qualified as estimated (J) based on professional judgment. Combined radium has historically been detected in these wells, and this sampling event is consistent with these results, as qualified.
- 6. <u>Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)</u> The LCS contains a matrix similar to that of the sample that has been spiked with known concentrations of target analytes. The LCS is prepared and analyzed by the same method as the samples. As a measure of analytical accuracy, the results of the LCS are compared against the known analyte concentrations in the spike to determine the percent recovery (REC). The purpose of the LCS is to determine the performance of the laboratory with respect to analyte recovery, independent of field sample matrix interference. For some methods, the lab performed a LCSD. The results between the LCS and

Memorandum (continued)



July 8, 2020 Page 3

LCSD were compared with each other for reproducibility using the relative percent difference (RPD). With the following exceptions, all LCS/LCSD RECs and/or RPDs were within their respective QC limits:

- QC batch WG1486263: the LCS REC for dissolved solids recovered below its QC limit. The associated samples had detections of dissolved solids and were qualified as estimated low bias (J-).
- 7. <u>Matrix Spike/Matrix Spike Duplicates (MS/MSD)</u> MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the RPD. They are also compared against the unspiked portion of the sample for REC of the spike. Qualification is typically limited to the spiked sample for any MS/MSD issues, unless otherwise noted. Site-specific MS/MSDs were collected during each sampling event. The following summarizes these site-specific MS/MSD analyses:
 - MW-15/GW-01: The spike amount for sulfate was less than one-fourth the concentration in the noted parent sample. As such, no conclusion could be made regarding the accuracy of this spike. No data qualifiers were added based on this MS/MSD.

All other MS/MSD results for this noted sample were within control limits.

- 8. <u>Laboratory Duplicate Results</u> In instances where a MS/MSD was not applicable, laboratory duplicate analyses were performed. Laboratory duplicates provide information on the ability to reproduce lab results and to account for error introduced from handling, shipping, storage, preparation, and lab analysis. All project-specific laboratory duplicate results were within control limits.
- 9. <u>Field Duplicate Results</u> Field duplicate results provide information on the ability to reproduce field results and account for error introduced from handling, shipping, storage, preparation, and analysis of field samples. There are no specific USEPA criteria for qualifying data from field duplicate results. Depending upon the sample concentration, one of the following criteria based upon NFGI is applicable:
 - Is the compound detected in both portions?
 - If the sample concentrations are greater than 5 times the detection limit, then the maximum allowable RPD is 20 percent for water samples.
 - If the sample concentrations are less than 5 times the detection limit, then a sensitivity test is applied. For the sensitivity test, the sample concentrations must agree within ± the lower detection limit for water samples.



July 8, 2020 Page 4

• If the radium results are reported above their minimum detectable concentration (MDC), the normalized difference (also called the relative error ratio) between the duplicate pair was calculated. The maximum normalized difference is 1.96 for the radium samples.

One field duplicate pair was collected for the May 2020 sampling event. Table 2 presents the sideby-side comparison of the field duplicate results. Qualifiers are not typically added based on the field duplicate review unless otherwise noted. The higher of the two concentrations are considered more viable for use in reporting.

- MW-10/GW-01 // DUP-1/GW-01: The combined radium results slightly exceeded the normalized difference. These results were previously qualified for method blank detections. All other field duplicate results were adequately replicated, and no qualifiers were added based on field duplicate review.
- 10. <u>Detection and Quantitation Limits</u> In one or more samples the sulfate analysis required a dilution to account for high concentrations and/or matrix interferences. Qualifiers were not necessary based on these dilutions.
- 11. <u>Conclusion</u> The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid, as qualified, for use in reporting the results of this investigation.

Attachments

Table 1: Data Qualifiers Table 2: Field Duplicate Results

Table 1Data QualifiersKansas City Board of Public Utilities (BPU) - Kansas City, KansasNearman Creek Power Station Bottom Ash Pond – May 2020

Sample Identification	Laboratory Number	Parameter(s)	Data Qualifier	Reason for Qualification
All Samples in	SDG L1223308	рН	J	Holding time exceeded (see text)
MW-13/GW-01	L1223308-06	Dissolved solids	I	LCS REC < QC Limit
MW-16/GW-01	L1223308-09	Dissolved solids	J-	
All Samples in	SDG L1223378	Combined Radium	J	Method Blank Detection (see text)

Notes:

- J(-) Estimated Value (low bias)
- LCS Laboratory Control Sample
- QC Quality Control
- REC Percent recovery
- SDG Sample Delivery Group

Table 2

Field Duplicate Results Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas Nearman Creek Power Station Bottom Ash Pond – May 2020

	Sample Identification: Date Sampled: SDG(s):	MW-10/GW-01 5/27/2020 L1223308-05 L1223378-05 (radium)	DUP-1/GW-01 5/27/2020 L1223308-10 L1223378-10 (radium)	Meets QC Criteria
Parameter	Unit	Result	Result	
Dissolved Solids	mg/l	761	751	Yes
Chloride	mg/l	9.86	9.87	Yes
Fluoride	mg/l	0.162	0.162	Yes
Sulfate	mg/l	138	138	Yes
рН	su	6.99	7.06	Yes
Barium	mg/l	0.129	0.128	Yes
Boron	mg/l	1.17	1.14	Yes
Calcium	mg/l	173	173	Yes
Lithium	mg/l	0.04	0.0367	Yes
Combined Radium (including +/- uncertainty	pCi/l	0.213 (+/- 0.865)	0.808 (+/- 0.920)	Yes

Notes:

mg/l - milligrams per liter

pCi/I - picoCuries per liter

QC - Quality Control

SDG - Sample Delivery Group

su - standard unit



ANALYTICAL REPORT

Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description: L1223378 05/29/2020 62801 BPU Nearman groundwater

Report To:

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

Entire Report Reviewed By:

Linde Cashmen

Linda Cashman 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.

ACCOUNT: Kansas City Board of Public Utilities PROJECT: 62801 BPU Nearman SDG: L1223378 DATE/TIME: 06/29/20 19:01

PAGE: 1 of 20

TABLE OF CONTENTS

*

Sc

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	5
Sr: Sample Results	6
MW-2A/GW01 L1223378-01	6
MW-3/GW01 L1223378-02	7
MW-4/GW01 L1223378-03	8
MW-8A/GW01 L1223378-04	9
MW-10/GW01 L1223378-05	10
MW-13/GW01 L1223378-06	11
MW-14/GW01 L1223378-07	12
MW-15/GW01 L1223378-08	13
MW-16/GW01 L1223378-09	14
DUP-1/GW01 L1223378-10	15
Qc: Quality Control Summary	16
Radiochemistry by Method 904	16
Radiochemistry by Method SM7500Ra B M	17
GI: Glossary of Terms	18
Al: Accreditations & Locations	19
Sc: Sample Chain of Custody	20

SDG: L1223378 DATE/TIME: 06/29/20 19:01 PAGE: 2 of 20

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GC QC

			Collected by	Collected date/time	Received da	te/time
MW-2A/GW01 L1223378-01 Non-Potable Water			Kevin Bolling	05/27/20 14:40	05/29/20 09	:00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, T
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 11:38	SNR	Mt. Juliet, T
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 11:38	RGT	Mt. Juliet, T
			Collected by	Collected date/time	Received da	te/time
MW-3/GW01 L1223378-02 Non-Potable Water			Kevin Bolling	05/27/20 15:40	05/29/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, T
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 11:38	SNR	Mt. Juliet, T
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 11:38	RGT	Mt. Juliet, T
MW-4/GW01 L1223378-03 Non-Potable Water			Collected by Kevin Bolling	Collected date/time 05/27/20 16:45	Received da 05/29/20 09	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time	-	
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, T
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 11:38	SNR	Mt. Juliet, T
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 11:38	RGT	Mt. Juliet, T
MW-8A/GW01 L1223378-04 Non-Potable Water			Collected by Kevin Bolling	Collected date/time 05/27/20 12:40	Received da 05/29/20 09	
<i>f</i> lethod	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, T
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, T
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, T
			Collected by	Collected date/time	Received da	te/time
MW-10/GW01 L1223378-05 Non-Potable Water			Kevin Bolling	05/27/20 13:30	05/29/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, T
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, T
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, T
MW-13/GW01 L1223378-06 Non-Potable Water			Collected by Kevin Bolling	Collected date/time 05/28/20 09:50	Received da 05/29/20 09	
	Datab	Dilution	5			
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, T
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, T
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, T

PROJECT: 62801 BPU Nearman

SDG: L1223378

DATE/TIME: 06/29/20 19:01

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			Collected by	Collected date/time	Received dat	
MW-14/GW01 L1223378-07 Non-Potable Water			Kevin Bolling	05/27/20 11:30	05/29/20 09	:00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	te/time
MW-15/GW01 L1223378-08 Non-Potable Water			Kevin Bolling	05/27/20 10:18	05/29/20 09	:00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	te/time
MW-16/GW01 L1223378-09 Non-Potable Water			Kevin Bolling	05/28/20 10:55	05/29/20 09	:00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
	WG1492751 WG1496885	1 1	06/16/20 10:29 06/22/20 14:42	06/24/20 09:45 06/24/20 12:22	SNR SNR	
Radiochemistry by Method Calculation						Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN Mt. Juliet, TN
Radiochemistry by Method Calculation Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42 06/22/20 14:42	06/24/20 12:22 06/24/20 12:22	SNR RGT	Mt. Juliet, TN Mt. Juliet, TN te/time
Radiochemistry by Method Calculation Radiochemistry by Method SM7500Ra B M DUP-1/GW01 L1223378-10 Non-Potable Water	WG1496885	1	06/22/20 14:42 06/22/20 14:42 Collected by Kevin Bolling Preparation	06/24/20 12:22 06/24/20 12:22 Collected date/time 05/27/20 00:00 Analysis	SNR RGT Received dat	Mt. Juliet, TN Mt. Juliet, TN te/time
Radiochemistry by Method Calculation Radiochemistry by Method SM7500Ra B M DUP-1/GW01 L1223378-10 Non-Potable Water Method	WG1496885 WG1496885 Batch	1 1 Dilution	06/22/20 14:42 06/22/20 14:42 Collected by Kevin Bolling Preparation date/time	06/24/20 12:22 06/24/20 12:22 Collected date/time 05/27/20 00:00 Analysis date/time	SNR RGT Received dat 05/29/20 09 Analyst	Mt. Juliet, TN Mt. Juliet, TN te/time :00 Location
Radiochemistry by Method Calculation Radiochemistry by Method SM7500Ra B M DUP-1/GWO1 L1223378-10 Non-Potable Water Method Radiochemistry by Method 904	WG1496885 WG1496885 Batch WG1492751	1 1 Dilution	06/22/20 14:42 06/22/20 14:42 Collected by Kevin Bolling Preparation date/time 06/16/20 10:29	06/24/20 12:22 06/24/20 12:22 Collected date/time 05/27/20 00:00 Analysis date/time 06/24/20 09:45	SNR RGT Received dat 05/29/20 09 Analyst SNR	Mt. Juliet, TN Mt. Juliet, TN te/time :00 Location Mt. Juliet, TN
Radiochemistry by Method 904 Radiochemistry by Method Calculation Radiochemistry by Method SM7500Ra B M DUP-1/GW01 L1223378-10 Non-Potable Water Method Radiochemistry by Method 904 Radiochemistry by Method 904 Radiochemistry by Method SM7500Ra B M	WG1496885 WG1496885 Batch	1 1 Dilution	06/22/20 14:42 06/22/20 14:42 Collected by Kevin Bolling Preparation date/time	06/24/20 12:22 06/24/20 12:22 Collected date/time 05/27/20 00:00 Analysis date/time	SNR RGT Received dat 05/29/20 09 Analyst	Mt. Jul Mt. Jul te/time :00 Loca

SDG: L1223378

DATE/TIME: 06/29/20 19:01

CASE NARRATIVE

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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.

inde Cashmen

Linda Cashman Project Manager

SDG: L1223378

MW-2A/GW01

Collected date/time: 05/27/20 14:40

SAMPLE RESULTS - 01 L1223378

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	0.747		0.593	0.918	06/24/2020 09:45	WG1492751
(T) Barium	98.9			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	108			79.0-136	06/24/2020 09:45	WG1492751
Radiochemistry by	Method Calcu	llation				
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	.					

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
Combined Radium	1.06		0.828	1.17	06/24/2020 11:38	WG1496885	

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.317		0.235	0.255	06/24/2020 11:38	WG1496885
(T) Barium-133	98.1			30.0-143	06/24/2020 11:38	WG1496885

SAMPLE RESULTS - 02 L1223378

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.11		0.535	0.75	06/24/2020 09:45	WG1492751
(T) Barium	101			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	101			79.0-136	06/24/2020 09:45	WG1492751
Radiochemistry b	y Method Calcu	llation				
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.19		0.654	0.924	06/24/2020 11:38	WG1496885

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.0858		0.119	0.174	06/24/2020 11:38	WG1496885
(T) Barium-133	107			30.0-143	06/24/2020 11:38	WG1496885

SAMPLE RESULTS - 03 L1223378

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.124		0.614	1.11	06/24/2020 09:45	WG1492751
(T) Barium	94.4			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	102			79.0-136	06/24/2020 09:45	WG1492751
Radiochemistry b	by Method Calcu	lation				
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	6://			01/1		

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty	MDA pCi/l	Analysis Date date / time	Batch	
Combined Radium	0.0763		0.747	1.33	06/24/2020 11:38	WG1496885	

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.0763		0.133	0.216	06/24/2020 11:38	WG1496885	
(T) Barium-133	104			30.0-143	06/24/2020 11:38	WG1496885	

MW-8A/GW01

Collected date/time: 05/27/20 12:40

SAMPLE RESULTS - 04 L1223378

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.367		0.606	1.14	06/24/2020 09:45	WG1492751
(T) Barium	88.4			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	106			79.0-136	06/24/2020 09:45	WG1492751

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		5
Combined Radium	0.0386		0.806	1.5	06/24/2020 12:22	WG1496885	

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.0386		0.200	0.357	06/24/2020 12:22	WG1496885	
(T) Barium-133	101			30.0-143	06/24/2020 12:22	WG1496885	

SAMPLE RESULTS - 05

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°Qc

Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-228	-1.46		0.666	1.3	06/24/2020 09:45	<u>WG1492751</u>	
(T) Barium	93.8			62.0-143	06/24/2020 09:45	WG1492751	
(T) Yttrium	111			79.0-136	06/24/2020 09:45	WG1492751	

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
Combined Radium	0.213		0.865	1.53	06/24/2020 12:22	WG1496885	

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.213		0.199	0.229	06/24/2020 12:22	WG1496885	
(T) Barium-133	99.0			30.0-143	06/24/2020 12:22	WG1496885	

SAMPLE RESULTS - 06 L1223378

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Qc

Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.386		0.606	1.06	06/24/2020 09:45	WG1492751
(T) Barium	88.4			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	101			79.0-136	06/24/2020 09:45	WG1492751

Radiochemistry by Method Calculation

Radiochemistry by	/ Method Calcı	ulation					
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		q
Combined Radium	0.776		0.871	1.32	06/24/2020 12:22	WG1496885	~

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.390		0.265	0.258	06/24/2020 12:22	WG1496885	
(T) Barium-133	114			30.0-143	06/24/2020 12:22	WG1496885	

SAMPLE RESULTS - 07 L1223378

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.15		0.579	1.15	06/24/2020 09:45	WG1492751
(T) Barium	80.3			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	105			79.0-136	06/24/2020 09:45	WG1492751

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
nalyte	pCi/l		+/-	pCi/l	date / time		

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.113		0.151	0.219	06/24/2020 12:22	WG1496885	
(T) Barium-133	119			30.0-143	06/24/2020 12:22	WG1496885	

SAMPLE RESULTS - 08 L1223378

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.801		0.635	1.13	06/24/2020 09:45	WG1492751
(T) Barium	91.5			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	112			79.0-136	06/24/2020 09:45	WG1492751
Radiochemistry by	Method Calcu	lation				
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
Combined Radium	0.859		0.766	1.37	06/24/2020 12:22	WG1496885	

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time	—	
RADIUM-226	0.0579		0.131	0.24	06/24/2020 12:22	WG1496885	
(T) Barium-133	116			30.0-143	06/24/2020 12:22	WG1496885	

SAMPLE RESULTS - 09 L1223378

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Radiochemistry by Method 904

	-					
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.294		0.573	1.22	06/24/2020 09:45	WG1492751
(T) Barium	82.2			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	104			79.0-136	06/24/2020 09:45	WG1492751

Radiochemistry by Method Calculation

Radiochemistry by	Method Calcu	Ilation					
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		5
Combined Radium	0.198		0.790	1.51	06/24/2020 12:22	WG1496885	ູ

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.198		0.217	0.287	06/24/2020 12:22	WG1496885	
(T) Barium-133	103			30.0-143	06/24/2020 12:22	WG1496885	

DUP-1/GW01 Collected date/time: 05/27/20 00:00

SAMPLE RESULTS - 10 L1223378



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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	0.646		0.707	0.873	06/24/2020 09:45	WG1492751
(T) Barium	101			62.0-143	06/24/2020 09:45	WG1492751
(T) Yttrium	101			79.0-136	06/24/2020 09:45	WG1492751
Radiochemistry by N	lethod Calcu	ulation				
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
Combined Radium	0.808		0.920	1.18	06/24/2020 13:17	WG1496885	

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.163		0.213	0.304	06/24/2020 13:17	WG1496885
(T) Barium-133	103			30.0-143	06/24/2020 13:17	WG1496885

Radiochemistry by Method 904

QUALITY CONTROL SUMMARY L1223378-01,02,03,04,05,06,07,08,09,10

Method Blank (MB)

(MB) R3543388-1 06	6/23/20 10:00		
	MB Result	MB Qualifier	MB MDA
Analyte	pCi/l		pCi/l
Radium-228	0.862		0.296
(T) Barium	87.3		
(T) Yttrium	105		

L1223378-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1223378-01 06/2	24/20 09:45 • (DUF							
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-228	0.747	0.613	1	19.7	0.132		20	3
(T) Barium	98.9	94.6						
(T) Yttrium	108	100						

Laboratory Control Sample (LCS)

(LCS) R3543388-2 06	CS) R3543388-2 06/23/20 10:00							
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier			
Analyte	pCi/l	pCi/l	%	%				
Radium-228	5.00	5.20	104	80.0-120				
(T) Barium			88.5					
(T) Yttrium			103					

L1223378-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223378-08 06/24/20 09:45 • (MS) R3543388-3 06/23/20 10:00 • (MSD) R3543388-4 06/23/20 10:00													
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	10.0	0.801	11.0	10.0	102	92.4	1	70.0-130			9.49		20
(T) Barium		91.5			93.0	93.7							
(T) Yttrium		112			103	104							

ACCOUNT:	PROJECT:	SDC.	DATE/TIME:	PAGE:
Kansas City Board of Public Utilities	62801 BPU Nearman	SDG: L1223378	06/29/20 19:01	16 of 20

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Radiochemistry by Method SM7500Ra B M

QUALITY CONTROL SUMMARY L1223378-01,02,03,04,05,06,07,08,09,10

Method Blank (MB)

(MB) R3543240-1 06	(MB) R3543240-1 06/24/20 11:38					
	MB Result	MB Qualifier	MB MDA			
Analyte	pCi/l		pCi/l			
Radium-226	-0.00564		0.0711			
(T) Barium-133	96.6					

L1223378-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1223378-01 06	5/24/20 11:38 • (DUP)	R3543240-5	06/24/20	11:38				
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-226	0.317	0.0350	1	160	0.826		20	3
(T) Barium-133	98.1	89.2						

Laboratory Control Sample (LCS)

(LCS) R3543240-2 06	CS) R3543240-2 06/24/20 11:38								
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier				
Analyte	pCi/l	pCi/l	%	%					
Radium-226	5.02	5.32	106	80.0-120					
(T) Barium-133			102						

L1223378-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223378-08 06/24	OS) L1223378-08 06/24/20 12:22 • (MS) R3543240-3 06/24/20 11:38 • (MSD) R3543240-4 06/24/20 11:38												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.1	0.0579	20.6	21.2	102	105	1	75.0-125			3.11		20
(T) Barium-133		116			99.8	98.9							

DATE/TIME: 06/29/20 19:01 Qc

GLOSSARY OF TERMS

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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

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

PROJECT: 62801 BPU Nearman SDG: L1223378 DATE/TIME: 06/29/20 19:01 PAGE: 18 of 20

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

State Accreditations

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia ¹	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
lowa	364
Kansas	E-10277
Kentucky ¹⁶	90010
Kentucky ²	16
Louisiana	AI30792
Louisiana ¹	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico ¹	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Dhio-VAP	CL0069
Oklahoma	9915
Dregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Fennessee ¹⁴	2006
lexas	T104704245-18-15
Гexas ⁵	LAB0152
Jtah	TN00003
/ermont	VT2006
/irginia	460132
Washington	C847
Vest Virginia	233
Wisconsin	9980939910
Wyoming	A21 A

Third Party Federal Accreditations

101.1 100.17005	4464.64		10.0700
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

Our Locations

Kansas City Board of Public Utilities

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



62801 BPU Nearman

L1223378

PAGE: 19 of 20

06/29/20 19:01

		Billing Info	rmation:	and the second				Analysis	/ Conta	iner / Preserv	vative	[Sector	Chain of Custody	Page of
Kansas City Board of Pul 300 N 65th Street Kansas City, KS 66102	olic Utilities	ic Utilities Attn: Ellen Bouse 300 N 65th Street Kansas City, KS 66102		Pres Chk	13 <l< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th>- Pace) National Ce</th><th>Analytical * nter for Testing & Innovatio</th></l<>							- Pace) National Ce	Analytical * nter for Testing & Innovatio	
leport to: ngrid Setzler		Email To: isetzler@bpu.com;kbrown@bpu.com;k		opu.com;bhc	oye@b	EONH b							12065 Lebanon Rd Mount Juliet, TN 37 Phone: 615-758-585	8 70 1
Project Description:	City/State		5.527	Please Ci PT MT C		-Add	1. A.			1997 - 19 A			Phone: 800-767-585 Fax: 615-758-5859	
groundwater	Collected	Kans	Lab Project #			DPE			The second				SDG #1223	3378
Phone: 913-573-9806	62801 BPU Nearma	n	KCKAN02-MV	V NEARM	AN	IL-HDPE-							C18	36
Collected by (print): Kouin Belling	Site/Facility ID #		P.O. #			(A228							Acctnum: KCK	
Collected by (signature):	Rush? (Lab MUST	e Day	Quote # Date Results	Needed		Rad, RA226, RA228							Template: T15 Prelogin: P76 PM: 650 - Lind	8465
Immediately Packed on Ice N Y	Two Day 10	Day (Rad Only)			No. of								A real field and a real state of the second st	4-15-20 edEX Ground
Sample ID	Comp/Grab Matrix	* Depth	Date	Time	Cntrs	Tota	1.1.1			1 and a second			Remarks	Sample # (lab only)
MW-2A / GWO)	NPW		5-27-20	1440	2	X								- 01
MW-3 / GWOD	NPW	過じる。	5.27-20	1540	2	X					1		he shaker k	62
MW-4 16W01	NPW		5-27-20	1645	5 2	X	12							03
MW-8A / GWO1	NPW		5-27.20	1240	2	X				-77				04
MW-10 / GWOI	NPW	an an an an	5-27-20	1336	2	X					1.5		an the Ballin of the	05
MW-13/6W01	NPW	1	5-28-20	0950	2	X	E. agelia	2		in the second			and the second second	06
MW-14 / GW OI	NPW		3-27-20	a server server server	2	X	100			and the second se				07
MW-15 (GWO) WS/MSO	NPW		5-27-20	1018	2	X	1	r.l.						08
MW-16 / GWOI	NPW	and the	5-28-20	1055	2	X							and a Trained	09
DUP-1 / (WO)	NPW		5-27-20	-	2	X		12			1			10
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	emarks:						int sa Marine Marine Marine		H	Temp Other		COC Sea COC Sig Bottles Correct	Sample Receipt Ch al Present/Intact gned/Accurate: s arrive intact: t bottles used:	
	amples returned via: UPSFedExCou	ier	Tracki									VOA Zer	ient volume sent: <u>If Applicab</u> ro Headspace: vation Correct/Ch	<u>le</u> Y
Relinquished by : (Signature)	Date:	-70 Tim	ne: Receiv	Signa	ature)	-			lank Red	HCL TBR	. / Меон	RAD Scr	reen <0.5 mR/hr:	7-1
Relinguished by : (Signature)	Date:	Tim	1820 F	ed by: (Signa	ature)			Temp	A	and the second se	Received:	If preser	vation required by Lo	
Relinquished by : (Signature)	Date:	Tim		ved for lab by	y: (Signa	ture)		Date;		Time:		Hold:		Condition: NCF / OK

Memorandum



Date:	July 8, 2020
То:	Brian Hoye
From:	Kortney Blaufuss
Re:	Quality Assurance/Quality Control (QA/QC) Review of Analytical Data Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas Nearman Creek Power Station Bottom Ash Pond – May 2020 Project No. 88777

Groundwater samples were collected for analysis of assessment monitoring parameters at the Nearman Creek Power Station Bottom Ash Pond at the Kansas City Board of Public Utilities (BPU) site in Kansas City, Kansas. These samples were collected May 27 through 28, 2020. All noted samples were submitted to Pace Analytical National Center for Testing & Innovation of Mount Juliet, Tennessee (Pace National) (formerly known as ESC Lab Sciences) for analysis by one or more of the following methods:

Parameters	Analytical Method
Metals	SW-846 6010B/6020
Mercury	SW-846 7470A
Chloride, Fluoride, Sulfate	SW-846 9056A
Dissolved Solids	SM 2540 C-2011
pН	SW-846 9040C
Radium 226 and 228 ² (Combined)	SM 7500 Ra B M (radium-226)
	EPA 904.0 (radium-228)

Notes:

¹Metals performed by SW-846 6010B include barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lithium, and molybdenum. Metals performed by SW-846 6020 include antimony, arsenic, lead, selenium, and thallium. ²Project reporting requirements per the Sampling and Analysis Plan are for a combined radium-226/radium-228 concentration. These were measured separately, and the combined result was calculated and reported by the laboratory.

A Stage I data review was performed for Quality Assurance (QA)/Quality Control (QC) results in association with the samples collected to evaluate the results for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in the guidelines presented in *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI) (USEPA, 2017). Any data qualifiers added during the course of this review are presented on Table 1.

- 1. <u>Chain-of-Custody (COC)</u> The relinquished and received signatures, times, and dates on the COCs were present.
- 2. <u>Requested Analyses Completed</u> All analyses were completed as requested for the appropriate parameters for the May groundwater sampling event.
 - It should be noted that selenium was analyzed under the SW-846 6020 method for the May 2020 sampling event, and analyzed under SW-846 6010B for previous sampling events. As such, for statistical purposes the reporting limits for selenium were averaged. There are no statistically significant data points for selenium, and impact to the data negligible.



July 8, 2020 Page 2

3. <u>Holding Times</u> – The lab flagged all pH results for this sampling event with an "T8" to indicate the sample was received too close to the holding time expiration/past holding time for analysis. All reported pH results for these samples should be considered estimated (J). Note, the pH was also measured in the field and would provide a more accurate measurement as they are recorded on-site at the time of sample collection.

With the above exception, all other samples were extracted and/or analyzed within their respective holding time.

- 4. <u>Sample Preservation</u> All samples were received by the laboratory below the recommended 2 to 6 degrees Celsius (°C) sample preservation temperature range. Because no samples were received frozen, all were considered viable.
- 5. <u>Laboratory Method Blanks</u> Method blanks were reviewed to determine the potential for sample cross contamination due to handling within the laboratory. With the following exceptions, no detections of target analytes were noted in the method blanks:
 - Molybdenum (0.00193 J mg/L) was detected in the method blank in batch WG1484995. The associated sample was nondetect for molybdenum. As such, cross-contamination was not a concern, and no data qualifiers were added.
 - Radium-226 (-0.00564 pCi/L) and radium-228 (0.862 pCi/L) were detected in the method blanks in batches WG1496885 and WG1492751, respectively. Because the radium-226 detection exhibited a negative result, it was considered non detect. Historical data shows radium (226 and/or 228) has been detected above the reporting limit in more than one sampling event, and there is also a level of uncertainty in radium results that is not typically addressed or relevant information provided for this scope of work. Rather than qualifying all samples nondetect (U) based on these method blank concentrations, as these data will be used for statistical analyses, the samples were qualified as follows:
 - All of the samples had detections with an associated uncertainty at or near the radium-228 method blank concentration. Because this fraction was used to report the combined radium concentration, all combined radium results were qualified as estimated (J) based on professional judgment. Combined radium has historically been detected in these wells, and this sampling event is consistent with these results, as qualified.
- 6. <u>Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)</u> The LCS contains a matrix similar to that of the sample that has been spiked with known concentrations of target analytes. The LCS is prepared and analyzed by the same method as the samples. As a measure of analytical accuracy, the results of the LCS are compared against the known analyte concentrations in the spike to determine the percent recovery (REC). The purpose of the LCS is to determine the performance of the laboratory with respect to analyte recovery, independent of field sample matrix interference. For some methods, the lab performed a LCSD. The results between the LCS and



July 8, 2020 Page 3

LCSD were compared with each other for reproducibility using the relative percent difference (RPD). With the following exceptions, all LCS/LCSD RECs and/or RPDs were within their respective QC limits:

- QC batch WG1486263: the LCS REC for dissolved solids recovered below its QC limit. The associated samples had detections of dissolved solids and were qualified as estimated low bias (J-).
- 7. <u>Matrix Spike/Matrix Spike Duplicates (MS/MSD)</u> MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the RPD. They are also compared against the unspiked portion of the sample for REC of the spike. Qualification is typically limited to the spiked sample for any MS/MSD issues, unless otherwise noted. Site-specific MS/MSDs were collected during each sampling event. The following summarizes these site-specific MS/MSD analyses:
 - MW-15/GW-01: The spike amount for sulfate was less than one-fourth the concentration in the noted parent sample. As such, no conclusion could be made regarding the accuracy of this spike. No data qualifiers were added based on this MS/MSD.

All other MS/MSD results for this noted sample were within control limits.

- 8. <u>Laboratory Duplicate Results</u> In instances where a MS/MSD was not applicable, laboratory duplicate analyses were performed. Laboratory duplicates provide information on the ability to reproduce lab results and to account for error introduced from handling, shipping, storage, preparation, and lab analysis. All project-specific laboratory duplicate results were within control limits.
- 9. <u>Field Duplicate Results</u> Field duplicate results provide information on the ability to reproduce field results and account for error introduced from handling, shipping, storage, preparation, and analysis of field samples. There are no specific USEPA criteria for qualifying data from field duplicate results. Depending upon the sample concentration, one of the following criteria based upon NFGI is applicable:
 - Is the compound detected in both portions?
 - If the sample concentrations are greater than 5 times the detection limit, then the maximum allowable RPD is 20 percent for water samples.
 - If the sample concentrations are less than 5 times the detection limit, then a sensitivity test is applied. For the sensitivity test, the sample concentrations must agree within ± the lower detection limit for water samples.



July 8, 2020 Page 4

• If the radium results are reported above their minimum detectable concentration (MDC), the normalized difference (also called the relative error ratio) between the duplicate pair was calculated. The maximum normalized difference is 1.96 for the radium samples.

One field duplicate pair was collected for the May 2020 sampling event. Table 2 presents the sideby-side comparison of the field duplicate results. Qualifiers are not typically added based on the field duplicate review unless otherwise noted. The higher of the two concentrations are considered more viable for use in reporting.

- MW-10/GW-01 // DUP-1/GW-01: The combined radium results slightly exceeded the normalized difference. These results were previously qualified for method blank detections. All other field duplicate results were adequately replicated, and no qualifiers were added based on field duplicate review.
- 10. <u>Detection and Quantitation Limits</u> In one or more samples the sulfate analysis required a dilution to account for high concentrations and/or matrix interferences. Qualifiers were not necessary based on these dilutions.
- 11. <u>Conclusion</u> The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid, as qualified, for use in reporting the results of this investigation.

Attachments

Table 1: Data Qualifiers Table 2: Field Duplicate Results

Table 1Data QualifiersKansas City Board of Public Utilities (BPU) - Kansas City, KansasNearman Creek Power Station Bottom Ash Pond – May 2020

Sample Identification	Laboratory Number	Parameter(s)	Data Qualifier	Reason for Qualification
All Samples in	SDG L1223308	рН	J	Holding time exceeded (see text)
MW-13/GW-01	L1223308-06	Dissolved solids	I	LCS REC < QC Limit
MW-16/GW-01	L1223308-09	Dissolved solids	J-	
All Samples in	All Samples in SDG L1223378		J	Method Blank Detection (see text)

Notes:

- J(-) Estimated Value (low bias)
- LCS Laboratory Control Sample
- QC Quality Control
- REC Percent recovery
- SDG Sample Delivery Group

Table 2

Field Duplicate Results Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas Nearman Creek Power Station Bottom Ash Pond – May 2020

	Sample Identification: Date Sampled: SDG(s):	MW-10/GW-01 5/27/2020 L1223308-05 L1223378-05 (radium)	DUP-1/GW-01 5/27/2020 L1223308-10 L1223378-10 (radium)	Meets QC Criteria
Parameter	Unit	Result	Result	
Dissolved Solids	mg/l	761	751	Yes
Chloride	mg/l	9.86	9.87	Yes
Fluoride	mg/l	0.162	0.162	Yes
Sulfate	mg/l	138	138	Yes
рН	su	6.99	7.06	Yes
Barium	mg/l	0.129	0.128	Yes
Boron	mg/l	1.17	1.14	Yes
Calcium	mg/l	173	173	Yes
Lithium	mg/l	0.04	0.0367	Yes
Combined Radium (including +/- uncertainty	pCi/l	0.213 (+/- 0.865)	0.808 (+/- 0.920)	Yes

Notes:

mg/l - milligrams per liter

pCi/I - picoCuries per liter

QC - Quality Control

SDG - Sample Delivery Group

su - standard unit



ANALYTICAL REPORT

Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description: L1276512 10/22/2020 KCBPU Nearman GW-Creek Bottom Ash Pond

Report To:

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

Entire Report Reviewed By:

Van Samill

T. Alan Harvill 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.

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1276512 DATE/TIME: 10/30/20 14:35

PAGE: 1 of 28

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TABLE OF CONTENTS

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Sc

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	6
Sr: Sample Results	7
MW-2A/GW02 L1276512-01	7
MW-3/GW02 L1276512-02	8
MW-4/GW02 L1276512-03	9
MW-8A/GW02 L1276512-04	10
MW-10/GW02 L1276512-05	11
MW-13/GW02 L1276512-06	12
MW-14/GW02 L1276512-07	13
MW-15/GW02 L1276512-08	14
MW-16/GW02 L1276512-09	15
DUP-1/GW02 L1276512-10	16
Qc: Quality Control Summary	17
Gravimetric Analysis by Method 2540 C-2011	17
Wet Chemistry by Method 9040C	18
Wet Chemistry by Method 9056A	19
Mercury by Method 7470A	21
Metals (ICP) by Method 6010D	22
Metals (ICPMS) by Method 6020B	24
GI: Glossary of Terms	25
Al: Accreditations & Locations	26
Sc: Sample Chain of Custody	27

SDG: L1276512 DATE/TIME: 10/30/20 14:35

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			Collected by	Collected date/time	Received da	te/time
MW-2A/GW02 L1276512-01 GW			Jonathan Hermanson	10/19/20 11:00	10/22/20 09:	00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 05:26	10/28/20 05:26	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 06:18	10/28/20 06:18	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 07:58	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 13:15	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 21:31	LD	Mt. Juliet, TN

MW-3/GW02 L1276512-02 GW			Collected by Jonathan Hermanson	Collected date/time 10/19/20 12:05	Received da 10/22/20 09:	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 06:44	10/28/20 06:44	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 06:57	10/28/20 06:57	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:11	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 13:57	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 21:54	LD	Mt. Juliet, TN

MW-4/GW02 L1276512-03 GW			Collected by Jonathan Hermanson	Collected date/time 10/19/20 12:50	Received dat 10/22/20 09:	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	date/time 10/24/20 08:14	date/time 10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 07:37	10/28/20 07:37	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:17	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 14:00	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:06	LD	Mt. Juliet, TN

MW-8A/GW02 L1276512-04 GW			Collected by Jonathan Hermanson	Collected date/time 10/19/20 08:50	Received dat 10/22/20 09:0	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 08:03	10/28/20 08:03	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 08:16	10/28/20 08:16	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:19	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 14:03	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:09	LD	Mt. Juliet, TN

MW-10/GW02 L1276512-05 GW			Collected by Jonathan Hermanson	Collected date/time 10/19/20 09:55	Received da 10/22/20 09	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 08:29	10/28/20 08:29	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 08:42	10/28/20 08:42	ELN	Mt. Juliet, TN
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 Kansas City Board of Public Utilities
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 3 of 28

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MW-10/GW02 L1276512-05 GW			Collected by Jonathan Hermanson	Collected date/time 10/19/20 09:55	Received da 10/22/20 09	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:21	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 14:05	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:12	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-13/GW02 L1276512-06 GW			Jonathan Hermanson	10/19/20 15:15	10/22/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 08:55	10/28/20 08:55	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:23	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 19:11	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:15	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-14/GW02 L1276512-07 GW			Jonathan Hermanson	10/19/20 17:15	10/22/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 09:21	10/28/20 09:21	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 09:34	10/28/20 09:34	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:25	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 19:14	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:19	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-15/GW02 L1276512-08 GW			Jonathan Hermanson	10/20/20 09:20	10/22/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 10:13	10/28/20 10:13	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 10:26	10/28/20 10:26	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:27	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 19:17	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:22	LD	Mt. Juliet, TN
			Collected by	Collected date/time		
MW-16/GW02 L1276512-09 GW			Jonathan Hermanson	10/19/20 16:15	10/22/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 10:39	10/28/20 10:39	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 10:53	10/28/20 10:53	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:29	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 18:57	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:25	LD	Mt. Juliet, TN
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Kansas City Board of Public Utilities

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4 of 28

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		Collected by	Collected date/time	Received date/time	
DUP-1/GW02 L1276512-10 GW					
Batch	Dilution	Preparation	Analysis	Analyst	Location
		date/time	date/time		
WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
WG1566100	1	10/28/20 11:06	10/28/20 11:06	ELN	Mt. Juliet, TN
WG1566100	5	10/28/20 11:19	10/28/20 11:19	ELN	Mt. Juliet, TN
WG1563994	1	10/25/20 11:54	10/26/20 08:31	ABL	Mt. Juliet, TN
WG1565552	1	10/28/20 12:43	10/28/20 19:26	EL	Mt. Juliet, TN
WG1564169	1	10/24/20 14:13	10/25/20 22:28	LD	Mt. Juliet, TN
	WG1564807 WG1564759 WG1566100 WG1566100 WG1563994 WG1565552	WG15648071WG15647591WG15661001WG15661005WG15639941WG15655521	Jonathan Hermanson Batch Dilution Preparation date/time WG1564807 1 10/24/20 08:14 WG1564759 1 10/26/20 00:17 WG1566100 1 10/28/20 11:06 WG1566100 5 10/28/20 11:19 WG1563994 1 10/25/20 11:54 WG1565552 1 10/28/20 12:43	Jonathan Hermanson 10/19/20 00:00 Batch Dilution Preparation date/time Analysis date/time WG1564807 1 10/24/20 08:14 10/24/20 11:22 WG1564759 1 10/26/20 00:17 10/26/20 00:17 WG1566100 1 10/28/20 11:06 10/28/20 11:06 WG1566100 5 10/28/20 11:19 10/28/20 11:19 WG15663994 1 10/25/20 11:54 10/26/20 08:31 WG1565552 1 10/28/20 12:43 10/28/20 19:26	Jonathan Hermanson 10/19/20 00:00 10/22/20 09:00 Batch Dilution Preparation date/time Analysis Analyst WG1564807 1 10/24/20 08:14 10/24/20 11:22 TH WG1564759 1 10/26/20 00:17 10/26/20 00:17 MCG WG1566100 1 10/28/20 11:06 10/28/20 11:06 ELN WG1566100 5 10/28/20 11:19 10/28/20 11:19 ELN WG15663094 1 10/25/20 11:54 10/26/20 08:31 ABL WG1565552 1 10/28/20 12:43 10/28/20 19:26 EL

SDG: L1276512 ³Ss

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CASE NARRATIVE

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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.

Hamill.

T. Alan Harvill Project Manager

SDG: L1276512 DATE/TIME: 10/30/20 14:35

SAMPLE RESULTS - 01

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	622		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	7.14	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-01 WG1564759: 7.14 at 22.7C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	12.7		1.00	1	10/28/2020 05:26	WG1566100
Fluoride	0.234		0.150	1	10/28/2020 05:26	WG1566100
Sulfate	113		25.0	5	10/28/2020 06:18	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 07:58	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.171		0.00500	1	10/26/2020 13:15	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 13:15	<u>WG1565114</u>
Boron	0.221		0.200	1	10/26/2020 13:15	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 13:15	WG1565114
Calcium	168	V	1.00	1	10/26/2020 13:15	WG1565114
Chromium	ND		0.0100	1	10/26/2020 13:15	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 13:15	WG1565114
Lithium	0.0302		0.0150	1	10/26/2020 13:15	<u>WG1565114</u>
Molybdenum	ND		0.00500	1	10/26/2020 13:15	WG1565114

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 21:31	<u>WG1564169</u>
Arsenic	0.00289		0.00200	1	10/25/2020 21:31	WG1564169
Lead	ND		0.00500	1	10/25/2020 21:31	WG1564169
Selenium	ND		0.00200	1	10/25/2020 21:31	WG1564169
Thallium	ND		0.00200	1	10/25/2020 21:31	WG1564169

SDG: L1276512

SAMPLE RESULTS - 02 L1276512

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Gravimetric Analysis by Method 2540 C	2-2011
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	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	737		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Wet Chemistry by Meth	od 9040C				
	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	6.97	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-02 WG1564759: 6.97 at 20.7C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	6.91		1.00	1	10/28/2020 06:44	<u>WG1566100</u>
Fluoride	0.178		0.150	1	10/28/2020 06:44	<u>WG1566100</u>
Sulfate	117		25.0	5	10/28/2020 06:57	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:11	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.170		0.00500	1	10/26/2020 13:57	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 13:57	WG1565114
Boron	ND		0.200	1	10/26/2020 13:57	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 13:57	WG1565114
Calcium	198		1.00	1	10/26/2020 13:57	WG1565114
Chromium	ND		0.0100	1	10/26/2020 13:57	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 13:57	WG1565114
Lithium	0.0521		0.0150	1	10/26/2020 13:57	WG1565114
Molybdenum	ND		0.00500	1	10/26/2020 13:57	WG1565114

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 21:54	WG1564169
Arsenic	ND		0.00200	1	10/25/2020 21:54	WG1564169
Lead	ND		0.00500	1	10/25/2020 21:54	WG1564169
Selenium	0.00224		0.00200	1	10/25/2020 21:54	WG1564169
Thallium	ND		0.00200	1	10/25/2020 21:54	WG1564169

SDG: L1276512 Qc

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	478		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	SU			date / time	
рН	7.23	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-03 WG1564759: 7.23 at 20.6C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	9.94		1.00	1	10/28/2020 07:37	WG1566100
Fluoride	0.175		0.150	1	10/28/2020 07:37	WG1566100
Sulfate	66.5		5.00	1	10/28/2020 07:37	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:17	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.118		0.00500	1	10/26/2020 14:00	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 14:00	WG1565114
Boron	ND		0.200	1	10/26/2020 14:00	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 14:00	WG1565114
Calcium	122		1.00	1	10/26/2020 14:00	WG1565114
Chromium	ND		0.0100	1	10/26/2020 14:00	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 14:00	WG1565114
Lithium	0.0340		0.0150	1	10/26/2020 14:00	WG1565114
Molybdenum	ND		0.00500	1	10/26/2020 14:00	WG1565114

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:06	WG1564169
Arsenic	ND		0.00200	1	10/25/2020 22:06	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:06	WG1564169
Selenium	0.00252		0.00200	1	10/25/2020 22:06	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:06	WG1564169

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	953		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	7.17	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-04 WG1564759: 7.17 at 20.8C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	23.9		1.00	1	10/28/2020 08:03	WG1566100
Fluoride	0.357		0.150	1	10/28/2020 08:03	WG1566100
Sulfate	353		25.0	5	10/28/2020 08:16	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:19	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.194		0.00500	1	10/26/2020 14:03	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 14:03	WG1565114
Boron	2.66		0.200	1	10/26/2020 14:03	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 14:03	WG1565114
Calcium	160		1.00	1	10/26/2020 14:03	WG1565114
Chromium	ND		0.0100	1	10/26/2020 14:03	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 14:03	WG1565114
Lithium	0.0281		0.0150	1	10/26/2020 14:03	WG1565114
Molybdenum	0.0105		0.00500	1	10/26/2020 14:03	WG1565114

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:09	WG1564169
Arsenic	0.0373		0.00200	1	10/25/2020 22:09	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:09	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:09	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:09	WG1564169

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	752		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	SU			date / time	
рН	7.42	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-05 WG1564759: 7.42 at 20.5C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	12.2		1.00	1	10/28/2020 08:29	WG1566100
Fluoride	0.167		0.150	1	10/28/2020 08:29	WG1566100
Sulfate	143		25.0	5	10/28/2020 08:42	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:21	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.116		0.00500	1	10/26/2020 14:05	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 14:05	WG1565114
Boron	1.22		0.200	1	10/26/2020 14:05	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 14:05	WG1565114
Calcium	168		1.00	1	10/26/2020 14:05	WG1565114
Chromium	ND		0.0100	1	10/26/2020 14:05	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 14:05	WG1565114
Lithium	0.0446		0.0150	1	10/26/2020 14:05	WG1565114
Molybdenum	ND		0.00500	1	10/26/2020 14:05	WG1565114

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:12	WG1564169
Arsenic	0.00461		0.00200	1	10/25/2020 22:12	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:12	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:12	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:12	WG1564169

SAMPLE RESULTS - 06 L1276512

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Gravimetric Analysis by Method 25	540 C-2011
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	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	704		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Wet Chemistry by Meth	nod 9040C				
	Result	Qualifier	Dilution	Analysis	Batch
Analyte	SU			date / time	
рН	6.94	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-06 WG1564759: 6.94 at 21C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	20.6		1.00	1	10/28/2020 08:55	WG1566100
Fluoride	0.294		0.150	1	10/28/2020 08:55	WG1566100
Sulfate	92.4		5.00	1	10/28/2020 08:55	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:23	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.354		0.00500	1	10/28/2020 19:11	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 19:11	WG1565552
Boron	ND		0.200	1	10/28/2020 19:11	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 19:11	WG1565552
Calcium	181		1.00	1	10/28/2020 19:11	WG1565552
Chromium	ND		0.0100	1	10/28/2020 19:11	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 19:11	WG1565552
Lithium	0.0356		0.0150	1	10/28/2020 19:11	WG1565552
Molybdenum	ND		0.00500	1	10/28/2020 19:11	WG1565552

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:15	WG1564169
Arsenic	0.0303		0.00200	1	10/25/2020 22:15	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:15	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:15	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:15	WG1564169

SDG: L1276512 Qc

SAMPLE RESULTS - 07 L1276512

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Gravimetric Analysis by Method 2540 C-2011	
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	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	882		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Wet Chemistry by Meth	od 9040C				
	Result	Qualifier	Dilution	Analysis	Batch
Analyte	SU			date / time	
рН	6.83	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-07 WG1564759: 6.83 at 20.8C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	16.0		1.00	1	10/28/2020 09:21	<u>WG1566100</u>
Fluoride	0.199		0.150	1	10/28/2020 09:21	WG1566100
Sulfate	181		25.0	5	10/28/2020 09:34	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:25	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.138		0.00500	1	10/28/2020 19:14	<u>WG1565552</u>
Beryllium	ND		0.00200	1	10/28/2020 19:14	WG1565552
Boron	ND		0.200	1	10/28/2020 19:14	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 19:14	WG1565552
Calcium	218		1.00	1	10/28/2020 19:14	WG1565552
Chromium	ND		0.0100	1	10/28/2020 19:14	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 19:14	WG1565552
Lithium	0.0287		0.0150	1	10/28/2020 19:14	<u>WG1565552</u>
Molybdenum	ND		0.00500	1	10/28/2020 19:14	WG1565552

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:19	WG1564169
Arsenic	ND		0.00200	1	10/25/2020 22:19	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:19	WG1564169
Selenium	0.0118		0.00200	1	10/25/2020 22:19	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:19	WG1564169

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	560		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	7.71	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-08 WG1564759: 7.71 at 20.8C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	21.4		1.00	1	10/28/2020 10:13	WG1566100
Fluoride	0.424		0.150	1	10/28/2020 10:13	WG1566100
Sulfate	211		25.0	5	10/28/2020 10:26	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:27	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.114		0.00500	1	10/28/2020 19:17	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 19:17	WG1565552
Boron	ND		0.200	1	10/28/2020 19:17	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 19:17	<u>WG1565552</u>
Calcium	82.6		1.00	1	10/28/2020 19:17	WG1565552
Chromium	ND		0.0100	1	10/28/2020 19:17	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 19:17	WG1565552
Lithium	0.0526		0.0150	1	10/28/2020 19:17	<u>WG1565552</u>
Molybdenum	ND		0.00500	1	10/28/2020 19:17	WG1565552

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:22	WG1564169
Arsenic	0.00488		0.00200	1	10/25/2020 22:22	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:22	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:22	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:22	WG1564169

SDG: L1276512 Qc

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	821		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
рН	6.84	<u>T8</u>	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-09 WG1564759: 6.84 at 20.5C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	35.4		1.00	1	10/28/2020 10:39	<u>WG1566100</u>
Fluoride	ND		0.150	1	10/28/2020 10:39	<u>WG1566100</u>
Sulfate	115		25.0	5	10/28/2020 10:53	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:29	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.298		0.00500	1	10/28/2020 18:57	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 18:57	WG1565552
Boron	ND		0.200	1	10/28/2020 18:57	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 18:57	WG1565552
Calcium	231	V	1.00	1	10/28/2020 18:57	WG1565552
Chromium	ND		0.0100	1	10/28/2020 18:57	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 18:57	WG1565552
Lithium	0.0596		0.0150	1	10/28/2020 18:57	WG1565552
Molybdenum	ND		0.00500	1	10/28/2020 18:57	WG1565552

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:25	WG1564169
Arsenic	0.0313		0.00200	1	10/25/2020 22:25	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:25	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:25	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:25	WG1564169

SAMPLE RESULTS - 10 L1276512

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Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	736		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Wet Chemistry by Method 9040C								
	Result	Qualifier	Dilution	Analysis	Batch			
Analyte	SU			date / time				
рН	7.50	<u>T8</u>	1	10/26/2020 00:17	WG1564759			

Sample Narrative:

L1276512-10 WG1564759: 7.5 at 21C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	12.1		1.00	1	10/28/2020 11:06	<u>WG1566100</u>
Fluoride	0.168		0.150	1	10/28/2020 11:06	<u>WG1566100</u>
Sulfate	144		25.0	5	10/28/2020 11:19	WG1566100

Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:31	WG1563994

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.116		0.00500	1	10/28/2020 19:26	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 19:26	<u>WG1565552</u>
Boron	1.20		0.200	1	10/28/2020 19:26	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 19:26	<u>WG1565552</u>
Calcium	170		1.00	1	10/28/2020 19:26	WG1565552
Chromium	ND		0.0100	1	10/28/2020 19:26	<u>WG1565552</u>
Cobalt	ND		0.0100	1	10/28/2020 19:26	WG1565552
Lithium	0.0412		0.0150	1	10/28/2020 19:26	WG1565552
Molybdenum	ND		0.00500	1	10/28/2020 19:26	WG1565552

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:28	WG1564169
Arsenic	0.00475		0.00200	1	10/25/2020 22:28	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:28	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:28	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:28	WG1564169

WG1564807

Gravimetric Analysis by Method 2540 C-2011

QUALITY CONTROL SUMMARY L1276512-01.02.03.04.05.06.07.08.09.10

Method Blank (MB)

(MB) R3585329-1 10	/24/20 11:22			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

Laboratory Control Sample (LCS)

(LCS) R3585329-2 10/24/20 11:22							
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier		
Analyte	mg/l	mg/l	%	%			
Dissolved Solids	8800	7560	85.9	77.4-123			

Qc

SDG: L1276512 DATE/TIME: 10/30/20 14:35

PAGE: 17 of 28

WG1564759

Wet Chemistry by Method 9040C

QUALITY CONTROL SUMMARY <u>L1276512-01,02,03,04,05,06,07,08,09,10</u>

ONE LAB. NATIONWIDE.

L1274287-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1274287-01	10/26/20 00:17 •	(DUP) R3585376-2	10/26/20 00:17
(00) = = 1 = 0, 01	10/20/20 00.0	(200) 1100000000 2	10/20/20 00.17

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	8.21	8.21	1	0.000		1

Sample Narrative:

OS: 8.21 at 21.1C

DUP: 8.21 at 20.9C

L1276512-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1276512-07 10/26/2	OS) L1276512-07 10/26/20 00:17 • (DUP) R3585376-3 10/26/20 00:17												
Original Result DUP Result Dilution DUP RPD <u>DUP Qualifier</u> DUP RPD Limits													
Analyte	SU	su		%		%							
рН	6.83	6.83	1	0.000		1							

Sample Narrative:

OS: 6.83 at 20.8C

DUP: 6.83 at 21.1C

Laboratory Control Sample (LCS)

(LCS) R3585376-1 10/26/20 00:17												
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier							
Analyte	su	su	%	%								
рН	10.0	10.0	100	99.0-101								

Sample Narrative:

LCS: 10.01 at 19.4C

ACCOUNT:
Kansas City Board of Public Utilities

Qc

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1276512-01,02,03,04,05,06,07,08,09,10

ONE LAB. NATIONWIDE.

Method Blank (MB)

(MB) R3586932-1	10/28/20 04:47

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

L1276512-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1276512-01 10/28/2	DS) L1276512-01 10/28/20 05:26 • (DUP) R3586932-3 10/28/20 05:39													
Original Result DUP Result Dilution DUP RPD <u>DUP Qualifier</u> DUP RPD Limits														
Analyte	mg/l	mg/l		%		%								
Chloride	12.7	12.6	1	0.293		15								
Fluoride	0.234	0.227	1	2.95		15								
Sulfate	120	119	1	0.317	E	15								

L1276512-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1276512-01 10/28/2	(OS) L1276512-01 10/28/20 06:18 • (DUP) R3586932-6 10/28/20 06:31												
	Original Result DUP Result Dilution DUP RPD <u>DUP Qualifier</u> DUP RPD Limits												
Analyte	mg/l	mg/l		%		%							
Sulfate	113	114	5	0.192		15							

L1276619-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1276619-01 10/28/2	(OS) L1276619-01 10/28/20 16:21 • (DUP) R3586932-7 10/28/20 16:34													
Original Result DUP Result Dilution DUP RPD DUP Qualifier DUP RPD Limits														
Analyte	mg/l	mg/l		%										
Chloride	1.64	1.76	1	7.32		5								
Fluoride	ND	0.150	1	3.88										
Sulfate	9.12	9.40	1	2.98		5								

Laboratory Control Sample (LCS)

(LCS) R3586932-2 10/28/20 05:00												
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier							
Analyte	mg/l	mg/l	%	%								
Chloride	40.0	39.4	98.6	80.0-120								
Fluoride	8.00	8.10	101	80.0-120								

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1276512 DATE/TIME: 10/30/20 14:35

PAGE: 19 of 28 Qc

WG1566100

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1276512-01,02,03,04,05,06,07,08,09,10

ONE LAB. NATIONWIDE.

Qc

Laboratory Control Sample (LCS)

(LCS) R3586932-2 10/28/20 05:00												
	Rec. Limits	LCS Qualifier										
Analyte	mg/l	mg/l	%	%								
Sulfate	40.0	39.6	98.9	80.0-120								

L1276512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276512-01 10/28/2	(OS) L1276512-01 10/28/20 05:26 • (MS) R3586932-4 10/28/20 05:52 • (MSD) R3586932-5 10/28/20 06:05														
Spike Amount Original Result MS Result MSD Result MS Rec. MSD Rec. Dilution Rec. Limits <u>MS Qualifier</u> MSD Qualifier RPD RPD Limits															
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%			
Chloride	50.0	12.7	62.4	65.1	99.4	105	1	80.0-120			4.31	15			
Fluoride	5.00	0.234	5.22	5.53	99.6	106	1	80.0-120			5.80	15			
Sulfate	50.0	120	164	169	88.3	98.4	1	80.0-120	E	E	3.04	15			

L1276619-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1276619-01 10/28/2	DS) L1276619-01 10/28/20 16:21 • (MS) R3586932-8 10/28/20 16:47											
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier					
Analyte	mg/l	mg/l	mg/l	%		%						
Chloride	50.0	1.64	51.2	99.0	1	80.0-120						
Fluoride	5.00	ND	5.10	99.2	1	80.0-120						
Sulfate	50.0	9.12	59.0	99.8	1	80.0-120						

DATE/TIME: 10/30/20 14:35

PAGE: 20 of 28

WG1563994

Mercury by Method 7470A

QUALITY CONTROL SUMMARY L1276512-01,02,03,04,05,06,07,08,09,10

Method Blank (MB)

(MB) R3585516-1 10	/26/20 07:54				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Mercury	U		0.000100	0.000200	

Laboratory Control Sample (LCS)

(LCS) R3585516-2 10/26	/20 07:56				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Mercury	0.00300	0.00287	95.5	80.0-120	

L1276512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276512-01 10/26/2	0 07:58 • (MS)	R3585516-3 10	/26/20 08:00	• (MSD) R3585	516-4 10/26/2	0 08:02						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.00300	ND	0.00266	0.00270	88.8	90.1	1	75.0-125			1.53	20

DATE/TIME: 10/30/20 14:35

Metals (ICP) by Method 6010D

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R3585839-1 10	0/26/20 13:08			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Barium	U		0.000895	0.00500
Beryllium	U		0.000460	0.00200
Boron	U		0.0254	0.200
Cadmium	U		0.000563	0.00200
Calcium	U		0.389	1.00
Chromium	U		0.00500	0.0100
Cobalt	U		0.000807	0.0100
Lithium	U		0.00574	0.0150
Molybdenum	U		0.00104	0.00500

Laboratory Control Sample (LCS)

(LCS) R3585839-2 10	0/26/20 13:12				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Barium	1.00	0.995	99.5	80.0-120	
Beryllium	1.00	0.989	98.9	80.0-120	
Boron	1.00	0.985	98.5	80.0-120	
Cadmium	1.00	0.962	96.2	80.0-120	
Calcium	10.0	9.82	98.2	80.0-120	
Chromium	1.00	0.985	98.5	80.0-120	
Cobalt	1.00	0.985	98.5	80.0-120	
Lithium	1.00	0.958	95.8	80.0-120	
Molybdenum	1.00	1.01	101	80.0-120	

L1276512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits	
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%	
Barium	1.00	0.171	1.18	1.16	101	98.8	1	75.0-125			1.53	20	
Beryllium	1.00	ND	1.00	1.00	100	100	1	75.0-125			0.0991	20	
Boron	1.00	0.221	1.21	1.21	99.1	99.1	1	75.0-125			0.0424	20	
Cadmium	1.00	ND	0.998	0.981	99.8	98.1	1	75.0-125			1.66	20	
Calcium	10.0	168	174	175	54.8	64.9	1	75.0-125	\vee	\vee	0.578	20	
Chromium	1.00	ND	0.991	0.981	99.1	98.1	1	75.0-125			1.02	20	
Cobalt	1.00	ND	1.01	0.997	101	99.3	1	75.0-125			1.64	20	
ithium	1.00	0.0302	0.995	0.998	96.4	96.8	1	75.0-125			0.382	20	
Molybdenum	1.00	ND	1.03	1.02	103	102	1	75.0-125			1.28	20	

Kansas City Board of Public Utilities

KCBPU Nearman

L1276512

DATE/TIME: 10/30/20 14:35

PAGE: 22 of 28

Qc

Metals (ICP) by Method 6010D

QUALITY CONTROL SUMMARY

Qc

Method Blank (MB)

(MB) R3586819-1 10	0/28/20 18:52			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	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) R3586819-2 10	0/28/20 18:54				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Barium	1.00	1.01	101	80.0-120	
Beryllium	1.00	0.948	94.8	80.0-120	
Boron	1.00	0.976	97.6	80.0-120	
Cadmium	1.00	0.959	95.9	80.0-120	
Calcium	10.0	9.70	97.0	80.0-120	
Chromium	1.00	0.944	94.4	80.0-120	
Cobalt	1.00	0.979	97.9	80.0-120	
Lithium	1.00	0.939	93.9	80.0-120	
Molybdenum	1.00	1.01	101	80.0-120	

L1276512-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits	
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%	
Barium	1.00	0.298	1.26	1.27	95.9	97.3	1	75.0-125			1.07	20	
Beryllium	1.00	ND	0.944	0.954	94.4	95.4	1	75.0-125			1.05	20	
Boron	1.00	ND	1.11	1.13	96.5	97.7	1	75.0-125			1.10	20	
Cadmium	1.00	ND	0.962	0.973	96.2	97.3	1	75.0-125			1.11	20	
Calcium	10.0	231	233	237	15.2	56.9	1	75.0-125	\vee	\vee	1.78	20	
Chromium	1.00	ND	0.929	0.946	92.9	94.6	1	75.0-125			1.72	20	
Cobalt	1.00	ND	0.992	1.00	99.2	100	1	75.0-125			0.831	20	
ithium	1.00	0.0596	1.01	1.01	94.6	95.1	1	75.0-125			0.564	20	
lolybdenum	1.00	ND	0.994	1.01	99.4	101	1	75.0-125			1.83	20	

Kansas City Board of Public Utilities

KCBPU Nearman

L1276512

10/30/20 14:35

PAGE: 23 of 28 Metals (ICPMS) by Method 6020B

QUALITY CONTROL SUMMARY L1276512-01,02,03,04,05,06,07,08,09,10

Method Blank (MB)

(MB) R3585369-1 10/25/20 21:25

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Antimony	U		0.00103	0.00400
Arsenic	U		0.000180	0.00200
Lead	U		0.000849	0.00500
Selenium	U		0.000300	0.00200
Thallium	U		0.000121	0.00200

Laboratory Control Sample (LCS)

(LCS) R3585369-2	S) R3585369-2 10/25/20 21:28									
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier					
Analyte	mg/l	mg/l	%	%						
Antimony	0.0500	0.0510	102	80.0-120						
Arsenic	0.0500	0.0475	95.0	80.0-120						
Lead	0.0500	0.0458	91.7	80.0-120						
Selenium	0.0500	0.0490	97.9	80.0-120						
Thallium	0.0500	0.0447	89.5	80.0-120						

L1276512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276512-01 10/25/2	20 21:31 • (MS) R3	3585369-4 10/	25/20 21:38 •	(MSD) R35853	69-5 10/25/2	0 21:41						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony	0.0500	ND	0.0536	0.0535	107	107	1	75.0-125			0.180	20
Arsenic	0.0500	0.00289	0.0494	0.0506	93.1	95.4	1	75.0-125			2.30	20
Lead	0.0500	ND	0.0439	0.0457	87.8	91.3	1	75.0-125			3.96	20
Selenium	0.0500	ND	0.0487	0.0497	97.5	99.4	1	75.0-125			1.99	20
Thallium	0.0500	ND	0.0431	0.0449	86.1	89.8	1	75.0-125			4.19	20

DATE/TIME: 10/30/20 14:35

Qc

GLOSSARY OF TERMS

*

GI

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 resul 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
	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial

E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
Т8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

PROJECT: KCBPU Nearman SDG: L1276512 DATE/TIME: 10/30/20 14:35

PAGE: 25 of 28

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

State Accreditations

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia ¹	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
lowa	364
Kansas	E-10277
Kentucky ¹⁶	90010
Kentucky ²	16
Louisiana	AI30792
Louisiana ¹	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
Louisiana ¹ Maine Maryland Massachusetts Michigan Minnesota Mississippi Missouri	LA180010 TN0002 324 M-TN003 9958 047-999-395 TN00003 340

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico 1	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee ¹⁴	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

Third Party Federal Accreditations

101.1 100.17005	4464.64		10.0700
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

Our Locations

Kansas City Board of Public Utilities

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



KCBPU Nearman

L1276512



10/30/20 14:35

			Billing Infor	rmation:				<u> </u>	A	nalvsis /	Contair	ner / Pres	ervative	1	Chain of Custo	dy Page <u></u> f _ of ∠
Carrsas City Board of Public Utilities		ties	300 N 65 Kansas C	th St ity, KS 66102	Pres Chk		C7							- Pac) CANALY tical Canter for Testing & Innovel Canter for Testing & Innovel	
eport lo:			Email To:											12065 Lebanon Rd		
ngrid Setzler			isetzler@b										Mount Juliet, TN Phone: 615-758- Phone: 800-767-	5858		
Project Description: City/State GW-Creek Bottom Ash Pond Collected:		City/State Collected:			Please C PT MT C		es								Fax: 615-758-58	
hone: 913-573-9806	Client Project # KCBPU Nearman Site/Facility ID #			Lab Project # KCKAN02-M	W NEARM	AN2	Sulfate 125mlHDPE-NoPres	03	Pres						sdg # /2 G1	.76512 98
Jonathan Hummason				P.O. #			IDHIM	PE-HN	250mlHDPE-NoPres						Acctnum: KC	
Collected by (signature):	cted by (signature): Rush? (Lab MUST Be			Quote #			125	IHDI	HIL			Template: T109043 Prelogin: P803940				
mmediately Packed on Ice NY_X			Day y (Rad Only) ay (Rad Only)	Date Result		No.	Sulfate	Metals 250mlHDPE-HNO3	pH 250n							650 - Linda Cashman
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	CI, FI, S	Metal	TDS, p			n			Shipped Via: Remarks	Sample # (lab only
NW-2A Jowsa	bras	GW	-	10-24-20	1100	3	X	X	X						and Property	- ' C I
nw-3/bwor	bras	GW	-	10-10-20	1205	3	X	X	X							02
NW-4 6WO2	brab	GW	-	6-19-20	1250	3	X	X	X							. 83
MW-BA / 6W SA	6000	GW	-	10-19-20	0850	3	X	X	X							- 04
10 6002	brub	GW		10-19-20	0955	3	X	X	X	146						05
1W-13/6W02	brab	GW	and a	10 -19-20	1515	3	X	X	X					1		06
MW-14 60002	Grab	GW	-	10-19-20	1715	3	X	X	X			122.453				07
MW-15 Gwoh	Linb	GW	i man	10-20-20	0920	3	X	X	X	1221						08
MW-16 6402	Geab	GW	-	10-10-20	1615	3	X	X	X							09
DUP-1 6HO2	brab	GW		10-101-20	-	3	X	X	X						ample Receipt	10
ss - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	^{Remarks:} Sł	andard	Turne	truoze		a Taris				pH		_ Temp _ Other		COC Sea COC Sign Bottles Correct	l Present/Intac med/Accurate: arrive intact: bottles used:	
DW - Drinking Water OT - Other	Samples returne	d via: xCourier		Tracki	ng.# 918	62	500	663	54	163	751	133	56	VOA Zer	ent volume sent <u>If Applica</u> > Headspace:	ble Y
Relinquished by : (Signature)		Date:	Time	e: Recei	red by: Signa	ture)	1.4.1			Trip Blan	k Receiv		CL / MeoH		ation Correct/C een <0.5 mR/hr:	
John Human		10-21-20		15 904	×					- MA	<u>A+</u>	1	BR/			
Relin quished by : (Signature)	C.	Date: 10-H-,	Time 20 /4	e: Receiv	ved by: (Signa	ture)			TA	Temp:	17:	C ^{Bottle}	s Received:	If preserv	ation required by L	ogin: Date/Time
Relinquished by : (Signature)		Date:	Time		red for lab by	: (Signat	ure)			Date:	22-	Time	20	Hold:		Condition: NCF / Ck

	19. 19 M 1		Billing Infor	mation:	14 - 14 - 14 - 14 - 14 - 14 - 14 - 14 -				A	nalvsis / (Contain	er / Preservative	Land and the second sec	Chain of Custody	Page 2 of	
Kansas City Board of Public Utilities 300 N 65th Street Kansas City, KS 66102		ies	300 N 65 Kansas C	th St ity, KS 66102		Pres Chk								- Pace. Netional C	Analytical* unter for Testing 8 innovation	
Report to:			Email To:	an ann an 19 Ann Ràistean									12065 Lebanon Rd			
Ingrid Setzler		isetzler@bj	pu.com;kbrown@	.com;kbrown@bpu.com;bhoye(Mount Juliet, TN 37 Phone: 615-758-58	58		
Project Description: City/State GW-Creek Bottom Ash Pond Collected:			ircle: CT ET	es	1.000						Phone: 800-767-58 Fax: 615-758-5859					
Phone: 913-573-9806	Client Project			Lab Project #		1	E-NoPres		6	Sec.				SDG # 12	76512	
Phone: 313-375-3000	KCBPU Nea	irman		KCKAN02-M	W NEARM	AN2		03	Pre					Table #		
Collected by (print): Jonathan Husoninson	Site/Facility ID # Rush? (Lab MUST Be Notified) Same Day Five Day Next Day 5 Day (Rad Only) Two Day 10 Day (Rad Only) Three Day		é natio	P.O. #	.0. #		125mlHDPE-	E-HNG	PE-No					Acctnum: KCK	Acctnum: KCKAN02	
Collected by (signature):			Day y (Rad Only)	Quote # Date Resul		No.	Sulfate 125		pH 250miHDPE-NaPres					Prelogin: P80 PM: 650 - Lind: PB:		
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	CI, FI,	Metal	TDS, p					Shipped Via: Fi Remarks	Sample # (lab only)	
DUP.2		GW				3	X	X	X							
Mrs marza luna me	1 h	GW		10-19-20	1100	3	X	x	x							
MED MU-2A/6002ms	head	GW	-	10-19-20	1100	3	X	x	x						0	
OF THE OFTIGE OFTIGE OF	0.45				110-			1.97								
				Anton	21			-				1.10		1.00		
La contra c			1	The	Am	th_		1.4.1						A Star		
						T	T	10				24		a strate		
	1.53	China and			a second			10-1	41-2	0				1.11		
		4-1-12-1	1 NATO							64		2/				
				Ster Carr	1000					1.18			and the second s			
SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	marks:	andre	L The	naround	4					pH Flow		_ Temp _ Other	COC Seal Pr COC Signed, Bottles arr Correct bot	rive intact: ttles used:	ecklint NP Y N ZY N ZY N Y N	
	uples returned UPS FedEx			Track	ing #918	6:	150	6 6	384	1/63	TS	16320		volume sent: <u>If Applicab</u> eadspace:		
Relinquished by : (Signature)		ate:	Time	11	ved by: (Signa	ature)				Trip Blank	k Receiv	red: Yes No HCL / MeoH	VOA Zero Headspace: Preservation Correct/Checked: Y N RAD Screen <0.5 mR/hr: N			
Relifiquished by (Signature)	D	0-21-2 ate:	Time		ived by: (Signa	ture)	2. 1. 4.			Temp.//	A	TBR Bottles Received:	If preservatio	n required by Log	in: Date/Time	
Relinquished by : (Signature)		0-21- ate:	<u>کا حر</u> ۔ Time	and the second se	red for lab by	: (Signa	ture)			Date:	1=1	Time:	Hold:		Condition:	
Insurdance of its Sugard	ing the set of a				uter	una	5			10-7	12-	20900			NCF / OK	



ANALYTICAL REPORT

November 16, 2020

Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description:

L1276537 10/22/2020 62801 BPU Nearman groundwater

Report To:

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

Entire Report Reviewed By:

Linde Cashman

Linda Cashman 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.

ACCOUNT: Kansas City Board of Public Utilities

PROJECT: 62801 BPU Nearman

SDG: L1276537

DATE/TIME: 11/16/20 18:22 PAGE: 1 of 21

TABLE OF CONTENTS

*

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	5
Sr: Sample Results	6
MW-2A/GW02 L1276537-01	6
MW-3/GW02 L1276537-02	7
MW-4/GW02 L1276537-03	8
MW-8A/GW02 L1276537-04	9
MW-10/GW02 L1276537-05	10
MW-13/GW02 L1276537-06	11
MW-14/GW02 L1276537-07	12
MW-15/GW02 L1276537-08	13
MW-16/GW02 L1276537-09	14
DUP-1/GW02 L1276537-10	15
Qc: Quality Control Summary	16
Radiochemistry by Method 904	16
Radiochemistry by Method SM7500Ra B M	17
GI: Glossary of Terms	18
Al: Accreditations & Locations	19
Sc: Sample Chain of Custody	20

SDG: L1276537 DATE/TIME: 11/16/20 18:22

SA	MPLE S	SUMN	/IARY		ONE I	_AB. NATIONWIDE.
MW-2A/GW02 L1276537-01 Non-Potable Water			Collected by Jonathan Hermanson	Collected date/time 10/19/20 11:00	Received da 10/22/20 09	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
MW-3/GW02 L1276537-02 Non-Potable Water			Jonathan Hermanson	10/19/20 12:05	10/22/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
MW-4/GW02 L1276537-03 Non-Potable Water			Jonathan Hermanson	10/19/20 12:50	10/22/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
MW-8A/GW02 L1276537-04 Non-Potable Water			Jonathan Hermanson	10/19/20 08:50	10/22/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
MW-10/GW02 L1276537-05 Non-Potable Water			Jonathan Hermanson	10/19/20 09:55	10/22/20 09	:00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	ite/time
MW-13/GW02 L1276537-06 Non-Potable Water			Jonathan Hermanson	10/19/20 15:15	10/22/20 09	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

PROJECT: 62801 BPU Nearman

SDG: L1276537

DATE/TIME: 11/16/20 18:22 ¥

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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			Collected by	Collected date/time	Received da	te/time
MW-14/GW02 L1276537-07 Non-Potable Water			Jonathan Hermanson	10/19/20 17:15	10/22/20 09	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-15/GW02 L1276537-08 Non-Potable Water			Jonathan Hermanson	10/20/20 09:20	10/22/20 09:00	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-16/GW02 L1276537-09 Non-Potable Water			Jonathan Hermanson	10/19/20 16:15	10/22/20 09	:00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

		Collected by	Collected date/time	Received dat	e/time
		Jonathan Hermanson	10/19/20 00:00	10/22/20 09:	00
Batch	Dilution	Preparation	Analysis	Analyst	Location
		date/time	date/time		
WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
	WG1566757 WG1573322	WG1566757 1 WG1573322 1	Jonathan HermansonBatchDilutionWG15667571WG157332210/28/20 12:05WG15733221	Jonathan Hermanson 10/19/20 00:00 Batch Dilution Preparation date/time Analysis date/time WG1566757 1 10/28/20 12:05 11/06/20 14:10 WG1573322 1 11/09/20 09:50 11/10/20 16:10	Batch Dilution Preparation date/time Analysis date/time Analysis WG1566757 1 10/28/20 12:05 11/06/20 14:10 JMR WG1573322 1 11/09/20 09:50 11/10/20 16:10 RGT

WG1573322

1

11/09/20 09:50

11/10/20 16:10

RGT

Mt. Juliet, TN

Radiochemistry by Method SM7500Ra B M

SDG: L1276537 DATE/TIME: 11/16/20 18:22

CASE NARRATIVE

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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.

inde Cashmen

Linda Cashman Project Manager

SDG: L1276537 PAGE: 5 of 21

MW-2A/GW02

Collected date/time: 10/19/20 11:00

SAMPLE RESULTS - 01 L1276537

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-228	0.482	J	0.462	0.854	11/06/2020 14:10	WG1566757	
(T) Barium	104			62.0-143	11/06/2020 14:10	WG1566757	
(T) Yttrium	105			79.0-136	11/06/2020 14:10	WG1566757	

Radiochemistry by Method Calculation

Radiochemistry by	Method Calcı	ulation					
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	'
Analyte	pCi/l		+ / -	pCi/l	date / time		5
Combined Radium	0.727		0.717	1.19	11/10/2020 16:10	WG1573322	٢Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.244		0.255	0.336	11/10/2020 16:10	WG1573322
(T) Barium-133	98.3			30.0-143	11/10/2020 16:10	WG1573322

SAMPLE RESULTS - 02 L1276537

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.469	U	0.425	0.818	11/06/2020 14:10	WG1566757
(T) Barium	97.3			62.0-143	11/06/2020 14:10	WG1566757
(T) Yttrium	94.5			79.0-136	11/06/2020 14:10	WG1566757

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	0.118		0.158	0.229	11/10/2020 16:10	WG1573322	
(T) Barium-133	111			30.0-143	11/10/2020 16:10	WG1573322	

SAMPLE RESULTS - 03 L1276537

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	-0.808	U	0.642	1.22	11/06/2020 14:10	WG1566757
(T) Barium	98.5			62.0-143	11/06/2020 14:10	WG1566757
(T) Yttrium	99.6			79.0-136	11/06/2020 14:10	WG1566757

Radiochemistry by Method Calculation

Radiochemistry by	/ Method Calcı	ulation					
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	2.34		1.17	1.44	11/10/2020 16:10	WG1573322	ँSr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	2.34		0.530	0.219	11/10/2020 16:10	WG1573322	
(T) Barium-133	104			30.0-143	11/10/2020 16:10	WG1573322	

MW-8A/GW02

Collected date/time: 10/19/20 08:50

SAMPLE RESULTS - 04 L1276537

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Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-228	-0.305	U	0.625	1.18	11/06/2020 14:10	WG1566757	
(T) Barium	91.8			62.0-143	11/06/2020 14:10	WG1566757	
(T) Yttrium	110			79.0-136	11/06/2020 14:10	WG1566757	

Radiochemistry by Method Calculation

Radiochemistry by	Method Calcu	ulation					
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.919		1.01	1.53	11/10/2020 16:10	WG1573322	ຶSr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.919		0.388	0.35	11/10/2020 16:10	WG1573322	
(T) Barium-133	88.7			30.0-143	11/10/2020 16:10	<u>WG1573322</u>	

MW-10/GW02

Collected date/time: 10/19/20 09:55

SAMPLE RESULTS - 05 L1276537

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.13	J	0.645	1.18	11/06/2020 14:10	WG1566757
(T) Barium	98.4			62.0-143	11/06/2020 14:10	WG1566757
(T) Yttrium	102			79.0-136	11/06/2020 14:10	WG1566757

Radiochemistry by Method Calculation

Radiochemistry by	/ Method Calcı	ulation					
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	1.26		0.833	1.46	11/10/2020 16:10	WG1573322	ĩSi

	Result	Qualifier Unc	ertainty MDA	Analysis Date	Batch	
Analyte	pCi/l	+/-	pCi/l	date / time		
RADIUM-226	0.129	0.18	8 0.283	11/10/2020 16:10	WG1573322	
(T) Barium-133	84.2		30.0-143	11/10/2020 16:10	<u>WG1573322</u>	

SAMPLE RESULTS - 06 L1276537

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Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-228	2.75		0.575	1	11/06/2020 14:10	WG1566757	
(T) Barium	100			62.0-143	11/06/2020 14:10	WG1566757	
(T) Yttrium	97.8			79.0-136	11/06/2020 14:10	WG1566757	

Radiochemistry by Method Calculation

Radiochemistry by Method Calculation											
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch					
Analyte	pCi/l		+/-	pCi/l	date / time		5				
Combined Radium	3.19		0.861	1.33	11/10/2020 16:10	WG1573322					

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.434		0.286	0.332	11/10/2020 16:10	WG1573322	
(T) Barium-133	101			30.0-143	11/10/2020 16:10	WG1573322	

SAMPLE RESULTS - 07 L1276537

Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	1.39		0.538	0.971	11/06/2020 14:10	WG1566757
(T) Barium	99.1			62.0-143	11/06/2020 14:10	WG1566757
(T) Yttrium	106			79.0-136	11/06/2020 14:10	WG1566757
De alta also activitators las s						
Radiochemistry by I	viethod Calcu	llation				
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
Combined Radium	1.51		0.692	1.18	11/10/2020 16:10	WG1573322	

Radiochemistry by Method SM7500Ra B M

	Result	Qualifier Uno	certainty MDA	Analysis Date	Batch
Analyte	pCi/l	+/.	pCi/l	date / time	
RADIUM-226	0.124	0.15	54 0.212	11/10/2020 16:10	WG1573322
(T) Barium-133	91.0		30.0-143	11/10/2020 16:10	WG1573322

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MW-15/GW02

Collected date/time: 10/20/20 09:20

SAMPLE RESULTS - 08 L1276537

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-228	-0.428	U	0.603	1.14	11/06/2020 14:10	WG1566757	
(T) Barium	98.7			62.0-143	11/06/2020 14:10	<u>WG1566757</u>	
(T) Yttrium	106			79.0-136	11/06/2020 14:10	WG1566757	
		1					
Radiochemistry b	by Method Calcu	llation					
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch		
Analyte	pCi/l		+ / -	pCi/l	date / time		c	5
Combined Radium	0.234		0.845	1.45	11/10/2020 16:10	WG1573322		ଁSr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.234		0.242	0.309	11/10/2020 16:10	WG1573322	
(T) Barium-133	75.2			30.0-143	11/10/2020 16:10	WG1573322	

MW-16/GW02

Collected date/time: 10/19/20 16:15

SAMPLE RESULTS - 09 L1276537

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.957	J	0.562	1.03	11/06/2020 14:10	WG1566757
(T) Barium	95.7			62.0-143	11/06/2020 14:10	WG1566757
(T) Yttrium	102			79.0-136	11/06/2020 14:10	WG1566757
Radiochemistry b	y Method Calcu	lation				
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	01/1			<u></u>		

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
Combined Radium	2.49		1.16	1.46	11/10/2020 16:10	WG1573322	

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	1.54		0.596	0.429	11/10/2020 16:10	WG1573322	
(T) Barium-133	74.7			30.0-143	11/10/2020 16:10	WG1573322	

DUP-1/GW02 Collected date/time: 10/19/20 00:00

SAMPLE RESULTS - 10 L1276537

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Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	0.496	J	0.515	0.952	11/06/2020 14:10	WG1566757
(T) Barium	95.8			62.0-143	11/06/2020 14:10	WG1566757
(T) Yttrium	97.2			79.0-136	11/06/2020 14:10	WG1566757

Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l	<u>uuunnon</u>	+ / -	pCi/l	date / time		
RADIUM-226	0.392		0.293	0.297	11/10/2020 16:10	WG1573322	
(T) Barium-133	82.9			30.0-143	11/10/2020 16:10	WG1573322	

Radiochemistry by Method 904

QUALITY CONTROL SUMMARY L1276537-01,02,03,04,05,06,07,08,09,10

Method Blank (MB)

(MB) R3591810-1 11/0	5/20 09:45		
	MB Result	MB Qualifier	MB MDA
Analyte	pCi/l		pCi/l
Radium-228	-0.0192	<u>U</u>	0.449
(T) Barium	99.8		
(T) Yttrium	98.5		

L1276537-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1276537-02 11/0	06/20 14:10 • (DUP)	R3591810-5	11/05/20 09	9:45					
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit	
Analyte	pCi/l	pCi/l		%			%		
Radium-228	-0.469	0.268	1	200	0.878	U	20	3	
(T) Barium	97.3	88.9							
(T) Yttrium	94.5	98.7							

Laboratory Control Sample (LCS)

/05/20 09:45				
Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
pCi/l	pCi/l	%	%	
5.00	5.25	105	80.0-120	
		100		
		98.1		
	Spike Amount pCi/l	Spike Amount LCS Result pCi/l pCi/l	Spike Amount LCS Result LCS Rec. pCi/l pCi/l % 5.00 5.25 105 100 100 100	Spike Amount LCS Result LCS Rec. Rec. Limits pCi/l pCi/l % % 5.00 5.25 105 80.0-120 100 100 100 100 100

L1276537-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276537-01 11/06/20 14:10 • (MS) R3591810-3 11/05/20 09:45 • (MSD) R3591810-4 11/05/20 09:45													
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	10.0	0.482	10.9	13.3	104	128	1	70.0-130			19.9		20
(T) Barium		104			88.8	91.2							
(T) Yttrium		105			101	98.1							

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Kansas City Board of Public Utilities	62801 BPU Nearman	L1276537	11/16/20 18:22	16 of 21

Radiochemistry by Method SM7500Ra B M

QUALITY CONTROL SUMMARY L1276537-01,02,03,04,05,06,07,08,09,10

Method Blank (MB)

(MB) R3592737-1 11/1	0/20 16:10		
	MB Result	MB Qualifier	MB MDA
Analyte	pCi/l		pCi/l
Radium-226	-0.0141		0.114
(T) Barium-133	61.1		

L1282250-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1282250-01 11/	10/20 16:10 • (DUP) F	R3592737-5	11/10/20 16	:10				
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-226	0.266	0.153	1	54.2	0.361		20	3
(T) Barium-133	77.6	97.5						

Laboratory Control Sample (LCS)

(LCS) R3592737-2 11/	10/20 16:10				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	pCi/l	pCi/l	%	%	
Radium-226	5.02	5.71	114	80.0-120	
(T) Barium-133			77.8		

L1276537-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276537-01 11/10/2	0 16:10 • (MS) R3	3592737-3 11/10	0/20 16:10 • (N	ISD) R3592737	-4 11/10/20 16	:10							
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.1	0.244	24.1	21.0	119	103	1	75.0-125			13.5		20
(T) Barium-133		98.3			86.8	101							

DATE/TIME: 11/16/20 18:22

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GLOSSARY OF TERMS

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GI

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.

PROJECT: 62801 BPU Nearman SDG: L1276537 DATE/TIME: 11/16/20 18:22

PAGE: 18 of 21

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

State Accreditations

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia ¹	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
lowa	364
Kansas	E-10277
Kentucky ¹⁶	90010
Kentucky ²	16
Louisiana	AI30792
Louisiana ¹	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico 1	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee ¹⁴	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

Third Party Federal Accreditations

101.1 100.17005	4404.04		10.0700
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

Our Locations

Kansas City Board of Public Utilities

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



62801 BPU Nearman

L1276537



11/16/20 18:22

		al a	Billing Info	rmation:	P				Analysis	/ Contai	iner / Pres	ervative			Chain of Custody	Page of
Kansas City Board of Pu	blic Utilit	ies	300 N 65	en Bouse Sth Street Sity, KS 66102		Pres Chk	ir								Pace	Analytical [*] Inter for Testing & Innovat
Kansas City, KS 66102			L. Cas	and a second s		1	03									
Report to: Ingrid Setzler			Email To: isetzler@b	pu.com;kbrown@	bpu.com;bho	oye@b	NH P								12065 Lebanon Rd Mount Juliet, TN 37 Phone: 615-758-585	8 NOT THE
Project Description: groundwater		City/State Collected:			Please Ci PT MT C		E-Ad		1 2 2						Phone: 800-767-585 Fax: 615-758-5859	
Phone: 913-573-9806	Client Project 62801 BPU	#		Lab Project # KCKAN02-MV	N NEARM	AN	1L-HDPE-Add HNO3								sdg # 12- G1	76537 97
Collected by (print): Jandhon Hermonson	Site/Facility II)#		P.O. #			A228								Acctnum: KCK	
Jonathin Hummson collected by (signature):	and the state of the state of the			Quote # Date Results	s Needed		Rad, RA226, RA228							ari 2 Vic	Template: T15 Prelogin: P80 PM: 650 - Linda	3939
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MW-3 16402	bus	NPW		1019-20	1205	2	x	1.						No.es		02
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UN-BA GWOD	Grab	NPW	-	10-19-20	0850	2	X									04
AW-10/1000	Grab	NPW	a star	10-19-20	0955	2	X							- 2.4	1998	05
NW-13 6402	bras	NPW		10-19-20	1515	2	X							in the second	1	06
lowoz	Gents	NPW	-	10-19-20	175	2	X		17 523						an der die see al. Anter ander an en die see al.	07
AW-15/ GIVER	beab	NPW	-	10-20-20	0920	2	X									08
MW-16/6ND2	Grab	NPW	-	10-14-20	1615	2	X									09
DUP-1/ LWD2	bearb	NPW	-	10-19-20	1-4	2	X									w
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater DW Drinking Water	marks: Stando imples roturned		en acou	med	0.				pH Flov		_ Temp		COC S Bottl Corre	Seal Pr Signed/ Les arr ect bot	le Receipt Ch esent/Intact: Accurate: ive intact: tles used: volume sent:	
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Relinquished by : (Signature)		ate:	Time	e: Receiv	ed for lab by	(Signat	ure)		Date:	22	Time	900	Hold:			Condition: NCF / OK

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Kans _{its} City, KS 66102		1.54					6									
Report to: Ingrid Setzler			Email To: isetzler@b	opu.com;kbrowi	@bpu.com;bh	oye@b	EONH b								12065 Lebanon Rd Mount Juliet, TN 37 Phone: 615-758-58	122 11 11 12
Project Description: groundwater		City/State Collected:			Please C PT MT		PE-Ad							1.440	Phone: 800-767-58 Fax: 615-758-5859	
Phone: 913-573-9806	Client Project	t# J Nearman		Lab Project # KCKAN02-I	WW NEARM	AN	11-HDP							1.1	SDG # 12 Table #	76537
Collected by (print): Janathanflermonson	Site/Facility I	D#		P.O. #			RA228								Acctnum: KCk	AN02
collected by (signature):	Same [Lab MUST Be	Day	Quote #			RA226,R					<u>e</u>		12	Template: T15 Prelogin: P80	3939
mmediately Packed on Ice N X Y		ay5 Day ay10 Da Day			ults Needed	No. of	Rad,RA							1.2	PM: 650 - Lind PB:	
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	Tota F					1 De			Shipped Via: For Remarks	Sample # (lab only
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Relinquished by : (Signature)	D.	ate:	Time		eived for lab by	: (Signat	ure)		Da	te:	Time:	200	Hold:			Condition: NCF / OK



ANALYTICAL REPORT

Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description: L1294466 12/09/2020 KCBPU Nearman GW-Creek Bottom Ash Pond

Report To:

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

Entire Report Reviewed By:

Linde Cashman

Linda Cashman 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.

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1294466 DATE/TIME: 12/11/20 13:43

PAGE: 1 of 10

TABLE OF CONTENTS

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
MW-8A L1294466-01	5
Qc: Quality Control Summary	6
Metals (ICP) by Method 6010D	6
Metals (ICPMS) by Method 6020B	7
GI: Glossary of Terms	8
Al: Accreditations & Locations	9
Sc: Sample Chain of Custody	10

SDG: L1294466 DATE/TIME: 12/11/20 13:43 × ²Tc

Sc

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

*

³Ss

Qc

MW-8A L1294466-01 GW			Collected by Jonathan Hermanson	Collected date/time 12/08/20 15:00	Received dat 12/09/20 12:0	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Metals (ICP) by Method 6010D	WG1588986	1	12/09/20 18:14	12/09/20 23:02	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1588132	1	12/09/20 23:27	12/10/20 16:49	LD	Mt. Juliet, TN

SDG: L1294466

CASE NARRATIVE

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⁺Cn

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.

inde Cashman

Linda Cashman Project Manager

SDG: L1294466

G: 466

SAMPLE RESULTS - 01

*

Ss

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	0.0339		0.0100	1	12/09/2020 23:02	WG1588986

Metals (ICPMS) by Method 6020B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	0.0354		0.00200	1	12/10/2020 16:49	WG1588132

WG1588986

Metals (ICP) by Method 6010D

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R3601977-1 12/0	9/20 21:47			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Arsenic	U		0.00440	0.0100

Laboratory Control Sample (LCS)

(LCS) R3601977-2 12/09	9/20 21:49				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Arsenic	1.00	0.912	91.2	80.0-120	

L1293037-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1293037-04 12/09/2	20 21:52 • (MS)	R3601977-4 12	2/09/20 21:57 •	(MSD) R36019	77-5 12/09/20	21:59						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	1.00	ND	0.921	0.910	91.5	90.4	1	75.0-125			1.25	20

SDG: L1294466 DATE/TIME: 12/11/20 13:43

PAGE: 6 of 10

WG1588132

Metals (ICPMS) by Method 6020B

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R3602323-1 12/10	0/20 16:29			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Arsenic	U		0.000180	0.00200

Laboratory Control Sample (LCS)

(LCS) R3602323-2 12/10)/20 16:33				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Arsenic	0.0500	0.0497	99.3	80.0-120	

Qc

*

SDG: L1294466 DATE/TIME: 12/11/20 13:43

PAGE: 7 of 10

GLOSSARY OF TERMS

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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 resul 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 fo 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

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

PROJECT: KCBPU Nearman SDG: L1294466 DATE/TIME: 12/11/20 13:43

PAGE: 8 of 10

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

State Accreditations

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico ¹	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee ¹⁴	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	A21 A

Third Party Federal Accreditations

101.1 100.17005	4404.04		10.0700
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

Our Locations

Kansas City Board of Public Utilities

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



KCBPU Nearman

L1294466

PAGE: 9 of 10

12/11/20 13:43

Kansas City Board of Pul 300 N 65th Street	olic Utilit	ies	Billing Info 300 N 65 Kansas C			Pres Chk		2 010					eservative			_ Chain of Custody Race, Nettoral Ca	Page of Analytical* Inter for Testing & Innovation
Kansas City, KS 66102 Report to:			Email To;					6016								12065 Lebanon Rd	
ngrid Setzler		-	isetzler@bpu.com;kbrown@bpu.com;bhoye					IJ.								Mount Juliet, TN 37122 Phone: 615-758-5858	
Project Description: GW-Creek Bottom Ash Pond		City/State Collected:	Please PT MT				es	es.								Phone: 800-767-5859 Fax: 615-758-5859	
Phone: 913-573-9806 Client Project # KCBPU Nearman			Lab Project # KCKAN02-M	W NEARMAN2		125mlHDPE-NoPres	a Arsenia	NoPres					SDG # 1294466 C038				
Collected by (print): Jonethan Hismanson	Rush? (Lab MUST Be Notif W3 Same Day Five Day Next Day 5 Day (Rad		age d	P.O. #	P.O. #		INHDP	E-HNO							Acctnum: KCKAN02		
Collected by (signature):			Day (Rad Only)	Quote # Date Results Needed		d		Metals 250mlHDPE-HNO3	250miHDPE-							Template: T178887 Prelogin: P815232 PM: 650 - Linda Cashman	
Inimediately Packed on Ice N Y	Two Da	y 10 D Day	ay (Rad Only)	12-11-20		No. of	Sulfate	s.25	pH 2						PB:		
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Chtrs	CI, FI,	Metal	TDS, F		•					Shipped Via: Fe Remarks	Sample # (lab only)
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SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	^{marks:} R	arks: Rush - 1 Day Turr						A	pH Temp Flow Other			Corre	Sample Receipt Checklist COC Seal Present/Intact: /NP Y COC Signed/Accurate: /Y Bottles arrive intact:Y Correct bottles used:Y Sufficient volume sent:Y				
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Relinquished by : (Signature)	Date: Time			Time: Received by:(Signature					Trip Blank Received: Yes / No HCL / MeoH			Pres	Preservation Correct/Checked: ZY _N RAD Screen <0.5 mR/hr: ZY _N				
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Memorandum



Date:	December 18, 2020
То:	Brian Hoye
From:	Kortney Blaufuss
Re:	Quality Assurance/Quality Control (QA/QC) Review of Analytical Data Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas Nearman Creek Power Station Bottom Ash Pond – October 2020 <u>Project No. 88777</u>

Groundwater samples were collected for analysis of assessment monitoring parameters at the Nearman Creek Power Station Bottom Ash Pond at the Kansas City Board of Public Utilities (BPU) site in Kansas City, Kansas. These samples were collected October 19 through 20, 2020. All noted samples were submitted to Pace Analytical National Center for Testing & Innovation of Mount Juliet, Tennessee (Pace National) (formerly known as ESC Lab Sciences) for analysis by one or more of the following methods:

Parameters	Analytical Method
Metals	SW-846 6010D/6020B
Mercury	SW-846 7470A
Chloride, Fluoride, Sulfate	SW-846 9056A
Dissolved Solids	SM 2540 C-2011
pH	SW-846 9040C
Radium 226 and 228 ² (Combined)	SM 7500 Ra B M (radium-226)
	EPA 904.0 (radium-228)

Notes:

¹Metals performed by SW-846 6010D include barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lithium, and molybdenum. Metals performed by SW-846 6020B include antimony, arsenic, lead, selenium, and thallium. ²Project reporting requirements per the Sampling and Analysis Plan are for a combined radium-226/radium-228 concentration. These were measured separately, and the combined result was calculated and reported by the laboratory.

A Stage I data review was performed for Quality Assurance (QA)/Quality Control (QC) results in association with the samples collected to evaluate the results for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in the guidelines presented in *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI) (USEPA, 2017). Any data qualifiers added during the course of this review are presented on Table 1.

- 1. <u>Chain-of-Custody (COC)</u> The relinquished and received signatures, times, and dates on the COCs were present.
- 2. <u>Requested Analyses Completed</u> All analyses were completed as requested for the appropriate parameters for the October groundwater sampling event.
- 3. <u>Holding Times</u> The lab flagged all pH results for this sampling event with an "T8" to indicate the sample was received too close to the holding time expiration/past holding time for analysis. All reported pH results for these samples should be considered estimated (J). Note, the pH was also measured in the field and would provide a more accurate measurement as they are recorded on-site at the time of sample collection.

Memorandum (continued)



November 23, 2020 Page 2

With the above exception, all other samples were extracted and/or analyzed within their respective holding time.

- 4. <u>Sample Preservation</u> All samples were received by the laboratory below the recommended 2 to 6 degrees Celsius (°C) sample preservation temperature range. Because no samples were received frozen, all were considered viable.
- 5. <u>Laboratory Method Blanks</u> Method blanks were reviewed to determine the potential for sample cross contamination due to handling within the laboratory. With the following exceptions, no detections of target analytes were noted in the method blanks:
 - Radium-226 (-0.0141 pCi/L) was detected in the method blank in batch WG1573322. Because the radium-226 detection exhibited a negative result, it was considered non detect. No further actions or data qualifiers were necessary.
- 6. <u>Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)</u> The LCS contains a matrix similar to that of the sample that has been spiked with known concentrations of target analytes. The LCS is prepared and analyzed by the same method as the samples. As a measure of analytical accuracy, the results of the LCS are compared against the known analyte concentrations in the spike to determine the percent recovery (REC). The purpose of the LCS is to determine the performance of the laboratory with respect to analyte recovery, independent of field sample matrix interference. For some methods, the lab performed a LCSD. The results between the LCS and LCSD were compared with each other for reproducibility using the relative percent difference (RPD). All LCS/LCSD RECs and/or RPDs were within their respective QC limits.
- 7. <u>Matrix Spike/Matrix Spike Duplicates (MS/MSD)</u> MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the RPD. They are also compared against the unspiked portion of the sample for REC of the spike. Qualification is typically limited to the spiked sample for any MS/MSD issues, unless otherwise noted. Site-specific MS/MSDs were collected during each sampling event. The following summarizes these site-specific MS/MSD analyses:
 - MW-2A/GW02: The sulfate concentrations exceeded the upper calibration range of the instrument, and were flagged "E" by the laboratory to indicate this. No conclusion could be made regarding the accuracy of this MS/MSD. Analytical assessment was made by the associated LCS results, and no qualifiers were added based on this MS/MSD.

Additionally, on this same parent sample, the spike amount for calcium was less than onefourth the sample concentration for MW-2A/GW02. The lab flagged these results "V" to indicate this. No conclusion could be made regarding the accuracy of this MS/MSD. Analytical assessment was made by the associated LCS results, and no qualifiers were added based on this MS/MSD.

Memorandum (continued)



November 23, 2020 Page 3

• MW-16/GW02: The spike amount for calcium was less than one-fourth the sample concentration for the noted spike parent sample. The lab flagged these results "V" to indicate this. No conclusion could be made regarding the accuracy of this MS/MSD. Analytical assessment was made by the associated LCS results, and no qualifiers were added based on this MS/MSD.

All other site-specific MS/MSD results were within control limits.

- 8. <u>Laboratory Duplicate Results</u> For some methods, laboratory duplicate analyses were performed. Laboratory duplicates provide information on the ability to reproduce lab results and to account for error introduced from handling, shipping, storage, preparation, and lab analysis. All project-specific laboratory duplicate results were within control limits, except the following:
 - MW-2A/GW02: The sulfate concentrations for the laboratory duplicates exceeded the upper calibration range of the instrument ("E" qualifier). The laboratory duplicate RPD between these two samples was within the QC limits, and no further review was necessary.
- 9. <u>Field Duplicate Results</u> Field duplicate results provide information on the ability to reproduce field results and account for error introduced from handling, shipping, storage, preparation, and analysis of field samples. There are no specific USEPA criteria for qualifying data from field duplicate results. Depending upon the sample concentration, one of the following criteria based upon NFGI is applicable:
 - Is the compound detected in both portions?
 - If the sample concentrations are greater than 5 times the detection limit, then the maximum allowable RPD is 20 percent for water samples.
 - If the sample concentrations are less than 5 times the detection limit, then a sensitivity test is applied. For the sensitivity test, the sample concentrations must agree within ± the lower detection limit for water samples.
 - If the radium results are reported above their minimum detectable concentration (MDC), the normalized difference (also called the relative error ratio) between the duplicate pair was calculated. The maximum normalized difference is 1.96 for the radium samples.

One field duplicate pair was collected for the October 2020 sampling event. Table 2 presents the side-by-side comparison of the field duplicate results. Although some elevated RPDs were noted, qualifiers are not typically added based on the field duplicate review unless significant issues were noted. The higher of the two concentrations are considered more viable for use in reporting.

10. <u>Detection and Quantitation Limits</u> – In one or more samples the sulfate analysis required a dilution to account for high concentrations and/or matrix interferences. Qualifiers were not necessary based

Memorandum (continued)



November 23, 2020 Page 4

on these dilutions.

11. <u>Conclusion</u> – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid, as qualified, for use in reporting the results of this investigation.

Attachments

Table 1: Data QualifiersTable 2: Field Duplicate Results - Detections Only

Table 1Data QualifiersKansas City Board of Public Utilities (BPU) - Kansas City, KansasNearman Creek Power Station Bottom Ash Pond – October 2020

Sample Identification	Laboratory Number	Parameter(s)	Data Qualifier	Reason for Qualification
All Samples in SDG L1276512		pН	J	Holding time exceeded (see text)

Notes:

J - Estimated Value

QC - Quality Control

SDG - Sample Delivery Group

Table 2

Field Duplicate Results - Detections Only Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas Nearman Creek Power Station Bottom Ash Pond – October 2020

	Sample Identification: Date Sampled: SDG(s):	MW-2A/GW02 10/19/2020 L1276512-01 L1276537-01 (radium)	DUP-1/GW02 10/19/2020 L1276512-10 L1276537-10 (radium)	Meets QC Criteria
Parameter	Unit	Result	Result	
Arsenic	mg/l	0.00289	0.00475	Yes
Barium	mg/l	0.171	0.116	RPD 38%
Boron	mg/l	0.221	1.2	RPD 137%
Calcium	mg/l	168	170	Yes
Chloride	mg/l	12.7	12.1	Yes
Dissolved Solids	mg/l	622	736	Yes
Fluoride	mg/l	0.234	0.168	Yes
Lithium	mg/l	0.0302	0.0412	Yes
Sulfate	mg/l	113	144	RPD 24%
Combined Radium (including +/- uncertainty)	pCi/l	0.727 (+/- 0.717)	0.888 (+/- 0.808)	Yes

Notes:

mg/l - milligrams per liter

pCi/l - picoCuries per liter

QC - Quality Control

RPD - relative percent difference

SDG - Sample Delivery Group

su - standard unit





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