



# 2020 Annual Groundwater Monitoring and Corrective Action Report

For the  
Federal Coal Combustion Residuals Rule

Wilson Phase II Landfill  
D.B Wilson Generating Station  
Ohio County, Kentucky

Prepared for:



Big Rivers Electric Corporation  
D.B. Wilson Generating Station  
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## Executive Summary

This report summarizes groundwater monitoring and corrective action activities completed between January 1 and December 31, 2020 at the Big Rivers Electric Corporation (BREC) Wilson Phase II Landfill (the Unit) as required by 40 CFR 257.90(e) of the United States Environmental Protection Agency (USEPA) coal combustion residuals (CCR) Rule. A site figure presenting the location of the Unit is presented as **Figure 1**. The program monitoring networks for the Unit, including supporting monitoring wells are illustrated on **Figure 2**. No monitoring wells were installed, modified or abandoned during the reporting period.

Results of baseline groundwater monitoring performed in 2016 and 2017 indicated that the Unit would require initiation of Assessment monitoring under the CCR Rule, as most of the Appendix III constituents, excluding fluoride and pH, have downgradient statistically significant increases (SSIs) over background. On February 5, 2018, BREC posted a formal notification that the Unit would transition from Baseline Detection to an Assessment monitoring program.

Groundwater analytical data collected during Assessment monitoring at the Unit indicated that Appendix IV constituents were detected in downgradient monitoring wells at SSIs over background. Per CCR Rule requirements, groundwater protection standards (GWPSs) for each Appendix IV constituent were developed and the data were tested for whether the concentrations represented statistically significant levels (SSLs) above their respective GWPSs. SSLs identified in the current annual reporting period are as follows:

- Cobalt: MW-5, MW-6, and MW-10
- Lithium: MW-6

On January 14, 2019, BREC posted a formal notification that the Wilson Phase II Landfill would initiate an Assessment of Corrective Measures (ACM) per 40 CFR § 257.95(g)(5), fulfilling the requirement of 40 CFR § 257.107(h)(7). In June 2019 BREC finalized the ACM in which applicable remedial technologies to address cobalt impacts in groundwater were identified pursuant to Title 40 CFR Section 257.96. A report summarizing the results of the ACM (AECOM, June 2019) was posted to BREC's publicly accessible CCR reporting website on July 10, 2019.

A public meeting has not been held to date to discuss the results of the ACM for the Wilson Phase II Landfill. BREC is working to establish a comprehensive list of data collection needs to proceed forward with remedy evaluation for this unit and anticipates providing additional data in future semi-annual remedy selection progress reports.

Other activities and conditions for the 2020 annual reporting period include:

- Semi-annual Assessment groundwater monitoring events were performed in April and October 2020;
- No monitoring well installation, repair, or decommissioning was performed; and
- No program transitions (Detection to Assessment or vice versa) were triggered.

Anticipated activities for the next annual reporting period include:

- Completion of two semi-annual Assessment groundwater monitoring events;
- Progress towards selection of a remedy for the Unit.

## 1. Introduction

At the request of Big Rivers Electric Corporation (BREC), AECOM Technical Services, Inc. (AECOM) prepared this 2020 Annual Groundwater Monitoring and Corrective Action Report for the BREC D.B. Wilson Phase II Landfill (the Unit), located in Ohio County, Kentucky. This report was prepared in accordance with Part 257.90, Sub-Part (e) of the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule. The CCR Rule was established to regulate the disposal of CCR produced by electricity generating facilities (USEPA, 2015).

This report summarizes all activities related to the CCR Rule groundwater monitoring program at the Unit in 2020. The following sections present a site background summary, a discussion of field activities performed, a summary of laboratory results, statistical evaluation findings, and conclusions regarding groundwater conditions in the aquifer system subject to monitoring under the CCR Rule.

As stated in previous Annual Groundwater Monitoring and Corrective Action Reports, statistical results of the Baseline groundwater data indicated that the Unit required initiation of Assessment monitoring under the CCR Rule, as most of the Appendix III constituents, excluding fluoride and pH, reported statistically significant increases (SSIs) over background. On February 5, 2018, BREC posted a formal notification that the Unit would enter into an Assessment Monitoring Program, fulfilling the requirement of 40 Code of Federal Regulations (CFR) § 257.107(h)(4).

### 1.1 Site Description

The Wilson Phase II Landfill is located in Ohio County approximately 5 miles northwest of the town of Centertown, Kentucky (**Figure 1**). The property is located northwest and adjacent to the D.B. Wilson Generating Station (Wilson Station). The current Wilson Phase II Landfill footprint is approximately 92 acres (**Figure 2**). Adjacent to the Phase II Landfill on the east is the Wilson Station Phase I Landfill, which is currently being regulated by Special Waste permit by the Kentucky Department for Environmental Protection, Division of Waste Management (KDMW) under Title 401 of the Kentucky Administrative Regulations (KAR) Section 45.

The Wilson Phase II Landfill is currently active and raised above adjacent ground to a maximum elevation of approximately 520 feet above mean sea level (AMSL). The original ground surface within the landfill footprint was an irregular post-mining reclaimed surface.

### 1.2 Program Monitoring Well Systems

#### 1.2.1 Operating Permit Monitoring Wells

Prior to implementation of the CCR Rule, a groundwater monitoring well network was already present at the Unit in compliance with the requirements of the facility's operating permit. The existing wells are located along the perimeter of the permitted footprint for the Wilson Phase II Landfill and meet the CCR Rule requirements that downgradient monitoring wells must be located at the waste boundary of the (active) CCR unit, or as close as practical.

Under the requirements stated in the operating permit, five (5) monitoring wells (MW-5, MW-6, MW-7, MW-8 and MW-10) were installed adjacent to the Wilson Phase II CCR Landfill to determine the general direction of groundwater movement and to monitoring groundwater at the site. MW-8 is located north of the landfill and is considered upgradient. MW-5, MW-6 (both west of the landfill), MW-7 (southwest of the landfill) and MW-10 (south of the landfill) are considered as downgradient. As-built specifics of each well installation are summarized on **Table 1**. The locations of the groundwater monitoring wells are shown on **Figure 2**. Each well has a dedicated bladder pump and tubing system installed for sampling purposes.

As stated in the CCR monitoring well network certification, the stratigraphic interval considered as the most prominent water-transmitting zone within and adjacent to the Wilson Station is material identified as

reclaimed surface mining spoil material comprised of disrupted consolidated sandstone and shale of the Carbondale Formation. The United States Geological Survey (USGS) Geologic Map of the Equality Quadrangle describes underlying bedrock as “Sandstone, siltstone, shale, coal and underclay: Sandstone, light- to medium-gray, fine-grained, massive, micaceous, locally grades into thin-bedded siltstone. Siltstone, light- to medium-gray and yellowish-brown.” For purposes of compliance with the CCR Rule groundwater monitoring requirements, this disrupted sequence comprising the unconsolidated mine spoil is considered the uppermost aquifer underlying the Wilson Phase II Landfill.

Details about the monitoring network are presented in the *Monitoring Well Completion Report, D.B. Wilson Special Waste Landfill, Solid Waste Permit Number 092-00004, Ohio County, Kentucky* (Associated Engineers, Inc., April 13, 2009). **No changes were made to the Program Monitoring Well System in 2020.** Monitoring wells MW-1, MW-2, MW-3, MW-4, P-9, and P-11 are included in the CCR program as “water level only” monitoring points.

## 1.2.2 Characterization Monitoring Wells

To address the requirements of 40 CFR § 257.95(g)(1), five (5) Characterization monitoring wells (MW-102, MW-104, MW-105, MW-110, and MW-4D) were installed in October 2018 for the characterization of groundwater at locations indicated on **Figure 2**. As-built specifics of each well installation are summarized on **Table 1**.

The Characterization monitoring wells, located at projected downgradient positions east, southeast, south, and southwest of the Unit, were used to assist in the characterization of the existence, quality, quantity, areal extent, and depth of groundwater degradation, and the rate and direction of migration of CCR contaminants in the groundwater.

## 2. 2020 Activities Summary

The following subsections describe the activities that were performed in 2020 for the Wilson Phase II Landfill related to the CCR Groundwater Monitoring Network.

### 2.1 Groundwater Sampling

Two groundwater sampling events were conducted at Wilson Phase II Landfill in 2020, fulfilling the sampling requirements for Assessment monitoring and Characterization. The following table summarizes the dates of the sampling events and the wells included in each event.

Event Type	Sampling Event	Dates	Wells Sampled
Assessment	14	April 22, 2020	Background (Upgradient) MW-8 Downgradient MW-5, MW-6, MW-7. MW-10
Characterization	3	April 22-23, 2020	Characterization Wells MW-4D, MW-102, MW-104, MW-105, MW110
Assessment	15	October 13, 2020	Background (Upgradient) MW-8 Downgradient MW-5, MW-6, MW-7. MW-10
Characterization	4	October 13,2020	Characterization Wells MW-4D, MW-102, MW-104, MW-105, MW110

Monitoring wells were sampled following low flow sampling techniques developed and incorporated into current operating permits, which are maintained within the operating record at Wilson Station.

Groundwater sampling activities were performed by BREC personnel in April and October 2020. Groundwater samples collected during the April and October 2020 sampling events were submitted to Pace Analytical Services, LLC in Madisonville, Kentucky and were analyzed for Appendix III and Appendix IV parameters, in accordance with 40 CFR § 257.95(b). No filtration of samples was conducted in either the field or laboratory procedures. Laboratory analyses were performed in accordance with approved USEPA methods.

### 2.2 Groundwater Assessment Plan

The Wilson Phase I Landfill and the Wilson Phase II Landfill are regulated under separate regulatory programs. As a result, groundwater data for each unit is evaluated under separate procedures; under 401 KAR 45:160 for Phase I and under 40 CFR 257 for Phase II.

In February 2020 BREC submitted a Groundwater Assessment Plan (GWAP) to KDWM to perform additional assessment of groundwater impacts at the Wilson Phase I Landfill in accordance with the requirements of 401 KAR 45:160. In December 2020 BREC received comments from KDWM on the GWAP. BREC is currently working to address KDWM's comments so that additional assessment of site-wide groundwater impacts can move forward in 2021.

## 3. Data Evaluation

### 3.1 Groundwater Flow

Groundwater level data collected during the 2020 monitoring events are summarized on **Table 2**. The data collected during October 2020 were used to construct a piezometric surface map to illustrate groundwater flow conditions for the uppermost aquifer (see **Figure 3**). These data are representative of general conditions at the Unit.

Overall groundwater flow beneath the footprint of the Wilson Phase II Landfill is to the south and southeast. Groundwater flow beneath the Landfill is influenced by extensive strip-mining and the physical extent of mine spoil deposits. These mine spoil deposits are laterally limited by the remaining bedrock high-walls left undisturbed south of the north side of State Route 85 and beyond (west of) the western edge of the Wilson Phase II Landfill.

### 3.2 Sampling Results

During 2020 a total of two (2) Assessment monitoring and Characterization sampling events were completed. Results from these sampling events are summarized on the tables included in **Appendix A**. Complete analytical laboratory reports are included in **Appendix B**.

### 3.3 Statistical Evaluation

As part of previous Assessment monitoring performed at the Unit, background and downgradient wells for the Phase II Landfill were sampled for Appendix IV constituents from 2018 through 2019. In accordance with 40 CFR § 257.95, groundwater protection standards (GWPS) were established for detected Appendix IV constituents. Previous Assessment monitoring results indicate the presence of Appendix IV constituents at Statistically Significant Levels (SSL) above their respective GWPSs in the following monitoring wells:

- MW-6: lithium
- MW-10: cobalt.

In accordance with 40 CFR § 257.93(f), 40 CFR § 257.93(h), and 40 CFR § 257.95(d)(2), statistical evaluation of the Assessment groundwater data collected to date was conducted as part of developing this summary report. The evaluation was conducted to identify any SSIs over baseline concentrations for the Appendix III and Appendix IV parameters and any SSLs over established GWPS for detected Appendix IV parameters. A summary of the 2020 statistical evaluation conducted on the Appendix III and Assessment Appendix IV parameters is provided as **Appendix C**.

Statistical methods were chosen in accordance with 40 CFR § 257.93(f) and the rationale behind why each method was selected is outlined in Statistical Methods Certification Document dated June 28, 2016. The Appendix III groundwater quality data were evaluated using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at a background monitoring well. For the Unit, monitoring well MW-8 is designated as the background well because it is located upgradient, whereas monitoring wells MW-5, MW-6, MW-7, and MW-10 are designated as compliance wells because they are located downgradient.

The statistical analysis results indicate that the following Appendix III constituents have SSIs over background (see **Appendix C; Table C3**):

- MW-5: boron, calcium, chloride, sulfate, and total dissolved solids (TDS);
- MW-6: boron, calcium, chloride, sulfate, and TDS;



- MW-7: boron, calcium, chloride, pH (field), and TDS; and
- MW-10: boron, calcium, chloride, and TDS.

Fluoride did not have any verified SSIs over background. Based on these results, Assessment monitoring is required to continue at the Unit on a semi-annual basis.

The statistical analysis results also indicate that the following Appendix IV constituents have SSIs over background (see **Appendix C; Table C4**):

- MW-5: cobalt and lithium;
- MW-6: cobalt, lead, and lithium;
- MW-7: chromium, cobalt, lead, and lithium; and
- MW-10: cobalt.

These constituents were further evaluated to determine whether they are present at SSLs over the GWPS by calculating the lower confidence limit (LCL) at 95% confidence for each well and constituent using all of the Baseline, Detection, and Assessment monitoring results collected to date. For a constituent to be present at an SSL over the GWPS, its LCL must be greater than the GWPS.

Analytical data were reviewed for consistency with historic data prior to any statistical evaluation. Background data were checked for high or low outliers that were removed following EPA (1989) procedures prior to statistical analysis. Outliers include some previous values with elevated detection limits. In addition, issues were noted with the October 2020 analytical data for MW-8, as the cobalt result (15 µg/L) exceeded the GWPS and was an order of magnitude higher than the 14 previous background measurements. Upon discussing this result with BREC it was determined that during the October 2020 sampling event difficulties were encountered with the submersible pump utilized to perform the low-flow sampling, resulting in higher than normal turbidity during sample collection, which likely biased the MW-8 sample and would have skewed the GWPS, leading to false negative SSL results for the downgradient wells. For this reason, the October 2020 result for MW-8 has been excluded from statistical analysis.

**Appendix C, Table C5** provides a summary of the LCLs and GWPS for cobalt and lithium at monitoring wells MW-5, MW-6, MW-7, and MW-10. The results indicate that cobalt at monitoring wells MW-5, MW-6, and MW-10 and lithium at monitoring well MW-6 are present at SSLs above the GWPS. The LCLs for the remaining wells and constituents are equal to or less than the GWPS and thus are not considered SSLs.

On December 6, 2018, BREC posted a formal notification that one or more constituent in Appendix IV has been detected at SSLs above the established GWPS as required by 40 CFR Part 257.107(h)(6).

### 3.4 Conclusions

Based upon the statistical evaluation of Appendix III and Appendix IV parameters collected during Assessment Monitoring at the Wilson Phase II Landfill, BREC will continue Assessment Monitoring in 2021.

## **4. 2021 Planned Activities**

### **4.1 Groundwater Monitoring**

Continued Semi-Annual Assessment monitoring of all operating permit monitoring wells for the Unit is planned for 2021.

### **4.2 Remedy Selection**

As required by 40 CFR Section 257.97, BREC is in the process of selecting a remedy for groundwater impacts at the Unit.

Currently BREC considers four (4) potential corrective action alternatives as viable options to address groundwater impacts at the Unit. To evaluate each alternative, additional data collection will likely be required. BREC is currently evaluating data collection needs in the following areas to assist with remedy selection:

- 1) Nature and Extent of impact – groundwater trends, influence of non-groundwater remedies, etc.
- 2) Physical Characteristics – available data on the physical characteristics of the landfill and the groundwater environment
- 3) Performance Modeling – data needed to develop digital models demonstrating the effectiveness of potential alternatives
- 4) Engineering – feasibility, cost estimates, etc.

BREC is working to establish a comprehensive list of data collection needs to proceed forward with remedy evaluation and anticipates providing additional data in future semi-annual remedy selection progress reports.

The 2021 groundwater monitoring program will continue to assist in evaluating the success of the non-groundwater release remedies implemented in 2019 and will further provide relevant and important information to be considered in the final groundwater remedy selection.

## 5. References

AECOM, 2018. Annual Groundwater Monitoring and Corrective Action Report, 2016-2017; D.B. Wilson CCR Landfill, Ohio County, Kentucky.

AECOM, 2019. Annual Groundwater Monitoring and Corrective Action Report, 2018; D.B. Wilson CCR Landfill, Ohio County, Kentucky.

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Goudarzi, G.H., Geologic Map of the Equality Quadrangle, Western Kentucky, U.S. Geological Survey, 1969.

USEPA, 40 CFR Part 257. [EPA-HQ-RCRA-2015-0331; FRL-9928-44-OSWER]. RIN-2050-AE81. Technical Amendments to the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities—Correction of the Effective Date. Federal Register / Vol. 80, No. 127 / Thursday, July 2, 2015 / Rules and Regulations.

USEPA, 40 CFR Part 257. [EPA-HQ-OLEM-2017-0286; FRL-9973-31-OLEM]. RIN-2050-AG88. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Amendments to the National Minimum Criteria (Phase One); Proposed Rule. Federal Register / Vol. 83, No. 51 / Thursday, March 15, 2018 / Proposed Rules.

## Tables

**TABLE 1**  
**MONITORING WELL SYSTEM SUMMARY OF MONITORING WELL CONSTRUCTION**  
**WILSON PHASE II LANDFILL**  
**BIG RIVERS ELECTRIC CORPORATION - WILSON STATION**  
**OHIO COUNTY, KENTUCKY**

Well No.		Location*		Reference Elevation*		Casing Length (feet, TOIC)	Size / Type (ID / Material)	Filter Pack Interval (feet, NAD27)		Screened Interval (feet, NAD27)		Bottom of Boring (feet, GS)
		Lat	Long	TOIC (feet, NAD27)	GS (feet, NAD27)			Top	Bottom	Top	Bottom	
<b>Operating Permit Monitoring Wells</b>												
MW-5 (8005-3477)	D	37.4638	-87.0910	469.14	467.42	75.0	2 inch / PVC	404.92	391.42	402.92	392.92	76
MW-6 (8005-3476)	D	37.4614	-87.0910	433.06	431.12	53.5	2 inch / PVC	390.42	377.12	388.12	378.12	54
MW-7 (8005-3479)	D	37.4584	-87.0913	426.14	424.08	50.0	2 inch / PVC	386.58	373.18	384.58	374.58	50.9
MW-8 (8005-3475)	U / B	37.4682	-87.0883	471.60	470.01	63.5	2 inch / PVC	419.53	405.96	417.05	407.05	64.05
MW-10 (8005-3478)	D	37.4544	-87.0902	398.91	396.91	22.4	2 inch / PVC	387.16	373.83	384.99	374.99	23.08
<b>Characterization Wells</b>												
MW-4D (8007-4811)	D / C	37.4542	-87.0851	410.02	407.03	96.4	2 inch / PVC	326.03	313.03	324.03	314.03	111
MW-102 (8007-2995)	D / C	37.4613	-87.0757	399.71	396.46	39.3	2 inch / PVC	372.46	360.46	370.46	360.46	36
MW-104 (8007-2994)	D / C	37.4517	-87.0826	392.87	389.76	43.4	2 inch / PVC	361.76	349.26	359.76	349.76	40
MW-105 (8007-2992)	D / C	37.4516	-87.0973	396.74	393.56	63.3	2 inch / PVC	366.56	333.56	343.56	333.56	60
MW-110 (8007-2996)	D / C	37.4521	-87.0907	393.54	390.56	42.8	2 inch / PVC	362.56	350.56	360.56	350.56	76 / 40
<b>Water Levels Only</b>												
P-9 (8005-3480)	water level only	37.4622	-87.0867	432.37	429.19	38.7	2 inch / PVC	402.99	389.99	400.99	390.99	39.2
P-11 (8005-3472)	water level only	37.4593	-87.0872	446.55	444.03	68.6	2 inch / PVC	388.43	374.90	385.93	375.93	69.13
MW-1 (8002-9621)	water level only	37.4667	-87.0852	443.89	442.31	36.3	4 inch / PVC	419.6	407.6	417.6	407.6	36
MW-2 (8002-9622)	water level only	37.4618	-87.0820	417.11	414.60	36.0	4 inch / PVC	393.3	381.1	391.1	381.1	36
MW-3 (8002-9623)	water level only	37.4576	-87.0845	411.12	408.19	36.2	4 inch / PVC	387.2	374.9	384.9	374.9	36
MW-4 (8002-9624)	water level only	37.4546	-87.0850	408.82	406.55	31.3	4 inch / PVC	389.6	377.5	387.5	377.5	31

Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky June 2015 and November 2018

Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum

PVC = Polyvinyl chloride

ID = Internal Diameter

TOIC = Top of internal casing, or measured from (below) TOIC

GS = Ground Surface, or measured from (below) GS

U / B = Upgradient / Background

D = Downgradient

C = Characterization

**TABLE 2**  
**MONITORING WELL NETWORK GROUNDWATER ELEVATIONS**  
**WILSON PHASE II CCR LANDFILL**  
**BIG RIVERS ELECTRIC CORPORATION - WILSON STATION**  
**OHIO COUNTY, KENTUCKY**

<b>WILSON PHASE II CCR LANDFILL</b>										
<b>OPERATING PERMIT GROUNDWATER MONITORING WELLS</b>										
<b>Reference Elevation TOIC*(ft, NAD27)</b>	<b>MW-5</b>		<b>MW-6</b>		<b>MW-7</b>		<b>MW-8</b>		<b>MW-10</b>	
	Downgradient 469.14		Downgradient 433.06		Downgradient 426.14		Upgradient/Background 471.60		Downgradient 398.91	
<b>Date Measured</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>
4/22/2020	54.98	414.16	40.65	392.41	37.64	388.50	43.68	427.92	10.95	387.96
10/28/2020	57.71	411.43	42.59	390.47	39.98	386.16	45.53	426.07	13.33	385.58

<b>CHARACTERIZATION GROUNDWATER MONITORING WELLS</b>										
<b>Reference Elevation TOIC*(ft, NAD27)</b>	<b>MW-4D</b>		<b>MW-102</b>		<b>MW-104</b>		<b>MW-105</b>		<b>MW-110</b>	
	Characterization 410.02		Characterization 399.71		Characterization 392.87		Characterization 396.74		Characterization 393.54	
<b>Date Measured</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>
4/22/2020	21.72	388.30	10.79	388.92	6.29	386.58	6.24	390.50	7.19	386.35
10/28/2020	23.98	386.04	11.58	388.13	6.94	385.93	6.27	390.47	8.93	384.61

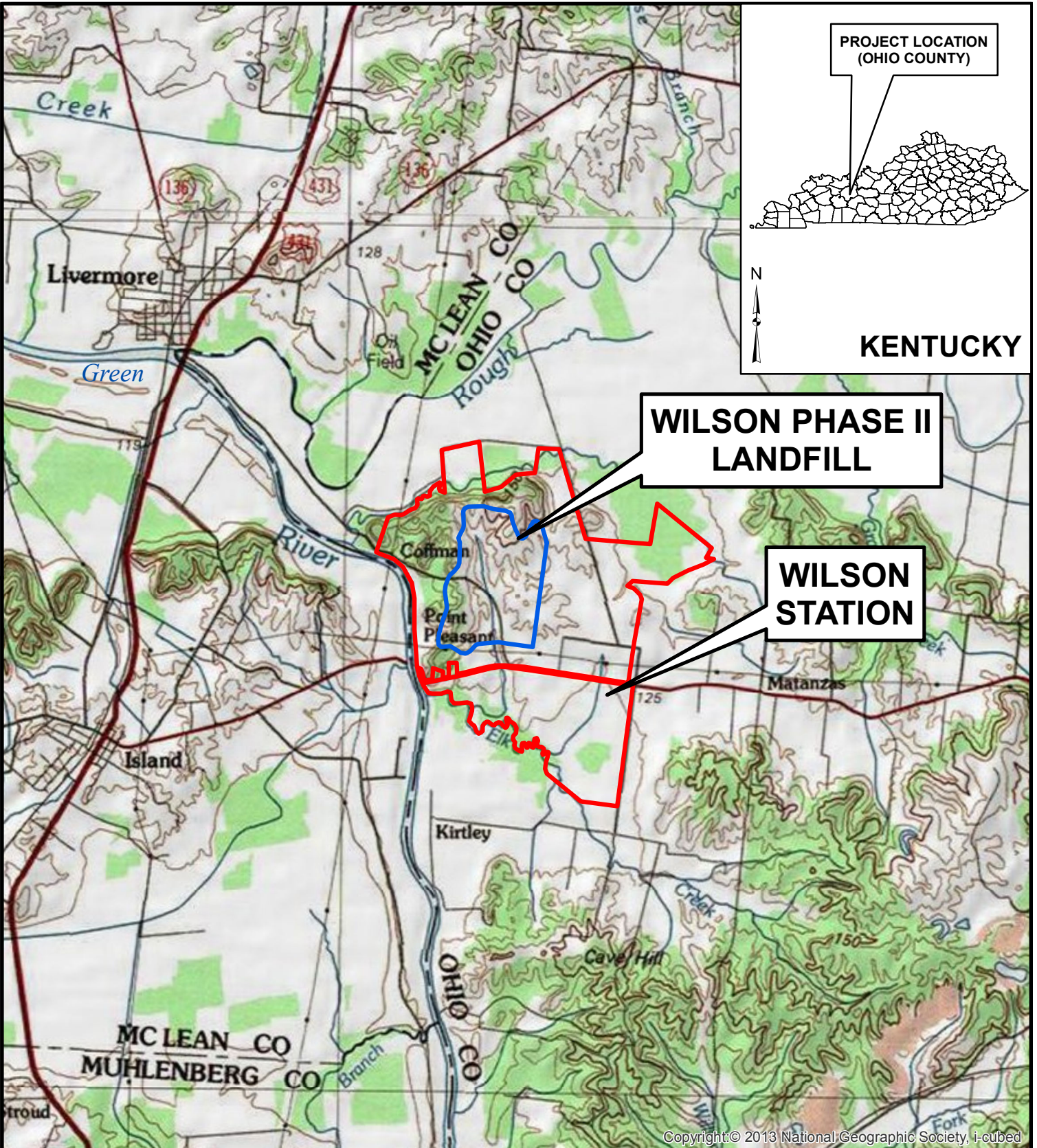
TABLE 2 (continued)  
**GROUNDWATER ELEVATIONS**  
**SUPPLEMENTAL WATER LEVEL ONLY MONITORING POINTS**  
**BIG RIVERS ELECTRIC CORPORATION - WILSON STATION**  
**OHIO COUNTY, KENTUCKY**

Reference Elevation TOIC*(ft, NAD27)	SUPPLEMENTAL WATER LEVEL ONLY MONITORING POINTS								PEIZOMETERS			
	MW-1		MW-2		MW-3		MW-4		North (P9)		South (P11)	
	Water Level Only 443.89		Water Level Only 417.11		Water Level Only 411.12		Water Level Only 408.82		Water Level Only 432.37		Water Level Only 446.55	
Date Measured	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)
4/22/2019	19.58	424.31	17.07	400.04	22.59	388.53	20.58	388.24	24.33	408.04	58.10	388.45
10/28/2020	19.47	424.42	18.51	398.6	24.59	386.53	22.78	386.04	24.51	407.86	60.50	386.05

Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky June 2015  
 Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum  
 TOIC = Top of internal casing  
 GW = Groundwater; GS = Ground Surface; NM = Not measured

## Figures





UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

EQUALITY QUADRANGLE  
(<https://viewer.nationalmap.gov/basic/>)

0 3,000 6,000  
Feet



*Wilson Station  
Ohio County, Kentucky*

FIGURE 1  
SITE LOCATION MAP

DATE: 5/21/2019

SCALE: 1IN = 1,500 FEET

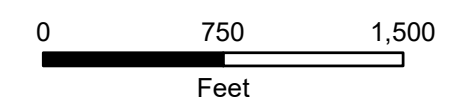
CREATED BY: ALW

JOB NO. 60602363



**Legend**

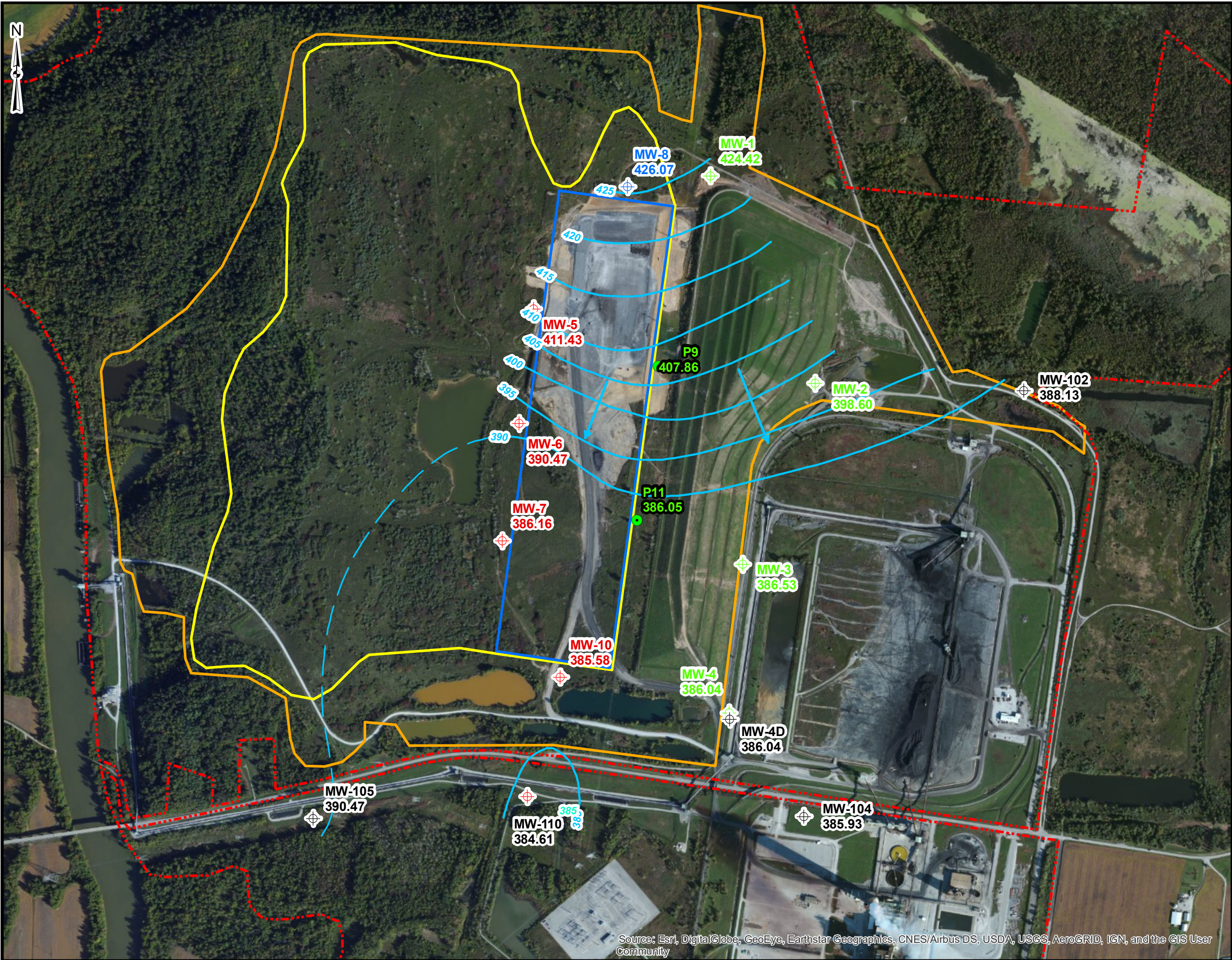
- Property Boundary
- CCR Phase 2 Fill
- Bond Increment
- KAR Permit Area
- Downgradient CCR Monitoring Well Location
- Upgradient CCR Monitoring Well Location
- Characterization Monitoring Well Location
- Monitoring Well Location (Water Level Only)
- Piezometer Location (Water Level Only)



Wilson Station Landfill  
Ohio County, Kentucky

FIGURE 2  
WELL LOCATION MAP

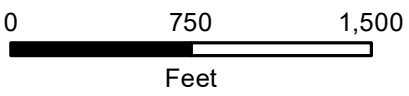
DATE: 12/9/2019	SCALE: 1IN = 750 FEET
CREATED BY: ALW	
JOB NO. 60579935	



**Legend**

- Downgradient CCR Monitoring Well Location
- Upgradient CCR Monitoring Well Location
- Characterization Monitoring Well Location
- Piezometer Location (Water Level Only)
- Monitoring Well Location (Water Level Only)
- Property Boundary
- Bond Increment
- CCR Phase 2 Fill
- KAR Permit Area
- Water Table Contour (Inferred from Available Monitoring Data)
- Groundwater Flow Direction

409.69 Groundwater Elevation (Feet, NAD27)  
Measured October 28, 2020



**Big Rivers** *Wilson Landfill*  
ELECTRIC CORPORATION Ohio County, Kentucky

FIGURE 3  
GROUNDWATER SURFACE MAP  
October 2020

DATE: 11/13/2020	SCALE: 1IN = 750 FEET
CREATED BY: AEH	
JOB NO. 60579935	

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

# Appendix A

## Analytical Summary Tables

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-5**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																		
			4/4/2016	5/20/2016	8/25/2016	10/4/2016	2/15/2017	5/17/2017	8/16/2017	9/28/2017	10/12/2017	4/13/2018	7/12/2018	10/3/2018	6/30/2019	11/6/2019	4/22/2020	10/13/2020			
			Baseline Events										Assessment	Re-sample	Assessment						
Boron	0.08		0.387 JB	0.282 JB	0.386 J	0.367 JB	0.839 J	0.981 JB	1.17		0.81 J	1.27		0.667 J	0.755 JB	ND D2 U	ND D2 U	0.66		0.69	
Calcium	0.5		673	472	509	464	471 B	514 B	480		493	480 B		504	471	670 D1	541 D1	600 D1		571 D1	
Chloride	3		49.3 B	60.2 JB	73.5	89.8	160 B	169 B	180		158 B	261		69.3 B	94.0 B	159 D	98.2 D	208 D		199 D	
Fluoride	1		ND J	ND J	ND	0.838	ND J	ND J	ND JB		ND J	2.88		ND J	ND J	ND U	ND U	<0.20		<0.20	
Sulfate	5		1630	1950	1670 B	1570 B	1620	1530	2040 B		1860 B	1730 B		1520	1640 B	2060 D	1490 D	2820 D		1800 D	
pH (Field Measurement)	0.10		6.59	6.34	7.17	6.93	5.94	6.92	6.77		6.46	7.18	6.67	6.13	6.25	6.39	6.44	6.71		5.95	
Total Dissolved Solids	10		2840	2960	2940	2930	3000	3100	3220		3090	3040		3210	3200	3440	3290	3460		3770	
<b>APPENDIX IV CONSTITUENTS</b>																					
Antimony	0.002	0.006 mg/L	ND	ND	ND J	ND JB	ND	ND JB	ND JB		ND J			ND JB	ND J	NA	ND U	ND U	<0.005	<0.005	
Arsenic	0.005	0.01 mg/L	0.00524 J	0.00523	0.00577 B	ND J	ND J	ND JB	ND J		ND J			ND J	ND J	ND J	0.0025	0.0023	0.0025	0.0029	
Barium	0.2	2 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J		ND J			ND J	ND J	NA	0.010	0.010	0.011	0.011	
Beryllium	0.002	0.004 mg/L	ND	ND J	ND J	ND J	ND	ND J	ND J		ND			ND	NA	NA	ND U	ND U	<0.0020	<0.0020	
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND	ND	ND		ND			ND	NA	NA	ND U	ND U	<0.0010	<0.0010	
Chromium	0.003	0.1 mg/L	ND	ND J	0.00309 B	ND J	ND	ND J	ND		ND J			ND J	ND	NA	ND U	ND U	<0.0020	<0.0020	
Cobalt	0.005	0.006 mg/L	0.00909 J	0.00829	0.00659	0.00664	0.00518	0.0057		ND J	0.0051			0.00873	0.00672	0.00660	0.009	0.008	0.008	0.010	
Fluoride	1	4 mg/L	ND J	ND J	ND	0.838	ND J	ND J	ND JB		ND J			ND J	ND J	ND J	ND U	ND U	<0.20	<0.20	
Lead	0.005	0.015 mg/L	ND	ND	ND J	ND JB	ND J	ND J	ND J		ND J			ND J	ND J	NA	ND U	ND U	<0.002	<0.002	
Lithium	0.05	0.040 mg/L	0.0243 J	0.0283 J	0.0374 J	0.0338 J	0.0432	0.042 J	0.0489 J		0.0398			0.0370 J	0.0375 J	0.0382 J	0.03	0.03	0.03	0.03	
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND		ND			ND	NA	NA	ND U	ND U	<0.0005	<0.0005	
Molybdenum	0.01	0.1 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J		ND J			ND J	ND J	ND J	0.004 J	0.004 J	0.004 J	0.004 J	
Radium 226	1	5 pCi/L	0.645	0.915	0.714	1.19	1.01	0.967	1.22	1.01			0.783	0.711	1.23	1.8	0.434	1.22	1.70		
Radium 228																					
Selenium	0.01	0.05 mg/L	ND	ND J	ND J	ND J	ND J	ND JB	ND J		ND			ND J	ND J	NA	ND U	ND U	<0.003	<0.003	
Thallium	0.001	0.002 mg/L	ND	ND J	ND	ND J	ND	ND J	ND J		ND			ND	ND	NA	ND U	ND U	<0.0020	<0.0020	

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)  
 GWPS = Groundwater Protection Standard  
 NA = Not Analyzed  
 NC = Not Collected  
 ND = Not Detected at or above Method Detection Limit  
 pCi/L = picoCuries per Liter  
 J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.  
 B = Compound was found in the blank and sample.  
 D = Results reported from dilution  
 D1 = Sample required dilution due to high concentration of target analyte  
 D2 = Sample required dilution due to matrix interference  
 H3 = Sample received and analyzed past holding time  
 U = Target analyte was analyzed for, but was below detection limit

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-6**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																
			4/5/2016	5/19/2016	8/25/2016	10/4/2016	2/15/2017	5/18/2017	8/16/2017	9/29/2017	10/12/2017	4/13/2018	7/12/2018	10/4/2018	6/30/2019	11/6/2019	4/22/2020	10/13/2020	
			Baseline Events									Assessment		Re-sample		Assessment			
Boron	0.08		0.255 JB	0.243 JB	0.27 J	0.228 JB	0.293	0.265 JB	0.298 J	0.328 J	0.286 J		0.250 J	0.272 JB	ND D2 U	ND D2 U	0.31	0.34	
Calcium	0.5		534	466	470	445	414 B	490 B	477	459	438 B		478 J	426	433 D1	482 D1	511 D1	483 D1	
Chloride	3		3.65 B	5.09 B	4.1 B	4.63	4.93	4.37 B	5.49 B	5.36 B	5.6		4.79 B	6.16 B	8.2	16.3	10.2	18.9	
Fluoride	1		ND J	ND JB	ND	ND	ND J	ND J	ND JB	ND J	2.96		ND J	ND J	ND U	ND U	0.21	<0.20	
Sulfate	5		1560	1710	1660 B	1790 B	1610	1570	1840 B	1630 B	1670 B		1730	1590 B	2040 D	1280 D	2370 D1	1750 D	
pH (Field Measurement)	0.10		6.40	6.26	6.56	6.64	6.09	6.35	6.36	6.29	6.4	6.15	6.07	6.08	6.39	6.29	6.21	6.72	
Total Dissolved Solids	10		2740	2780	2790	2800	2620	2820	2950	2900	2920		2920	3050	2700	3170	2750	3030	
<b>APPENDIX IV CONSTITUENTS</b>																			
Antimony	0.002	0.006 mg/L	ND	ND J	ND J	ND JB	ND J	ND JB	ND JB	ND JB			ND JB	ND J	NA	ND U	ND U	<0.005	<0.005
Arsenic	0.005	0.01 mg/L	ND J	0.00736	ND JB	0.00534	0.0123	ND B	0.00598	0.00632			ND J	0.00683	0.00592	0.0046	0.0060	0.0050	0.0054
Barium	0.2	2 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J			ND J	ND J	NA	0.010	0.012	0.012	0.013
Beryllium	0.002	0.004 mg/L	ND	ND	ND	ND J	ND	ND	ND	ND			ND	NA	NA	ND U	ND U	<0.0020	<0.0020
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND U	<0.0010	<0.0010
Chromium	0.003	0.1 mg/L	ND	ND J	ND B	ND	ND	ND	ND	ND J			ND J	ND	NA	ND U	ND U	<0.0020	0.0007 J
Cobalt	0.005	0.006 mg/L	0.00728 J	0.00713	0.0074	0.00688	0.0054	0.0059	0.00578	0.00686			0.00742	0.00672	0.00666	0.008	0.008	0.009	0.009
Fluoride	1	4 mg/L	ND J	ND J	ND	ND	ND J	ND J	ND JB	ND J			ND J	ND J	ND J	ND U	ND U	0.21	<0.20
Lead	0.005	0.015 mg/L	ND	ND J	ND J	ND JB	ND J	ND J	ND J	ND J			ND J	ND J	NA	ND U	0.0005 J	0.0005 J	0.0006 J
Lithium	0.05	0.040 mg/L	0.0326 J	0.0419 J	0.0494 J	0.0459 J	0.0508	0.0455 J	0.0495 J	0.0472 J			0.0470 J	0.0496 J	0.0463 J	0.04	0.04	0.04	0.04
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	0.000161 J F1			ND	NA	NA	ND U	ND U	<0.0005	<0.0005
Molybdenum	0.01	0.1 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J			ND J	ND J	ND J	0.006 J	0.007 J	0.006 J	0.007 J
Radium 226	1	5 pCi/L	0.596	0.581	0.519	0.847	0.919	0.892	0.82	0.639			0.900	0.795	1.44	0.8	1.42	0.804	0.568
Radium 228																			
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND J	ND	ND	ND	ND			ND	ND	NA	ND U	ND U	<0.003	<0.003
Thallium	0.001	0.002 mg/L	ND	ND J	ND J	ND J	ND	ND	ND	ND J			ND J	ND	NA	ND U	ND U	<0.0020	<0.0020

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)  
 GWPS = Groundwater Protection Standard  
 NA = Not Analyzed  
 NC = Not Collected  
 ND = Not Detected at or above Method Detection Limit  
 pCi/L = picoCuries per Liter  
 J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.  
 B = Compound was found in the blank and sample.  
 F1 = MS and/or MSD Recovery is outside acceptance limits.  
 D = Results reported from dilution  
 D1 = Sample required dilution due to high concentration of target analyte  
 D2 = Sample required dilution due to matrix interference  
 H3 = Sample received and analyzed past holding time  
 U = Target analyte was analyzed for, but was below detection limit

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY**  
MW-7

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																	
			4/4/2016	5/19/2016	8/25/2016	10/6/2016	2/15/2017	5/18/2017	8/16/2017	9/29/2017	10/12/2017	4/13/2018	7/12/2018	10/4/2018	6/27/2019	11/7/2019	4/22/2020	10/13/2020		
			Baseline Events										Assessment	Re-sample	Assessment					
Boron	0.08		0.241 JB	0.165 JB	0.277 J	0.203 JB	0.293 J	0.232 JB	0.263 J	0.28 J	0.245 J		0.324 J	0.395 JB	1.75 B	1.41 D2	1.58 D1	2.26 D1		
Calcium	0.5		364	241	287	251	262 B	273 B	268	269	259 B		297	271	329	331 D1	369 D1	350 D1		
Chloride	3		3.47 B	5.31 B	5.67 B	5.65 B	6.15	6.91 B	7.91 B	7.54 B	7.77		17.1 B	21.9 B	32.0	30.1	40.0	45.0 D		
Fluoride	1		ND J	ND J	ND J	ND J	ND J	ND JB	ND J	1.43		ND J	ND J	0.222	0.21		0.27	0.22		
Sulfate	5		759	784	813 B	822	850	877	940 B	1780 B	910 B		837	888 B	1030	809 D	1310 D1	1050 D		
pH (Field Measurement)	0.10		6.53	6.29	6.60	7.33	5.60	6.55	6.49	6.32	6.50	6.26	6.18	6.23	6.66	6.59	6.90	6.02		
Total Dissolved Solids	10		1450	1450	1520	1560	1540	1550	1600	1590	1610		1720	1750	1820	1890	1910	1950		
<b>APPENDIX IV CONSTITUENTS</b>																				
Antimony	0.002	0.006 mg/L	ND	ND	ND J	ND JB	ND	ND JB	ND JB	ND JB		ND JB	ND J	NA	0.000242 JB	ND U	<0.005	<0.005		
Arsenic	0.005	0.01 mg/L	ND	ND J	ND JB	ND J	ND J	ND JB	ND J	ND J		ND J	ND J	ND J	0.00423 J	0.0034	0.0075	0.0036		
Barium	0.2	2 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J		ND J	ND J	NA	0.0164 JB	0.013	0.025	0.013		
Beryllium	0.002	0.004 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND	ND U	<0.0020	<0.0020		
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND	ND U	<0.0010	<0.0010		
Chromium	0.003	0.1 mg/L	ND	ND J	0.00304 B	ND	ND	ND	ND	ND		ND J	ND	NA	0.0247 B	ND U	0.0053	<0.0020		
Cobalt	0.005	0.006 mg/L	0.0084 J	0.0058	0.0062	0.00483 J	0.00531	0.00358 J	0.00395 J	0.00454 J		0.00468 J	0.00365 J	0.00346 J	0.00236 JB	ND U	0.006	<0.004		
Fluoride	1	4 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND JB	ND J		ND J	ND J	ND J	0.222	0.21	0.27	0.22		
Lead	0.005	0.015 mg/L	ND	ND	ND	ND J	ND	ND	ND	ND		ND	ND J	NA	0.000348 J	ND U	0.004	<0.002		
Lithium	0.05	0.040 mg/L	0.0241 J	0.0241 J	0.0305 J	0.0263 J	0.0318 J	0.0277 J	0.0291 J	0.0278		0.0261 J	0.0271 J	0.0273 J	0.0323 J	0.02	0.03	0.03		
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND	ND U	<0.0005	<0.0005		
Molybdenum	0.01	0.1 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J		ND J	ND J	ND J	0.0142	0.006 J	0.003 J	0.005 J		
Radium 226	1	5 pCi/L	0.727	0.558	0.613	0.66	ND	0.817	0.852	0.779		0.572	0.697	0.935	0.597	0.864	1.05	0.967		
Radium 228																				
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	NA	0.000427 J	ND U	<0.003	<0.003		
Thallium	0.001	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	NA	ND	ND U	<0.0020	<0.0020		

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)  
 GWPS = Groundwater Protection Standard  
 NA = Not Analyzed  
 NC = Not Collected  
 ND = Not Detected at or above Method Detection Limit  
 pCi/L = picoCuries per Liter  
 J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.  
 B = Compound was found in the blank and sample.  
 HF = Hold time exceedence  
 D = Results reported from dilution  
 D1 = Sample required dilution due to high concentration of target analyte

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-8**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																		
			4/4/2016	5/19/2016	8/25/2016	10/3/2016	2/15/2017	5/17/2017	8/15/2017	9/28/2017	10/12/2017	4/13/2018	7/12/2018	10/3/2018	6/30/2019	11/5/2019	4/22/2020	10/13/2020			
			Baseline Events										Assessment	Re-sample	Assessment						
Boron	0.08		ND JB	ND JB	ND J	ND JB	ND J	ND JB	ND J	ND J	ND J	ND J	ND J	ND J	ND J	0.0388 JB	ND D2 U	ND D2 M2 U	<0.10	<0.10	
Calcium	0.5		329	242	237	226	213 B	225 B	230	214	216 B		245	207	248 D1	240 D1 M3	255 D1	249 D1			
Chloride	3		4.12 B	5.48 B	4.38 B	4.69	4.7	4.19 B	4.68 B	4.82 B	4.44		3.83 B	4.80 B	4.1	4.7			3.6	3.7	
Fluoride	1		ND J	ND J	ND J	ND JB	ND J	ND J	ND JB	ND J	1.210		ND J	ND J	0.2	0.27			0.27	0.23	
Sulfate	5		876	910	872 B	854 B	779 B	877	964 B	900 B	894 B		887	799 B	920 D	1480 D			1010 D	992 D	
pH (Field Measurement)	0.10		6.47	6.34	6.64	6.63	4.91	6.47	6.44	6.35	6.50	6.28	6.08	6.25	6.30	6.30			6.18	6.55	
Total Dissolved Solids	10		1530	1590	1550	1520	1450	1560	1590	1520	1560		1690	1560	1640	1570			1500	1680	
<b>APPENDIX IV CONSTITUENTS</b>																					
Antimony	0.002	0.006 mg/L	ND	ND	ND J	ND JB	ND	ND JB	ND JB	ND J			ND JB	ND J	NA	ND U	ND U	<0.005	<0.005		
Arsenic	0.005	0.01 mg/L	0.00931 J	0.00698	0.00709 B	0.00581	0.00799	0.0072 B	0.00548	0.00515			0.00525	0.00558	0.00757	0.0054	0.0056	0.0056	0.0144		
Barium	0.2	2 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J			ND J	ND J	NA	0.024	0.022	0.024	0.070		
Beryllium	0.002	0.004 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND M2 U	<0.0020	<0.0020		
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND U	<0.0010	0.0004 J		
Chromium	0.003	0.1 mg/L	ND	ND J	ND JB	ND	ND	ND	ND	ND			ND J	ND J	NA	ND U	0.0009 J	0.0008 J	0.0224		
Cobalt	0.005	0.006 mg/L	ND	0.00156 J	0.00118 J	0.0015 J	0.0011 J	0.000739 J	0.000943 J	0.00102 J			0.000800 J	0.00113 J	0.000849 J	ND U	ND U	<0.004	0.015		
Fluoride	1	4 mg/L	ND J	ND J	ND J	ND JB	ND J	ND J	ND JB	ND J			ND J	ND J	ND J	0.2	0.27	0.27	0.23		
Lead	0.005	0.015 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND J	NA	ND U	0.0005 J	<0.002	0.012		
Lithium	0.05	0.040 mg/L	ND	ND	0.0116 J	0.012 J	0.0142 J	0.0103 J	0.0137 J	ND			ND	0.0125 J	0.0129 J	0.009 J	0.009 J	0.009 J	0.02		
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND U	<0.0005	<0.0005		
Molybdenum	0.01	0.1 mg/L	0.0187 J	0.0142	0.0145	0.0151	0.0185	0.0137	0.0166	0.0153			0.0123	0.0129	0.0137	0.01	0.01	0.01	0.01		
Radium 226	1	5 pCi/L	1.12	1.31	0.741	1.12	0.854	1.07	1.04	0.901			0.802	1.29	1.69	2.8	0.946	1.07	2.94		
Radium 228																					
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND	ND	ND	ND J	ND			ND	ND J	NA	ND U	ND U	<0.003	<0.003		
Thallium	0.001	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	NA	ND U	0.0001 J	<0.0020	<0.0020		

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)  
 GWPS = Groundwater Protection Standard  
 NA = Not Analyzed  
 NC = Not Collected  
 ND = Not Detected at or above Method Detection Limit  
 pCi/L = picoCuries per Liter  
 J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.  
 B = Compound was found in the blank and sample.  
 D = Results reported from dilution  
 D1 = Sample required dilution due to high concentration of target analyte  
 D2 = Sample required dilution due to matrix interference  
 H3 = Sample received and analyzed past holding time  
 M2 = Matrix spike recovery was low; the method control sample recovery was acceptable.  
 M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.  
 U = Target analyte was analyzed for, but was below detection limit



**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-10**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																
			4/5/2016	5/18/2016	8/25/2016	10/6/2016	2/17/2017	5/18/2017	8/18/2017	10/2/2017	10/13/2017	4/14/2018	7/13/2018	10/5/2018	6/30/2019	11/4/2019	4/22/2020	10/13/2020	
			Baseline Events										Assessment	Re-sample	Assessment				
Boron	0.08		0.291 JB	0.217 JB	0.205 J	0.166 JB	0.229 J	0.163 JB	0.196 J	0.181 J	0.251 J		0.144 J	0.286 JB	ND D2 U	ND U D2	0.28	0.39	
Calcium	0.5		497	390	404	369	440 B	390 B	368	379 B	347 B		378 J	334	369 D1	409 D1	415 D1	404 D1	
Chloride	3		53.7 B	85.7 JB	53	44 B	44 B	47.4 B	43.5 B	63.3	83		48.2 B	59.2 B	80.1 D	143 D	68.6 D	89.2 D	
Fluoride	1		ND JB	ND J	ND	ND J	ND J	ND J	ND JB	ND J	2.8		ND J	ND J	ND U	ND U	<0.20	<0.20	
Sulfate	5		2090	2210	2000 B	2030	1980 B	2070	2320 B	2250 B	2080 B		2010	1850 B	2440 D	553 D	3580 D	1380 D	
pH (Field Measurement)	0.10		6.03	5.82	6.05	6.91	4.62	5.88	5.83	5.84	6.00	5.90	5.68	5.44	6.01	5.53	6.26	6.16	
Total Dissolved Solids	10		2980	3300	3240	3230	3050	3240	3200	3300	3120		3270	3120	2980	2960	3170	3290	
<b>APPENDIX IV CONSTITUENTS</b>																			
Antimony	0.002	0.006 mg/L	ND	ND	ND J	ND JB	ND	ND JB	0.00396 B	ND JB		ND JB	ND J	NA	ND U	ND U	<0.005	<0.005	
Arsenic	0.005	0.01 mg/L	ND J	ND J	ND JB	ND J	ND J	ND JB	ND J	ND JB		ND J	ND J	ND J	0.0009 J	0.0025	0.0011	0.0009 J	
Barium	0.2	2 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J		ND J	ND J	NA	0.009	0.01	0.008	0.010	
Beryllium	0.002	0.004 mg/L	ND	ND J	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND U	ND U	<0.0020	<0.0020	
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND J	ND J	ND	ND		ND	NA	NA	0.0001 J	ND U	<0.0010	<0.0010	
Chromium	0.003	0.1 mg/L	ND	ND J	ND JB	ND	ND	ND	ND	ND J		ND J	ND	NA	ND U	ND U	<0.0020	0.0007 J	
Cobalt	0.005	0.006 mg/L	0.158	0.113	0.126	0.108	0.0836	0.121	0.139		0.0412	0.0704	0.114	0.110	0.108	0.082	0.078		
Fluoride	1	4 mg/L	ND J	ND J	ND	ND J	ND J	ND J	ND JB	ND J		ND J	ND J	ND J	ND U	ND U	<0.20	<0.20	
Lead	0.005	0.015 mg/L	ND	ND J	ND J	ND J	ND J	ND	ND	ND J		ND J	ND J	NA	ND U	ND U	<0.002	<0.002	
Lithium	0.05	0.040 mg/L	ND	ND	0.0141 J	0.0149 J	0.0133 J	0.0109 J	0.0129 J	0.0124 J		ND	0.0102 J	0.0147 J	0.009 J	ND U	0.006 J	0.008 J	
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND U	ND U	<0.0005	<0.0005	
Molybdenum	0.01	0.1 mg/L	ND	ND	ND	ND	ND	ND	ND J	ND		ND	ND	ND	ND U	0.003 J	<0.01	<0.01	
Radium 226	1	5 pCi/L	ND	ND	ND	ND	ND	0.384	0.372	0.506		0.721	0.472	0.625	1.2	0.11	0.414	0.944	
Radium 228			ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	NA	ND U	ND U	<0.003	<0.003
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND	ND	ND	ND J	ND JB		ND	ND	NA	ND U	ND U	<0.003	<0.003	
Thallium	0.001	0.002 mg/L	ND	ND J	ND J	ND	ND	ND	ND J	ND		ND	ND	NA	ND U	0.0001 J	<0.0020	<0.0020	

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)  
 GWPS = Groundwater Protection Standard  
 NA = Not Analyzed  
 NC = Not Collected  
 ND = Not Detected at or above Method Detection Limit  
 pCi/L = picoCuries per Liter  
 J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.  
 B = Compound was found in the blank and sample.  
 D = Results reported from dilution  
 D1 = Sample required dilution due to high concentration of target analyte  
 D2 = Sample required dilution due to matrix interference  
 H3 = Sample received and analyzed past holding time  
 U = Target analyte was analyzed for, but was below detection limit

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-4D**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE									
			11/2/2018		6/28/2019		11/8/2019		4/22/2020		10/13/2020	
			Characterization									
Boron	0.08		6.60		8.09	D2	9.11	D2	10.2	D1	9.39	D1
Calcium	0.5		607		635	D1	628	D1	714	D1	659	D1
Chloride	3		676	B	826	D	537	D	1280.0	D	1210	D
Fluoride	1		ND	J	ND	DU	0.21		0.26		0.23	
Sulfate	5		1720	B	1330	D	1100	D	2650	D	1260	D
pH (Field Measurement)	0.10		6.05		6.46		6.34		6.31		6.47	
Total Dissolved Solids	10		4180		4140		3500		4690		4410	
<b>APPENDIX IV CONSTITUENTS</b>												
Antimony	0.002	0.006 mg/L	ND	JB	ND	U	ND	U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND	JB	0.0032		0.0032		0.0039		0.0037	
Barium	0.2	2 mg/L	ND	J	0.016		0.016		0.016		0.018	
Beryllium	0.002	0.004 mg/L	ND	J	ND	U	ND	U	<0.0020		<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND	U	ND	U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	0.00591	B	0.0006	J	ND	U	<0.0020		0.0010	J
Cobalt	0.005	0.006 mg/L	0.0122		0.010		0.015		0.010		0.012	
Fluoride	1	4 mg/L	ND	J	ND	DU	0.21		0.26		0.23	
Lead	0.005	0.015 mg/L	ND	J	ND	U	ND	U	<0.002		0.0005	J
Lithium	0.05	0.040 mg/L	0.181		0.14		0.14		0.16		0.17	
Mercury	0.0002	0.002 mg/L	ND		ND	U	ND	U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	0.0185		0.007	J	0.01		0.02		0.01	
Radium 226	1	5 pCi/L	1.58		2.7		1.86		0.851		1.71	
Radium 228												
Selenium	0.01	0.05 mg/L	ND	J	0.001	J	0.001	J	0.001	J	<0.003	
Thallium	0.001	0.002 mg/L	ND	J	ND	U	ND	U	<0.0020		<0.0020	

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS = Groundwater Protection Standard

NA = Not Analyzed

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ND = Not Detected at or above Method Detection Limit

pCi/L = picoCuries per Liter

J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.

B = Compound was found in the blank and sample.

D = Results reported from dilution

D1 = Sample required dilution due to high concentration of target analyte

D2 = Sample required dilution due to matrix interference

H3 = Sample received and analyzed past holding time

U = Target analyte was analyzed for, but was below detection limit

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-102**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE									
			11/2/2018		6/27/2019		11/8/2019		4/22/2020		10/13/2020	
			Characterization									
Boron	0.08		ND	J	0.108	JB	ND	D2 M4 U	<0.10		<0.10	
Calcium	0.5		81.3		80.9		85.1	D2	94.5	D1	86.8	D2
Chloride	3		33.3	B	33.3		35.3		33.1		32.9	D2
Fluoride	1		ND	J	0.343		0.36		0.34		0.30	
Sulfate	5		265	B	279		307	D	259	D	261	D
pH (Field Measurement)	0.10		6.58		6.7		6.61		6.48		6.33	
Total Dissolved Solids	10		781		760		728		724		836	
<b>APPENDIX IV CONSTITUENTS</b>												
Antimony	0.002	0.006 mg/L	ND	JB	0.000101	JB	ND	U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND	JB	0.00414	J	0.0031		0.0047		0.0036	
Barium	0.2	2 mg/L	ND	J	0.0596	JB	0.059		0.051		0.058	
Beryllium	0.002	0.004 mg/L	ND		0.000134	J	ND	U	<0.0020		<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND		ND	U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	0.00321	B	0.00140	JB	0.0006	J	<0.0020		<0.0020	
Cobalt	0.005	0.006 mg/L	0.00263	J	0.00286	JB	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	0.343		0.36		0.34		0.30	
Lead	0.005	0.015 mg/L	ND	J	0.000164	J	ND	U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	ND		ND		ND	U	<0.02		<0.02	
Mercury	0.0002	0.002 mg/L	ND		ND		ND	U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	0.0111		0.00112	J	0.002	J	<0.01		<0.01	
Radium 226	1	5 pCi/L	1.22		0.187	U	0.425		0.084		0.741	
Radium 228												
Selenium	0.01	0.05 mg/L	ND		ND		ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND		ND	U	<0.0020		<0.0020	

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS = Groundwater Protection Standard

NA = Not Analyzed

NC = Not Collected

ND = Not Detected at or above Method Detection Limit

pCi/L = picoCuries per Liter

J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.

B = Compound was found in the blank and sample.

HF = Hold time exceedence

D = Results reported from dilution

D2 = Sample required dilution due to matrix interference

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-104**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE									
			11/2/2018		6/27/2019		11/8/2019		4/22/2020		10/13/2020	
			Characterization									
Boron	0.08		ND	J	0.0765	JB	ND	U D2	<0.10		<0.10	
Calcium	0.5		227		221		257	D1	258	D1	267	D1
Chloride	3		11.8	B	12.7		13.2		13.0		11.4	
Fluoride	1		ND	J	0.129	J	ND	U	<0.20		<0.20	
Sulfate	5		639	JB	513		587	D M1	662	D	628	D
pH (Field Measurement)	0.10		6.43		6.87		6.64		6.50		6.41	
Total Dissolved Solids	10		1410		1360		1490		1380		1590	
<b>APPENDIX IV CONSTITUENTS</b>												
Antimony	0.002	0.006 mg/L	ND	JB	0.000173	JB	ND	U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND	JB	0.00174	J	0.0027		0.0010		0.0006	J
Barium	0.2	2 mg/L	ND	J	0.0734	JB	0.064		0.050		0.047	
Beryllium	0.002	0.004 mg/L	ND	J	0.000142	J	ND	U	<0.0020		<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND		ND	U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	0.00361	B	0.0178	B	0.0037		0.0007	J	<0.0020	
Cobalt	0.005	0.006 mg/L	0.00388	J	0.00164	JB	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	0.129	J	ND	U	<0.20		<0.20	
Lead	0.005	0.015 mg/L	ND	J	0.000785	J	0.002		<0.002		<0.002	
Lithium	0.05	0.040 mg/L	0.0326	J	0.0261	J	0.03		0.02		0.03	
Mercury	0.0002	0.002 mg/L	ND		ND		ND	U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	0.0124		0.00319	J	ND	U	0.003	J	<0.01	
Radium 226	1	5 pCi/L	2.16		0.952		1.24		0.823		1.88	
Radium 228												
Selenium	0.01	0.05 mg/L	ND		ND		ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND		ND	U	<0.0020		<0.0020	

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS = Groundwater Protection Standard

NA = Not Analyzed

NC = Not Collected

ND = Not Detected at or above Method Detection Limit

pCi/L = picoCuries per Liter

J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.

B = Compound was found in the blank and sample.

U = Target analyte was analyzed for, but was below detection limit

^ = Instrument related QC is outside acceptance limits

HF = Hold time exceedence

D = Results reported from dilution

D1 = Sample required dilution due to high concentration of target analyte

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-105**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE									
			11/2/2018		6/27/2019		11/7/2019		4/22/2020		10/13/2020	
			Characterization									
Boron	0.08		ND	J	0.348	JB	ND	D2 M4 U	0.33		0.37	
Calcium	0.5		124		58.6		72.0	D2 M1	60.4	D1	49.2	D2
Chloride	3		10.5	B	9.34		10.1		9.5		8.7	
Fluoride	1		ND	J	0.638		0.55		0.67		0.61	
Sulfate	5		216	JB	37.6		73.7	D	91.8	D	75.4	D
pH (Field Measurement)	0.10		6.75		7.70		7.51		7.78		8.02	
Total Dissolved Solids	10		747		548		612		398		550	
<b>APPENDIX IV CONSTITUENTS</b>												
Antimony	0.002	0.006 mg/L	ND	JB	0.000186	JB	ND	U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND	JB	0.00186	J	ND	U	<0.0010		<0.0010	
Barium	0.2	2 mg/L	0.207		0.288	B	0.326		0.255		0.256	
Beryllium	0.002	0.004 mg/L	ND	J	0.000398	J	ND	U	<0.0020		<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND		ND	U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	0.00388	B	0.00784	B	ND	U	<0.0020		<0.0020	
Cobalt	0.005	0.006 mg/L	0.00488	J	0.00435	JB	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	0.638		0.55		0.67		0.61	
Lead	0.005	0.015 mg/L	ND	J	0.00326	J	ND	U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	0.0141	J	0.0278	J	0.03	M1	0.02		0.02	
Mercury	0.0002	0.002 mg/L	ND		ND		ND	U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	0.0131		0.00231	J	0.002	J	0.002	J	0.002	J
Radium 226	1	5 pCi/L	1.08		0.558	U	0.829		1.15		1.30	
Radium 228												
Selenium	0.01	0.05 mg/L	ND		ND		ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		0.0000510	J	ND	U	<0.0020		<0.0020	

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pCi/L = picoCuries per Liter

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B = Compound was found in the blank and sample.

HF = Hold time exceedence

D = Results reported from dilution

D1 = Sample required dilution due to high concentration of target analyte

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-110**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE					
			11/2/2018	6/27/2019	11/7/2019	4/22/2020	10/13/2020	
			Characterization					
Boron	0.08		ND J	0.0716 JB	ND U D2	<0.10	<0.10	
Calcium	0.5		33.8	38.9	47.6 D2	39.9 D1	37.9 D2	
Chloride	3		14.4 B	11.1	10.0	11.5	10.5	
Fluoride	1		ND J	0.229	0.23	0.28	0.24	
Sulfate	5		102 B	70.0	61.2 D	71.7 D	56 D	
pH (Field Measurement)	0.10		6.93	6.92	6.83	6.89	6.87	
Total Dissolved Solids	10		333	296	348	208	278	
<b>APPENDIX IV CONSTITUENTS</b>								
Antimony	0.002	0.006 mg/L	ND JB	0.000130 JB	ND U	<0.005	<0.005	
Arsenic	0.005	0.01 mg/L	ND JB	0.00118 J	ND U	0.0019	0.0011	
Barium	0.2	2 mg/L	ND J	0.0535 JB	0.051	0.051	0.053	
Beryllium	0.002	0.004 mg/L	ND	ND	ND U	<0.0020	<0.0020	
Cadmium	0.001	0.005 mg/L	ND	ND	ND U	<0.0010	<0.0010	
Chromium	0.003	0.1 mg/L	0.00967 B	0.00217 JB	ND U	0.0007 J	<0.0020	
Cobalt	0.005	0.006 mg/L	0.00240 J	0.000827 JB	ND U	<0.004	<0.004	
Fluoride	1	4 mg/L	ND J	0.229	0.23	0.28	0.24	
Lead	0.005	0.015 mg/L	ND J	0.000539 J	ND U	<0.002	<0.002	
Lithium	0.05	0.040 mg/L	0.0122 J	ND	0.006 J	<0.02	<0.02	
Mercury	0.0002	0.002 mg/L	ND	ND	ND U	<0.0005	<0.0005	
Molybdenum	0.01	0.1 mg/L	ND J	ND	ND U	<0.01	<0.01	
Radium 226	1	5 pCi/L	1.19	0.816	1.10	1.53	1.49	
Radium 228								
Selenium	0.01	0.05 mg/L	ND	ND	ND U	<0.003	<0.003	
Thallium	0.001	0.002 mg/L	ND	ND	ND U	<0.0020	<0.0020	

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS = Groundwater Protection Standard

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NC = Not Collected

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^ = Instrument related QC is outside acceptance limits

D = Results reported from dilution

D1 = Sample required dilution due to high concentration of target analyte

## **Appendix B**

# **Analytical Laboratory Reports**

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**Certificate of Analysis**  
**0033753**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 14:20

---

Project Name: MW-5 Wilson 092-00004

Workorder: 0033753

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



A handwritten signature in black ink that reads "Rob Whittington".

---

Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*





**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0033753-01	MW5/	Groundwater	04/22/2020 09:25	04/23/2020 13:25	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>		<u>Value</u>		
0033753-01	Field Conductance		4100		
	Field pH		6.71		
	Field Temp (C)		15.99		

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0912. Cobalt result added to report.

**ANALYTICAL RESULTS**

Lab Sample ID: **0033753-01**  
Description: **MW5**

Sample Collection Date Time: 04/22/2020 09:25  
Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Arsenic</b>	<b>0.0025</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Barium</b>	<b>0.011</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Boron</b>	<b>0.66</b>		mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:12	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Calcium</b>	<b>600</b>	D1	mg/L	40.0	13.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:18	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Cobalt</b>	<b>0.008</b>		mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Iron</b>	<b>6.73</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:12	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Magnesium</b>	<b>263</b>	D1	mg/L	20.0	9.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:18	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/04/2020 11:46	DMH
<b>Molybdenum</b>	<b>0.004</b>	J	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Nickel</b>	<b>0.005</b>		mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Potassium</b>	<b>11.7</b>	D1	mg/L	5.00	2.20	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:15	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
<b>Sodium</b>	<b>84.7</b>	D1	mg/L	2.60	1.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:15	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:29	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>476</b>		mg/L	4		2320 B-2011	04/29/2020 14:32	04/29/2020 14:32	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 14:32	04/29/2020 14:32	HMF
<b>Total Alkalinity</b>	<b>476</b>		mg/L	4		2320 B-2011	04/29/2020 14:32	04/29/2020 14:32	HMF
<b>Chemical Oxygen Demand</b>	<b>15</b>		mg/L	8	8	HACH 8000	04/27/2020 16:45	04/27/2020 16:45	ALT
<b>Specific Conductance (Lab)</b>	<b>3700</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:13	04/27/2020 15:13	GAT
<b>Hardness as CaCO3</b>	<b>1710</b>	D	mg/L	5	5	2340 C (as HACH 8226)	05/04/2020 11:46	05/04/2020 11:46	CLL
<b>Total Dissolved Solids</b>	<b>3460</b>		mg/L	50	50	2540 C-2011	04/27/2020 11:04	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>1.5</b>		mg/L	0.5		5310 C-2011	05/02/2020 01:12	05/02/2020 01:12	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.067</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>1.15</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>1.22</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>208</b>	D	mg/L	10.0	7.2	EPA 300.0 REV 2.1	05/02/2020 05:09	05/02/2020 05:09	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	05/02/2020 04:48	05/02/2020 04:48	CSC
<b>Sulfate</b>	<b>2820</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/02/2020 05:29	05/02/2020 05:29	CSC

**Notes for work order 0033753**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

**Standard Qualifiers/Acronyms**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD RPD	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>								
<b>Blank (B018047-BLK1)</b>								
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32								
Total Dissolved Solids	ND	25	mg/L					U
<b>LCS (B018047-BS1)</b>								
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32								
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120	
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>								
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32								
Total Dissolved Solids	716	50	mg/L		724		1.11	10
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>								
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32								
Total Dissolved Solids	364	50	mg/L		372		2.17	10
<b>Batch B018081 - Default Prep Wet Chem</b>								
<b>Blank (B018081-BLK1)</b>								
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41								
Chemical Oxygen Demand	ND	8	mg/L					U
<b>LCS (B018081-BS1)</b>								
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41								
Chemical Oxygen Demand	127	8	mg/L				90-110	
<b>Duplicate (B018081-DUP1) Source: 0040126-01</b>								
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50								
Chemical Oxygen Demand	206	8	mg/L		210		1.84	25
<b>Matrix Spike (B018081-MS1) Source: 0040126-01</b>								
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50								
Chemical Oxygen Demand	416	8	mg/L	250	210	82.7	90-110	M2
<b>Matrix Spike Dup (B018081-MSD1) Source: 0040126-01</b>								
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50								
Chemical Oxygen Demand	414	8	mg/L	250	210	81.8	90-110	0.537 10 M2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>										
<b>Blank (B018086-BLK1)</b>										
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54										
Specific Conductance (Lab)	ND	1	umhos/cm							U
<b>LCS (B018086-BS1)</b>										
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120			
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>										
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09										
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24	
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>										
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27										
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24	
<b>Batch B018100 - Default Prep Wet Chem</b>										
<b>Blank (B018100-BLK1)</b>										
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21										
Total Organic Carbon	ND	0.5	mg/L							U
<b>LCS (B018100-BS1)</b>										
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43										
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120			
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>										
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07										
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25	
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>										
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27										
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25	
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>										
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29										
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2) Source: 0033759-01**

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Total Alkalinity	235	4	mg/L	235		99.8	80-120			
Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	250	4	mg/L	235		106	80-120			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018391 - Default Prep Wet Chem**

**Duplicate (B018391-DUP1) Source: 0033751-01**

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Total Alkalinity	309	4	mg/L		301			2.43	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	

**Duplicate (B018391-DUP2) Source: 0033759-01**

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Total Alkalinity	402	4	mg/L		394			2.01	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	

**Matrix Spike (B018391-MS1) Source: 0033743-01**

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
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**Matrix Spike (B018391-MS2) Source: 0033759-01**

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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**Batch B019045 - Default Prep Wet Chem**

**Blank (B019045-BLK1)**

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B019045-BS1)**

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B019045-DUP1) Source: 0041237-02**

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
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**Matrix Spike (B019045-MS1) Source: 0041237-02**

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018474 - Default Prep IC**

**Blank (B018474-BLK1)**

Prepared: 5/2/2020 1:02, Analyzed: 5/2/2020 1:02

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B018474-BS1)**

Prepared: 5/2/2020 0:42, Analyzed: 5/2/2020 0:42

Chloride	9.7		mg/L	10.0		97.0	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			
Sulfate	10.0		mg/L	10.0		99.9	90-110			

**Matrix Spike (B018474-MS1)**

Source: 0033759-01

Prepared: 5/2/2020 9:35, Analyzed: 5/2/2020 9:35

Chloride	552		mg/L	10.0	1170	NR	80-120			M2
Fluoride	1.75		mg/L	10.0	0.24	15.1	80-120			M2
Sulfate	627		mg/L	10.0	2710	NR	80-120			M2

**Matrix Spike Dup (B018474-MSD1)**

Source: 0033759-01

Prepared: 5/2/2020 9:56, Analyzed: 5/2/2020 9:56

Fluoride	1.81		mg/L	10.0	0.24	15.7	80-120	3.09	20	M2
Sulfate	640		mg/L	10.0	2710	NR	80-120	2.10	20	M2
Chloride	558		mg/L	10.0	1170	NR	80-120	1.05	10	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033753**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

Scheduled for: **03/02/2020**



Client: Big Rivers Electric Corporation Wilson Station

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: MW-5 Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Brian Edwards*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY** \*required information\*

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033753-01 A	<u>4/22/20</u>	<u>0925</u>	Plastic 1L	1	MW5	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033753-01 B	<u>4/22/20</u>	<u>0925</u>	Plastic 500mL pH<2 w/HNO3	1	MW5	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033753-01 C	<u>4/22/20</u>	<u>0925</u>	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
0033753-01 D	<u>4/22/20</u>	<u>0925</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)

Preservation Check: pH :   
Preservation Check: pH :   
Preservation Check: pH :

Preservation Check Performed by: *ACL*

Field data collected by: *Travis Speed* Date (mm/dd/yy) 4/22/20 Time (24 hr) 0925  
pH 6.71 Cond <sup>mS/cm</sup> 4.10 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.99 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Brian Edwards* Received by: (Signature) *abby...* Date (mm/dd/yy) 4-23-20 Time (24 hr) 1325

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-5 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#: 258508-6

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Smith  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033753-01 E	<u>4/22/20</u>	<u>0925</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/>	MW5	g / c	Radium 228 (sub)
0033753-01 F	<u>4/22/20</u>	<u>0925</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/>	MW5	g / c	Radium 228 (sub)
0033753-01 G	<u>4/22/20</u>	<u>0925</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/>	MW5	g / c	Radium Total (sub)

Preservation Check Performed by: AM

Field data collected by: Travis Smith Date (mm/dd/yy) 4/22/20 Time (24 hr) 0925

pH 6.71 Cond (umho) 4.10 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.99 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Travis Smith</u>	Received by: (Signature) <u>abby dunn</u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

May 18, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33753  
Pace Project No.: 30360644

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 33753  
Pace Project No.: 30360644

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33753  
Pace Project No.: 30360644

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360644001	0033753-01	Water	04/22/20 09:25	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 33753  
Pace Project No.: 30360644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360644001	0033753-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33753  
Pace Project No.: 30360644

**Sample: 0033753-01**      **Lab ID: 30360644001**      Collected: 04/22/20 09:25      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.0670 ± 0.405 (0.631)</b> <b>C:NA T:94%</b>	pCi/L	05/18/20 14:43	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.15 ± 0.468 (0.764)</b> <b>C:79% T:91%</b>	pCi/L	05/14/20 10:56	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.22 ± 0.873 (1.40)</b>	pCi/L	05/18/20 16:00	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33753  
Pace Project No.: 30360644

QC Batch: 394308	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360644001

METHOD BLANK: 1909681 Matrix: Water

Associated Lab Samples: 30360644001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.453 ± 0.239 (0.657) C:83% T:82%	pCi/L	05/14/20 10:56	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33753  
Pace Project No.: 30360644

QC Batch: 394309	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360644001

METHOD BLANK: 1909682 Matrix: Water

Associated Lab Samples: 30360644001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.127 ± 0.277 (0.478) C:NA T:86%	pCi/L	05/18/20 13:52	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33753  
Pace Project No.: 30360644

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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WO#: 30360644



Chain of Custody



Workorder: 33753

Workorder Name: MW-5 Wilson 092-00004

Owner Received Date: 4/23/2020

Results Requested By:

Report To:

Subcontract To:

Requested Analysis

McCoy & McCoy Labs  
P.O. Box 907  
Madisonville, KY 42409  
270-821-7375  
r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg P/  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
(724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Received By	Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc				
1											
2	0033753-01		04/22/20 09:25	IR44-McCoy	Water	X	X		<i>[Signature]</i>	4/23/20 09:10	
3											
4											
5											
6											
7											
8											
9											
10											

LAB USE ONLY

001

Cooler Temperature on Receipt 3.18 °C Custody Seal Y or N Received on Ice Y or N Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002rev.00 24March2009

Page 1 of 1

SUBCONTRACT ORDER

# 30360644 Pace Analytical Services, LLC Kentucky  
0033753

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033753-01	Water	Sampled:04/22/2020 09:25	Specific Method
Radium Total (sub)	10/19/2020 09:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/19/2020 09:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/19/2020 09:25	EPA 903.1	

Released By May Geoghegan Date 04-27-20
 Received By \_\_\_\_\_ Date \_\_\_\_\_  
 Released By \_\_\_\_\_ Date \_\_\_\_\_
 Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # 30360644

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 1811

Label	<u>JSM</u>
LIMS Login	<u>JSM</u>

Custody Seal on Cooler/Box Present:  yes  no    Seals intact:  yes  no

Thermometer Used 9    Type of Ice:  Wet  Blue  None

Cooler Temperature    Observed Temp 3.8 °C    Correction Factor: -0.5 °C    Final Temp: 3.3 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID      Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation:
				Lot # of added preservative:
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

---

**Certificate of Analysis**  
**0033754**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 14:22

---

Project Name: MW-6 Wilson 092-00004

Workorder: 0033754

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



---

Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
--------	------------------------	--------	----------------	---------------	------------

0033754-01	MW6/	Groundwater	04/22/2020 10:35	04/23/2020 13:25	Travis Sneed
------------	------	-------------	------------------	------------------	--------------

<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>
0033754-01	Field Conductance	3230
	Field Dissolved Oxygen	0.24
	Field pH	6.21
	Field Temp (C)	15.86
	Field Turbidity	59.6

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@ 0911. Cobalt result added to report.

**ANALYTICAL RESULTS**

Lab Sample ID: **0033754-01**  
Description: **MW6**

Sample Collection Date Time: 04/22/2020 10:35  
Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
<b>Arsenic</b>	<b>0.0050</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/04/2020 12:05	DMH
<b>Barium</b>	<b>0.012</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
<b>Boron</b>	<b>0.31</b>		mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:21	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
<b>Calcium</b>	<b>511</b>	D1	mg/L	40.0	13.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:37	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/04/2020 12:05	DMH
<b>Cobalt</b>	<b>0.009</b>		mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/04/2020 12:05	DMH
<b>Iron</b>	<b>5.94</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:21	AKB
<b>Lead</b>	<b>0.0005</b>	J	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
<b>Lithium</b>	<b>0.04</b>		mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
<b>Magnesium</b>	<b>238</b>	D1	mg/L	20.0	9.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:37	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/04/2020 12:05	DMH
<b>Molybdenum</b>	<b>0.006</b>	J	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
<b>Nickel</b>	<b>0.018</b>		mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/04/2020 12:05	DMH
<b>Potassium</b>	<b>10.7</b>	D1	mg/L	5.00	2.20	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:25	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
<b>Sodium</b>	<b>40.2</b>	D1	mg/L	2.60	1.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:25	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:33	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/04/2020 12:05	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>510</b>		mg/L	4		2320 B-2011	04/29/2020 14:39	04/29/2020 14:39	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 14:39	04/29/2020 14:39	HMF
<b>Total Alkalinity</b>	<b>510</b>		mg/L	4		2320 B-2011	04/29/2020 14:39	04/29/2020 14:39	HMF
<b>Chemical Oxygen Demand</b>	<b>8</b>		mg/L	8	8	HACH 8000	04/27/2020 16:45	04/27/2020 16:45	ALT
<b>Specific Conductance (Lab)</b>	<b>3080</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:14	04/27/2020 15:14	GAT
<b>Hardness as CaCO3</b>	<b>1800</b>	D	mg/L	5	5	2340 C (as HACH 8226)	05/04/2020 11:52	05/04/2020 11:52	CLL
<b>Total Dissolved Solids</b>	<b>2750</b>		mg/L	50	50	2540 C-2011	04/27/2020 11:08	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>1.5</b>		mg/L	0.5		5310 C-2011	05/02/2020 01:34	05/02/2020 01:34	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>-0.091</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>0.804</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>0.804</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW





**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>10.2</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/02/2020 05:50	05/02/2020 05:50	CSC
<b>Fluoride</b>	<b>0.21</b>		mg/L	0.20		EPA 300.0 REV 2.1	05/02/2020 05:50	05/02/2020 05:50	CSC
<b>Sulfate</b>	<b>2370</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/02/2020 06:11	05/02/2020 06:11	CSC

**Notes for work order 0033754**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			





**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>										
<b>Blank (B018047-BLK1)</b>										
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018047-BS1)</b>										
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120			
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>										
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	716	50	mg/L		724			1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>										
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	364	50	mg/L		372			2.17	10	
<b>Batch B018081 - Default Prep Wet Chem</b>										
<b>Blank (B018081-BLK1)</b>										
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018081-BS1)</b>										
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41										
Chemical Oxygen Demand	127	8	mg/L				90-110			
<b>Duplicate (B018081-DUP1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	206	8	mg/L		210			1.84	25	
<b>Matrix Spike (B018081-MS1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	416	8	mg/L	250	210	82.7	90-110			M2
<b>Matrix Spike Dup (B018081-MSD1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	414	8	mg/L	250	210	81.8	90-110	0.537	10	M2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD Limits	RPD RPD	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>									
<b>Blank (B018086-BLK1)</b>									
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54									
Specific Conductance (Lab)	ND	1	umhos/cm						U
<b>LCS (B018086-BS1)</b>									
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55									
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120		
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>									
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09									
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>									
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27									
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24
<b>Batch B018100 - Default Prep Wet Chem</b>									
<b>Blank (B018100-BLK1)</b>									
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21									
Total Organic Carbon	ND	0.5	mg/L						U
<b>LCS (B018100-BS1)</b>									
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43									
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120		
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>									
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07									
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>									
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27									
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>									
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29									
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120		



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2) Source: 0033759-01**

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Total Alkalinity	235	4	mg/L	235		99.8	80-120			
Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	250	4	mg/L	235		106	80-120			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B018391 - Default Prep Wet Chem

Duplicate (B018391-DUP1) Source: 0033751-01

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Total Alkalinity	309	4	mg/L		301			2.43	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	

Duplicate (B018391-DUP2) Source: 0033759-01

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Total Alkalinity	402	4	mg/L		394			2.01	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	

Matrix Spike (B018391-MS1) Source: 0033743-01

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
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Matrix Spike (B018391-MS2) Source: 0033759-01

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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Batch B019045 - Default Prep Wet Chem

Blank (B019045-BLK1)

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B019045-BS1)

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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Duplicate (B019045-DUP1) Source: 0041237-02

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
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Matrix Spike (B019045-MS1) Source: 0041237-02

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018474 - Default Prep IC**

**Blank (B018474-BLK1)**

Prepared: 5/2/2020 1:02, Analyzed: 5/2/2020 1:02

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B018474-BS1)**

Prepared: 5/2/2020 0:42, Analyzed: 5/2/2020 0:42

Chloride	9.7		mg/L	10.0		97.0	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			
Sulfate	10.0		mg/L	10.0		99.9	90-110			

**Matrix Spike (B018474-MS1)**

Source: 0033759-01

Prepared: 5/2/2020 9:35, Analyzed: 5/2/2020 9:35

Chloride	552		mg/L	10.0	1170	NR	80-120			M2
Fluoride	1.75		mg/L	10.0	0.24	15.1	80-120			M2
Sulfate	627		mg/L	10.0	2710	NR	80-120			M2

**Matrix Spike Dup (B018474-MSD1)**

Source: 0033759-01

Prepared: 5/2/2020 9:56, Analyzed: 5/2/2020 9:56

Fluoride	1.81		mg/L	10.0	0.24	15.7	80-120	3.09	20	M2
Sulfate	640		mg/L	10.0	2710	NR	80-120	2.10	20	M2
Chloride	558		mg/L	10.0	1170	NR	80-120	1.05	10	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033754**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-6 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033754-01 A	<u>04-22-20</u>	<u>10:35</u>	Plastic 1L	1	MW6	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033754-01 B	<u>04-22-20</u>	<u>10:35</u>	Plastic 500mL pH<2 w/HNO3	1	MW6	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033754-01 C	<u>04-22-20</u>	<u>16:35</u>	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
0033754-01 D	<u>04-22-20</u>	<u>10:35</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)

Preservation Check: pH :   
Preservation Check: pH :   
Preservation Check: pH :

Preservation Check Performed by: AS

Field data collected by: Travis Sneed Date (mm/dd/yy) 04-22-20 Time (24 hr) 10:35  
pH 6.21 Cond ( $\mu$ mho) 3.23 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.86 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 0.24 Turb. (NTU) 59.6  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>APM</u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-6 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#: 258508-6

Please Print Legibly

State: KY

Quote# \_\_\_\_\_

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033754-01 E	<u>04-22-20</u>	<u>10:35</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW6	g / c	Radium 228 (sub)
0033754-01 F	<u>04-22-20</u>	<u>10:35</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW6	g / c	Radium 228 (sub)
0033754-01 G	<u>04-22-20</u>	<u>10:35</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW6	g / c	Radium Total (sub)

Preservation Check Performed by: *ASU*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) 04-22-20 Time (24 hr) 10:35

pH 6.21 Cond <sup>MS</sup> (umho) 3.23 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.86 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 0.24 Turb. (NTU) 59.6

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Sneed</i></u>	Received by: (Signature) <u><i>abby park</i></u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____



May 18, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33754  
Pace Project No.: 30360645

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 33754  
Pace Project No.: 30360645

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33754  
Pace Project No.: 30360645

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360645001	0033754-01	Water	04/22/20 10:35	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 33754  
Pace Project No.: 30360645

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360645001	0033754-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33754  
Pace Project No.: 30360645

**Sample: 0033754-01**      **Lab ID: 30360645001**      Collected: 04/22/20 10:35      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>-0.0913 ± 0.343 (0.573)</b> <b>C:NA T:91%</b>	pCi/L	05/18/20 14:43	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.804 ± 0.454 (0.851)</b> <b>C:79% T:89%</b>	pCi/L	05/14/20 10:56	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.804 ± 0.797 (1.42)</b>	pCi/L	05/18/20 16:00	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33754  
Pace Project No.: 30360645

QC Batch: 394308	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360645001

METHOD BLANK: 1909681 Matrix: Water

Associated Lab Samples: 30360645001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.453 ± 0.239 (0.657) C:83% T:82%	pCi/L	05/14/20 10:56	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33754  
Pace Project No.: 30360645

QC Batch: 394309	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360645001

METHOD BLANK: 1909682 Matrix: Water

Associated Lab Samples: 30360645001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.127 ± 0.277 (0.478) C:NA T:86%	pCi/L	05/18/20 13:52	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33754  
Pace Project No.: 30360645

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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# 30360645

SUBCONTRACT ORDER  
Pace Analytical Services, LLC Kentucky  
0033754

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033754-01	Water	Sampled:04/22/2020 10:35	Specific Method
Radium Total (sub)	10/19/2020 10:35	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/19/2020 10:35	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/19/2020 10:35	EPA 903.1	

Released By Nancy Hooper Date 04-27-20 Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # 30360645

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 1811

Label	<u>JSM</u>
LIMS Login	<u>JSM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 3.7 °C Correction Factor: -0.5 °C Final Temp: 3.2 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH &lt; 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation: _____
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

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**Certificate of Analysis**  
**0033755**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 14:26

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Project Name: MW-7 Wilson 092-00004

Workorder: 0033755

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



A handwritten signature in black ink that reads "Rob Whittington".

---

Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0033755-01	MW7/	Groundwater	04/22/2020 10:55	04/23/2020 13:25	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0033755-01	Field Conductance				2320
	Field pH				6.90
	Field Temp (C)				18.22

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0911. Cobalt result added to report.



### ANALYTICAL RESULTS

Lab Sample ID: **0033755-01**  
Description: **MW7**

Sample Collection Date Time: 04/22/2020 10:55  
Sample Received Date Time: 04/23/2020 13:25

#### Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Arsenic</b>	<b>0.0075</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Barium</b>	<b>0.025</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Boron</b>	<b>1.58</b>	D1	mg/L	1.00	1.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:43	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Calcium</b>	<b>369</b>	D1	mg/L	40.0	13.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:47	AKB
<b>Chromium</b>	<b>0.0053</b>		mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Cobalt</b>	<b>0.006</b>		mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Copper</b>	<b>0.003</b>		mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Iron</b>	<b>15.1</b>	D1	mg/L	1.00	0.500	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:43	AKB
<b>Lead</b>	<b>0.004</b>		mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Magnesium</b>	<b>134</b>	D1	mg/L	20.0	9.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:47	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:07	DMH
<b>Molybdenum</b>	<b>0.003</b>	J	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Nickel</b>	<b>0.013</b>		mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Potassium</b>	<b>8.90</b>		mg/L	0.50	0.22	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:40	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Sodium</b>	<b>36.1</b>	D1	mg/L	2.60	1.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:43	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH
<b>Zinc</b>	<b>0.02</b>		mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:37	DMH

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>320</b>		mg/L	4		2320 B-2011	04/29/2020 14:47	04/29/2020 14:47	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 14:47	04/29/2020 14:47	HMF
<b>Total Alkalinity</b>	<b>320</b>		mg/L	4		2320 B-2011	04/29/2020 14:47	04/29/2020 14:47	HMF
<b>Chemical Oxygen Demand</b>	<b>112</b>		mg/L	8	8	HACH 8000	04/27/2020 16:46	04/27/2020 16:46	ALT
<b>Specific Conductance (Lab)</b>	<b>2250</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:16	04/27/2020 15:16	GAT
<b>Hardness as CaCO3</b>	<b>1350</b>	D	mg/L	5	5	2340 C (as HACH 8226)	05/04/2020 11:58	05/04/2020 11:58	CLL
<b>Total Dissolved Solids</b>	<b>1910</b>		mg/L	50	50	2540 C-2011	04/27/2020 11:12	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>1.3</b>		mg/L	0.5		5310 C-2011	05/02/2020 01:56	05/02/2020 01:56	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.040</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>1.01</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>1.05</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>40.0</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/02/2020 06:31	05/02/2020 06:31	CSC
<b>Fluoride</b>	<b>0.27</b>		mg/L	0.20		EPA 300.0 REV 2.1	05/02/2020 06:31	05/02/2020 06:31	CSC
<b>Sulfate</b>	<b>1310</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/02/2020 06:52	05/02/2020 06:52	CSC

**Notes for work order 0033755**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>										
<b>Blank (B018047-BLK1)</b>										
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018047-BS1)</b>										
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120			
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>										
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	716	50	mg/L		724			1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>										
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	364	50	mg/L		372			2.17	10	
<b>Batch B018081 - Default Prep Wet Chem</b>										
<b>Blank (B018081-BLK1)</b>										
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018081-BS1)</b>										
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41										
Chemical Oxygen Demand	127	8	mg/L				90-110			
<b>Duplicate (B018081-DUP1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	206	8	mg/L		210			1.84	25	
<b>Matrix Spike (B018081-MS1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	416	8	mg/L	250	210	82.7	90-110			M2
<b>Matrix Spike Dup (B018081-MSD1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	414	8	mg/L	250	210	81.8	90-110	0.537	10	M2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD RPD	Limit	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>									
<b>Blank (B018086-BLK1)</b>									
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54									
Specific Conductance (Lab)	ND	1	umhos/cm						U
<b>LCS (B018086-BS1)</b>									
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55									
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120		
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>									
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09									
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>									
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27									
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24
<b>Batch B018100 - Default Prep Wet Chem</b>									
<b>Blank (B018100-BLK1)</b>									
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21									
Total Organic Carbon	ND	0.5	mg/L						U
<b>LCS (B018100-BS1)</b>									
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43									
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120		
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>									
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07									
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>									
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27									
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>									
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29									
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120		





**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2) Source: 0033759-01**

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Total Alkalinity	235	4	mg/L	235		99.8	80-120			
Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	250	4	mg/L	235		106	80-120			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018391 - Default Prep Wet Chem**

**Duplicate (B018391-DUP1) Source: 0033751-01**

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Total Alkalinity	309	4	mg/L		301			2.43	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	

**Duplicate (B018391-DUP2) Source: 0033759-01**

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Total Alkalinity	402	4	mg/L		394			2.01	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	

**Matrix Spike (B018391-MS1) Source: 0033743-01**

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
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**Matrix Spike (B018391-MS2) Source: 0033759-01**

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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**Batch B019045 - Default Prep Wet Chem**

**Blank (B019045-BLK1)**

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B019045-BS1)**

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B019045-DUP1) Source: 0041237-02**

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
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**Matrix Spike (B019045-MS1) Source: 0041237-02**

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018474 - Default Prep IC**

**Blank (B018474-BLK1)**

Prepared: 5/2/2020 1:02, Analyzed: 5/2/2020 1:02

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B018474-BS1)**

Prepared: 5/2/2020 0:42, Analyzed: 5/2/2020 0:42

Chloride	9.7		mg/L	10.0		97.0	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			
Sulfate	10.0		mg/L	10.0		99.9	90-110			

**Matrix Spike (B018474-MS1)**

Source: 0033759-01

Prepared: 5/2/2020 9:35, Analyzed: 5/2/2020 9:35

Chloride	552		mg/L	10.0	1170	NR	80-120			M2
Fluoride	1.75		mg/L	10.0	0.24	15.1	80-120			M2
Sulfate	627		mg/L	10.0	2710	NR	80-120			M2

**Matrix Spike Dup (B018474-MSD1)**

Source: 0033759-01

Prepared: 5/2/2020 9:56, Analyzed: 5/2/2020 9:56

Fluoride	1.81		mg/L	10.0	0.24	15.7	80-120	3.09	20	M2
Sulfate	640		mg/L	10.0	2710	NR	80-120	2.10	20	M2
Chloride	558		mg/L	10.0	1170	NR	80-120	1.05	10	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033755**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-7 Wilson 092-00004**

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000

PWS ID#:

State: KY

PO#: 258508-6

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # 0033755 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033755-01 A	<u>4/22/20</u>	<u>1055</u>	Plastic 1L	1	MW7	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033755-01 B	<u>4/22/20</u>	<u>1055</u>	Plastic 500mL pH<2 w/HNO3	1	MW7	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033755-01 C	<u>4/22/20</u>	<u>1055</u>	Plastic 500mL pH<2 w/H2SO4	1	MW7	g / c	COD TOC
0033755-01 D	<u>4/22/20</u>	<u>1055</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW7	g / c	Radium 226 (sub)

Preservation Check: pH :

Preservation Check: pH :

Preservation Check: pH :

Preservation Check Performed by: ACU

Field data collected by: Travis Sneed Date (mm/dd/yy) 4/22/20 Time (24 hr) 1055  
pH 6.90 Cond <sup>mS/cm</sup> 2.32 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 18.22 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>abby sauer</u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-7 Wilson 092-00004**

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6

Please Print Legibly

Quote# \_\_\_\_\_

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes X No \_\_\_\_\_

Samples Chlorinated? Yes \_\_\_\_\_ No \_\_\_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033755 Sample ID#							
0033755-01 E	<u>4/22/20</u>	<u>1055</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW7	g / c	Radium 228 (sub)
0033755-01 F	<u>4/22/20</u>	<u>1055</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW7	g / c	Radium 228 (sub)
0033755-01 G	<u>4/22/20</u>	<u>1055</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1	MW7	g / c	Radium Total (sub)

Preservation Check Performed by: *ASU*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) *4/22/20* Time (24 hr) *1055*  
pH *6.90* Cond (umho) *2.32* Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) *18.22* or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Travis Sneed* Received by: (Signature) *ASU* Date (mm/dd/yy) *4-23-20* Time (24 hr) *1325*

May 18, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33755  
Pace Project No.: 30360643

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 33755  
Pace Project No.: 30360643

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33755  
Pace Project No.: 30360643

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360643001	0033755-01	Water	04/22/20 10:55	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 33755  
Pace Project No.: 30360643

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360643001	0033755-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33755  
Pace Project No.: 30360643

**Sample: 0033755-01**      **Lab ID: 30360643001**      Collected: 04/22/20 10:55      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.0400 ± 0.437 (0.697)</b> <b>C:NA T:87%</b>	pCi/L	05/18/20 14:43	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.01 ± 0.504 (0.887)</b> <b>C:79% T:75%</b>	pCi/L	05/14/20 10:55	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.05 ± 0.941 (1.58)</b>	pCi/L	05/18/20 16:00	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33755  
Pace Project No.: 30360643

QC Batch: 394308	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360643001

METHOD BLANK: 1909681 Matrix: Water

Associated Lab Samples: 30360643001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.453 ± 0.239 (0.657) C:83% T:82%	pCi/L	05/14/20 10:56	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33755  
Pace Project No.: 30360643

QC Batch: 394309	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360643001

METHOD BLANK: 1909682 Matrix: Water

Associated Lab Samples: 30360643001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.127 ± 0.277 (0.478) C:NA T:86%	pCi/L	05/18/20 13:52	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33755  
Pace Project No.: 30360643

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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WO#: 30360643



Chain of Custody

Workorder: 33755

Workorder Name: MW-7 Wilson 092-00004

Owner Received Date: 4/23/2020

Results Requested By:

Report To:

Subcontract To:

Requested Analysis

McCoy & McCoy Labs  
P.O. Box 907  
Madisonville, KY 42409  
270-821-7375  
r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg P/1  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
(724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers			Date/Time	Revised By	Date/Time	Comments
1												
2	0033755-01		04/22/20 10:55	IR44-McCoy	Water							
3												
4												
5												
6												
7												
8												
9												
10												
										EPA 903.1		
										EPA 904.0 Radium Sum Calc		
												LAB USE ONLY

Cooler Temperature on Receipt 4.5 °C Custody Seal Y or N Received on Ice Y or N Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002rev.00 24March2009

Page 1 of 1

# 30360643

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0033755

SENDING LABORATORY:


Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033755-01	Water	Sampled:04/22/2020 10:55	Specific Method
Radium Total (sub)	10/19/2020 10:55	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/19/2020 10:55	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/19/2020 10:55	EPA 903.1	


04-27-20

---

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

---

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_



Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # #-30360643

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 5386 1811

Label JSM  
LIMS Login JSM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 4.5 °C Correction Factor: -0.5 °C Final Temp: 4.0 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH&lt;2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person-Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted-By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

---

**Certificate of Analysis**  
**0033758**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 14:28

---

Project Name: MW-8 Wilson 092-00004

Workorder: 0033758

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



---

Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
--------	------------------------	--------	----------------	---------------	------------

0033758-01	MW8/	Groundwater	04/22/2020 07:55	04/23/2020 13:25	Travis Sneed
------------	------	-------------	------------------	------------------	--------------

<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>
0033758-01	Field Conductance	2050
	Field Dissolved Oxygen	0.41
	Field pH	6.18
	Field Temp (C)	15.00
	Field Turbidity	16.3

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0910. Cobalt result added to report.



**ANALYTICAL RESULTS**

Lab Sample ID: **0033758-01**  
 Description: **MW8**

Sample Collection Date Time: 04/22/2020 07:55  
 Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
<b>Arsenic</b>	<b>0.0056</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:11	DMH
<b>Barium</b>	<b>0.024</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:50	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
<b>Calcium</b>	<b>255</b>	D1	mg/L	40.0	13.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:56	AKB
<b>Chromium</b>	<b>0.0008</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:11	DMH
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:11	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:11	DMH
<b>Iron</b>	<b>38.0</b>	D1	mg/L	1.00	0.500	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:53	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
<b>Lithium</b>	<b>0.009</b>	J	mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
<b>Magnesium</b>	<b>138</b>	D1	mg/L	20.0	9.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:56	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:11	DMH
<b>Molybdenum</b>	<b>0.01</b>		mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
<b>Nickel</b>	<b>0.002</b>	J	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:11	DMH
<b>Potassium</b>	<b>4.46</b>		mg/L	0.50	0.22	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:50	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
<b>Sodium</b>	<b>41.1</b>	D1	mg/L	2.60	1.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:53	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:41	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:11	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>236</b>		mg/L	4		2320 B-2011	04/29/2020 14:52	04/29/2020 14:52	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 14:52	04/29/2020 14:52	HMF
<b>Total Alkalinity</b>	<b>236</b>		mg/L	4		2320 B-2011	04/29/2020 14:52	04/29/2020 14:52	HMF
<b>Chemical Oxygen Demand</b>	<b>22</b>		mg/L	8	8	HACH 8000	04/27/2020 16:46	04/27/2020 16:46	ALT
<b>Specific Conductance (Lab)</b>	<b>1940</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:20	04/27/2020 15:20	GAT
<b>Hardness as CaCO3</b>	<b>820</b>	D	mg/L	2	2	2340 C (as HACH 8226)	05/04/2020 12:42	05/04/2020 12:42	CLL
<b>Total Dissolved Solids</b>	<b>1500</b>		mg/L	50	50	2540 C-2011	04/27/2020 11:16	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>2.8</b>		mg/L	0.5		5310 C-2011	05/02/2020 02:17	05/02/2020 02:17	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.395</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>0.675</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>1.07</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>3.6</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/02/2020 07:12	05/02/2020 07:12	CSC
<b>Fluoride</b>	<b>0.27</b>		mg/L	0.20		EPA 300.0 REV 2.1	05/02/2020 07:12	05/02/2020 07:12	CSC
<b>Sulfate</b>	<b>1010</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/02/2020 07:32	05/02/2020 07:32	CSC

**Notes for work order 0033758**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>										
<b>Blank (B018047-BLK1)</b>										
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018047-BS1)</b>										
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120			
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>										
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	716	50	mg/L		724			1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>										
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	364	50	mg/L		372			2.17	10	
<b>Batch B018081 - Default Prep Wet Chem</b>										
<b>Blank (B018081-BLK1)</b>										
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018081-BS1)</b>										
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41										
Chemical Oxygen Demand	127	8	mg/L				90-110			
<b>Duplicate (B018081-DUP1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	206	8	mg/L		210			1.84	25	
<b>Matrix Spike (B018081-MS1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	416	8	mg/L	250	210	82.7	90-110			M2
<b>Matrix Spike Dup (B018081-MSD1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	414	8	mg/L	250	210	81.8	90-110	0.537	10	M2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>										
<b>Blank (B018086-BLK1)</b>										
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54										
Specific Conductance (Lab)	ND	1	umhos/cm							U
<b>LCS (B018086-BS1)</b>										
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120			
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>										
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09										
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24	
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>										
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27										
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24	
<b>Batch B018100 - Default Prep Wet Chem</b>										
<b>Blank (B018100-BLK1)</b>										
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21										
Total Organic Carbon	ND	0.5	mg/L							U
<b>LCS (B018100-BS1)</b>										
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43										
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120			
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>										
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07										
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25	
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>										
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27										
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25	
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>										
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29										
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2)** Source: 0033759-01

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Total Alkalinity	235	4	mg/L	235		99.8	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	250	4	mg/L	235		106	80-120			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018391 - Default Prep Wet Chem</b>										
<b>Duplicate (B018391-DUP1)</b>		<b>Source: 0033751-01</b>								
Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34										
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	
Total Alkalinity	309	4	mg/L		301			2.43	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
<b>Duplicate (B018391-DUP2)</b>										
<b>Duplicate (B018391-DUP2)</b>		<b>Source: 0033759-01</b>								
Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	402	4	mg/L		394			2.01	10	
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	
<b>Matrix Spike (B018391-MS1)</b>										
<b>Matrix Spike (B018391-MS1)</b>		<b>Source: 0033743-01</b>								
Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40										
Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
<b>Matrix Spike (B018391-MS2)</b>										
<b>Matrix Spike (B018391-MS2)</b>		<b>Source: 0033759-01</b>								
Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18										
Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
<b>Batch B019045 - Default Prep Wet Chem</b>										
<b>Blank (B019045-BLK1)</b>										
Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56										
Hardness as CaCO3	ND	1	mg/L							U
<b>LCS (B019045-BS1)</b>										
Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58										
Hardness as CaCO3	230	1	mg/L	225		102	80-120			
<b>Duplicate (B019045-DUP1)</b>										
<b>Duplicate (B019045-DUP1)</b>		<b>Source: 0041237-02</b>								
Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56										
Hardness as CaCO3	214	1	mg/L		200			6.76	10	
<b>Matrix Spike (B019045-MS1)</b>										
<b>Matrix Spike (B019045-MS1)</b>		<b>Source: 0041237-02</b>								
Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58										
Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			





**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018474 - Default Prep IC**

**Blank (B018474-BLK1)**

Prepared: 5/2/2020 1:02, Analyzed: 5/2/2020 1:02

Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B018474-BS1)**

Prepared: 5/2/2020 0:42, Analyzed: 5/2/2020 0:42

Sulfate	10.0		mg/L	10.0		99.9	90-110			
Chloride	9.7		mg/L	10.0		97.0	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			

**Matrix Spike (B018474-MS1)**

Source: 0033759-01

Prepared: 5/2/2020 9:35, Analyzed: 5/2/2020 9:35

Fluoride	1.75		mg/L	10.0	0.24	15.1	80-120			M2
Sulfate	627		mg/L	10.0	2710	NR	80-120			M2
Chloride	552		mg/L	10.0	1170	NR	80-120			M2

**Matrix Spike Dup (B018474-MSD1)**

Source: 0033759-01

Prepared: 5/2/2020 9:56, Analyzed: 5/2/2020 9:56

Fluoride	1.81		mg/L	10.0	0.24	15.7	80-120	3.09	20	M2
Chloride	558		mg/L	10.0	1170	NR	80-120	1.05	10	M2
Sulfate	640		mg/L	10.0	2710	NR	80-120	2.10	20	M2

**Certified Analyses included in this Report**

Analyte	Certifications
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**2320 B-2011 in Water**

Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)

**2340 C (as HACH 8226) in Water**

Hardness as CaCO3	KY Drinking Water Mdv (00030)
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**2510 B-2011 in Water**

Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
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**2540 C-2011 in Water**

Total Dissolved Solids	KY Drinking Water Mdv (00030)
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**5310 C-2011 in Water**

Total Organic Carbon	KY Drinking Water Mdv (00030)
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**EPA 300.0 REV 2.1 in Water**

Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)

**HACH 8000 in Water**

Chemical Oxygen Demand	KY Wastewater Mdv (00030)
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**SW846 6010 B in Water**

**Sample Acceptance Checklist for Work Order 0033758**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 03/02/2020



Client: Big Rivers Electric Corporation Wilson Station

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: MW-8 Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#:  
State: Ky

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes K No \_\_\_\_\_

Samples Chlorinated? Yes \_\_\_\_\_ No \_\_\_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # 0033758 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033758-01 A	<u>04-22-20</u>	<u>7:55</u>	Plastic 1L	1	MW8	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033758-01 B	<u>04-22-20</u>	<u>7:55</u>	Plastic 500mL pH<2 w/HNO3	1	MW8	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033758-01 C	<u>04-22-20</u>	<u>7:55</u>	Plastic 500mL pH<2 w/H2SO4	1	MW8	g / c	COD TOC
0033758-01 D	<u>04-22-20</u>	<u>7:55</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW8	g / c	Radium 226 (sub)

Preservation Check: pH : ✓

Preservation Check: pH : ✓

Preservation Check: pH : ✓

Preservation Check Performed by: *AS*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) 04-22-20 Time (24 hr) 7:55  
pH 6.18 Cond <sup>ms</sup> 2.05 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.00 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 0.41 Turb. (NTU) 163  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Sneed</i></u>	Received by: (Signature) <u><i>Abby Trumb</i></u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-8 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:

PO#: 258508-6

Please Print Legibly

State: KY

Quote# \_\_\_\_\_

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033758-01 E	<u>04-22-20</u>	<u>7:55</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW8	g / c	Radium 228 (sub)
0033758-01 F	<u>04-22-20</u>	<u>7:55</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW8	g / c	Radium 228 (sub)
0033758-01 G	<u>04-22-20</u>	<u>7:55</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW8	g / c	Radium Total (sub)

Preservation Check Performed by: *AM*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) 04-22-20 Time (24 hr) 7:55  
pH 6.18 Cond (umho) 2.05 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.00 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 0.41 Turb. (NTU) 163  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Sneed</i></u>	Received by: (Signature) <u><i>Abby Z...</i></u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
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May 18, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33758  
Pace Project No.: 30360647

Dear Rob Whittington:

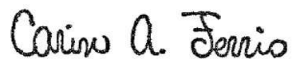
Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 33758  
Pace Project No.: 30360647

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33758  
Pace Project No.: 30360647

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360647001	0033758-01	Water	04/22/20 07:55	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 33758  
Pace Project No.: 30360647

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360647001	0033758-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33758  
Pace Project No.: 30360647

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 0033758-01</b> <b>Lab ID: 30360647001</b> Collected: 04/22/20 07:55      Received: 04/28/20 09:10      Matrix: Water PWS:      Site ID:      Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.395 ± 0.453 (0.625)</b> <b>C:NA T:84%</b>	pCi/L	05/18/20 14:43	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.675 ± 0.411 (0.781)</b> <b>C:83% T:88%</b>	pCi/L	05/14/20 10:56	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.07 ± 0.864 (1.41)</b>	pCi/L	05/18/20 16:00	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33758  
Pace Project No.: 30360647

QC Batch: 394308	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360647001

METHOD BLANK: 1909681 Matrix: Water

Associated Lab Samples: 30360647001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.453 ± 0.239 (0.657) C:83% T:82%	pCi/L	05/14/20 10:56	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33758  
Pace Project No.: 30360647

QC Batch: 394309	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360647001

METHOD BLANK: 1909682 Matrix: Water

Associated Lab Samples: 30360647001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.127 ± 0.277 (0.478) C:NA T:86%	pCi/L	05/18/20 13:52	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33758  
Pace Project No.: 30360647

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

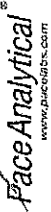
## REPORT OF LABORATORY ANALYSIS

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WO#: 30360647



Chain of Custody



Workorder: 33758

Workorder Name: MW-8 Wilson 092-00004

Owner Received Date: 4/23/2020

Results Requested By:

Report To:

Subcontract To:

McCoy & McCoy Labs  
P.O. Box 907  
Madisonville, KY 42409  
270-821-7375  
r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg P/ 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Received By	Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc				
1											
2	0033758-01		04/22/20 07:55	IR44-McCoy	Water	X	X		<i>[Signature]</i>	4/23/20 0910	
3											
4											
5											
6											
7											
8											
9											
10											
Transfers Released By											
1											
2											
3											

LAB USE ONLY

001

Cooler Temperature on Receipt 4.5 °C Custody Seal Y or N Received on Ice Y or N Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002rev.00 24March2009

Page 1 of 1

# 30360647

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0033758

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033758-01	Water	Sampled:04/22/2020 07:55	Specific Method
Radium Total (sub)	10/19/2020 07:55	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/19/2020 07:55	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/19/2020 07:55	EPA 903.1	

*Nancy Yeager* 04-27-20  
 Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_  
 Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # 30360647

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 1811

Label DSM  
LIMS Login DSM

Custody Seal on Cooler/Box Present:  yes  no    Seals intact:  yes  no

Thermometer Used 9    Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 4.5 °C    Correction Factor: -0.5 °C    Final Temp: 4.0 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID      Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>pH &lt; 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0033744

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 13:50

Project Name: MW-10 Wilson 092-00004

Workorder: 0033744

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*





**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0033744-01	MW10/	Groundwater	04/22/2020 07:50	04/23/2020 13:25	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0033744-01	Field Conductance				3760
	Field pH				6.26
	Field Temp (C)				13.66

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0921. Cobalt result added to report.

**ANALYTICAL RESULTS**

Lab Sample ID: **0033744-01**

Description: **MW10**

Sample Collection Date Time: 04/22/2020 07:50

Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Arsenic</b>	<b>0.0011</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Barium</b>	<b>0.008</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Boron</b>	<b>0.28</b>		mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:18	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Calcium</b>	<b>415</b>	D1	mg/L	40.0	13.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:25	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Cobalt</b>	<b>0.082</b>		mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Iron</b>	<b>9.91</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:18	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Lithium</b>	<b>0.006</b>	J	mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Magnesium</b>	<b>234</b>	D1	mg/L	20.0	9.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:25	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/02/2020 17:25	DMH
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Nickel</b>	<b>0.046</b>		mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Potassium</b>	<b>6.38</b>		mg/L	0.50	0.22	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:18	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
<b>Sodium</b>	<b>179</b>	D1	mg/L	26.0	10.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:25	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:40	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>166</b>		mg/L	4		2320 B-2011	04/29/2020 11:52	04/29/2020 11:52	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 11:52	04/29/2020 11:52	HMF
<b>Total Alkalinity</b>	<b>166</b>		mg/L	4		2320 B-2011	04/29/2020 11:52	04/29/2020 11:52	HMF
<b>Chemical Oxygen Demand</b>	<b>35</b>		mg/L	8	8	HACH 8000	04/27/2020 15:25	04/27/2020 15:25	ALT
<b>Specific Conductance (Lab)</b>	<b>3400</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 14:58	04/27/2020 14:58	GAT
<b>Hardness as CaCO3</b>	<b>1240</b>	D	mg/L	5	5	2340 C (as HACH 8226)	05/04/2020 11:14	05/04/2020 11:14	CLL
<b>Total Dissolved Solids</b>	<b>3170</b>		mg/L	50	50	2540 C-2011	04/27/2020 09:13	04/28/2020 12:15	MAG
<b>Total Organic Carbon</b>	<b>1.0</b>		mg/L	0.5		5310 C-2011	05/01/2020 20:09	05/01/2020 20:09	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.082</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>0.332</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>0.414</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>68.6</b>	D	mg/L	25.0	18.0	EPA 300.0 REV 2.1	05/01/2020 18:34	05/01/2020 18:34	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	05/01/2020 18:13	05/01/2020 18:13	CSC
<b>Sulfate</b>	<b>3580</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/01/2020 18:54	05/01/2020 18:54	CSC

**Notes for work order 0033744**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.
Y2	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018020 - Default Prep Wet Chem**

**Blank (B018020-BLK1)**

Prepared: 4/27/2020 8:45, Analyzed: 4/28/2020 12:15

Total Dissolved Solids	ND	25	mg/L							U
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**LCS (B018020-BS1)**

Prepared: 4/27/2020 8:49, Analyzed: 4/28/2020 12:15

Total Dissolved Solids	1440	25	mg/L	1500		96.3	80-120			
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**Duplicate (B018020-DUP1) Source: 0043533-01**

Prepared: 4/27/2020 10:13, Analyzed: 4/28/2020 12:15

Total Dissolved Solids	ND	50	mg/L		ND				10	U
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**Duplicate (B018020-DUP2) Source: 0033742-01**

Prepared: 4/27/2020 10:17, Analyzed: 4/28/2020 12:15

Total Dissolved Solids	74	50	mg/L		76			2.67	10	
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**Batch B018080 - Default Prep Wet Chem**

**Blank (B018080-BLK1)**

Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20

Chemical Oxygen Demand	ND	8	mg/L							U
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**LCS (B018080-BS1)**

Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20

Chemical Oxygen Demand	121	8	mg/L				90-110			
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**Duplicate (B018080-DUP1) Source: 0042854-01**

Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30

Chemical Oxygen Demand	36	8	mg/L		22			47.1	25	Y1
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**Matrix Spike (B018080-MS1) Source: 0042854-01**

Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30

Chemical Oxygen Demand	274	8	mg/L	250	22	101	90-110			
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**Matrix Spike Dup (B018080-MSD1) Source: 0042854-01**

Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30

Chemical Oxygen Demand	263	8	mg/L	250	22	96.3	90-110	4.34	10	
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>										
<b>Blank (B018086-BLK1)</b>										
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54										
Specific Conductance (Lab)	ND	1	umhos/cm							U
<b>LCS (B018086-BS1)</b>										
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120			
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>										
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09										
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24	
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>										
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27										
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24	
<b>Batch B018100 - Default Prep Wet Chem</b>										
<b>Blank (B018100-BLK1)</b>										
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21										
Total Organic Carbon	ND	0.5	mg/L							U
<b>LCS (B018100-BS1)</b>										
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43										
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120			
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>										
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07										
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25	
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>										
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27										
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25	
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>										
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29										
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2) Source: 0033759-01**

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Total Alkalinity	235	4	mg/L	235		99.8	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	250	4	mg/L	235		106	80-120			
Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch B018391 - Default Prep Wet Chem

Duplicate (B018391-DUP1) Source: 0033751-01

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	
Total Alkalinity	309	4	mg/L		301			2.43	10	

Duplicate (B018391-DUP2) Source: 0033759-01

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	
Total Alkalinity	402	4	mg/L		394			2.01	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

Matrix Spike (B018391-MS1) Source: 0033743-01

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
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Matrix Spike (B018391-MS2) Source: 0033759-01

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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Batch B019045 - Default Prep Wet Chem

Blank (B019045-BLK1)

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B019045-BS1)

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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Duplicate (B019045-DUP1) Source: 0041237-02

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
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Matrix Spike (B019045-MS1) Source: 0041237-02

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018473 - Default Prep IC**

**Blank (B018473-BLK1)**

Prepared: 5/1/2020 15:50, Analyzed: 5/1/2020 15:50

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B018473-BS1)**

Prepared: 5/1/2020 15:30, Analyzed: 5/1/2020 15:30

Fluoride	9.60		mg/L	10.0		96.0	90-110			
Sulfate	9.7		mg/L	10.0		97.1	90-110			
Chloride	9.6		mg/L	10.0		96.1	90-110			

**Matrix Spike (B018473-MS1)**

Source: 0033742-01

Prepared: 5/2/2020 0:01, Analyzed: 5/2/2020 0:01

Chloride	10.1		mg/L	10.0	0.0	101	80-120			
Fluoride	10.2		mg/L	10.0	0.06	101	80-120			
Sulfate	10.8		mg/L	10.0	0.005	108	80-120			

**Matrix Spike Dup (B018473-MSD1)**

Source: 0033742-01

Prepared: 5/2/2020 0:21, Analyzed: 5/2/2020 0:21

Fluoride	13.2		mg/L	10.0	0.06	132	80-120	26.2	20	M1, Y2
Chloride	13.1		mg/L	10.0	0.0	131	80-120	25.7	10	M1, Y2
Sulfate	14.5		mg/L	10.0	0.005	145	80-120	28.8	20	M1, Y2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033744**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

**Scheduled for: 03/02/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

**Project:** MW-10 Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033744-01 A	<u>4/22/20</u>	<u>0750</u>	Plastic 1L	1	MW10	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033744-01 B	<u>4/22/20</u>	<u>0750</u>	Plastic 500mL pH<2 w/HNO3	1	MW10	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033744-01 C	<u>4/22/20</u>	<u>0750</u>	Plastic 500mL pH<2 w/H2SO4	1	MW10	g / c	COD TOC
0033744-01 D	<u>4/22/20</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW10	g / c	Radium 226 (sub)

Preservation Check: pH :

Preservation Check: pH :

Preservation Check: pH :

Preservation Check Performed by: AS

Field data collected by: Travis Sneed Date (mm/dd/yy) 4/22/20 Time (24 hr) 0750  
pH 6.26 Cond <sup>mS/cm</sup> 3.76 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 13.66 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Travis Sneed Received by: (Signature) Abby Parki Date (mm/dd/yy) 4-23-20 Time (24 hr) 1325

# Chain of Custody



Scheduled for: 03/02/2020

Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-10 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No   
Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033744-01 E	<u>4/22/20</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW10	g / c	Radium 228 (sub)
0033744-01 F	<u>4/22/20</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW10	g / c	Radium 228 (sub)
0033744-01 G	<u>4/22/20</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW10	g / c	Radium Total (sub)

Preservation Check Performed by: *AS*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) *4/22/20* Time (24 hr) *0750*

pH *6.26* Cond (umho) *3.76* Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) *13.66* or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Sneed</i></u>	Received by: (Signature) <u><i>abby parker</i></u>	Date (mm/dd/yy) <u><i>4-23-20</i></u>	Time (24 hr) <u><i>1325</i></u>
_____	_____	_____	_____
_____	_____	_____	_____

May 18, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33744  
Pace Project No.: 30360642

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 33744  
Pace Project No.: 30360642

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33744  
Pace Project No.: 30360642

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360642001	0033744-01	Water	04/22/20 07:50	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 33744  
Pace Project No.: 30360642

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360642001	0033744-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33744  
Pace Project No.: 30360642

**Sample: 0033744-01**      **Lab ID: 30360642001**      Collected: 04/22/20 07:50      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.0821 ± 0.360 (0.550)</b> <b>C:NA T:95%</b>	pCi/L	05/18/20 14:19	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.332 ± 0.371 (0.778)</b> <b>C:80% T:84%</b>	pCi/L	05/14/20 10:55	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.414 ± 0.731 (1.33)</b>	pCi/L	05/18/20 16:00	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33744  
Pace Project No.: 30360642

QC Batch: 394308	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360642001

METHOD BLANK: 1909681 Matrix: Water

Associated Lab Samples: 30360642001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.453 ± 0.239 (0.657) C:83% T:82%	pCi/L	05/14/20 10:56	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33744  
Pace Project No.: 30360642

QC Batch: 394309	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360642001

METHOD BLANK: 1909682 Matrix: Water

Associated Lab Samples: 30360642001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.127 ± 0.277 (0.478) C:NA T:86%	pCi/L	05/18/20 13:52	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33744  
Pace Project No.: 30360642

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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WO#: 30360642



30360642

Chain of Custody

Workorder: 33744

Workorder Name: MW-10 Wilson 092-00004

Owner Received Date: 4/23/2020

Results Requested By:

Report To:

Subcontract To:

Requested Analysis

McCoy & McCoy Labs

P.O. Box 907

Madisonville, KY 42409

270-821-7375

r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg PA

1638 Rosey Town Rd Suite 2,3,4

Greensburg, PA 15601

(724) 850-5615

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Received By	Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc				
1											
2	0033744-01		04/22/20 07:50	IR44-McCoy	Water	X	X		<i>[Signature]</i>	4/23/20 0910	
3											
4											
5											
6											
7											
8											
9											
10											

LAB USE ONLY

*[Handwritten mark]*

Cooler Temperature on Receipt 5.5 °C

Custody Seal Y or N

Received on Ice Y or N

Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002rev.00 24March2009

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SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0033744

# 30360642

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033744-01	Water	Sampled:04/22/2020 07:50	Specific Method <i>oe1</i>
Radium Total (sub)	10/19/2020 07:50	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/19/2020 07:50	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/19/2020 07:50	EPA 903.1	

*Nancy Gloger* 04.27.20  
Released By Date  
*JPH/MS* 4/28/2020 0910  
Received By Date

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Released By Date Received By Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # - 30360642

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 5386 1811

Label JSM  
LIMS Login JSM

Custody Seal on Cooler/Box Present:  yes  no    Seals intact:  yes  no

Thermometer Used 9    Type of Ice:  Wet  Blue  None

Cooler Temperature    Observed Temp 5.5 °C    Correction Factor: -0.5 °C    Final Temp: 5.0 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. <u>10D4191</u>
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID                      Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH &lt; 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0033752

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 14:18

Project Name: MW-4D Wilson 092-00004

Workorder: 0033752

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0033752-01	MW4D/	Groundwater	04/23/2020 07:50	04/23/2020 13:25	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0033752-01	Field Conductance				5890
	Field pH				6.31
	Field Temp (C)				15.69

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0914. Cobalt result added to report.

**ANALYTICAL RESULTS**

Lab Sample ID: **0033752-01**  
Description: **MW4D**

Sample Collection Date Time: 04/23/2020 07:50  
Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Arsenic</b>	<b>0.0039</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Barium</b>	<b>0.016</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Boron</b>	<b>10.2</b>	D1	mg/L	10.0	10.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:09	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Calcium</b>	<b>714</b>	D1	mg/L	40.0	13.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:09	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Cobalt</b>	<b>0.010</b>		mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Iron</b>	<b>7.31</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:02	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Lithium</b>	<b>0.16</b>		mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Magnesium</b>	<b>280</b>	D1	mg/L	20.0	9.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:09	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/04/2020 11:42	DMH
<b>Molybdenum</b>	<b>0.02</b>		mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Nickel</b>	<b>0.036</b>		mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Potassium</b>	<b>49.1</b>	D1	mg/L	5.00	2.20	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:06	AKB
<b>Selenium</b>	<b>0.001</b>	J	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Sodium</b>	<b>256</b>	D1	mg/L	26.0	10.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:09	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH
<b>Zinc</b>	<b>0.02</b>		mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:25	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>404</b>		mg/L	4		2320 B-2011	04/29/2020 14:25	04/29/2020 14:25	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 14:25	04/29/2020 14:25	HMF
<b>Total Alkalinity</b>	<b>404</b>		mg/L	4		2320 B-2011	04/29/2020 14:25	04/29/2020 14:25	HMF
<b>Chemical Oxygen Demand</b>	<b>45</b>		mg/L	8	8	HACH 8000	04/27/2020 16:45	04/27/2020 16:45	ALT
<b>Specific Conductance (Lab)</b>	<b>5470</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:12	04/27/2020 15:12	GAT
<b>Hardness as CaCO3</b>	<b>2290</b>	D	mg/L	5	5	2340 C (as HACH 8226)	05/04/2020 11:40	05/04/2020 11:40	CLL
<b>Total Dissolved Solids</b>	<b>4690</b>		mg/L	50	50	2540 C-2011	04/27/2020 11:00	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>0.5</b>		mg/L	0.5		5310 C-2011	05/02/2020 00:51	05/02/2020 00:51	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>-0.286</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>0.851</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>0.851</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW





**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>1280</b>	D	mg/L	50.0	36.0	EPA 300.0 REV 2.1	05/02/2020 03:47	05/02/2020 03:47	CSC
<b>Fluoride</b>	<b>0.26</b>		mg/L	0.20		EPA 300.0 REV 2.1	05/02/2020 03:26	05/02/2020 03:26	CSC
<b>Sulfate</b>	<b>2650</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/02/2020 03:47	05/02/2020 03:47	CSC

**Notes for work order 0033752**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			





**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD RPD	Notes	
<b>Batch B018047 - Default Prep Wet Chem</b>									
<b>Blank (B018047-BLK1)</b>									
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32									
Total Dissolved Solids	ND	25	mg/L					U	
<b>LCS (B018047-BS1)</b>									
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32									
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120		
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>									
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32									
Total Dissolved Solids	716	50	mg/L		724		1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>									
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32									
Total Dissolved Solids	364	50	mg/L		372		2.17	10	
<b>Batch B018081 - Default Prep Wet Chem</b>									
<b>Blank (B018081-BLK1)</b>									
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41									
Chemical Oxygen Demand	ND	8	mg/L					U	
<b>LCS (B018081-BS1)</b>									
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41									
Chemical Oxygen Demand	127	8	mg/L				90-110		
<b>Duplicate (B018081-DUP1) Source: 0040126-01</b>									
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50									
Chemical Oxygen Demand	206	8	mg/L		210		1.84	25	
<b>Matrix Spike (B018081-MS1) Source: 0040126-01</b>									
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50									
Chemical Oxygen Demand	416	8	mg/L	250	210	82.7	90-110	M2	
<b>Matrix Spike Dup (B018081-MSD1) Source: 0040126-01</b>									
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50									
Chemical Oxygen Demand	414	8	mg/L	250	210	81.8	90-110	0.537 10 M2	



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD RPD	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>								
<b>Blank (B018086-BLK1)</b>								
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54								
Specific Conductance (Lab)	ND	1	umhos/cm					U
<b>LCS (B018086-BS1)</b>								
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55								
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120	
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>								
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09								
Specific Conductance (Lab)	2980	1	umhos/cm		2990		0.0335	1.24
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>								
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27								
Specific Conductance (Lab)	1	1	umhos/cm		1		0.755	1.24
<b>Batch B018100 - Default Prep Wet Chem</b>								
<b>Blank (B018100-BLK1)</b>								
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21								
Total Organic Carbon	ND	0.5	mg/L					U
<b>LCS (B018100-BS1)</b>								
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43								
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120	
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>								
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07								
Total Organic Carbon	2.0	0.5	mg/L		2.0		0.0293	25
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>								
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27								
Total Organic Carbon	2.8	0.5	mg/L		2.8		0.410	25
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>								
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29								
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120	



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2)** Source: 0033759-01

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Total Alkalinity	235	4	mg/L	235		99.8	80-120			
Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	250	4	mg/L	235		106	80-120			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD RPD	RPD RPD	Notes
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**Batch B018391 - Default Prep Wet Chem**

**Duplicate (B018391-DUP1) Source: 0033751-01**

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Total Alkalinity	309	4	mg/L		301		2.43	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301			10	U
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND			10	

**Duplicate (B018391-DUP2) Source: 0033759-01**

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Total Alkalinity	402	4	mg/L		394		2.01	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND			10	U
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394		2.01	10	

**Matrix Spike (B018391-MS1) Source: 0033743-01**

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120		M2
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**Matrix Spike (B018391-MS2) Source: 0033759-01**

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120		M3
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**Batch B019045 - Default Prep Wet Chem**

**Blank (B019045-BLK1)**

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L						U
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**LCS (B019045-BS1)**

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120		
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**Duplicate (B019045-DUP1) Source: 0041237-02**

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200		6.76	10	
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**Matrix Spike (B019045-MS1) Source: 0041237-02**

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120		
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018474 - Default Prep IC**

**Blank (B018474-BLK1)**

Prepared: 5/2/2020 1:02, Analyzed: 5/2/2020 1:02

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B018474-BS1)**

Prepared: 5/2/2020 0:42, Analyzed: 5/2/2020 0:42

Chloride	9.7		mg/L	10.0		97.0	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			
Sulfate	10.0		mg/L	10.0		99.9	90-110			

**Matrix Spike (B018474-MS1)**

Source: 0033759-01

Prepared: 5/2/2020 9:35, Analyzed: 5/2/2020 9:35

Chloride	552		mg/L	10.0	1170	NR	80-120			M2
Fluoride	1.75		mg/L	10.0	0.24	15.1	80-120			M2
Sulfate	627		mg/L	10.0	2710	NR	80-120			M2

**Matrix Spike Dup (B018474-MSD1)**

Source: 0033759-01

Prepared: 5/2/2020 9:56, Analyzed: 5/2/2020 9:56

Fluoride	1.81		mg/L	10.0	0.24	15.7	80-120	3.09	20	M2
Sulfate	640		mg/L	10.0	2710	NR	80-120	2.10	20	M2
Chloride	558		mg/L	10.0	1170	NR	80-120	1.05	10	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033752**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-4D Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Trevi Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # 0033752 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033752-01 A	<u>4/23/20</u>	<u>0750</u>	Plastic 1L	1	MW4D	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033752-01 B	<u>4/23/20</u>	<u>0750</u>	Plastic 500mL pH<2 w/HNO3	1	MW4D	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033752-01 C	<u>4/23/20</u>	<u>0750</u>	Plastic 500mL pH<2 w/H2SO4	1	MW4D	g / c	COD TOC
0033752-01 D	<u>4/23/20</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4D	g / c	Radium 226 (sub)

Preservation Check: pH:   
Preservation Check: pH:   
Preservation Check: pH:

Preservation Check Performed by: *ASL*

Field data collected by: *Trevi Sneed* Date (mm/dd/yy) 4/23/20 Time (24 hr) 0750  
pH 6.31 Cond <sup>ns/cm</sup> 5.89 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.69 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Trevi Sneed* Received by: (Signature) *Abby Lamm* Date (mm/dd/yy) 4-23-20 Time (24 hr) 1325

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-4D Wilson 092-00004**

Phone: (270) 844-6000

PO#: 258508-6

PWS ID#: KY  
State: KY

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033752-01 E	<u>4/23/20</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW4D	g / c	Radium 228 (sub)
0033752-01 F	<u>4/23/20</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW4D	g / c	Radium 228 (sub)
0033752-01 G	<u>4/23/20</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW4D	g / c	Radium Total (sub)

Preservation Check Performed by: *AS*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) 4/23/20 Time (24 hr) 0750  
pH 6.51 Cond (umho) 5.89 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.69 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Sneed</i></u>	Received by: (Signature) <u><i>Abby...</i></u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____



May 19, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33752  
Pace Project No.: 30360656

Dear Rob Whittington:

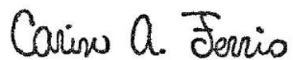
Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 33752  
Pace Project No.: 30360656

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33752  
Pace Project No.: 30360656

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360656001	0033752-01	Water	04/23/20 07:50	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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### SAMPLE ANALYTE COUNT

Project: 33752  
Pace Project No.: 30360656

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360656001	0033752-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33752  
Pace Project No.: 30360656

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 0033752-01</b> <b>Lab ID: 30360656001</b> Collected: 04/23/20 07:50      Received: 04/28/20 09:10      Matrix: Water PWS:      Site ID:      Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>-0.286 ± 0.460 (0.898)</b> <b>C:NA T:86%</b>	pCi/L	05/18/20 15:36	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.851 ± 0.525 (0.987)</b> <b>C:76% T:68%</b>	pCi/L	05/15/20 15:51	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.851 ± 0.985 (1.89)</b>	pCi/L	05/19/20 08:36	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33752  
Pace Project No.: 30360656

QC Batch: 394311	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360656001

METHOD BLANK: 1909693 Matrix: Water

Associated Lab Samples: 30360656001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.255 ± 0.240 (0.532) C:NA T:97%	pCi/L	05/18/20 15:36	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33752  
Pace Project No.: 30360656

QC Batch: 394310	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360656001

METHOD BLANK: 1909692 Matrix: Water

Associated Lab Samples: 30360656001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.175 ± 0.287 (0.624) C:79% T:85%	pCi/L	05/15/20 15:53	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33752  
Pace Project No.: 30360656

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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# 30360656

**SUBCONTRACT ORDER**  
Pace Analytical Services, LLC Kentucky  
0033752

**SENDING LABORATORY:**

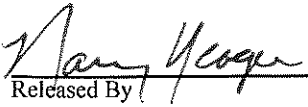
Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0033752-01</b>	<b>Water</b>	<b>Sampled:04/23/2020 07:50</b>	<b>Specific Method</b>
Radium Total (sub)	10/20/2020 07:50	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/20/2020 07:50	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/20/2020 07:50	EPA 903.1	


04-27-20

---

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

---

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # 30360656

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 5386 1811

Label	<u>JSM</u>
LIMS Login	<u>JSM</u>

Custody Seal on Cooler/Box Present:  yes  no    Seals intact:  yes  no

Thermometer Used 9    Type of Ice:  Wet  Blue  None

Cooler Temperature    Observed Temp 3.6 °C    Correction Factor: -0.5 °C    Final Temp: 3.1 °C  
 Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID      Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pHC2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0033745

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 13:55

Project Name: MW-102 Wilson 092-00004

Workorder: 0033745

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
--------	------------------------	--------	----------------	---------------	------------

0033745-01	MW102/	Groundwater	04/23/2020 08:10	04/23/2020 13:25	Travis Sneed
------------	--------	-------------	------------------	------------------	--------------

<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>
0033745-01	Field Conductance	1210
	Field Dissolved Oxygen	0.58
	Field pH	6.48
	Field Temp (C)	15.77
	Field Turbidity	3.8

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0920. Cobalt result added to report.

**ANALYTICAL RESULTS**

Lab Sample ID: **0033745-01**  
Description: **MW102**

Sample Collection Date Time: 04/23/2020 08:10  
Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
<b>Arsenic</b>	<b>0.0047</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
<b>Barium</b>	<b>0.051</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:28	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
<b>Calcium</b>	<b>94.5</b>	D1	mg/L	4.00	1.30	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:31	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
<b>Iron</b>	<b>6.01</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:28	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
<b>Magnesium</b>	<b>41.3</b>	D1	mg/L	2.00	0.900	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:31	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/02/2020 17:29	DMH
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
<b>Nickel</b>	<b>0.002</b>	J	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
<b>Potassium</b>	<b>2.46</b>		mg/L	0.50	0.22	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:28	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
<b>Sodium</b>	<b>135</b>	D1	mg/L	26.0	10.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:44	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:43	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>288</b>		mg/L	4		2320 B-2011	04/29/2020 11:55	04/29/2020 11:55	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 11:55	04/29/2020 11:55	HMF
<b>Total Alkalinity</b>	<b>288</b>		mg/L	4		2320 B-2011	04/29/2020 11:55	04/29/2020 11:55	HMF
<b>Chemical Oxygen Demand</b>	<b>14</b>		mg/L	8	8	HACH 8000	04/27/2020 15:25	04/27/2020 15:25	ALT
<b>Specific Conductance (Lab)</b>	<b>1190</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 14:59	04/27/2020 14:59	GAT
<b>Hardness as CaCO3</b>	<b>320</b>		mg/L	1	1	2340 C (as HACH 8226)	05/04/2020 11:16	05/04/2020 11:16	CLL
<b>Total Dissolved Solids</b>	<b>724</b>		mg/L	50	50	2540 C-2011	04/27/2020 10:32	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>1.0</b>		mg/L	0.5		5310 C-2011	05/01/2020 20:31	05/01/2020 20:31	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.084</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>-0.154</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>0.084</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>33.1</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/01/2020 19:56	05/01/2020 19:56	CSC
<b>Fluoride</b>	<b>0.34</b>		mg/L	0.20		EPA 300.0 REV 2.1	05/01/2020 19:56	05/01/2020 19:56	CSC
<b>Sulfate</b>	<b>259</b>	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	05/01/2020 20:16	05/01/2020 20:16	CSC

**Notes for work order 0033745**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.
Y2	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>										
<b>Blank (B018047-BLK1)</b>										
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018047-BS1)</b>										
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120			
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>										
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	716	50	mg/L		724			1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>										
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	364	50	mg/L		372			2.17	10	
<b>Batch B018080 - Default Prep Wet Chem</b>										
<b>Blank (B018080-BLK1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018080-BS1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	121	8	mg/L				90-110			
<b>Duplicate (B018080-DUP1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	36	8	mg/L		22			47.1	25	Y1
<b>Matrix Spike (B018080-MS1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	274	8	mg/L	250	22	101	90-110			
<b>Matrix Spike Dup (B018080-MSD1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	263	8	mg/L	250	22	96.3	90-110	4.34	10	



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD Limits	RPD RPD	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>									
<b>Blank (B018086-BLK1)</b>									
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54									
Specific Conductance (Lab)	ND	1	umhos/cm						U
<b>LCS (B018086-BS1)</b>									
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55									
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120		
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>									
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09									
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>									
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27									
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24
<b>Batch B018100 - Default Prep Wet Chem</b>									
<b>Blank (B018100-BLK1)</b>									
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21									
Total Organic Carbon	ND	0.5	mg/L						U
<b>LCS (B018100-BS1)</b>									
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43									
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120		
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>									
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07									
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>									
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27									
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>									
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29									
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120		





Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B018100 - Default Prep Wet Chem

Matrix Spike (B018100-MS2) Source: 0033759-01

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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Batch B018391 - Default Prep Wet Chem

Blank (B018391-BLK1)

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B018391-BLK2)

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B018391-BLK3)

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

LCS (B018391-BS1)

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Total Alkalinity	235	4	mg/L	235		99.8	80-120			

LCS (B018391-BS2)

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			
Total Alkalinity	250	4	mg/L	235		106	80-120			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018391 - Default Prep Wet Chem**

**Duplicate (B018391-DUP1) Source: 0033751-01**

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
Total Alkalinity	309	4	mg/L		301			2.43	10	

**Duplicate (B018391-DUP2) Source: 0033759-01**

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	
Total Alkalinity	402	4	mg/L		394			2.01	10	

**Matrix Spike (B018391-MS1) Source: 0033743-01**

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
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**Matrix Spike (B018391-MS2) Source: 0033759-01**

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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**Batch B019045 - Default Prep Wet Chem**

**Blank (B019045-BLK1)**

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B019045-BS1)**

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B019045-DUP1) Source: 0041237-02**

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
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**Matrix Spike (B019045-MS1) Source: 0041237-02**

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018473 - Default Prep IC**

**Blank (B018473-BLK1)**

Prepared: 5/1/2020 15:50, Analyzed: 5/1/2020 15:50

Fluoride	ND	0.20	mg/L							U
Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U

**LCS (B018473-BS1)**

Prepared: 5/1/2020 15:30, Analyzed: 5/1/2020 15:30

Sulfate	9.7		mg/L	10.0		97.1	90-110			
Chloride	9.6		mg/L	10.0		96.1	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			

**Matrix Spike (B018473-MS1)**

Source: 0033742-01

Prepared: 5/2/2020 0:01, Analyzed: 5/2/2020 0:01

Sulfate	10.8		mg/L	10.0	0.005	108	80-120			
Fluoride	10.2		mg/L	10.0	0.06	101	80-120			
Chloride	10.1		mg/L	10.0	0.0	101	80-120			

**Matrix Spike Dup (B018473-MSD1)**

Source: 0033742-01

Prepared: 5/2/2020 0:21, Analyzed: 5/2/2020 0:21

Sulfate	14.5		mg/L	10.0	0.005	145	80-120	28.8	20	M1, Y2
Chloride	13.1		mg/L	10.0	0.0	131	80-120	25.7	10	M1, Y2
Fluoride	13.2		mg/L	10.0	0.06	132	80-120	26.2	20	M1, Y2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033745**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-102 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033745-01 A	<u>04-23-20</u>	<u>8:10</u>	Plastic 1L	1	MW102	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033745-01 B	<u>04-23-20</u>	<u>8:10</u>	Plastic 500mL pH<2 w/HNO3	1	MW102	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033745-01 C	<u>04-23-20</u>	<u>8:10</u>	Plastic 500mL pH<2 w/H2SO4	1	MW102	g / c	COD TOC
0033745-01 D	<u>04-23-20</u>	<u>8:10</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW102	g / c	Radium 226 (sub)

Preservation Check: pH:

Preservation Check Performed by: [Signature]

Field data collected by: Travis Sneed Date (mm/dd/yy) 04-23-20 Time (24 hr) 8:10  
pH 6.48 Cond <sup>MS</sup> 1.21 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.77 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 0.58 Turb. (NTU) 3.8  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Travis Sneed Received by: (Signature) Abby Smith Date (mm/dd/yy) 4-23-20 Time (24 hr) 1325

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-102 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#: 258508-6

Please Print Legibly

Quote# \_\_\_\_\_

Collected by (Signature): Travis Sneed  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033745-01 E	<u>04-23-20</u>	<u>8:10</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/>	MW102	g / c	Radium 228 (sub)
0033745-01 F	<u>04-23-20</u>	<u>8:10</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/>	MW102	g / c	Radium 228 (sub)
0033745-01 G	<u>04-23-20</u>	<u>8:10</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: _____	1 <input checked="" type="checkbox"/>	MW102	g / c	Radium Total (sub)

Preservation Check Performed by: AS

Field data collected by: Travis Sneed Date (mm/dd/yy) 04-23-20 Time (24 hr) 8:10

pH 6.48 Cond (ms) 1.21 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.77 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 0.58 Turb. (NTU) 3.8

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>abbyham</u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

May 19, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33745  
Pace Project No.: 30360660

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 33745  
Pace Project No.: 30360660

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33745  
Pace Project No.: 30360660

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360660001	0033745-01	Water	04/23/20 08:10	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 33745  
Pace Project No.: 30360660

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360660001	0033745-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33745  
Pace Project No.: 30360660

**Sample: 0033745-01**      **Lab ID: 30360660001**      Collected: 04/23/20 08:10      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.0838 ± 0.339 (0.591)</b> <b>C:NA T:95%</b>	pCi/L	05/18/20 15:36	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>-0.154 ± 0.323 (0.787)</b> <b>C:76% T:85%</b>	pCi/L	05/15/20 15:52	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.0838 ± 0.662 (1.38)</b>	pCi/L	05/19/20 08:36	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33745  
Pace Project No.: 30360660

QC Batch: 394311	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360660001

METHOD BLANK: 1909693 Matrix: Water

Associated Lab Samples: 30360660001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.255 ± 0.240 (0.532) C:NA T:97%	pCi/L	05/18/20 15:36	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33745  
Pace Project No.: 30360660

QC Batch: 394310	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360660001

METHOD BLANK: 1909692 Matrix: Water

Associated Lab Samples: 30360660001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.175 ± 0.287 (0.624) C:79% T:85%	pCi/L	05/15/20 15:53	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33745  
Pace Project No.: 30360660

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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WO#: 30360660



Chain of Custody

Workorder: 33745      Workorder Name: MW-102 Wilson 092-0000      Owner Received Date: 4/23/2020      Results Requested By: Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		LAB USE ONLY
						EPA 903.1	EPA 904.0 Radium Sum Calc	
1								
2	0033745-01		04/23/20 08:10	IR44-McCoy	Water	X	X	001
3								
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>[Signature]</i>	4/23/20 09:10	
2					
3					

Cooler Temperature on Receipt 31.3 °C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC

This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

# 30360660 Pace Analytical Services, LLC Kentucky  
0033745

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033745-01	Water	Sampled:04/23/2020 08:10	Specific Method
Radium Total (sub)	10/20/2020 08:10	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/20/2020 08:10	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/20/2020 08:10	EPA 903.1	

Released By *Mary Hooper* Date *04-27-20* Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_



Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # 30360660

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 1811

Label	<u>JSM</u>
LIMS Login	<u>JSM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 3.3 °C Correction Factor: -0.5 °C Final Temp: 2.8 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH C 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0033746

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 13:58

Project Name: MW-104 Wilson 092-00004

Workorder: 0033746

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
--------	------------------------	--------	----------------	---------------	------------

0033746-01	MW104/	Groundwater	04/22/2020 14:05	04/23/2020 13:25	Travis Sneed
------------	--------	-------------	------------------	------------------	--------------

<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>
0033746-01	Field Conductance	2050
	Field Dissolved Oxygen	0.48
	Field pH	6.50
	Field Temp (C)	17.16
	Field Turbidity	96.1

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0919. Cobalt result added to report.



### ANALYTICAL RESULTS

Lab Sample ID: **0033746-01**  
Description: **MW104**

Sample Collection Date Time: 04/22/2020 14:05  
Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Arsenic</b>	<b>0.0010</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Barium</b>	<b>0.050</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:47	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Calcium</b>	<b>258</b>	D1	mg/L	40.0	13.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:53	AKB
<b>Chromium</b>	<b>0.0007</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Iron</b>	<b>4.34</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:47	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Lithium</b>	<b>0.02</b>		mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Magnesium</b>	<b>79.3</b>	D1	mg/L	2.00	0.900	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:50	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/02/2020 17:32	DMH
<b>Molybdenum</b>	<b>0.003</b>	J	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Nickel</b>	<b>0.003</b>		mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Potassium</b>	<b>8.53</b>		mg/L	0.50	0.22	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:47	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
<b>Sodium</b>	<b>97.1</b>	D1	mg/L	2.60	1.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:50	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:47	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>384</b>		mg/L	4		2320 B-2011	04/29/2020 12:01	04/29/2020 12:01	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 12:01	04/29/2020 12:01	HMF
<b>Total Alkalinity</b>	<b>384</b>		mg/L	4		2320 B-2011	04/29/2020 12:01	04/29/2020 12:01	HMF
<b>Chemical Oxygen Demand</b>	<b>11</b>		mg/L	8	8	HACH 8000	04/27/2020 15:25	04/27/2020 15:25	ALT
<b>Specific Conductance (Lab)</b>	<b>1750</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:00	04/27/2020 15:00	GAT
<b>Hardness as CaCO3</b>	<b>912</b>	D	mg/L	2	2	2340 C (as HACH 8226)	05/04/2020 11:20	05/04/2020 11:20	CLL
<b>Total Dissolved Solids</b>	<b>1380</b>		mg/L	50	50	2540 C-2011	04/27/2020 10:36	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>0.8</b>		mg/L	0.5		5310 C-2011	05/01/2020 20:53	05/01/2020 20:53	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.149</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>0.674</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>0.823</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>13.0</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/01/2020 20:37	05/01/2020 20:37	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	05/01/2020 20:37	05/01/2020 20:37	CSC
<b>Sulfate</b>	<b>662</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/01/2020 20:57	05/01/2020 20:57	CSC

**Notes for work order 0033746**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.
Y2	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>										
<b>Blank (B018047-BLK1)</b>										
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018047-BS1)</b>										
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120			
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>										
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	716	50	mg/L		724			1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>										
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	364	50	mg/L		372			2.17	10	
<b>Batch B018080 - Default Prep Wet Chem</b>										
<b>Blank (B018080-BLK1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018080-BS1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	121	8	mg/L				90-110			
<b>Duplicate (B018080-DUP1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	36	8	mg/L		22			47.1	25	Y1
<b>Matrix Spike (B018080-MS1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	274	8	mg/L	250	22	101	90-110			
<b>Matrix Spike Dup (B018080-MSD1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	263	8	mg/L	250	22	96.3	90-110	4.34	10	



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>										
<b>Blank (B018086-BLK1)</b>										
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54										
Specific Conductance (Lab)	ND	1	umhos/cm							U
<b>LCS (B018086-BS1)</b>										
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120			
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>										
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09										
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24	
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>										
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27										
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24	
<b>Batch B018100 - Default Prep Wet Chem</b>										
<b>Blank (B018100-BLK1)</b>										
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21										
Total Organic Carbon	ND	0.5	mg/L							U
<b>LCS (B018100-BS1)</b>										
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43										
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120			
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>										
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07										
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25	
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>										
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27										
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25	
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>										
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29										
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2)** Source: 0033759-01

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	235	4	mg/L	235		99.8	80-120			

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	250	4	mg/L	235		106	80-120			
Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch B018391 - Default Prep Wet Chem

Duplicate (B018391-DUP1) Source: 0033751-01

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Total Alkalinity	309	4	mg/L		301			2.43	10	
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U

Duplicate (B018391-DUP2) Source: 0033759-01

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	402	4	mg/L		394			2.01	10	
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	

Matrix Spike (B018391-MS1) Source: 0033743-01

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
------------------	----	---	------	------	----	------	--------	--	--	----

Matrix Spike (B018391-MS2) Source: 0033759-01

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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Batch B019045 - Default Prep Wet Chem

Blank (B019045-BLK1)

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B019045-BS1)

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
-------------------	-----	---	------	-----	--	-----	--------	--	--	--

Duplicate (B019045-DUP1) Source: 0041237-02

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
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Matrix Spike (B019045-MS1) Source: 0041237-02

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	-----------	-------------	-----	-----------	-------

**Batch B018473 - Default Prep IC**

**Blank (B018473-BLK1)**

Prepared: 5/1/2020 15:50, Analyzed: 5/1/2020 15:50

Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U

**LCS (B018473-BS1)**

Prepared: 5/1/2020 15:30, Analyzed: 5/1/2020 15:30

Fluoride	9.60		mg/L	10.0		96.0	90-110			
Sulfate	9.7		mg/L	10.0		97.1	90-110			
Chloride	9.6		mg/L	10.0		96.1	90-110			

**Matrix Spike (B018473-MS1)**

Source: 0033742-01

Prepared: 5/2/2020 0:01, Analyzed: 5/2/2020 0:01

Chloride	10.1		mg/L	10.0	0.0	101	80-120			
Sulfate	10.8		mg/L	10.0	0.005	108	80-120			
Fluoride	10.2		mg/L	10.0	0.06	101	80-120			

**Matrix Spike Dup (B018473-MSD1)**

Source: 0033742-01

Prepared: 5/2/2020 0:21, Analyzed: 5/2/2020 0:21

Sulfate	14.5		mg/L	10.0	0.005	145	80-120	28.8	20	M1, Y2
Fluoride	13.2		mg/L	10.0	0.06	132	80-120	26.2	20	M1, Y2
Chloride	13.1		mg/L	10.0	0.0	131	80-120	25.7	10	M1, Y2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033746**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-104 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:

PO#: 258508-6

Please Print Legibly

State: KY

Quote# \_\_\_\_\_

Collected by (Signature): *Travis Sneed* \*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033746-01 A	<u>04-22-20</u>	<u>1405</u>	Plastic 1L	1	MW104	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033746-01 B	<u>04-22-20</u>	<u>1405</u>	Plastic 500mL pH<2 w/HNO3	1	MW104	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033746-01 C	<u>04-22-20</u>	<u>1405</u>	Plastic 500mL pH<2 w/H2SO4	1	MW104	g / c	COD TOC
0033746-01 D	<u>04-22-20</u>	<u>1405</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW104	g / c	Radium 226 (sub)

Preservation Check: pH :

Preservation Check: pH :

Preservation Check: pH :

Preservation Check Performed by: *ASL*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) 04-22-20 Time (24 hr) 1405  
pH 6.50 Cond (umho) 2.05 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 17.16 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 0.48 Turb. (NTU) 96.1  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
<u><i>Travis Sneed</i></u>	<u><i>Abby Smith</i></u>	<u>4-23-20</u>	<u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 03/02/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-104 Wilson 092-00004**

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000

PO#: 258508-6

PWS ID#:

Quote# \_\_\_\_\_

Please Print Legibly

State: KY

Collected by (Signature): *Travis Speed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033746							
0033746-01 E	<u>04-22-20</u>	<u>1405</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW104	g / c	Radium 228 (sub)
0033746-01 F	<u>04-22-20</u>	<u>1405</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW104	g / c	Radium 228 (sub)
0033746-01 G	<u>04-22-20</u>	<u>1405</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW104	g / c	Radium Total (sub)

Preservation Check Performed by: *AM*

Field data collected by: *Travis Speed* Date (mm/dd/yy) 04-22-20 Time (24 hr) 1405

pH 6.50 Cond (umho) 2.05 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 17.16 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 0.48 Turb. (NTU) 96.1

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
<u><i>Travis Speed</i></u>	<u><i>amcyrhan</i></u>	<u>4-23-20</u>	<u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

May 19, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33746  
Pace Project No.: 30360675

Dear Rob Whittington:

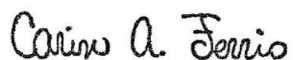
Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 33746  
Pace Project No.: 30360675

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33746  
Pace Project No.: 30360675

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360675001	0033746-01	Water	04/22/20 14:05	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 33746  
Pace Project No.: 30360675

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360675001	0033746-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33746  
Pace Project No.: 30360675

**Sample: 0033746-01**      **Lab ID: 30360675001**      Collected: 04/22/20 14:05      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.149 ± 0.395 (0.658)</b> <b>C:NA T:95%</b>	pCi/L	05/18/20 15:55	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.674 ± 0.445 (0.832)</b> <b>C:73% T:68%</b>	pCi/L	05/15/20 15:53	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.823 ± 0.840 (1.49)</b>	pCi/L	05/19/20 08:36	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33746  
Pace Project No.: 30360675

QC Batch: 394311	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360675001

METHOD BLANK: 1909693 Matrix: Water

Associated Lab Samples: 30360675001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.255 ± 0.240 (0.532) C:NA T:97%	pCi/L	05/18/20 15:36	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33746  
Pace Project No.: 30360675

QC Batch: 394310	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360675001

METHOD BLANK: 1909692 Matrix: Water

Associated Lab Samples: 30360675001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.175 ± 0.287 (0.624) C:79% T:85%	pCi/L	05/15/20 15:53	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33746  
Pace Project No.: 30360675

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

Chain of Custody

WO#: 30360675



30360675

Pace Analytical®  
www.pacelabs.com

Workorder: 33746      Workorder Name: MW-104 Wilson 092-0000      Owner Received Date: 4/23/2020      Results Requested By:  
Report To:      Subcontract To:

McCoy & McCoy Labs  
P.O. Box 907  
Madisonville, KY 42409  
270-821-7375  
r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg P/  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
(724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Requested Analysis	LAB USE ONLY
1									
2	0033746-01		04/22/20 14:05	IR44-McCoy	Water		X	EPA 903.1	EEI
3							X	EPA 904.0 Radium Sum Calc	
4									
5									
6									
7									
8									
9									
10									
Transfers	Released By	Date/Time	Received By	Date/Time	Comments				
1			<i>[Signature]</i>	4/23/20 0410					
2									
3									

Cooler Temperature on Receipt 2.9 °C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

# 30360675

Pace Analytical Services, LLC Kentucky

0033746

SENDING LABORATORY:

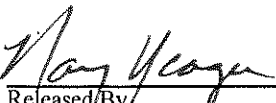
Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033746-01	Water	Sampled:04/22/2020 14:05	Specific Method
Radium Total (sub)	10/19/2020 14:05	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/19/2020 14:05	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/19/2020 14:05	EPA 903.1	


04-27-20

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Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

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Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # #-30360675

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 5386 1811

Label	<u>JSM</u>
LIMS Login	<u>JSM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 2.4 °C Correction Factor: -0.5 °C Final Temp: 1.9 °C  
 Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH &lt; 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation:
				Lot # of added preservative:
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person-Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted-By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

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**Certificate of Analysis**  
**0033747**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 14:00

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Project Name: MW-105 Wilson 092-00004

Workorder: 0033747

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



A handwritten signature in black ink that reads "Rob Whittington".

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Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*





**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0033747-01	MW105/	Groundwater	04/22/2020 13:05	04/23/2020 13:25	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0033747-01	Field Conductance				911
	Field pH				7.78
	Field Temp (C)				17.41

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0918. Cobalt result added to report.

**ANALYTICAL RESULTS**

Lab Sample ID: **0033747-01**  
Description: **MW105**

Sample Collection Date Time: 04/22/2020 13:05  
Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
<b>Barium</b>	<b>0.255</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
<b>Boron</b>	<b>0.33</b>		mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:56	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
<b>Calcium</b>	<b>60.4</b>	D1	mg/L	4.00	1.30	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:59	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
<b>Iron</b>	<b>1.88</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:56	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
<b>Lithium</b>	<b>0.02</b>		mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
<b>Magnesium</b>	<b>20.0</b>	D1	mg/L	2.00	0.900	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:59	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/02/2020 17:36	DMH
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
Nickel	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
<b>Potassium</b>	<b>5.73</b>		mg/L	0.50	0.22	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:56	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
<b>Sodium</b>	<b>146</b>	D1	mg/L	26.0	10.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 14:03	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:51	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>399</b>		mg/L	4		2320 B-2011	04/29/2020 12:07	04/29/2020 12:07	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 12:07	04/29/2020 12:07	HMF
<b>Total Alkalinity</b>	<b>399</b>		mg/L	4		2320 B-2011	04/29/2020 12:07	04/29/2020 12:07	HMF
Chemical Oxygen Demand	ND	u	mg/L	8	8	HACH 8000	04/27/2020 15:26	04/27/2020 15:26	ALT
<b>Specific Conductance (Lab)</b>	<b>966</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:01	04/27/2020 15:01	GAT
<b>Hardness as CaCO3</b>	<b>222</b>		mg/L	1	1	2340 C (as HACH 8226)	05/04/2020 11:22	05/04/2020 11:22	CLL
<b>Total Dissolved Solids</b>	<b>398</b>		mg/L	50	50	2540 C-2011	04/27/2020 10:40	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>1.0</b>		mg/L	0.5		5310 C-2011	05/01/2020 21:14	05/01/2020 21:14	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>-0.019</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>1.15</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>1.15</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>9.5</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/01/2020 21:18	05/01/2020 21:18	CSC
<b>Fluoride</b>	<b>0.67</b>		mg/L	0.20		EPA 300.0 REV 2.1	05/01/2020 21:18	05/01/2020 21:18	CSC
<b>Sulfate</b>	<b>91.8</b>	D	mg/L	20.0	10.0	EPA 300.0 REV 2.1	05/01/2020 21:38	05/01/2020 21:38	CSC

**Notes for work order 0033747**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.
Y2	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>										
<b>Blank (B018047-BLK1)</b>										
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018047-BS1)</b>										
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120			
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>										
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	716	50	mg/L		724			1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>										
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	364	50	mg/L		372			2.17	10	
<b>Batch B018080 - Default Prep Wet Chem</b>										
<b>Blank (B018080-BLK1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018080-BS1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	121	8	mg/L				90-110			
<b>Duplicate (B018080-DUP1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	36	8	mg/L		22			47.1	25	Y1
<b>Matrix Spike (B018080-MS1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	274	8	mg/L	250	22	101	90-110			
<b>Matrix Spike Dup (B018080-MSD1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	263	8	mg/L	250	22	96.3	90-110	4.34	10	



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>										
<b>Blank (B018086-BLK1)</b>										
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54										
Specific Conductance (Lab)	ND	1	umhos/cm							U
<b>LCS (B018086-BS1)</b>										
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120			
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>										
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09										
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24	
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>										
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27										
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24	
<b>Batch B018100 - Default Prep Wet Chem</b>										
<b>Blank (B018100-BLK1)</b>										
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21										
Total Organic Carbon	ND	0.5	mg/L							U
<b>LCS (B018100-BS1)</b>										
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43										
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120			
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>										
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07										
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25	
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>										
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27										
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25	
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>										
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29										
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B018100 - Default Prep Wet Chem

Matrix Spike (B018100-MS2) Source: 0033759-01

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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Batch B018391 - Default Prep Wet Chem

Blank (B018391-BLK1)

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B018391-BLK2)

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B018391-BLK3)

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

LCS (B018391-BS1)

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	235	4	mg/L	235		99.8	80-120			

LCS (B018391-BS2)

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	250	4	mg/L	235		106	80-120			
Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B018391 - Default Prep Wet Chem

Duplicate (B018391-DUP1) Source: 0033751-01

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Total Alkalinity	309	4	mg/L		301			2.43	10	
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U

Duplicate (B018391-DUP2) Source: 0033759-01

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	402	4	mg/L		394			2.01	10	
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	

Matrix Spike (B018391-MS1) Source: 0033743-01

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
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Matrix Spike (B018391-MS2) Source: 0033759-01

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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Batch B019045 - Default Prep Wet Chem

Blank (B019045-BLK1)

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B019045-BS1)

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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Duplicate (B019045-DUP1) Source: 0041237-02

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
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Matrix Spike (B019045-MS1) Source: 0041237-02

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018473 - Default Prep IC**

**Blank (B018473-BLK1)**

Prepared: 5/1/2020 15:50, Analyzed: 5/1/2020 15:50

Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U

**LCS (B018473-BS1)**

Prepared: 5/1/2020 15:30, Analyzed: 5/1/2020 15:30

Fluoride	9.60		mg/L	10.0		96.0	90-110			
Sulfate	9.7		mg/L	10.0		97.1	90-110			
Chloride	9.6		mg/L	10.0		96.1	90-110			

**Matrix Spike (B018473-MS1)**

Source: 0033742-01

Prepared: 5/2/2020 0:01, Analyzed: 5/2/2020 0:01

Chloride	10.1		mg/L	10.0	0.0	101	80-120			
Sulfate	10.8		mg/L	10.0	0.005	108	80-120			
Fluoride	10.2		mg/L	10.0	0.06	101	80-120			

**Matrix Spike Dup (B018473-MSD1)**

Source: 0033742-01

Prepared: 5/2/2020 0:21, Analyzed: 5/2/2020 0:21

Sulfate	14.5		mg/L	10.0	0.005	145	80-120	28.8	20	M1, Y2
Fluoride	13.2		mg/L	10.0	0.06	132	80-120	26.2	20	M1, Y2
Chloride	13.1		mg/L	10.0	0.0	131	80-120	25.7	10	M1, Y2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033747**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

Scheduled for: 03/02/2020



Client: Big Rivers Electric Corporation Wilson Station

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: MW-105 Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No \_\_\_\_\_

Samples Chlorinated? Yes \_\_\_\_\_ No \_\_\_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY** \*required information\*

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033747-01 A	<u>4/22/20</u>	<u>1305</u>	Plastic 1L	1	MW105	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033747-01 B	<u>4/22/20</u>	<u>1305</u>	Plastic 500mL pH<2 w/HNO3	1	MW105	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033747-01 C	<u>4/22/20</u>	<u>1305</u>	Plastic 500mL pH<2 w/H2SO4	1	MW105	g / c	COD TOC
0033747-01 D	<u>4/22/20</u>	<u>1305</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW105	g / c	Radium 226 (sub)

Preservation Check: pH :   
Preservation Check: pH :   
Preservation Check: pH :

Preservation Check Performed by: *Travis Sneed*

Field data collected by: Travis Sneed Date (mm/dd/yy) 4/22/20 Time (24 hr) 1305  
pH 7.78 Cond <sup>mS/cm</sup> 0.911 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 17.41 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Travis Sneed* Received by: (Signature) *Abby Rankin* Date (mm/dd/yy) 4-23-20 Time (24 hr) 1325

# Chain of Custody

Scheduled for: **03/02/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-105 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033747-01 E	<u>4/22/20</u>	<u>1305</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW105	g / c	Radium 228 (sub)
0033747-01 F	<u>4/22/20</u>	<u>1305</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW105	g / c	Radium 228 (sub)
0033747-01 G	<u>4/22/20</u>	<u>1305</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW105	g / c	Radium Total (sub)

Preservation Check Performed by: ASU

Field data collected by: Travis Sneed Date (mm/dd/yy) 4/22/20 Time (24 hr) 1305

pH 7.78 Cond (umho) 0.911 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 17.41 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>Abby Zamm</u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

May 19, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33747  
Pace Project No.: 30360672

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 33747  
Pace Project No.: 30360672

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33747  
Pace Project No.: 30360672

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360672001	0033747-01	Water	04/22/20 13:05	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 33747  
Pace Project No.: 30360672

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360672001	0033747-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33747  
Pace Project No.: 30360672

**Sample: 0033747-01**      **Lab ID: 30360672001**      Collected: 04/22/20 13:05      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>-0.0186 ± 0.311 (0.574)</b> <b>C:NA T:98%</b>	pCi/L	05/18/20 15:36	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.15 ± 0.507 (0.848)</b> <b>C:73% T:88%</b>	pCi/L	05/15/20 15:52	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.15 ± 0.818 (1.42)</b>	pCi/L	05/19/20 08:36	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33747  
Pace Project No.: 30360672

QC Batch: 394311	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360672001

METHOD BLANK: 1909693 Matrix: Water

Associated Lab Samples: 30360672001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.255 ± 0.240 (0.532) C:NA T:97%	pCi/L	05/18/20 15:36	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33747  
Pace Project No.: 30360672

QC Batch: 394310	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360672001

METHOD BLANK: 1909692 Matrix: Water

Associated Lab Samples: 30360672001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.175 ± 0.287 (0.624) C:79% T:85%	pCi/L	05/15/20 15:53	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33747  
Pace Project No.: 30360672

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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WO#: 30360672



Chain of Custody



Workorder: 33747

Workorder Name: MW-105 Wilson 092-0000

Owner Received Date: 4/23/2020

Results Requested By:

Report To:

Subcontract To:

Requested Analysis

McCoy & McCoy Labs

P.O. Box 907

Madisonville, KY 42409

270-821-7375

r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg PA

1638 Rosey Town Rd Suite 2,3,4

Greensburg, PA 15601

(724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		LAB USE ONLY
						EPA 903.1	EPA 904.0 Radium Sum Calc	
1								
2	0033747-01		04/22/20 13:05	IR44-McCoy	Water	X	X	001
3								
4								
5								
6								
7								
8								
9								
10								
Transfers	Released By	Date/Time	Received By	Date/Time	Comments			
1			<i>[Signature]</i>	4/23/20 0910				
2								
3								

Cooler Temperature on Receipt 3.9 °C

Custody Seal Y or N

Received on Ice Y or N

Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002rev.00 24March2009

Page 1 of 1

# 30360672

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0033747

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033747-01	Water	Sampled:04/22/2020 13:05	Specific Method
Radium Total (sub)	10/19/2020 13:05	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/19/2020 13:05	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/19/2020 13:05	EPA 903.1	

Released By May Hays Date 04-27-20 Received By \_\_\_\_\_ Date \_\_\_\_\_  
 Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # 30360672

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 1811

Label	<u>JSM</u>
LIMS Login	<u>JSM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 3.9 °C Correction Factor: -0.5 °C Final Temp: 3.4 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH &lt; 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person-Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted-By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

---

**Certificate of Analysis**  
**0033748**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 14:03

---

Project Name: MW-110 Wilson 092-00004

Workorder: 0033748

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



---

Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0033748-01	MW110/	Groundwater	04/22/2020 14:20	04/23/2020 13:25	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
0033748-01	Field Conductance	550			
	Field pH	6.89			
	Field Temp (C)	17.10			

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0917. Cobalt result added to report.



**ANALYTICAL RESULTS**

Lab Sample ID: **0033748-01**  
 Description: **MW110**

Sample Collection Date Time: 04/22/2020 14:20  
 Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
<b>Arsenic</b>	<b>0.0019</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
<b>Barium</b>	<b>0.051</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 14:06	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
<b>Calcium</b>	<b>39.9</b>	D1	mg/L	4.00	1.30	SW846 6010 B	04/24/2020 11:25	04/28/2020 14:09	AKB
<b>Chromium</b>	<b>0.0007</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
<b>Iron</b>	<b>5.60</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 14:06	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
<b>Magnesium</b>	<b>19.6</b>	D1	mg/L	2.00	0.900	SW846 6010 B	04/24/2020 11:25	04/28/2020 14:09	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/02/2020 17:40	DMH
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
<b>Nickel</b>	<b>0.001</b>	J	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
<b>Potassium</b>	<b>1.02</b>		mg/L	0.50	0.22	SW846 6010 B	04/24/2020 11:25	04/28/2020 14:06	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
<b>Sodium</b>	<b>33.7</b>	D1	mg/L	2.60	1.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 14:09	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:55	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>137</b>		mg/L	4		2320 B-2011	04/29/2020 12:14	04/29/2020 12:14	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 12:14	04/29/2020 12:14	HMF
<b>Total Alkalinity</b>	<b>137</b>		mg/L	4		2320 B-2011	04/29/2020 12:14	04/29/2020 12:14	HMF
<b>Chemical Oxygen Demand</b>	<b>10</b>		mg/L	8	8	HACH 8000	04/27/2020 15:26	04/27/2020 15:26	ALT
<b>Specific Conductance (Lab)</b>	<b>466</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:02	04/27/2020 15:02	GAT
<b>Hardness as CaCO3</b>	<b>178</b>		mg/L	1	1	2340 C (as HACH 8226)	05/04/2020 11:24	05/04/2020 11:24	CLL
<b>Total Dissolved Solids</b>	<b>208</b>		mg/L	50	50	2540 C-2011	04/27/2020 10:44	04/28/2020 12:32	MAG
<b>Total Organic Carbon</b>	<b>2.0</b>		mg/L	0.5		5310 C-2011	05/01/2020 21:36	05/01/2020 21:36	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.837</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>0.694</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>1.53</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW





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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>11.5</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/01/2020 21:58	05/01/2020 21:58	CSC
<b>Fluoride</b>	<b>0.28</b>		mg/L	0.20		EPA 300.0 REV 2.1	05/01/2020 21:58	05/01/2020 21:58	CSC
<b>Sulfate</b>	<b>71.7</b>	D	mg/L	20.0	10.0	EPA 300.0 REV 2.1	05/01/2020 22:19	05/01/2020 22:19	CSC

**Notes for work order 0033748**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.
Y2	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			
Sodium	6720		ug/L	6250	2.78	108	75-125			D2

**Post Spike (B017542-PS2) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			





Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>										
<b>Blank (B018047-BLK1)</b>										
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018047-BS1)</b>										
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120			
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>										
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	716	50	mg/L		724			1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>										
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	364	50	mg/L		372			2.17	10	
<b>Batch B018080 - Default Prep Wet Chem</b>										
<b>Blank (B018080-BLK1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018080-BS1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	121	8	mg/L				90-110			
<b>Duplicate (B018080-DUP1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	36	8	mg/L		22			47.1	25	Y1
<b>Matrix Spike (B018080-MS1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	274	8	mg/L	250	22	101	90-110			
<b>Matrix Spike Dup (B018080-MSD1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	263	8	mg/L	250	22	96.3	90-110	4.34	10	



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD Limits	RPD RPD	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>									
<b>Blank (B018086-BLK1)</b>									
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54									
Specific Conductance (Lab)	ND	1	umhos/cm						U
<b>LCS (B018086-BS1)</b>									
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55									
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120		
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>									
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09									
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>									
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27									
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24
<b>Batch B018100 - Default Prep Wet Chem</b>									
<b>Blank (B018100-BLK1)</b>									
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21									
Total Organic Carbon	ND	0.5	mg/L						U
<b>LCS (B018100-BS1)</b>									
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43									
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120		
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>									
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07									
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>									
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27									
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>									
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29									
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120		



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2)** Source: 0033759-01

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	235	4	mg/L	235		99.8	80-120			

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			
Total Alkalinity	250	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018391 - Default Prep Wet Chem</b>										
<b>Duplicate (B018391-DUP1)</b>		<b>Source: 0033751-01</b>								
Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34										
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	
Total Alkalinity	309	4	mg/L		301			2.43	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
<b>Duplicate (B018391-DUP2)</b>										
<b>Duplicate (B018391-DUP2)</b>		<b>Source: 0033759-01</b>								
Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04										
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	402	4	mg/L		394			2.01	10	
<b>Matrix Spike (B018391-MS1)</b>										
<b>Matrix Spike (B018391-MS1)</b>		<b>Source: 0033743-01</b>								
Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40										
Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
<b>Matrix Spike (B018391-MS2)</b>										
<b>Matrix Spike (B018391-MS2)</b>		<b>Source: 0033759-01</b>								
Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18										
Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
<b>Batch B019045 - Default Prep Wet Chem</b>										
<b>Blank (B019045-BLK1)</b>										
Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56										
Hardness as CaCO3	ND	1	mg/L							U
<b>LCS (B019045-BS1)</b>										
Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58										
Hardness as CaCO3	230	1	mg/L	225		102	80-120			
<b>Duplicate (B019045-DUP1)</b>										
<b>Duplicate (B019045-DUP1)</b>		<b>Source: 0041237-02</b>								
Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56										
Hardness as CaCO3	214	1	mg/L		200			6.76	10	
<b>Matrix Spike (B019045-MS1)</b>										
<b>Matrix Spike (B019045-MS1)</b>		<b>Source: 0041237-02</b>								
Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58										
Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018473 - Default Prep IC**

**Blank (B018473-BLK1)**

Prepared: 5/1/2020 15:50, Analyzed: 5/1/2020 15:50

Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U

**LCS (B018473-BS1)**

Prepared: 5/1/2020 15:30, Analyzed: 5/1/2020 15:30

Sulfate	9.7		mg/L	10.0		97.1	90-110			
Chloride	9.6		mg/L	10.0		96.1	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			

**Matrix Spike (B018473-MS1)**

Source: 0033742-01

Prepared: 5/2/2020 0:01, Analyzed: 5/2/2020 0:01

Chloride	10.1		mg/L	10.0	0.0	101	80-120			
Sulfate	10.8		mg/L	10.0	0.005	108	80-120			
Fluoride	10.2		mg/L	10.0	0.06	101	80-120			

**Matrix Spike Dup (B018473-MSD1)**

Source: 0033742-01

Prepared: 5/2/2020 0:21, Analyzed: 5/2/2020 0:21

Chloride	13.1		mg/L	10.0	0.0	131	80-120	25.7	10	M1, Y2
Fluoride	13.2		mg/L	10.0	0.06	132	80-120	26.2	20	M1, Y2
Sulfate	14.5		mg/L	10.0	0.005	145	80-120	28.8	20	M1, Y2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0033748**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **03/02/2020**



Client: Big Rivers Electric Corporation Wilson Station

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: MW-110 Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Brian Edwards*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY** \*required information\*

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033748-01 A	<u>4/22/20</u>	<u>1420</u>	Plastic 1L	1	MW110	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033748-01 B	<u>4/22/20</u>	<u>1420</u>	Plastic 500mL pH<2 w/HNO3	1	MW110	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033748-01 C	<u>4/22/20</u>	<u>1420</u>	Plastic 500mL pH<2 w/H2SO4	1	MW110	g / c	COD TOC
0033748-01 D	<u>4/22/20</u>	<u>1420</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW110	g / c	Radium 226 (sub)

Preservation Check: pH : N  
Preservation Check: pH : V  
Preservation Check: pH : V

Preservation Check Performed by: *AT*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) 4/22/20 Time (24 hr) 1420  
pH 6.89 Cond <sup>ms/cm</sup> 0.550 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 17.10 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Brian Edwards* Received by: (Signature) *Abby Rankin* Date (mm/dd/yy) 4-23-20 Time (24 hr) 1:325

# Chain of Custody



Scheduled for: 03/02/2020

Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-110 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Traus Speed*  
\*required information\*

Compliance Monitoring? Yes  No \_\_\_\_\_

Samples Chlorinated? Yes \_\_\_\_\_ No \_\_\_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033748-01 E	<u>4/22/20</u>	<u>1420</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub). Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW110	g / c	Radium 228 (sub)
0033748-01 F	<u>4/22/20</u>	<u>1420</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub). Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW110	g / c	Radium 228 (sub)
0033748-01 G	<u>4/22/20</u>	<u>1420</u>	Plastic 1L pH<2 w/HNO3 (Sub). Preservation Check: pH: <input checked="" type="checkbox"/>	1	MW110	g / c	Radium Total (sub)

Preservation Check Performed by: *ACI*

Field data collected by: *Traus Speed* Date (mm/dd/yy) 4/22/20 Time (24 hr) 1420

pH 6.89 Cond (umho) 0.550 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 17.10 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Traus Speed</i></u>	Received by: (Signature) <u><i>abney</i></u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

PACE- Check here if trip charge applied to associated COC

Printed: 3/27/2020 1:48:34PM



May 19, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33748  
Pace Project No.: 30360673

Dear Rob Whittington:

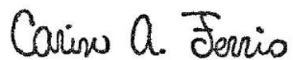
Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 33748  
Pace Project No.: 30360673

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33748  
Pace Project No.: 30360673

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360673001	0033748-01	Water	04/22/20 14:20	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 33748  
Pace Project No.: 30360673

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360673001	0033748-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33748  
Pace Project No.: 30360673

**Sample: 0033748-01**      **Lab ID: 30360673001**      Collected: 04/22/20 14:20      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.837 ± 0.495 (0.590)</b> <b>C:NA T:93%</b>	pCi/L	05/18/20 15:36	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.694 ± 0.413 (0.757)</b> <b>C:76% T:81%</b>	pCi/L	05/15/20 15:52	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.53 ± 0.908 (1.35)</b>	pCi/L	05/19/20 08:36	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33748  
Pace Project No.: 30360673

QC Batch: 394311	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360673001

METHOD BLANK: 1909693 Matrix: Water

Associated Lab Samples: 30360673001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.255 ± 0.240 (0.532) C:NA T:97%	pCi/L	05/18/20 15:36	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33748  
Pace Project No.: 30360673

QC Batch: 394310	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360673001

METHOD BLANK: 1909692 Matrix: Water

Associated Lab Samples: 30360673001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.175 ± 0.287 (0.624) C:79% T:85%	pCi/L	05/15/20 15:53	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33748  
Pace Project No.: 30360673

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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WO#: 30360673



Analytical  
www.pacilab.com

Chain of Custody

Workorder: 33748

Workorder Name: MW-110 Wilson 092-0000

Owner Received Date: 4/23/2020

Results Requested By:

Report To:

Subcontract To:

Requested Analysis

McCoy & McCoy Labs  
P.O. Box 907  
Madisonville, KY 42409  
270-821-7375  
r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
(724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Received By	Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc				
1											
2	0033748-01		04/22/20 14:20	IR44-McCoy	Water	X	X		<i>[Signature]</i>	4/23/20 08:10	
3											
4											
5											
6											
7											
8											
9											
10											
Transfers Released By											
1											
2											
3											

LAB USE ONLY  
*OK*

Cooler Temperature on Receipt 4.1 °C    Custody Seal Y or N    Received on Ice Y or N    Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002rev.00 24March2009

Page 1 of 1

# 30360673

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0033748

SENDING LABORATORY:

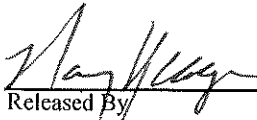
Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033748-01	Water	Sampled:04/22/2020 14:20	Specific Method
Radium Total (sub)	10/19/2020 14:20	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/19/2020 14:20	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/19/2020 14:20	EPA 903.1	


04.27.20

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Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

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Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # 30360673

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 5386 1811

Label JSM  
LIMS Login JSM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 4.1 °C Correction Factor: -0.5 °C Final Temp: 3.6 °C  
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

---

**Certificate of Analysis**  
**0033759**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 14:30

---

Project Name: Well Duplicate Wilson 092-00004

Workorder: 0033759

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



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Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0033759-01	Well Duplicate/	Groundwater	04/23/2020 08:30	04/23/2020 13:25	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
0033759-01	Field Conductance	5890			
	Field pH	6.31			
	Field Temp (C)	15.69			

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0909. Cobalt result added to report.

**ANALYTICAL RESULTS**

Lab Sample ID: **0033759-01**  
Description: **Well Duplicate**

Sample Collection Date Time: 04/23/2020 08:30  
Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
<b>Arsenic</b>	<b>0.0033</b>		mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:18	DMH
<b>Barium</b>	<b>0.016</b>		mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
<b>Boron</b>	<b>10.9</b>	D1	mg/L	10.0	10.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 16:15	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
<b>Calcium</b>	<b>720</b>	D1	mg/L	40.0	13.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 16:15	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:18	DMH
<b>Cobalt</b>	<b>0.012</b>		mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:18	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:18	DMH
<b>Iron</b>	<b>8.05</b>		mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 15:59	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
<b>Lithium</b>	<b>0.17</b>		mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
<b>Magnesium</b>	<b>278</b>	D1	mg/L	20.0	9.00	SW846 6010 B	04/24/2020 11:25	04/28/2020 16:15	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:18	DMH
<b>Molybdenum</b>	<b>0.008</b>	J	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
<b>Nickel</b>	<b>0.030</b>		mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:18	DMH
<b>Potassium</b>	<b>67.9</b>	D1	mg/L	5.00	2.20	SW846 6010 B	04/24/2020 11:25	04/28/2020 16:02	AKB
<b>Selenium</b>	<b>0.001</b>	J	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
<b>Sodium</b>	<b>234</b>	D1	mg/L	26.0	10.0	SW846 6010 B	04/24/2020 11:25	04/28/2020 16:15	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 18:44	DMH
<b>Zinc</b>	<b>0.02</b>		mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/04/2020 13:18	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>394</b>	M3	mg/L	4		2320 B-2011	04/29/2020 14:57	04/29/2020 14:57	HMF
Carbonate Alkalinity as CaCO3	ND	u, M3	mg/L	4		2320 B-2011	04/29/2020 14:57	04/29/2020 14:57	HMF
<b>Total Alkalinity</b>	<b>394</b>	M3	mg/L	4		2320 B-2011	04/29/2020 14:57	04/29/2020 14:57	HMF
<b>Chemical Oxygen Demand</b>	<b>51</b>		mg/L	8	8	HACH 8000	04/27/2020 16:46	04/27/2020 16:46	ALT
<b>Specific Conductance (Lab)</b>	<b>5260</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 15:21	04/27/2020 15:21	GAT
<b>Hardness as CaCO3</b>	<b>2510</b>	D	mg/L	5	5	2340 C (as HACH 8226)	05/04/2020 12:48	05/04/2020 12:48	CLL
<b>Total Dissolved Solids</b>	<b>4630</b>		mg/L	50	50	2540 C-2011	04/27/2020 11:20	04/28/2020 12:32	MAG
Total Organic Carbon	ND	M2, U	mg/L	0.5		5310 C-2011	05/02/2020 02:39	05/02/2020 02:39	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.174</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>1.39</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>1.56</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>1300</b>	D, M2	mg/L	25.0	18.0	EPA 300.0 REV 2.1	05/02/2020 08:54	05/02/2020 08:54	CSC
<b>Fluoride</b>	<b>0.27</b>	M2	mg/L	0.20		EPA 300.0 REV 2.1	05/02/2020 08:34	05/02/2020 08:34	CSC
<b>Sulfate</b>	<b>3010</b>	D, M2	mg/L	100	50.0	EPA 300.0 REV 2.1	05/02/2020 09:15	05/02/2020 09:15	CSC

**Notes for work order 0033759**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	M4, D2, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	M2, J5
Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			
Sodium	6720		ug/L	6250	2.78	108	75-125			D2

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018047 - Default Prep Wet Chem</b>										
<b>Blank (B018047-BLK1)</b>										
Prepared: 4/27/2020 10:24, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018047-BS1)</b>										
Prepared: 4/27/2020 10:28, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	1460	25	mg/L	1500		97.0	80-120			
<b>Duplicate (B018047-DUP1) Source: 0033745-01</b>										
Prepared: 4/27/2020 11:52, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	716	50	mg/L		724			1.11	10	
<b>Duplicate (B018047-DUP2) Source: 0041174-01</b>										
Prepared: 4/27/2020 11:56, Analyzed: 4/28/2020 12:32										
Total Dissolved Solids	364	50	mg/L		372			2.17	10	
<b>Batch B018081 - Default Prep Wet Chem</b>										
<b>Blank (B018081-BLK1)</b>										
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018081-BS1)</b>										
Prepared: 4/27/2020 16:41, Analyzed: 4/27/2020 16:41										
Chemical Oxygen Demand	127	8	mg/L				90-110			
<b>Duplicate (B018081-DUP1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	206	8	mg/L		210			1.84	25	
<b>Matrix Spike (B018081-MS1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	416	8	mg/L	250	210	82.7	90-110			M2
<b>Matrix Spike Dup (B018081-MSD1) Source: 0040126-01</b>										
Prepared: 4/27/2020 16:50, Analyzed: 4/27/2020 16:50										
Chemical Oxygen Demand	414	8	mg/L	250	210	81.8	90-110	0.537	10	M2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD Limits	RPD RPD	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>									
<b>Blank (B018086-BLK1)</b>									
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54									
Specific Conductance (Lab)	ND	1	umhos/cm						U
<b>LCS (B018086-BS1)</b>									
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55									
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120		
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>									
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09									
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>									
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27									
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24
<b>Batch B018100 - Default Prep Wet Chem</b>									
<b>Blank (B018100-BLK1)</b>									
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21									
Total Organic Carbon	ND	0.5	mg/L						U
<b>LCS (B018100-BS1)</b>									
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43									
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120		
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>									
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07									
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>									
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27									
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>									
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29									
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120		





**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2)** Source: 0033759-01

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
----------------------	-----	-----	------	------	-----	------	--------	--	--	----

**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Total Alkalinity	235	4	mg/L	235		99.8	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Total Alkalinity	250	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B018391 - Default Prep Wet Chem

Duplicate (B018391-DUP1) Source: 0033751-01

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
Total Alkalinity	309	4	mg/L		301			2.43	10	
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	

Duplicate (B018391-DUP2) Source: 0033759-01

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	402	4	mg/L		394			2.01	10	

Matrix Spike (B018391-MS1) Source: 0033743-01

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
------------------	----	---	------	------	----	------	--------	--	--	----

Matrix Spike (B018391-MS2) Source: 0033759-01

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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Batch B019045 - Default Prep Wet Chem

Blank (B019045-BLK1)

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B019045-BS1)

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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Duplicate (B019045-DUP1) Source: 0041237-02

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
-------------------	-----	---	------	--	-----	--	--	------	----	--

Matrix Spike (B019045-MS1) Source: 0041237-02

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018474 - Default Prep IC**

**Blank (B018474-BLK1)**

Prepared: 5/2/2020 1:02, Analyzed: 5/2/2020 1:02

Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B018474-BS1)**

Prepared: 5/2/2020 0:42, Analyzed: 5/2/2020 0:42

Chloride	9.7		mg/L	10.0		97.0	90-110			
Sulfate	10.0		mg/L	10.0		99.9	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			

**Matrix Spike (B018474-MS1)**

Source: 0033759-01

Prepared: 5/2/2020 9:35, Analyzed: 5/2/2020 9:35

Chloride	552		mg/L	10.0	1170	NR	80-120			M2
Fluoride	1.75		mg/L	10.0	0.24	15.1	80-120			M2
Sulfate	627		mg/L	10.0	2710	NR	80-120			M2

**Matrix Spike Dup (B018474-MSD1)**

Source: 0033759-01

Prepared: 5/2/2020 9:56, Analyzed: 5/2/2020 9:56

Sulfate	640		mg/L	10.0	2710	NR	80-120	2.10	20	M2
Fluoride	1.81		mg/L	10.0	0.24	15.7	80-120	3.09	20	M2
Chloride	558		mg/L	10.0	1170	NR	80-120	1.05	10	M2

**Certified Analyses included in this Report**

Analyte	Certifications
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**2320 B-2011 in Water**

Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)

**2340 C (as HACH 8226) in Water**

Hardness as CaCO3	KY Drinking Water Mdv (00030)
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**2510 B-2011 in Water**

Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
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**2540 C-2011 in Water**

Total Dissolved Solids	KY Drinking Water Mdv (00030)
------------------------	-------------------------------

**5310 C-2011 in Water**

Total Organic Carbon	KY Drinking Water Mdv (00030)
----------------------	-------------------------------

**EPA 300.0 REV 2.1 in Water**

Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)

**HACH 8000 in Water**

Chemical Oxygen Demand	KY Wastewater Mdv (00030)
------------------------	---------------------------

**SW846 6010 B in Water**

**Sample Acceptance Checklist for Work Order 0033759**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **03/02/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

**Project:** Well Duplicate Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258508-6  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed* \*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033759-01 A	<u>4/21/20</u>	<u>0830</u>	Plastic 1L	1	Well Duplicate	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033759-01 B	<u>4/23/20</u>	<u>0830</u>	Plastic 500mL pH<2 w/HNO3	1	Well Duplicate	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033759-01 C	<u>4/20/20</u>	<u>0830</u>	Plastic 500mL pH<2 w/H2SO4	1	Well Duplicate	g / c	COD TOC
0033759-01 D	<u>4/23/20</u>	<u>0830</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	Well Duplicate	g / c	Radium 226 (sub)

Preservation Check: pH :   
Preservation Check: pH :   
Preservation Check: pH :

Preservation Check Performed by: *AS*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) 4/23/20 Time (24 hr) 0830  
pH 6.31 Cond <sup>mS/cm</sup> 5.89 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.69 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Travis Sneed* Received by: (Signature) *aboyz...* Date (mm/dd/yy) 4-23-20 Time (24 hr) 1325

# Chain of Custody

Scheduled for: 03/02/2020



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station

**Project:** Well Duplicate Wilson 092-00004

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: 258506-6

Please Print Legibly

Quote# \_\_\_\_\_

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033759-01 E	<u>4/23/20</u>	<u>0830</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	Well Duplicate	g / c	Radium 228 (sub)
0033759-01 F	<u>4/23/20</u>	<u>0830</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	Well Duplicate	g / c	Radium 228 (sub)
0033759-01 G	<u>4/23/20</u>	<u>0830</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	Well Duplicate	g / c	Radium Total (sub)

Preservation Check Performed by: [Signature]

Field data collected by: Travis Speed Date (mm/dd/yy) 4/23/20 Time (24 hr) 0830

pH 6.31 Cond (umho) 5.89 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.69 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
<u>[Signature]</u>	<u>[Signature]</u>	<u>4-23-20</u>	<u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

PACE- Check here if trip charge applied to associated COC

Printed: 3/27/2020 1:56:51PM

May 19, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33759  
Pace Project No.: 30360657

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 33759  
Pace Project No.: 30360657

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33759  
Pace Project No.: 30360657

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360657001	0033759-01	Water	04/23/20 08:30	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 33759  
Pace Project No.: 30360657

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360657001	0033759-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33759  
Pace Project No.: 30360657

**Sample: 0033759-01**      **Lab ID: 30360657001**      Collected: 04/23/20 08:30      Received: 04/28/20 09:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.174 ± 0.372 (0.612)</b> <b>C:NA T:87%</b>	pCi/L	05/18/20 15:36	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.39 ± 0.533 (0.818)</b> <b>C:72% T:87%</b>	pCi/L	05/15/20 15:51	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.56 ± 0.905 (1.43)</b>	pCi/L	05/19/20 08:36	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33759  
Pace Project No.: 30360657

QC Batch: 394311	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360657001

METHOD BLANK: 1909693 Matrix: Water

Associated Lab Samples: 30360657001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.255 ± 0.240 (0.532) C:NA T:97%	pCi/L	05/18/20 15:36	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33759  
Pace Project No.: 30360657

QC Batch: 394310	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360657001

METHOD BLANK: 1909692 Matrix: Water

Associated Lab Samples: 30360657001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.175 ± 0.287 (0.624) C:79% T:85%	pCi/L	05/15/20 15:53	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33759  
Pace Project No.: 30360657

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

WO#: 30360657



Chain of Custody



Workorder: 33759

Workorder Name: Well Duplicate Wilson 092 Owner Received Date: 4/23/2020

Results Requested By:

Report To: Subcontract To: Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg P/ 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Received By	Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc				
1											
2	0033759-01		04/23/20 08:30	IR44-McCoy	Water	X	X		<i>[Signature]</i>		
3											
4											
5											
6											
7											
8											
9											
10											

LAB USE ONLY

*Del*

Cooler Temperature on Receipt 3.2 °C Custody Seal Y or N Received on Ice Y or N Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002rev.00 24March2009

Page 1 of 1

# 30360657

SUBCONTRACT ORDER  
Pace Analytical Services, LLC Kentucky  
0033759

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0033759-01	Water	Sampled:04/23/2020 08:30	Specific Method
Radium Total (sub)	10/20/2020 08:30	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/20/2020 08:30	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/20/2020 08:30	EPA 903.1	

Released/By *May Yeager* Date *04-27-20* Received By \_\_\_\_\_ Date \_\_\_\_\_  
 Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_



Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # - 30360657

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 1811

Label	<u>JSM</u>
LIMS Login	<u>JSM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 3.2 °C Correction Factor: -0.5 °C Final Temp: 2.7 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>JSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH &lt; 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>8mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person-Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted-By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0033742

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 05/29/2020 13:40

Project Name: Field Blank Wilson 092-00004

Workorder: 0033742

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 04/23/2020 13:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0033742-01	Field Blank/	Water	04/23/2020 08:45	04/23/2020 13:25	Travis Sneed

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 5/20/20@0922. Cobalt result added to report.



### ANALYTICAL RESULTS

Lab Sample ID: **0033742-01**  
Description: **Field Blank**

Sample Collection Date Time: 04/23/2020 08:45  
Sample Received Date Time: 04/23/2020 13:25

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Barium	ND	u	mg/L	0.004	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Boron	ND	M4, U	mg/L	0.10	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:06	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Calcium	ND	M4, U	mg/L	0.40	0.13	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:06	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:06	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Magnesium	ND	u	mg/L	0.200	0.090	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:06	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	04/24/2020 11:25	05/02/2020 16:58	DMH
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Nickel	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Potassium	ND	M4, U	mg/L	0.50	0.22	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:06	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Sodium	ND	u	mg/L	0.26	0.10	SW846 6010 B	04/24/2020 11:25	04/28/2020 13:06	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	04/24/2020 11:25	05/01/2020 17:32	DMH

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 11:47	04/29/2020 11:47	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	04/29/2020 11:47	04/29/2020 11:47	HMF
Total Alkalinity	ND	u	mg/L	4		2320 B-2011	04/29/2020 11:47	04/29/2020 11:47	HMF
Chemical Oxygen Demand	ND	u	mg/L	8	8	HACH 8000	04/27/2020 15:25	04/27/2020 15:25	ALT
<b>Specific Conductance (Lab)</b>	<b>4</b>		umhos/cm	1	1	2510 B-2011	04/27/2020 14:56	04/27/2020 14:56	GAT
<b>Hardness as CaCO3</b>	<b>30</b>		mg/L	1	1	2340 C (as HACH 8226)	05/04/2020 11:06	05/04/2020 11:06	CLL
<b>Total Dissolved Solids</b>	<b>76</b>		mg/L	50	50	2540 C-2011	04/27/2020 09:05	04/28/2020 12:15	MAG
<b>Total Organic Carbon</b>	<b>0.5</b>		mg/L	0.5		5310 C-2011	05/01/2020 19:26	05/01/2020 19:26	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>-0.103</b>	_Sub	pCi/L			EPA 903.1	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium-228</b>	<b>0.007</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW
<b>Radium</b>	<b>0.007</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/19/2020 09:27	05/19/2020 09:29	RCW



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	M1, Y2, U	mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/01/2020 16:11	05/01/2020 16:11	CSC
Fluoride	ND	M1, Y2, U	mg/L	0.20		EPA 300.0 REV 2.1	05/01/2020 16:11	05/01/2020 16:11	CSC
Sulfate	ND	M1, Y2, U	mg/L	1.0	0.5	EPA 300.0 REV 2.1	05/01/2020 16:11	05/01/2020 16:11	CSC

**Notes for work order 0033742**

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
M6	Matrix spike recovery was high.
U	Target analyte was analyzed for , but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.
Y2	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Blank (B017542-BLK1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:50

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Cobalt	ND	0.004	mg/L							U

**Blank (B017542-BLK2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:09

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.001	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U

**Blank (B017542-BLK3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:50

Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**LCS (B017542-BS1)**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 12:53

Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.57	0.40	mg/L	6.25		105	85-115			
Iron	6.39	0.100	mg/L	6.25		102	85-115			
Magnesium	5.72	0.200	mg/L	6.25		91.5	85-115			
Potassium	6.62	0.50	mg/L	6.25		106	85-115			
Cobalt	0.054	0.004	mg/L	0.0625		85.7	85-115			
Sodium	6.47	0.26	mg/L	6.25		103	85-115			

**LCS (B017542-BS2)**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 17:13

Molybdenum	0.05	0.01	mg/L	0.0625		86.2	85-115			
Antimony	0.058	0.005	mg/L	0.0625		93.6	85-115			
Mercury	0.0020	0.0005	mg/L	0.00250		79.8	85-115			L2
Arsenic	0.0537	0.0010	mg/L	0.0625		85.9	85-115			
Barium	0.054	0.004	mg/L	0.0625		86.5	85-115			
Beryllium	0.0495	0.0020	mg/L	0.0625		79.2	85-115			M2
Cadmium	0.0533	0.0010	mg/L	0.0625		85.3	85-115			
Chromium	0.0535	0.0020	mg/L	0.0625		85.5	85-115			
Copper	0.054	0.003	mg/L	0.0625		86.7	85-115			
Lead	0.051	0.002	mg/L	0.0625		81.1	85-115			L2
Lithium	0.05	0.02	mg/L	0.0625		82.7	85-115			L2
Nickel	0.053	0.003	mg/L	0.0625		85.3	85-115			
Selenium	0.053	0.003	mg/L	0.0625		85.4	85-115			
Thallium	0.0495	0.0020	mg/L	0.0625		79.1	85-115			L2
Zinc	0.05	0.02	mg/L	0.0625		86.2	85-115			

**LCS (B017542-BS3)**

Prepared: 4/24/2020 11:25, Analyzed: 5/2/2020 16:54

Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		110	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		102	85-115			
Arsenic	0.0651	0.0010	mg/L	0.0625		104	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0624	0.0020	mg/L	0.0625		99.8	85-115			
Cadmium	0.0652	0.0010	mg/L	0.0625		104	85-115			
Chromium	0.0645	0.0020	mg/L	0.0625		103	85-115			
Copper	0.066	0.003	mg/L	0.0625		106	85-115			
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.06	0.02	mg/L	0.0625		101	85-115			
Nickel	0.064	0.003	mg/L	0.0625		103	85-115			
Selenium	0.065	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0650	0.0020	mg/L	0.0625		104	85-115			
Zinc	0.07	0.02	mg/L	0.0625		105	85-115			





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:18

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	6.11	10.0	mg/L	6.25	ND	97.8	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.064	0.004	mg/L	0.0625	ND	102	80-120			
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, U

**Matrix Spike (B017542-MS2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:24

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	357	40.0	mg/L	6.25	382	NR	80-120			D2, M2
Iron	89.2	10.0	mg/L	6.25	96.5	NR	80-120			D2, M2
Magnesium	190	20.0	mg/L	6.25	197	NR	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Cobalt	0.546	0.004	mg/L	0.0625	0.547	NR	80-120			M3
Sodium	107	26.0	mg/L	6.25	108	NR	80-120			D2

**Matrix Spike (B017542-MS3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:48

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.2	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	ND	103	80-120			J5
Barium	0.066	0.004	mg/L	0.0625	ND	106	80-120			
Beryllium	0.0609	0.0020	mg/L	0.0625	ND	97.5	80-120			
Cadmium	0.0639	0.0010	mg/L	0.0625	ND	102	80-120			
Chromium	0.0633	0.0020	mg/L	0.0625	ND	101	80-120			
Copper	0.061	0.003	mg/L	0.0625	ND	97.6	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.7	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	104	80-120			
Nickel	0.062	0.003	mg/L	0.0625	ND	99.8	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	100	80-120			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	80-120			
Zinc	0.06	0.02	mg/L	0.0625	ND	103	80-120			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike (B017542-MS4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:11

Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Mercury	0.0022	0.0005	mg/L	0.00250	ND	86.7	80-120			
Molybdenum	0.04	0.01	mg/L	0.0625	0.002	53.5	80-120			J5, M2
Arsenic	0.0711	0.0010	mg/L	0.0625	0.0079	101	80-120			J5
Barium	0.068	0.004	mg/L	0.0625	0.005	102	80-120			
Beryllium	0.0507	0.0020	mg/L	0.0625	0.0013	79.2	80-120			M2
Cadmium	0.0781	0.0010	mg/L	0.0625	0.0211	91.1	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	0.0007	99.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	89.1	80-120			
Lithium	0.20	0.02	mg/L	0.0625	0.15	87.1	80-120			
Nickel	1.03	0.003	mg/L	0.0625	1.10	NR	80-120			M3, E
Selenium	0.032	0.003	mg/L	0.0625	ND	50.5	80-120			M2
Thallium	0.0560	0.0020	mg/L	0.0625	0.0011	87.8	80-120			
Zinc	1.85	0.02	mg/L	0.0625	2.25	NR	80-120			M3, E

**Matrix Spike Dup (B017542-MSD1) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:21

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	6.31	10.0	mg/L	6.25	ND	101	80-120	3.22	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, U
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	2.02	20	

**Matrix Spike Dup (B017542-MSD2) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:28

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	356	40.0	mg/L	6.25	382	NR	80-120	0.438	20	D2, M2
Iron	88.8	10.0	mg/L	6.25	96.5	NR	80-120	0.473	20	D2, M2
Magnesium	189	20.0	mg/L	6.25	197	NR	80-120	0.296	20	D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	106	26.0	mg/L	6.25	108	NR	80-120	0.573	20	D2
Cobalt	0.552	0.004	mg/L	0.0625	0.547	8.08	80-120	1.11	20	M3

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Matrix Spike Dup (B017542-MSD3) Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 18:52

Mercury	0.0024	0.0005	mg/L	0.00250	ND	97.5	80-120	5.63	20	
Antimony	0.073	0.005	mg/L	0.0625	ND	116	80-120	2.84	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	2.30	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	ND	104	80-120	0.685	20	J5
Barium	0.068	0.004	mg/L	0.0625	ND	108	80-120	2.25	20	
Beryllium	0.0616	0.0020	mg/L	0.0625	ND	98.6	80-120	1.15	20	
Cadmium	0.0655	0.0010	mg/L	0.0625	ND	105	80-120	2.55	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.38	20	
Copper	0.062	0.003	mg/L	0.0625	ND	99.0	80-120	1.42	20	
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120	2.37	20	
Lithium	0.07	0.02	mg/L	0.0625	ND	106	80-120	2.61	20	
Nickel	0.064	0.003	mg/L	0.0625	ND	103	80-120	3.35	20	
Selenium	0.064	0.003	mg/L	0.0625	ND	103	80-120	2.12	20	
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.2	80-120	2.37	20	
Zinc	0.07	0.02	mg/L	0.0625	ND	105	80-120	1.77	20	

**Matrix Spike Dup (B017542-MSD4) Source: 0033743-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:15

Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	0.226	20	
Molybdenum	0.03	0.01	mg/L	0.0625	0.002	52.5	80-120	1.71	20	J5, M2
Mercury	0.0022	0.0005	mg/L	0.00250	ND	89.1	80-120	2.77	20	
Arsenic	0.0692	0.0010	mg/L	0.0625	0.0079	98.0	80-120	2.76	20	J5
Barium	0.068	0.004	mg/L	0.0625	0.005	100	80-120	1.30	20	
Beryllium	0.0493	0.0020	mg/L	0.0625	0.0013	76.8	80-120	2.91	20	M2
Cadmium	0.0793	0.0010	mg/L	0.0625	0.0211	93.1	80-120	1.59	20	
Chromium	0.0616	0.0020	mg/L	0.0625	0.0007	97.5	80-120	2.35	20	
Copper	0.055	0.003	mg/L	0.0625	ND	87.6	80-120	3.65	20	
Lead	0.055	0.002	mg/L	0.0625	ND	88.6	80-120	0.549	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	93.5	80-120	1.99	20	
Nickel	1.04	0.003	mg/L	0.0625	1.10	NR	80-120	1.31	20	M3, E
Selenium	0.031	0.003	mg/L	0.0625	ND	49.5	80-120	2.00	20	M2
Thallium	0.0555	0.0020	mg/L	0.0625	0.0011	87.0	80-120	0.916	20	
Zinc	1.87	0.02	mg/L	0.0625	2.25	NR	80-120	1.21	20	M3, E



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B017542 - EPA 200.2**

**Post Spike (B017542-PS1)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 4/28/2020 16:31

Boron	121		ug/L	125	-1.32	96.8	75-125			D2
Calcium	6440		ug/L	6250	3.49	103	75-125			D2
Iron	6150		ug/L	6250	21.5	98.0	75-125			D2
Magnesium	6600		ug/L	6250	1.11	106	75-125			D2
Potassium	5980		ug/L	6250	9.01	95.6	75-125			D2
Sodium	6720		ug/L	6250	2.78	108	75-125			D2
Cobalt	62.7		ug/L	62.5	0.009	100	75-125			

**Post Spike (B017542-PS2)**

**Source: 0033742-01**

Prepared: 4/24/2020 11:25, Analyzed: 5/1/2020 19:19

Mercury	2.56		ug/L	2.50	0.0710	99.4	75-125			
Molybdenum	65.7		ug/L	62.5	0.03	105	75-125			
Antimony	71.0		ug/L	62.5	0.107	113	75-125			
Arsenic	64.2		ug/L	62.5	-0.0029	103	75-125			J5
Barium	67.2		ug/L	62.5	0.037	107	75-125			
Beryllium	56.7		ug/L	62.5	-0.0023	90.7	75-125			
Cadmium	63.6		ug/L	62.5	0.0053	102	75-125			
Chromium	61.7		ug/L	62.5	0.0998	98.6	75-125			
Copper	61.0		ug/L	62.5	-1.66	97.6	75-125			
Lead	60.7		ug/L	62.5	0.219	96.8	75-115			
Lithium	60.7		ug/L	62.5	0.05	97.0	75-125			
Nickel	62.6		ug/L	62.5	0.313	99.7	75-125			
Selenium	64.8		ug/L	62.5	-0.002	104	75-125			
Thallium	58.9		ug/L	62.5	0.0066	94.2	75-125			
Zinc	65.7		ug/L	62.5	1.46	103	75-125			



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B018020 - Default Prep Wet Chem</b>										
<b>Blank (B018020-BLK1)</b>										
Prepared: 4/27/2020 8:45, Analyzed: 4/28/2020 12:15										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B018020-BS1)</b>										
Prepared: 4/27/2020 8:49, Analyzed: 4/28/2020 12:15										
Total Dissolved Solids	1440	25	mg/L	1500		96.3	80-120			
<b>Duplicate (B018020-DUP1) Source: 0043533-01</b>										
Prepared: 4/27/2020 10:13, Analyzed: 4/28/2020 12:15										
Total Dissolved Solids	ND	50	mg/L		ND				10	U
<b>Duplicate (B018020-DUP2) Source: 0033742-01</b>										
Prepared: 4/27/2020 10:17, Analyzed: 4/28/2020 12:15										
Total Dissolved Solids	74	50	mg/L		76			2.67	10	
<b>Batch B018080 - Default Prep Wet Chem</b>										
<b>Blank (B018080-BLK1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	ND	8	mg/L							U
<b>LCS (B018080-BS1)</b>										
Prepared: 4/27/2020 15:20, Analyzed: 4/27/2020 15:20										
Chemical Oxygen Demand	121	8	mg/L				90-110			
<b>Duplicate (B018080-DUP1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	36	8	mg/L		22			47.1	25	Y1
<b>Matrix Spike (B018080-MS1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	274	8	mg/L	250	22	101	90-110			
<b>Matrix Spike Dup (B018080-MSD1) Source: 0042854-01</b>										
Prepared: 4/27/2020 15:30, Analyzed: 4/27/2020 15:30										
Chemical Oxygen Demand	263	8	mg/L	250	22	96.3	90-110	4.34	10	



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD Limits	RPD RPD	Notes
<b>Batch B018086 - Default Prep Wet Chem</b>									
<b>Blank (B018086-BLK1)</b>									
Prepared: 4/27/2020 14:54, Analyzed: 4/27/2020 14:54									
Specific Conductance (Lab)	ND	1	umhos/cm						U
<b>LCS (B018086-BS1)</b>									
Prepared: 4/27/2020 14:55, Analyzed: 4/27/2020 14:55									
Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	80-120		
<b>Duplicate (B018086-DUP1) Source: 0033751-01</b>									
Prepared: 4/27/2020 15:09, Analyzed: 4/27/2020 15:09									
Specific Conductance (Lab)	2980	1	umhos/cm		2990			0.0335	1.24
<b>Duplicate (B018086-DUP2) Source: 0043793-01</b>									
Prepared: 4/27/2020 15:27, Analyzed: 4/27/2020 15:27									
Specific Conductance (Lab)	1	1	umhos/cm		1			0.755	1.24
<b>Batch B018100 - Default Prep Wet Chem</b>									
<b>Blank (B018100-BLK1)</b>									
Prepared: 5/1/2020 18:21, Analyzed: 5/1/2020 18:21									
Total Organic Carbon	ND	0.5	mg/L						U
<b>LCS (B018100-BS1)</b>									
Prepared: 5/1/2020 18:43, Analyzed: 5/1/2020 18:43									
Total Organic Carbon	5.0	0.5	mg/L	5.00		101	80-120		
<b>Duplicate (B018100-DUP1) Source: 0033748-01</b>									
Prepared: 5/2/2020 0:07, Analyzed: 5/2/2020 0:07									
Total Organic Carbon	2.0	0.5	mg/L		2.0			0.0293	25
<b>Duplicate (B018100-DUP2) Source: 0033758-01</b>									
Prepared: 5/2/2020 4:27, Analyzed: 5/2/2020 4:27									
Total Organic Carbon	2.8	0.5	mg/L		2.8			0.410	25
<b>Matrix Spike (B018100-MS1) Source: 0033749-01</b>									
Prepared: 5/2/2020 0:29, Analyzed: 5/2/2020 0:29									
Total Organic Carbon	10.7	0.5	mg/L	2.50	8.2	101	80-120		



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018100 - Default Prep Wet Chem**

**Matrix Spike (B018100-MS2)** Source: 0033759-01

Prepared: 5/2/2020 4:49, Analyzed: 5/2/2020 4:49

Total Organic Carbon	3.6	0.5	mg/L	5.00	0.4	65.0	80-120			M2
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**Batch B018391 - Default Prep Wet Chem**

**Blank (B018391-BLK1)**

Prepared: 4/29/2020 11:33, Analyzed: 4/29/2020 11:33

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK2)**

Prepared: 4/29/2020 13:03, Analyzed: 4/29/2020 13:03

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B018391-BLK3)**

Prepared: 4/29/2020 15:33, Analyzed: 4/29/2020 15:33

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

**LCS (B018391-BS1)**

Prepared: 4/29/2020 12:58, Analyzed: 4/29/2020 12:58

Carbonate Alkalinity as CaCO3	232	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	235	4	mg/L	235		99.8	80-120			

**LCS (B018391-BS2)**

Prepared: 4/29/2020 15:29, Analyzed: 4/29/2020 15:29

Total Alkalinity	250	4	mg/L	235		106	80-120			
Carbonate Alkalinity as CaCO3	230	4	mg/L	225		102	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B018391 - Default Prep Wet Chem

Duplicate (B018391-DUP1) Source: 0033751-01

Prepared: 4/29/2020 12:34, Analyzed: 4/29/2020 12:34

Total Alkalinity	309	4	mg/L		301			2.43	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		301				10	U
Bicarbonate Alkalinity as CaCO3	309	4	mg/L		ND				10	

Duplicate (B018391-DUP2) Source: 0033759-01

Prepared: 4/29/2020 15:04, Analyzed: 4/29/2020 15:04

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	402	4	mg/L		394			2.01	10	
Bicarbonate Alkalinity as CaCO3	402	4	mg/L		394			2.01	10	

Matrix Spike (B018391-MS1) Source: 0033743-01

Prepared: 4/29/2020 12:40, Analyzed: 4/29/2020 12:40

Total Alkalinity	61	4	mg/L	50.4	22	77.0	80-120			M2
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Matrix Spike (B018391-MS2) Source: 0033759-01

Prepared: 4/29/2020 15:18, Analyzed: 4/29/2020 15:18

Total Alkalinity	413	4	mg/L	50.4	394	37.5	80-120			M3
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Batch B019045 - Default Prep Wet Chem

Blank (B019045-BLK1)

Prepared: 5/4/2020 10:56, Analyzed: 5/4/2020 10:56

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B019045-BS1)

Prepared: 5/4/2020 10:58, Analyzed: 5/4/2020 10:58

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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Duplicate (B019045-DUP1) Source: 0041237-02

Prepared: 5/4/2020 12:56, Analyzed: 5/4/2020 12:56

Hardness as CaCO3	214	1	mg/L		200			6.76	10	
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Matrix Spike (B019045-MS1) Source: 0041237-02

Prepared: 5/4/2020 12:58, Analyzed: 5/4/2020 12:58

Hardness as CaCO3	568	1	mg/L	318	200	116	80-120			
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B018473 - Default Prep IC**

**Blank (B018473-BLK1)**

Prepared: 5/1/2020 15:50, Analyzed: 5/1/2020 15:50

Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B018473-BS1)**

Prepared: 5/1/2020 15:30, Analyzed: 5/1/2020 15:30

Sulfate	9.7		mg/L	10.0		97.1	90-110			
Fluoride	9.60		mg/L	10.0		96.0	90-110			
Chloride	9.6		mg/L	10.0		96.1	90-110			

**Matrix Spike (B018473-MS1)**

Source: 0033742-01

Prepared: 5/2/2020 0:01, Analyzed: 5/2/2020 0:01

Sulfate	10.8		mg/L	10.0	0.005	108	80-120			
Chloride	10.1		mg/L	10.0	0.0	101	80-120			
Fluoride	10.2		mg/L	10.0	0.06	101	80-120			

**Matrix Spike Dup (B018473-MSD1)**

Source: 0033742-01

Prepared: 5/2/2020 0:21, Analyzed: 5/2/2020 0:21

Chloride	13.1		mg/L	10.0	0.0	131	80-120	25.7	10	M1, Y2
Sulfate	14.5		mg/L	10.0	0.005	145	80-120	28.8	20	M1, Y2
Fluoride	13.2		mg/L	10.0	0.06	132	80-120	26.2	20	M1, Y2

**Certified Analyses included in this Report**

Analyte	Certifications
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**2320 B-2011 in Water**

Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)

**2340 C (as HACH 8226) in Water**

Hardness as CaCO3	KY Drinking Water Mdv (00030)
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**2510 B-2011 in Water**

Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
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**2540 C-2011 in Water**

Total Dissolved Solids	KY Drinking Water Mdv (00030)
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**5310 C-2011 in Water**

Total Organic Carbon	KY Drinking Water Mdv (00030)
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**EPA 300.0 REV 2.1 in Water**

Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)

**HACH 8000 in Water**

Chemical Oxygen Demand	KY Wastewater Mdv (00030)
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**SW846 6010 B in Water**

**Sample Acceptance Checklist for Work Order 0033742**

Shipped By: Client

Temperature: 3.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 03/02/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station

**Project:** Field Blank Wilson 092-00004

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000

PO#: 258508-6

PWS ID#:

Quote# \_\_\_\_\_

Please Print Legibly

State: KY

Collected by (Signature): *Travis Speed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033742-01 A	<u>04-23-20</u>	<u>8:45</u>	Plastic 1L	1	Field Blank	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
0033742-01 B	<u>04-23-20</u>	<u>8:45</u>	Plastic 500mL pH<2 w/HNO3	1	Field Blank	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
0033742-01 C	<u>04-23-20</u>	<u>8:45</u>	Plastic 500mL pH<2 w/H2SO4	1	Field Blank	g / c	COD TOC
0033742-01 D	<u>04-23-20</u>	<u>8:45</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	Field Blank	g / c	Radium 226 (sub)

Preservation Check: pH :   
Preservation Check: pH :   
Preservation Check: pH :

Preservation Check Performed by: *ASL*

Field data collected by: *Travis Speed* Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

pH \_\_\_\_\_ Cond (umho) \_\_\_\_\_ Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) \_\_\_\_\_ or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Travis Speed* Received by: (Signature) *Abby Lamm* Date (mm/dd/yy) 4-23-20 Time (24 hr) 1325

# Chain of Custody

**Scheduled for: 03/02/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station

**Project:** Field Blank Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#:  
State: KY

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#: 258508-6

Please Print Legibly

Quote# \_\_\_\_\_

Collected by (Signature): Travis Sneed  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0033742-01 E	<u>04-23-20</u>	<u>8:45</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	Field Blank	g / c	Radium 228 (sub)
0033742-01 F	<u>04-23-20</u>	<u>8:45</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	Field Blank	g / c	Radium 228 (sub)
0033742-01 G	<u>04-23-20</u>	<u>8:45</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <input checked="" type="checkbox"/>	1	Field Blank	g / c	Radium Total (sub)

Preservation Check Performed by: AM

Field data collected by: <u>Travis Sneed</u>	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
	Tot Cl (mg/L) _____	Free Cl (mg/L) _____
	DO (mg/L) _____	Turb. (NTU) _____

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>abby fark</u>	Date (mm/dd/yy) <u>4-23-20</u>	Time (24 hr) <u>1325</u>
_____	_____	_____	_____
_____	_____	_____	_____

May 19, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 33742  
Pace Project No.: 30360658

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 33742  
Pace Project No.: 30360658

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 33742  
Pace Project No.: 30360658

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30360658001	0033742-01	Water	04/23/20 08:45	04/28/20 09:10

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 33742  
Pace Project No.: 30360658

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30360658001	0033742-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 33742  
Pace Project No.: 30360658

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 0033742-01</b> <b>Lab ID: 30360658001</b> Collected: 04/23/20 08:45      Received: 04/28/20 09:10      Matrix: Water PWS:      Site ID:      Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>-0.103 ± 0.239 (0.519)</b> <b>C:NA T:95%</b>	pCi/L	05/18/20 15:36	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.00670 ± 0.393 (0.911)</b> <b>C:74% T:81%</b>	pCi/L	05/15/20 15:52	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.00670 ± 0.632 (1.43)</b>	pCi/L	05/19/20 08:36	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33742  
Pace Project No.: 30360658

QC Batch: 394311	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360658001

METHOD BLANK: 1909693 Matrix: Water

Associated Lab Samples: 30360658001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.255 ± 0.240 (0.532) C:NA T:97%	pCi/L	05/18/20 15:36	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 33742  
Pace Project No.: 30360658

QC Batch: 394310	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30360658001

METHOD BLANK: 1909692 Matrix: Water

Associated Lab Samples: 30360658001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.175 ± 0.287 (0.624) C:79% T:85%	pCi/L	05/15/20 15:53	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 33742  
Pace Project No.: 30360658

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

WO#: 30360658



Chain of Custody

Workorder: 33742    Workorder Name: Field Blank Wilson 092-000    Owner Received Date: 4/23/2020    Results Requested By:   
 Report To: Subcontract To:

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Requested Analysis	LAB USE ONLY
1									
2	0033742-01		04/23/20 08:45	IR44-McCoy	Water			EPA 903.1 X	001
3								EPA 904.0 Radium Sum Calc X	
4									
5									
6									
7									
8									
9									
10									
Transfers	Released By	Date/Time	Received By	Date/Time	Comments				
1			<i>[Signature]</i>	4/23/20 09:40					
2									
3									

Cooler Temperature on Receipt 2.6 °C    Custody Seal Y or N    Received on Ice Y or N    Sample Intact Y or N  
 \*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

# 30360658 Pace Analytical Services, LLC Kentucky  
0033742

SENDING LABORATORY:

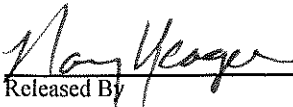
Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0033742-01</b>	<b>Water</b>	<b>Sampled:04/23/2020 08:45</b>	<b>Specific Method</b>
Radium Total (sub)	10/20/2020 08:45	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/20/2020 08:45	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/20/2020 08:45	EPA 903.1	


04-27-20

---

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

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Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KY

Project # # - 30360658

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 5386 1811

Label DSM  
LIMS Login DSM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 2.6 °C Correction Factor: -0.5 °C Final Temp: 2.1 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DSM 4/28/2020</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>pH &lt; 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DSM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DSM</u> Date: <u>4/28/2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

---

**Certificate of Analysis**  
**0092631**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:47

---

Project Name: MW-5 Wilson 092-00004

Workorder: 0092631

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



---

Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*





**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092631-01	MW5/	Groundwater	10/13/2020 08:55	10/14/2020 8:38	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092631-01	Field Conductance				3960
	Field pH				5.95
	Field Temp (C)				16.68

**ANALYTICAL RESULTS**

Lab Sample ID: **0092631-01**  
Description: **MW5**

Sample Collection Date Time: 10/13/2020 08:55  
Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Arsenic</b>	<b>0.0029</b>		mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Barium</b>	<b>0.011</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Boron</b>	<b>0.69</b>		mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:32	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Calcium</b>	<b>571</b>	D1	mg/L	40.0	13.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:37	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Cobalt</b>	<b>0.010</b>		mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
Copper	ND	u, B	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Iron</b>	<b>7.45</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:33	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Magnesium</b>	<b>251</b>	D1	mg/L	20.0	9.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:37	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Molybdenum</b>	<b>0.004</b>	J	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Nickel</b>	<b>0.006</b>		mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Potassium</b>	<b>12.5</b>	D2	mg/L	5.00	2.20	SW846 6010 B	10/15/2020 07:52	10/16/2020 10:32	dmh
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
<b>Sodium</b>	<b>91.2</b>	D2	mg/L	2.60	1.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:33	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:21	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>495</b>		mg/L	4		2320 B-2011	10/21/2020 18:49	10/21/2020 18:49	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 18:49	10/21/2020 18:49	HMF
<b>Total Alkalinity</b>	<b>495</b>		mg/L	4		2320 B-2011	10/21/2020 18:49	10/21/2020 18:49	HMF
<b>Chemical Oxygen Demand</b>	<b>14</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:30	HMF
<b>Specific Conductance (Lab)</b>	<b>3800</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:58	10/20/2020 15:58	CML
<b>Hardness as CaCO3</b>	<b>2320</b>	D	mg/L	5	5	2340 C (as HACH 8226)	10/19/2020 11:46	10/19/2020 11:46	CLL
<b>Total Dissolved Solids</b>	<b>3770</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>2.0</b>		mg/L	0.5		5310 C-2011	10/18/2020 00:27	10/18/2020 00:27	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.191</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>1.51</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>1.70</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>199</b>	D	mg/L	50.0	36.0	EPA 300.0 REV 2.1	10/21/2020 01:37	10/21/2020 01:37	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	10/21/2020 01:20	10/21/2020 01:20	CSC
<b>Sulfate</b>	<b>1800</b>	D	mg/L	200	100	EPA 300.0 REV 2.1	10/21/2020 11:02	10/21/2020 11:02	CSC

**Notes for work order 0092631**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.  
Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			U, D2, M4
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	U, D2, M4
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B042498 - Default Prep Wet Chem</b>										
<b>Blank (B042498-BLK1)</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B042498-BS1)</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
<b>Duplicate (B042498-DUP1) Source: 0092629-01</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
<b>Duplicate (B042498-DUP2) Source: 0102128-01</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	364	50	mg/L		370			1.63	10	
<b>Batch B042577 - Default Prep Wet Chem</b>										
<b>Blank (B042577-BLK1)</b>										
Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58										
Hardness as CaCO3	ND	1	mg/L							U
<b>LCS (B042577-BS1)</b>										
Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00										
Hardness as CaCO3	230	1	mg/L	225		102	80-120			
<b>Duplicate (B042577-DUP1) Source: 0100778-02</b>										
Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16										
Hardness as CaCO3	268	1	mg/L		260			3.03	10	
<b>Matrix Spike (B042577-MS1) Source: 0100778-02</b>										
Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18										
Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
<b>Batch B042587 - Default Prep Wet Chem</b>										
<b>Blank (B042587-BLK1)</b>										
Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08										
Total Organic Carbon	ND	0.5	mg/L							U



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B042587 - Default Prep Wet Chem

LCS (B042587-BS1)

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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Duplicate (B042587-DUP1) Source: 0092628-01

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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Duplicate (B042587-DUP2) Source: 0100200-01

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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Matrix Spike (B042587-MS1) Source: 0092629-01

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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Matrix Spike (B042587-MS2) Source: 0100200-02

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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Batch B043117 - Default Prep Wet Chem

Blank (B043117-BLK1)

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK2)

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK3)

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	254	4	mg/L	235		108	80-120			

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	295	4	mg/L		283			4.39	10	

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Total Alkalinity	281	4	mg/L		268			4.88	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043187 - Default Prep Wet Chem

LCS (B043187-BS1)

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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Duplicate (B043187-DUP1) Source: 0092629-01

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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Duplicate (B043187-DUP2) Source: 0102262-01

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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Batch B043582 - Default Prep Wet Chem

Blank (B043582-BLK1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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LCS (B043582-BS1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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Duplicate (B043582-DUP1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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Matrix Spike (B043582-MS1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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Matrix Spike Dup (B043582-MSD1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043121 - Default Prep IC**

**Blank (B043121-BLK1)**

Prepared: 10/20/2020 22:42, Analyzed: 10/20/2020 22:42

Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U

**LCS (B043121-BS1)**

Prepared: 10/20/2020 22:25, Analyzed: 10/20/2020 22:25

Sulfate	9.2		mg/L	10.0		91.8	90-110			
Fluoride	9.25		mg/L	10.0		92.5	90-110			
Chloride	9.4		mg/L	10.0		93.7	90-110			

**Matrix Spike (B043121-MS1)**

Source: 0092635-01

Prepared: 10/21/2020 5:58, Analyzed: 10/21/2020 5:58

Chloride	48.6		mg/L	10.0	68.0	NR	80-120			M2
Sulfate	242		mg/L	10.0	593	NR	80-120			M2
Fluoride	9.28		mg/L	10.0	0.19	90.9	80-120			

**Matrix Spike Dup (B043121-MSD1)**

Source: 0092635-01

Prepared: 10/21/2020 6:15, Analyzed: 10/21/2020 6:15

Chloride	48.1		mg/L	10.0	68.0	NR	80-120	1.05	10	M2
Fluoride	9.21		mg/L	10.0	0.19	90.2	80-120	0.811	20	
Sulfate	240		mg/L	10.0	593	NR	80-120	0.795	20	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0092631**

Shipped By: Client

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-5 Wilson 092-00004**

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000  
PWS ID#:  
State: 154

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092631 Sample ID#	*required information* Date (mm/dd/yy): <u>10-13-20</u>	Collection Time (24 hr): <u>8:55</u>	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092631-01 A	<u>10-13-20</u>	<u>8:55</u>	Plastic 1L	1	MW5	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092631-01 B	<u>10-13-20</u>	<u>8:55</u>	Plastic 500mL pH<2 w/HNO3	1	MW5	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010E
0092631-01 C	<u>10-13-20</u>	<u>8:55</u>	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
0092631-01 D	<u>10-13-20</u>	<u>8:55</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)

Preservation Check: pH:   
Preservation Check: pH:   
Preservation Check: pH:

Preservation Check Performed by: *Noy*

Field data collected by: *Travis Sneed* Date (mm/dd/yy) 10-13-20 Time (24 hr) 8:55  
pH 5.95 Cond (umho) 3960 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 16.68 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Travis Sneed* Received by: (Signature) *[Signature]* Date (mm/dd/yy) 10-14-20 Time (24 hr) 0838

# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
**Big Rivers Electric Corporation Wilson Station**  
**Mike Galbraith**  
**PO Box 24**  
**Henderson, KY 42419**

Invoice To:  
**Big Rivers Electric Corporation Wilson Station**  
**Brian Edwards**  
**PO Box 24**  
**Henderson, KY 42419**

Project: **MW-5 Wilson 092-00004**

Phone: **(270) 844-6000**  
PWS ID#:  
State: **KY**

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): *[Signature]*

Compliance Monitoring? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes  No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy): Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092631-01 E	<u>10-13-20</u> <u>8:55</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
		Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092631-01 F	<u>10-13-20</u> <u>8:55</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
		Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092631-01 G	<u>10-13-20</u> <u>8:55</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW5	g / c	Radium Total (sub)
		Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092631-01 H	<u>10-13-20</u> <u>8:55</u>	AG 250mL pH<2 w/H2SO4	1	MW5	g / c	TOC
		Preservation Check: pH :	<input checked="" type="checkbox"/>			

Preservation Check Performed by: *NDY*

Field data collected by: *Tegan's Speed* Date (mm/dd/yy) *10-13-20* Time (24 hr) *8:55*

pH *5.95* Cond (umho) *3960* Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) *16.68* or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>[Signature]</i></u>	Received by: (Signature) <u><i>[Signature]</i></u>	Date (mm/dd/yy) <u><i>10-14-20</i></u>	Time (24 hr) <u><i>0838</i></u>
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November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92631  
Pace Project No.: 30387825

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 92631  
Pace Project No.: 30387825

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

### SAMPLE SUMMARY

Project: 92631  
Pace Project No.: 30387825

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387825001	0092631-01	Water	10/13/20 08:55	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92631  
Pace Project No.: 30387825

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387825001	0092631-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92631  
Pace Project No.: 30387825

**Sample: 0092631-01**      **Lab ID: 30387825001**      Collected: 10/13/20 08:55      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.  
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	<b>0.191 ± 0.297 (0.515)</b> <b>C:NA T:103%</b>	pCi/L	11/04/20 12:59	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	<b>1.51 ± 0.530 (0.743)</b> <b>C:72% T:85%</b>	pCi/L	10/30/20 12:01	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	<b>1.70 ± 0.827 (1.26)</b>	pCi/L	11/04/20 14:23	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92631  
Pace Project No.: 30387825

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387825001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387825001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92631  
Pace Project No.: 30387825

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387825001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387825001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92631  
Pace Project No.: 30387825

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 92631      Workorder Name: MW-5 Wilson 092-00004      Owner Received Date: 10/14/2020      Results Requested By:   
 Report To:      Subcontract To:

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg Pl  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

WO#: 30387825

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc		
1					Ground				
2	0092631-01		10/13/20 08:55	IR44-McCoy	Water			X	
3								X	LAB USE ONLY
4									001
5									
6									
7									
8									
9									
10									

Received By: *John P. B.*      Date/Time: 10/15/2020

Cooler Temperature on Receipt: 50 °C      Custody Seal Y or N: N      Received on Ice Y or N: Y      Sample Intact Y or N: Y

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**SUBCONTRACT ORDER**

**Pace Analytical Services, LLC Kentucky  
0092631**

**#-30387825**

**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0092631-01</b>	<b>Water</b>	<b>Sampled:10/13/2020 08:55</b>	<b>Specific Method</b>
Radium Total (sub)	04/11/2021 08:55	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 08:55	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 08:55	EPA 903.1	

*[Signature]* 10.14.20  
Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387825

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 9238/9256/9271

Label	<u>BUM</u>
LIMS Login	<u>BUM</u>

Custody Seal on Cooler/Box Present:  yes  no    Seals intact:  yes  no

Thermometer Used 9    Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C    Correction Factor: -0.1 °C    Final Temp: 7.4/7.4 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot# <u>1000401</u>	Date and initials of person examining contents: <u>10/10/20 ETB</u>
-----------	------------------------------	---

	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID      Matrix: <u>WT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. <u>not time/date on containers</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>Added 5.0 mL of HNO3 to all bottles</u>
All containers meet method preservation requirements.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ET</u> Date/time of preservation: <u>10-10-2020 1745</u> Lot # of added preservative: <u>DL20-1174</u>
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ET</u> Date: <u>10-10-2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0092632

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:51

Project Name: MW-6 Wilson 092-00004

Workorder: 0092632

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092632-01	MW6/	Groundwater	10/13/2020 09:40	10/14/2020 8:38	Phillip Hill
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092632-01	Field Conductance				2410
	Field pH				6.72
	Field Temp (C)				16.60



**ANALYTICAL RESULTS**

Lab Sample ID: **0092632-01**  
 Description: **MW6**

Sample Collection Date Time: 10/13/2020 09:40  
 Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Arsenic</b>	<b>0.0054</b>		mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Barium</b>	<b>0.013</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Boron</b>	<b>0.34</b>		mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:35	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Calcium</b>	<b>483</b>	D1	mg/L	40.0	13.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:43	AKB
<b>Chromium</b>	<b>0.0007</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Cobalt</b>	<b>0.009</b>		mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
Copper	ND	u, B	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Iron</b>	<b>6.43</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:40	AKB
<b>Lead</b>	<b>0.0006</b>	J	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Lithium</b>	<b>0.04</b>		mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Magnesium</b>	<b>223</b>	D1	mg/L	20.0	9.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:43	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Molybdenum</b>	<b>0.007</b>	J	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Nickel</b>	<b>0.017</b>		mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Potassium</b>	<b>11.0</b>	D2	mg/L	5.00	2.20	SW846 6010 B	10/15/2020 07:52	10/16/2020 10:35	dmh
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
<b>Sodium</b>	<b>40.4</b>	D2	mg/L	2.60	1.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:40	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:24	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>526</b>		mg/L	4		2320 B-2011	10/21/2020 18:56	10/21/2020 18:56	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 18:56	10/21/2020 18:56	HMF
<b>Total Alkalinity</b>	<b>526</b>		mg/L	4		2320 B-2011	10/21/2020 18:56	10/21/2020 18:56	HMF
<b>Chemical Oxygen Demand</b>	<b>10</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:30	HMF
<b>Specific Conductance (Lab)</b>	<b>3140</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:59	10/20/2020 15:59	CML
<b>Hardness as CaCO3</b>	<b>2050</b>	D	mg/L	5	5	2340 C (as HACH 8226)	10/19/2020 11:52	10/19/2020 11:52	CLL
<b>Total Dissolved Solids</b>	<b>3030</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>1.8</b>		mg/L	0.5		5310 C-2011	10/18/2020 00:48	10/18/2020 00:48	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.060</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>0.508</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>0.568</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx





**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>18.9</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	10/21/2020 02:30	10/21/2020 02:30	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	10/21/2020 02:30	10/21/2020 02:30	CSC
<b>Sulfate</b>	<b>1750</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	10/21/2020 02:47	10/21/2020 02:47	CSC

**Notes for work order 0092632**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.  
Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for , but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
-----------	----	------	------	--	--	--	--	--	--	---

**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			U, D2, M4
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	U, D2, M4
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2





**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042498 - Default Prep Wet Chem**

**Blank (B042498-BLK1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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**LCS (B042498-BS1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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**Duplicate (B042498-DUP1) Source: 0092629-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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**Duplicate (B042498-DUP2) Source: 0102128-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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**Batch B042577 - Default Prep Wet Chem**

**Blank (B042577-BLK1)**

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B042577-BS1)**

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B042577-DUP1) Source: 0100778-02**

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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**Matrix Spike (B042577-MS1) Source: 0100778-02**

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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**Batch B042587 - Default Prep Wet Chem**

**Blank (B042587-BLK1)**

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B042587 - Default Prep Wet Chem

LCS (B042587-BS1)

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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Duplicate (B042587-DUP1) Source: 0092628-01

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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Duplicate (B042587-DUP2) Source: 0100200-01

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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Matrix Spike (B042587-MS1) Source: 0092629-01

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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Matrix Spike (B042587-MS2) Source: 0100200-02

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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Batch B043117 - Default Prep Wet Chem

Blank (B043117-BLK1)

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK2)

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK3)

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	254	4	mg/L	235		108	80-120			

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	295	4	mg/L		283			4.39	10	

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Total Alkalinity	281	4	mg/L		268			4.88	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
------------------	-----	---	------	------	-----	------	--------	--	--	--

**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
------------------	-----	---	------	------	-----	------	--------	--	--	----

**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
----------------------------	----	--	------------	--	--	--	--	--	--	---



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B043187 - Default Prep Wet Chem**

**LCS (B043187-BS1)**

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
----------------------------	------	--	----------	------	--	-----	--------	--	--	--

**Duplicate (B043187-DUP1) Source: 0092629-01**

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
----------------------------	------	---	----------	--	------	--	--	-------	------	--

**Duplicate (B043187-DUP2) Source: 0102262-01**

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
----------------------------	-----	---	----------	--	-----	--	--	-------	------	--

**Batch B043582 - Default Prep Wet Chem**

**Blank (B043582-BLK1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
------------------------	----	---	------	--	--	--	--	--	--	---

**LCS (B043582-BS1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
------------------------	-----	---	------	-----	--	------	--------	--	--	--

**Duplicate (B043582-DUP1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
------------------------	---	---	------	--	----	--	--	--	----	--

**Matrix Spike (B043582-MS1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
------------------------	-----	---	------	-----	----	-----	--------	--	--	--

**Matrix Spike Dup (B043582-MSD1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
------------------------	-----	---	------	-----	----	-----	--------	------	----	--



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B043121 - Default Prep IC**

**Blank (B043121-BLK1)**

Prepared: 10/20/2020 22:42, Analyzed: 10/20/2020 22:42

Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U

**LCS (B043121-BS1)**

Prepared: 10/20/2020 22:25, Analyzed: 10/20/2020 22:25

Sulfate	9.2		mg/L	10.0		91.8	90-110			
Fluoride	9.25		mg/L	10.0		92.5	90-110			
Chloride	9.4		mg/L	10.0		93.7	90-110			

**Matrix Spike (B043121-MS1)**

Source: 0092635-01

Prepared: 10/21/2020 5:58, Analyzed: 10/21/2020 5:58

Chloride	48.6		mg/L	10.0	68.0	NR	80-120			M2
Sulfate	242		mg/L	10.0	593	NR	80-120			M2
Fluoride	9.28		mg/L	10.0	0.19	90.9	80-120			

**Matrix Spike Dup (B043121-MSD1)**

Source: 0092635-01

Prepared: 10/21/2020 6:15, Analyzed: 10/21/2020 6:15

Chloride	48.1		mg/L	10.0	68.0	NR	80-120	1.05	10	M2
Fluoride	9.21		mg/L	10.0	0.19	90.2	80-120	0.811	20	
Sulfate	240		mg/L	10.0	593	NR	80-120	0.795	20	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0092632**

Shipped By: Client

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 09/07/2020



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station

**Project:** MW-6 Wilson 092-00004

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000  
PWS ID#: \_\_\_\_\_  
State: KY

PO#: \_\_\_\_\_  
Quote#: \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
0092632	(mm/dd/yy):	Time (24 hr):					
0092632-01 A	<u>10/13/20</u>	<u>940</u>	Plastic 1L	1	MW6	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092632-01 B	<u>10/12/20</u>	<u>940</u>	Plastic 500mL pH<2 w/HNO3	1	MW6	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092632-01 C	<u>10/13/20</u>	<u>940</u>	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
0092632-01 D	<u>10/13/20</u>	<u>940</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check Performed by: [Signature]

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/13/20 Time (24 hr) 940  
pH 6.72 Cond <sup>ms/cm</sup> 2.41 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 16.60 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
<u>[Signature]</u>	<u>[Signature]</u>	<u>10-14-20</u>	<u>08:35</u>

# Chain of Custody

Scheduled for: **09/07/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

**Project:** MW-6 Wilson 092-00004

Phone: (270) 844-6000

PWS ID#:

State: KY

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

*[Signature]*

Collected by (Signature): \_\_\_\_\_

*\*required information\**

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy): Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092632-01 E	<u>10/12/20</u> <u>940</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1 ✓	MW6	g / c	Radium 228 (sub)
		Preservation Check: pH : _____				
0092632-01 F	<u>10/13/20</u> <u>940</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1 ✓	MW6	g / c	Radium 228 (sub)
		Preservation Check: pH : _____				
0092632-01 G	<u>10/13/20</u> <u>940</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1 ✓	MW6	g / c	Radium Total (sub)
		Preservation Check: pH : _____				
0092632-01 H	<u>10/13/20</u> <u>940</u>	AG 250mL pH<2 w/H2SO4	1 ✓	MW6	g / c	TOC
		Preservation Check: pH : _____				

Preservation Check Performed by: Nap

Field data collected by: Phillip HSU Date (mm/dd/yy) 10/12/20 Time (24 hr) 940

pH 6.72 Cond <sup>µmho/cm</sup> 2.41 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.60 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0838</u>
--	--	------------------------------------	-----------------------------

PACE- Check here if trip charge applied to associated COC

Printed: 9/10/2020 10:07:28AM



November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92632  
Pace Project No.: 30387826

Dear Rob Whittington:

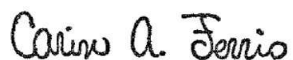
Enclosed are the analytical results for sample(s) received by the laboratory on October 15, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 92632  
Pace Project No.: 30387826

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92632  
Pace Project No.: 30387826

<b>Lab ID</b>	<b>Sample ID</b>	<b>Matrix</b>	<b>Date Collected</b>	<b>Date Received</b>
30387826001	0092632-01	Water	10/13/20 09:40	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92632  
Pace Project No.: 30387826

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387826001	0092632-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92632  
Pace Project No.: 30387826

**Sample: 0092632-01**      **Lab ID: 30387826001**      Collected: 10/13/20 09:40      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.  
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	<b>0.0599 ± 0.389 (0.785)</b> <b>C:NA T:85%</b>	pCi/L	11/04/20 12:59	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	<b>0.508 ± 0.429 (0.865)</b> <b>C:67% T:87%</b>	pCi/L	10/30/20 12:01	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	<b>0.568 ± 0.818 (1.65)</b>	pCi/L	11/04/20 14:23	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92632  
Pace Project No.: 30387826

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387826001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387826001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92632  
Pace Project No.: 30387826

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387826001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387826001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92632  
Pace Project No.: 30387826

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



Chain of Custody



Workorder: 92632      Workorder Name: MW-6 Wilson 092-00004      Owner Received Date: 10/14/2020      Results Requested By:   
 Report To:      Subcontract To:

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

WO#: 30387826

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		EPA 903.1	EPA 904.0 Radium Sum Calc	LAB USE ONLY	Requested Analysis
1					Ground			X			
2	0092632-01		10/13/20 09:40	IR44-McCoy	Water			X			
3											
4											
5											
6											
7											
8											
9											
10											

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>[Signature]</i>	10/15/200925	
2					
3					

Cooler Temperature on Receipt 52 °C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N  
 \*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky  
0092632

# 30387826

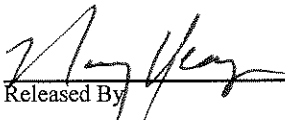
SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0092632-01	Water	Sampled:10/13/2020 09:40	Specific Method
Radium Total (sub)	04/11/2021 09:40	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 09:40	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 09:40	EPA 903.1	

 10-14-20  
 Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_  
 Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387826

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other

Tracking #: 1107 3386 9238/9256/9271

Label BUM  
LIMS Login BUM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4 °C  
Temp should be above freezing to 6°C

Comments: pH paper Lot# 1000401 Date and Initials of person examining contents: 10/16/20 ET

Comments:	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	/			5. <u>no time/date on containers</u>
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used: -Pace Containers Used:	/			10.
Containers Intact:	/			11.
Orthophosphate field filtered	/			12.
Hex Cr Aqueous sample field filtered	/			13.
Organic Samples checked for dechlorination:	/			14.
Filtered volume received for Dissolved tests	/			15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	/			16. <u>added 5.0ml of HNO3 to all bottles</u>
All containers meet method preservation requirements.	/			Initial when completed: <u>ET</u> Date/time of preservation: <u>10-16-20 1745</u> Lot # of added preservative: <u>DC20-1174</u>
Headspace in VOA Vials (>6mm):	/			17.
Trip Blank Present:	/			18.
Trip Blank Custody Seals Present	/			
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>ET</u> Date: <u>10-16-2020</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0092633

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:53

Project Name: MW-7 Wilson 092-00004

Workorder: 0092633

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092633-01	MW7/	Groundwater	10/13/2020 10:25	10/14/2020 8:38	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092633-01	Field Conductance				2450
	Field pH				6.02
	Field Temp (C)				16.29

**ANALYTICAL RESULTS**

Lab Sample ID: **0092633-01**  
Description: **MW7**

Sample Collection Date Time: 10/13/2020 10:25  
Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Arsenic</b>	<b>0.0036</b>		mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Barium</b>	<b>0.013</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Boron</b>	<b>2.26</b>	D1	mg/L	1.00	1.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:46	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Calcium</b>	<b>350</b>	D1	mg/L	40.0	13.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:49	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
Copper	ND	u, B	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Iron</b>	<b>4.27</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:46	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Magnesium</b>	<b>94.6</b>	D2	mg/L	2.00	0.900	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:46	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Molybdenum</b>	<b>0.005</b>	J	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Nickel</b>	<b>0.005</b>		mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Potassium</b>	<b>7.60</b>	D2	mg/L	5.00	2.20	SW846 6010 B	10/15/2020 07:52	10/16/2020 10:47	dmh
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
<b>Sodium</b>	<b>42.3</b>	D2	mg/L	2.60	1.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:46	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:42	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>337</b>		mg/L	4		2320 B-2011	10/21/2020 19:04	10/21/2020 19:04	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 19:04	10/21/2020 19:04	HMF
<b>Total Alkalinity</b>	<b>337</b>		mg/L	4		2320 B-2011	10/21/2020 19:04	10/21/2020 19:04	HMF
<b>Chemical Oxygen Demand</b>	<b>6</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:31	HMF
<b>Specific Conductance (Lab)</b>	<b>2340</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 16:00	10/20/2020 16:00	CML
<b>Hardness as CaCO3</b>	<b>1680</b>	D	mg/L	5	5	2340 C (as HACH 8226)	10/19/2020 12:58	10/19/2020 12:58	CLL
<b>Total Dissolved Solids</b>	<b>1950</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>1.5</b>		mg/L	0.5		5310 C-2011	10/18/2020 01:09	10/18/2020 01:09	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.276</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>0.691</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>0.967</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>45.0</b>	D	mg/L	1.0	0.7	EPA 300.0 REV 2.1	10/21/2020 03:22	10/21/2020 03:22	CSC
<b>Fluoride</b>	<b>0.22</b>		mg/L	0.20		EPA 300.0 REV 2.1	10/21/2020 03:04	10/21/2020 03:04	CSC
<b>Sulfate</b>	<b>1050</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	10/21/2020 03:39	10/21/2020 03:39	CSC

**Notes for work order 0092633**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.  
Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042498 - Default Prep Wet Chem**

**Blank (B042498-BLK1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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**LCS (B042498-BS1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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**Duplicate (B042498-DUP1) Source: 0092629-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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**Duplicate (B042498-DUP2) Source: 0102128-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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**Batch B042577 - Default Prep Wet Chem**

**Blank (B042577-BLK1)**

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B042577-BS1)**

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B042577-DUP1) Source: 0100778-02**

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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**Matrix Spike (B042577-MS1) Source: 0100778-02**

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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**Batch B042587 - Default Prep Wet Chem**

**Blank (B042587-BLK1)**

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042587 - Default Prep Wet Chem**

**LCS (B042587-BS1)**

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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**Duplicate (B042587-DUP1) Source: 0092628-01**

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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**Duplicate (B042587-DUP2) Source: 0100200-01**

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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**Matrix Spike (B042587-MS1) Source: 0092629-01**

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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**Matrix Spike (B042587-MS2) Source: 0100200-02**

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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**Batch B043117 - Default Prep Wet Chem**

**Blank (B043117-BLK1)**

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK2)**

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK3)**

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U





Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043117 - Default Prep Wet Chem

LCS (B043117-BS1)

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

LCS (B043117-BS2)

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	254	4	mg/L	235		108	80-120			

Duplicate (B043117-DUP1)

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	295	4	mg/L		283			4.39	10	

Duplicate (B043117-DUP2)

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Total Alkalinity	281	4	mg/L		268			4.88	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	

Matrix Spike (B043117-MS1)

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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Matrix Spike (B043117-MS2)

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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Batch B043187 - Default Prep Wet Chem

Blank (B043187-BLK1)

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043187 - Default Prep Wet Chem**

**LCS (B043187-BS1)**

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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**Duplicate (B043187-DUP1) Source: 0092629-01**

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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**Duplicate (B043187-DUP2) Source: 0102262-01**

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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**Batch B043582 - Default Prep Wet Chem**

**Blank (B043582-BLK1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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**LCS (B043582-BS1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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**Duplicate (B043582-DUP1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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**Matrix Spike (B043582-MS1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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**Matrix Spike Dup (B043582-MSD1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043121 - Default Prep IC**

**Blank (B043121-BLK1)**

Prepared: 10/20/2020 22:42, Analyzed: 10/20/2020 22:42

Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U

**LCS (B043121-BS1)**

Prepared: 10/20/2020 22:25, Analyzed: 10/20/2020 22:25

Sulfate	9.2		mg/L	10.0		91.8	90-110			
Fluoride	9.25		mg/L	10.0		92.5	90-110			
Chloride	9.4		mg/L	10.0		93.7	90-110			

**Matrix Spike (B043121-MS1)**

Source: 0092635-01

Prepared: 10/21/2020 5:58, Analyzed: 10/21/2020 5:58

Chloride	48.6		mg/L	10.0	68.0	NR	80-120			M2
Sulfate	242		mg/L	10.0	593	NR	80-120			M2
Fluoride	9.28		mg/L	10.0	0.19	90.9	80-120			

**Matrix Spike Dup (B043121-MSD1)**

Source: 0092635-01

Prepared: 10/21/2020 6:15, Analyzed: 10/21/2020 6:15

Chloride	48.1		mg/L	10.0	68.0	NR	80-120	1.05	10	M2
Fluoride	9.21		mg/L	10.0	0.19	90.2	80-120	0.811	20	
Sulfate	240		mg/L	10.0	593	NR	80-120	0.795	20	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

<b>Sample Acceptance Checklist for Work Order 0092633</b>	
Shipped By: Client	Temperature: 1.00° Celcius
<b>Condition</b>	
Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 09/07/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-7 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes  No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092633 Sample ID#	*required information* Date (mm/dd/yy): <u>10-13-20</u>	Collection Time (24 hr): <u>10:25</u>	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092633-01 A	<u>10-13-20</u>	<u>10:25</u>	Plastic 1L	1	MW7	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092633-01 B	<u>10-13-20</u>	<u>10:25</u>	Plastic 500mL pH<2 w/HNO3	1	MW7	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092633-01 C	<u>10-13-20</u>	<u>10:25</u>	Plastic 500mL pH<2 w/H2SO4	1	MW7	g / c	COD TOC
0092633-01 D	<u>10-13-20</u>	<u>10:25</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW7	g / c	Radium 226 (sub)

Preservation Check: pH:

Preservation Check: pH:

Preservation Check: pH:

Preservation Check Performed by: NOY

Field data collected by: Travis Sneed Date (mm/dd/yy) 10-13-20 Time (24 hr) 10:25

pH 6.02 Cond (umho) 2450 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.29 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Travis Sneed* Received by: (Signature) *Mike Galbraith* Date (mm/dd/yy) 10-14-20 Time (24 hr) 0838

# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-7 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: Ky

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes  No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092633-01 E	<u>10-13-20</u>	<u>10:25</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092633-01 F	<u>10-13-20</u>	<u>10:25</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092633-01 G	<u>10-13-20</u>	<u>10:25</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW7	g / c	Radium Total (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092633-01 H	<u>10-13-20</u>	<u>10:25</u>	AG 250mL pH<2 w/H2SO4	1	MW7	g / c	TOC
			Preservation Check: pH :	<input checked="" type="checkbox"/>			

Preservation Check Performed by: NDY

Field data collected by: Travis Sneed Date (mm/dd/yy) 10-13-20 Time (24 hr) 10:25  
pH 6.02 Cond (umho) 2450 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 16.29 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Sneed</i></u>	Received by: (Signature) <u><i>Mike Galbraith</i></u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0838</u>
_____	_____	_____	_____
_____	_____	_____	_____

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92633  
Pace Project No.: 30387827

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 92633  
Pace Project No.: 30387827

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92633  
Pace Project No.: 30387827

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387827001	0092633-01	Water	10/13/20 10:25	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92633  
Pace Project No.: 30387827

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387827001	0092633-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92633  
Pace Project No.: 30387827

**Sample: 0092633-01**      **Lab ID: 30387827001**      Collected: 10/13/20 10:25      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.276 ± 0.288 (0.406)</b> <b>C:NA T:93%</b>	pCi/L	11/04/20 12:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.691 ± 0.399 (0.725)</b> <b>C:72% T:87%</b>	pCi/L	10/30/20 12:01	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.967 ± 0.687 (1.13)</b>	pCi/L	11/04/20 14:23	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92633  
Pace Project No.: 30387827

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387827001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387827001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92633  
Pace Project No.: 30387827

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387827001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387827001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92633  
Pace Project No.: 30387827

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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Chain of Custody

Workorder: 92633      Workorder Name: MW-7 Wilson 092-00004      Owner Received Date: 10/14/2020      Results Requested By:

Report To: \_\_\_\_\_ Subcontract To: \_\_\_\_\_ Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

**WO#: 30387827**  
  
 30387827

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		LAB USE ONLY
						EPA 903.1	EPA 904.0 Radium Sum Calc	
1					Ground			
2	0092633-01		10/13/20 10:25	IR44-McCoy	Water		X	001
3								
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>[Signature]</i>	10/15/2020	
2					
3					

Cooler Temperature on Receipt SW °C      Custody Seal Y or N      Received on 10/15/2020      Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**SUBCONTRACT ORDER**

Pace Analytical Services, LLC Kentucky  
0092633

# 30387827

**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0092633-01</b>	<b>Water</b>	<b>Sampled:10/13/2020 10:25</b>	<b>Specific Method</b>
Radium Total (sub)	04/11/2021 10:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 10:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 10:25	EPA 903.1	

Released By *M. Yeager* Date *10-14-20* Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_



Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387827

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 9238/9256/9271

Label <u>BUM</u>
LIMS Login <u>BUM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4 °C  
 Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents:
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1000401 10/16/20 OVB no date/time on containers PHL2
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Initial when completed: <u>OVB</u> Date/time of preservation				
Lot # of added preservative				
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Initial when completed: <u>OVB</u> Date: <u>10/16/20</u>				

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0092634

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:55

Project Name: MW-8 Wilson 092-00004

Workorder: 0092634

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092634-01	MW8/	Groundwater	10/13/2020 08:05	10/14/2020 8:38	Phillip Hill
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
0092634-01	Field Conductance	1530			
	Field pH	6.55			
	Field Temp (C)	13.67			

### ANALYTICAL RESULTS

Lab Sample ID: **0092634-01**

Description: **MW8**

Sample Collection Date Time: 10/13/2020 08:05

Sample Received Date Time: 10/14/2020 08:38

#### Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Arsenic</b>	<b>0.0144</b>		mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Barium</b>	<b>0.070</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:51	DMH
<b>Cadmium</b>	<b>0.0004</b>	J	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Calcium</b>	<b>249</b>	D1	mg/L	40.0	13.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:55	AKB
<b>Chromium</b>	<b>0.0224</b>		mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Cobalt</b>	<b>0.015</b>		mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Copper</b>	<b>0.014</b>	B	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/21/2020 12:50	CAM
<b>Iron</b>	<b>47.4</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:52	AKB
<b>Lead</b>	<b>0.012</b>		mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Lithium</b>	<b>0.02</b>		mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Magnesium</b>	<b>95.3</b>	D2	mg/L	2.00	0.900	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:52	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Molybdenum</b>	<b>0.01</b>		mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Nickel</b>	<b>0.038</b>		mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Potassium</b>	<b>8.43</b>	D2	mg/L	5.00	2.20	SW846 6010 B	10/15/2020 07:52	10/16/2020 10:51	dmh
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Sodium</b>	<b>39.3</b>	D2	mg/L	2.60	1.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:52	AKB
<b>Thallium</b>	<b>0.0002</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM
<b>Zinc</b>	<b>0.11</b>		mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:46	CAM

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>296</b>		mg/L	4		2320 B-2011	10/21/2020 19:10	10/21/2020 19:10	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 19:10	10/21/2020 19:10	HMF
<b>Total Alkalinity</b>	<b>296</b>		mg/L	4		2320 B-2011	10/21/2020 19:10	10/21/2020 19:10	HMF
<b>Chemical Oxygen Demand</b>	<b>86</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:31	HMF
<b>Specific Conductance (Lab)</b>	<b>1880</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 16:01	10/20/2020 16:01	CML
<b>Hardness as CaCO3</b>	<b>680</b>	D	mg/L	2	2	2340 C (as HACH 8226)	10/19/2020 12:02	10/19/2020 12:02	CLL
<b>Total Dissolved Solids</b>	<b>1680</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>3.1</b>	D	mg/L	1.0		5310 C-2011	10/18/2020 01:30	10/18/2020 01:30	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>1.36</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>1.58</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>2.94</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



**Pace Analytical Services, LLC**

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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>3.7</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	10/21/2020 03:56	10/21/2020 03:56	CSC
<b>Fluoride</b>	<b>0.23</b>		mg/L	0.20		EPA 300.0 REV 2.1	10/21/2020 03:56	10/21/2020 03:56	CSC
<b>Sulfate</b>	<b>992</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	10/21/2020 04:14	10/21/2020 04:14	CSC

**Notes for work order 0092634**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for , but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			U, D2, M4
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	U, D2, M4
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B042498 - Default Prep Wet Chem</b>										
<b>Blank (B042498-BLK1)</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B042498-BS1)</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
<b>Duplicate (B042498-DUP1) Source: 0092629-01</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
<b>Duplicate (B042498-DUP2) Source: 0102128-01</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	364	50	mg/L		370			1.63	10	
<b>Batch B042577 - Default Prep Wet Chem</b>										
<b>Blank (B042577-BLK1)</b>										
Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58										
Hardness as CaCO3	ND	1	mg/L							U
<b>LCS (B042577-BS1)</b>										
Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00										
Hardness as CaCO3	230	1	mg/L	225		102	80-120			
<b>Duplicate (B042577-DUP1) Source: 0100778-02</b>										
Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16										
Hardness as CaCO3	268	1	mg/L		260			3.03	10	
<b>Matrix Spike (B042577-MS1) Source: 0100778-02</b>										
Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18										
Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
<b>Batch B042587 - Default Prep Wet Chem</b>										
<b>Blank (B042587-BLK1)</b>										
Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08										
Total Organic Carbon	ND	0.5	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042587 - Default Prep Wet Chem**

**LCS (B042587-BS1)**

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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**Duplicate (B042587-DUP1) Source: 0092628-01**

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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**Duplicate (B042587-DUP2) Source: 0100200-01**

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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**Matrix Spike (B042587-MS1) Source: 0092629-01**

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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**Matrix Spike (B042587-MS2) Source: 0100200-02**

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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**Batch B043117 - Default Prep Wet Chem**

**Blank (B043117-BLK1)**

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK2)**

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK3)**

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	254	4	mg/L	235		108	80-120			

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	295	4	mg/L		283			4.39	10	

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Total Alkalinity	281	4	mg/L		268			4.88	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043187 - Default Prep Wet Chem

LCS (B043187-BS1)

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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Duplicate (B043187-DUP1) Source: 0092629-01

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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Duplicate (B043187-DUP2) Source: 0102262-01

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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Batch B043582 - Default Prep Wet Chem

Blank (B043582-BLK1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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LCS (B043582-BS1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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Duplicate (B043582-DUP1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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Matrix Spike (B043582-MS1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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Matrix Spike Dup (B043582-MSD1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043121 - Default Prep IC**

**Blank (B043121-BLK1)**

Prepared: 10/20/2020 22:42, Analyzed: 10/20/2020 22:42

Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U

**LCS (B043121-BS1)**

Prepared: 10/20/2020 22:25, Analyzed: 10/20/2020 22:25

Sulfate	9.2		mg/L	10.0		91.8	90-110			
Fluoride	9.25		mg/L	10.0		92.5	90-110			
Chloride	9.4		mg/L	10.0		93.7	90-110			

**Matrix Spike (B043121-MS1)**

Source: 0092635-01

Prepared: 10/21/2020 5:58, Analyzed: 10/21/2020 5:58

Chloride	48.6		mg/L	10.0	68.0	NR	80-120			M2
Sulfate	242		mg/L	10.0	593	NR	80-120			M2
Fluoride	9.28		mg/L	10.0	0.19	90.9	80-120			

**Matrix Spike Dup (B043121-MSD1)**

Source: 0092635-01

Prepared: 10/21/2020 6:15, Analyzed: 10/21/2020 6:15

Chloride	48.1		mg/L	10.0	68.0	NR	80-120	1.05	10	M2
Fluoride	9.21		mg/L	10.0	0.19	90.2	80-120	0.811	20	
Sulfate	240		mg/L	10.0	593	NR	80-120	0.795	20	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0092634**

Shipped By: Client

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 09/07/2020



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-8 Wilson 092-00004**

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092634 Sample ID#	*required information* Date (mm/dd/yy): <u>10/13/20</u> Collection Time (24 hr): <u>805</u>	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092634-01 A	<u>10/13/20</u> <u>805</u>	Plastic 1L	1	MW8	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092634-01 B	<u>10/13/20</u> <u>805</u>	Plastic 500mL pH<2 w/HNO3	1	MW8	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092634-01 C	<u>10/13/20</u> <u>805</u>	Plastic 500mL pH<2 w/H2SO4	1	MW8	g / c	COD TOC
0092634-01 D	<u>10/13/20</u> <u>805</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW8	g / c	Radium 226 (sub)

Preservation Check: pH:   
Preservation Check: pH:   
Preservation Check: pH:

Preservation Check Performed by: NOY

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/13/20 Time (24 hr) 805  
pH 6.55 Cond 1.53 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 13.67 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0838</u>
_____	_____	_____	_____
_____	_____	_____	_____

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92634  
Pace Project No.: 30387828

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 92634  
Pace Project No.: 30387828

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92634  
Pace Project No.: 30387828

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387828001	0092634-01	Water	10/13/20 08:05	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92634  
Pace Project No.: 30387828

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387828001	0092634-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92634  
Pace Project No.: 30387828

**Sample: 0092634-01**      **Lab ID: 30387828001**      Collected: 10/13/20 08:05      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>1.36 ± 0.616 (0.587)</b> <b>C:NA T:91%</b>	pCi/L	11/04/20 12:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.58 ± 0.591 (0.882)</b> <b>C:68% T:79%</b>	pCi/L	10/30/20 12:01	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>2.94 ± 1.21 (1.47)</b>	pCi/L	11/04/20 14:23	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92634  
Pace Project No.: 30387828

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387828001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387828001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92634  
Pace Project No.: 30387828

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387828001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387828001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92634  
Pace Project No.: 30387828

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 92634      Workorder Name: MW-8 Wilson 092-00004      Owner Received Date: 10/14/2020      Results Requested By:   
 Report To:      Subcontract To:

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

WO#: 30387828



Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc		
1					Ground				
2	0092634-01		10/13/20 08:05	IR44-McCoy	Water			X	
3								X	
4									
5									
6									
7									
8									
9									
10									

LAB USE ONLY

001

Received By: *[Signature]*      Date/Time: 10/15/20 0925

Cooler Temperature on Receipt: 5.0 °C      Custody Seal: Y or N      Received on: 10/15/20      Sample Intact: Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**SUBCONTRACT ORDER**

Pace Analytical Services, LLC Kentucky  
0092634

# 30387828

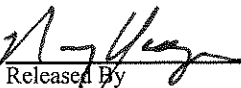
**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0092634-01	Water	Sampled:10/13/2020 08:05	Specific Method
Radium Total (sub)	04/11/2021 08:05	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 08:05	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 08:05	EPA 903.1	

Released By  Date 10.14.20 Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387828

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 9238/9256/9271

Label	<u>BUM</u>
LIMS Login	<u>BUM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.6 °C  
 Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and initials of person examining contents:
	Yes	No	N/A	
Chain of Custody Present:	/			1000401 10/16/20 OVB  no time/date on containers  PHU2
Chain of Custody Filled Out:	/			
Chain of Custody Relinquished:	/			
Sampler Name & Signature on COC:	/			
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	/			
Samples Arrived within Hold Time:	/			
Short Hold Time Analysis (<72hr remaining):	/			
Rush Turn Around Time Requested:	/			
Sufficient Volume:	/			
Correct Containers Used: -Pace Containers Used:	/			
Containers Intact:	/			
Orthophosphate field filtered			/	
Hex Cr Aqueous sample field filtered			/	
Organic Samples checked for dechlorination:			/	
Filtered volume received for Dissolved tests			/	
All containers have been checked for preservation, exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	/			
All containers meet method preservation requirements.	/			
				Initial when completed: <u>OVB</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>OVB</u> Date: <u>10/16/20</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

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**Certificate of Analysis**  
**0092622**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:23

---

Project Name: MW-10 Wilson 092-00004

Workorder: 0092622

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



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Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092622-01	MW10/	Groundwater	10/13/2020 10:25	10/14/2020 8:38	Phillip Hill
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092622-01	Field Conductance				2620
	Field pH				6.16
	Field Temp (C)				19.86





**ANALYTICAL RESULTS**

Lab Sample ID: **0092622-01**  
 Description: **MW10**

Sample Collection Date Time: 10/13/2020 10:25  
 Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Arsenic</b>	<b>0.0009</b>	J	mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Barium</b>	<b>0.010</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Boron</b>	<b>0.39</b>		mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 14:54	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Calcium</b>	<b>404</b>	D1	mg/L	40.0	13.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:21	AKB
<b>Chromium</b>	<b>0.0007</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Cobalt</b>	<b>0.078</b>		mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
Copper	ND	u, B	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Iron</b>	<b>13.7</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:18	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Lithium</b>	<b>0.008</b>	J	mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Magnesium</b>	<b>222</b>	D1	mg/L	20.0	9.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:21	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Nickel</b>	<b>0.036</b>		mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Potassium</b>	<b>6.33</b>	D2	mg/L	5.00	2.20	SW846 6010 B	10/15/2020 07:52	10/16/2020 10:19	dmh
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
<b>Sodium</b>	<b>165</b>	D1	mg/L	26.0	10.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:21	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:27	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>189</b>		mg/L	4		2320 B-2011	10/21/2020 16:54	10/21/2020 16:54	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 16:54	10/21/2020 16:54	HMF
<b>Total Alkalinity</b>	<b>189</b>		mg/L	4		2320 B-2011	10/21/2020 16:54	10/21/2020 16:54	HMF
<b>Chemical Oxygen Demand</b>	<b>23</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:28	HMF
<b>Specific Conductance (Lab)</b>	<b>3320</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:40	10/20/2020 15:40	CML
<b>Hardness as CaCO3</b>	<b>1300</b>	D	mg/L	5	5	2340 C (as HACH 8226)	10/19/2020 11:12	10/19/2020 11:12	CLL
<b>Total Dissolved Solids</b>	<b>3290</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>1.5</b>		mg/L	0.5		5310 C-2011	10/17/2020 19:32	10/17/2020 19:32	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.059</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>0.885</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>0.944</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>89.2</b>	D	mg/L	2.5	1.8	EPA 300.0 REV 2.1	10/21/2020 10:27	10/21/2020 10:27	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	10/20/2020 17:11	10/20/2020 17:11	CSC
<b>Sulfate</b>	<b>1380</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	10/20/2020 17:46	10/20/2020 17:46	CSC

**Notes for work order 0092622**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
  - Results contained in this report are only representative of the samples received.
  - PACE does not provide interpretation of these results unless otherwise stated .
  - All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
  - All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
  - Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
  - The Chain of Custody document is included as part of this report.
  - All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.
- Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting		Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
		Limit	Units							

**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B042498 - Default Prep Wet Chem

Blank (B042498-BLK1)

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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LCS (B042498-BS1)

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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Duplicate (B042498-DUP1) Source: 0092629-01

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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Duplicate (B042498-DUP2) Source: 0102128-01

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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Batch B042577 - Default Prep Wet Chem

Blank (B042577-BLK1)

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B042577-BS1)

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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Duplicate (B042577-DUP1) Source: 0100778-02

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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Matrix Spike (B042577-MS1) Source: 0100778-02

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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Batch B042587 - Default Prep Wet Chem

Blank (B042587-BLK1)

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042587 - Default Prep Wet Chem**

**LCS (B042587-BS1)**

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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**Duplicate (B042587-DUP1) Source: 0092628-01**

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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**Duplicate (B042587-DUP2) Source: 0100200-01**

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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**Matrix Spike (B042587-MS1) Source: 0092629-01**

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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**Matrix Spike (B042587-MS2) Source: 0100200-02**

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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**Batch B043117 - Default Prep Wet Chem**

**Blank (B043117-BLK1)**

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK2)**

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK3)**

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	254	4	mg/L	235		108	80-120			

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Total Alkalinity	295	4	mg/L		283			4.39	10	
Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	
Total Alkalinity	281	4	mg/L		268			4.88	10	

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043187 - Default Prep Wet Chem

LCS (B043187-BS1)

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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Duplicate (B043187-DUP1) Source: 0092629-01

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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Duplicate (B043187-DUP2) Source: 0102262-01

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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Batch B043582 - Default Prep Wet Chem

Blank (B043582-BLK1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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LCS (B043582-BS1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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Duplicate (B043582-DUP1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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Matrix Spike (B043582-MS1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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Matrix Spike Dup (B043582-MSD1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043120 - Default Prep IC**

**Blank (B043120-BLK1)**

Prepared: 10/20/2020 15:45, Analyzed: 10/20/2020 15:45

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B043120-BS1)**

Prepared: 10/20/2020 15:27, Analyzed: 10/20/2020 15:27

Fluoride	9.42		mg/L	10.0		94.2	90-110			
Sulfate	9.4		mg/L	10.0		93.7	90-110			
Chloride	9.5		mg/L	10.0		95.4	90-110			

**Matrix Spike (B043120-MS1)**

Source: 0092620-01

Prepared: 10/20/2020 21:50, Analyzed: 10/20/2020 21:50

Fluoride	12.3		mg/L	10.0	0.00	123	80-120			M1
Chloride	12.4		mg/L	10.0	0.2	122	80-120			M1
Sulfate	12.3		mg/L	10.0	0.05	122	80-120			M1

**Matrix Spike Dup (B043120-MSD1)**

Source: 0092620-01

Prepared: 10/20/2020 22:07, Analyzed: 10/20/2020 22:07

Chloride	11.7		mg/L	10.0	0.2	115	80-120	5.59	10	
Sulfate	11.6		mg/L	10.0	0.05	116	80-120	5.62	20	
Fluoride	11.7		mg/L	10.0	0.00	117	80-120	4.70	20	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0092622**

Shipped By: Client

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 09/07/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

**Project:** MW-10 Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#:       
State: KY

PO#:       
Quote#:     

Please Print Legibly

Collected by (Signature): *[Signature]*  
\*required information\*

Compliance Monitoring? Yes      No     

Samples Chlorinated? Yes      No     

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date      Start time      End Date      End Time      Temp (oC)     

Effluent: Start Date      Start time      End Date      End Time      Temp (oC)     

LAB USE ONLY Workorder # 0092622 Sample ID#	*required information* Date (mm/dd/yy): <u>10/13/20</u>	Collection Time (24 hr): <u>1025</u>	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092622-01 A	<u>10/13/20</u>	<u>1025</u>	Plastic 1L	1	MW10	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092622-01 B	<u>10/13/20</u>	<u>1025</u>	Plastic 500mL pH<2 w/HNO3	1	MW10	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092622-01 C	<u>10/13/20</u>	<u>1025</u>	Plastic 500mL pH<2 w/H2SO4	1	MW10	g / c	COD TOC
0092622-01 D	<u>10/13/20</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW10	g / c	Radium 226 (sub)

Preservation Check: pH:      ✓  
Preservation Check: pH:      ✓  
Preservation Check: pH:      ✓

Preservation Check Performed by: NOY

Field data collected by: Phillip Hu Date (mm/dd/yy) 10/13/20 Time (24 hr) 1025  
pH 6.16 Cond <sup>ml/cm</sup> 2.62 Res Cl (mg/L)      Tot Cl (mg/L)      Free Cl (mg/L)       
Temp (oC) 19.86 or (oF)      Static Water Level      DO (mg/L)      Turb. (NTU)       
Flow (MGD)      or (CFS)      or (g/min)     

Relinquished by: (Signature) *[Signature]* Received by: (Signature) *[Signature]* Date (mm/dd/yy) 10-14-20 Time (24 hr) 0838



# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-10 Wilson 092-00004**

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000

PWS ID#:

State: KY

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]

Compliance Monitoring? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
<b>0092622</b>	(mm/dd/yy):	Time (24 hr):					
Sample ID#							
0092622-01 E	<u>10/13/20</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>✓</u>			
0092622-01 F	<u>10/13/20</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>✓</u>			
0092622-01 G	<u>10/13/20</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW10	g / c	Radium Total (sub)
			Preservation Check: pH :	<u>✓</u>			
0092622-01 H	<u>10/13/20</u>	<u>1025</u>	AG 250mL pH<2 w/H2SO4	1	MW10	g / c	TOC
			Preservation Check: pH :	<u>✓</u>			

Preservation Check Performed by: NOY

Field data collected by: <u>Philip H...</u>	Date (mm/dd/yy) <u>10/13/20</u>	Time (24 hr) <u>1025</u>
pH <u>6.16</u>	Cond <sup>us/cm</sup> <u>2.62</u>	Res Cl (mg/L) _____
Temp (oC) <u>19.86</u>	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	Free Cl (mg/L) _____
	or (g/min) _____	Static Water Level _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0838</u>
_____	_____	_____	_____
_____	_____	_____	_____

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92622  
Pace Project No.: 30387813

Dear Rob Whittington:

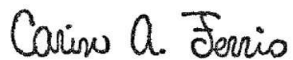
Enclosed are the analytical results for sample(s) received by the laboratory on October 15, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 92622  
Pace Project No.: 30387813

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92622  
Pace Project No.: 30387813

<b>Lab ID</b>	<b>Sample ID</b>	<b>Matrix</b>	<b>Date Collected</b>	<b>Date Received</b>
30387813001	0092622-01	Water	10/13/20 10:25	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 92622  
Pace Project No.: 30387813

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387813001	0092622-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92622  
Pace Project No.: 30387813

**Sample: 0092622-01**      **Lab ID: 30387813001**      Collected: 10/13/20 10:25      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.0589 ± 0.306 (0.634)</b> <b>C:NA T:86%</b>	pCi/L	11/04/20 12:44	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.885 ± 0.493 (0.898)</b> <b>C:63% T:90%</b>	pCi/L	10/30/20 12:00	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.944 ± 0.799 (1.53)</b>	pCi/L	11/04/20 14:03	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92622  
Pace Project No.: 30387813

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387813001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387813001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92622  
Pace Project No.: 30387813

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387813001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387813001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92622  
Pace Project No.: 30387813

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody

Workorder: 92622      Workorder Name: MW-10 Wilson 092-00004      Owner Received Date: 10/14/2020      Results Requested By:

Report To: \_\_\_\_\_ Subcontract To: \_\_\_\_\_ Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

WO#: 30387813



Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc		
1					Ground				
2	0092622-01		10/13/20 10:25	IR44-McCoy	Water				
3									
4									
5									
6									
7									
8									
9									
10									

LAB USE ONLY

201

Received By: *[Signature]*      Date/Time: 10/15/2020

Cooler Temperature on Receipt 5W °C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC. This chain of custody is considered complete as is since this information is available in the owner laboratory.



Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387813

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 9238/9256/9271

Label BUM  
LIMS Login BUM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4 °C

Temp should be above freezing to 6°C

Comments: pH paper Lot# 1000401 Date and initials of person examining contents: 10/16/20 OVB

Comments:	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				<u>not initial date on containers</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>PHC2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u> Date: <u>10/16/20</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0092630

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:45

Project Name: MW-4D Wilson 092-00004

Workorder: 0092630

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092630-01	MW4D/	Groundwater	10/13/2020 15:20	10/14/2020 8:38	Phillip Hill
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092630-01	Field Conductance				3960
	Field pH				6.47
	Field Temp (C)				20.19

**ANALYTICAL RESULTS**

Lab Sample ID: **0092630-01**

Description: **MW4D**

Sample Collection Date Time: 10/13/2020 15:20

Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Arsenic</b>	<b>0.0037</b>		mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Barium</b>	<b>0.018</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Boron</b>	<b>9.39</b>	D1	mg/L	2.00	2.00	SW846 6010 B	10/15/2020 07:52	10/22/2020 09:23	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Calcium</b>	<b>659</b>	D1	mg/L	40.0	13.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:30	AKB
<b>Chromium</b>	<b>0.0010</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Cobalt</b>	<b>0.012</b>		mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
Copper	ND	u, B	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Iron</b>	<b>10.8</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:18	AKB
<b>Lead</b>	<b>0.0005</b>	J	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Lithium</b>	<b>0.17</b>		mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Magnesium</b>	<b>256</b>	D1	mg/L	20.0	9.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:30	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Molybdenum</b>	<b>0.01</b>		mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Nickel</b>	<b>0.038</b>		mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Potassium</b>	<b>42.7</b>	D2	mg/L	5.00	2.20	SW846 6010 B	10/15/2020 07:52	10/16/2020 10:29	dmh
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Sodium</b>	<b>230</b>	D1	mg/L	26.0	10.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 14:30	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM
<b>Zinc</b>	<b>0.02</b>		mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:17	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>414</b>		mg/L	4		2320 B-2011	10/21/2020 18:42	10/21/2020 18:42	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 18:42	10/21/2020 18:42	HMF
<b>Total Alkalinity</b>	<b>414</b>		mg/L	4		2320 B-2011	10/21/2020 18:42	10/21/2020 18:42	HMF
<b>Chemical Oxygen Demand</b>	<b>424</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:30	HMF
<b>Specific Conductance (Lab)</b>	<b>5140</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:57	10/20/2020 15:57	CML
<b>Hardness as CaCO3</b>	<b>2410</b>	D	mg/L	5	5	2340 C (as HACH 8226)	10/19/2020 11:40	10/19/2020 11:40	CLL
<b>Total Dissolved Solids</b>	<b>4410</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>0.9</b>		mg/L	0.5		5310 C-2011	10/18/2020 00:06	10/18/2020 00:06	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.268</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>1.44</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>1.71</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



**Pace Analytical Services, LLC**

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Madisonville, KY 42431

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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>1210</b>	D	mg/L	50.0	36.0	EPA 300.0 REV 2.1	10/21/2020 01:02	10/21/2020 01:02	CSC
<b>Fluoride</b>	<b>0.23</b>		mg/L	0.20		EPA 300.0 REV 2.1	10/21/2020 00:44	10/21/2020 00:44	CSC
<b>Sulfate</b>	<b>1260</b>	D	mg/L	200	100	EPA 300.0 REV 2.1	10/21/2020 10:45	10/21/2020 10:45	CSC



**Notes for work order 0092630**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.  
Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for , but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			U, D2, M4



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			U, D2, M4

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042498 - Default Prep Wet Chem**

**Blank (B042498-BLK1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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**LCS (B042498-BS1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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**Duplicate (B042498-DUP1) Source: 0092629-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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**Duplicate (B042498-DUP2) Source: 0102128-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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**Batch B042577 - Default Prep Wet Chem**

**Blank (B042577-BLK1)**

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B042577-BS1)**

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B042577-DUP1) Source: 0100778-02**

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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**Matrix Spike (B042577-MS1) Source: 0100778-02**

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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**Batch B042587 - Default Prep Wet Chem**

**Blank (B042587-BLK1)**

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042587 - Default Prep Wet Chem**

**LCS (B042587-BS1)**

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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**Duplicate (B042587-DUP1) Source: 0092628-01**

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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**Duplicate (B042587-DUP2) Source: 0100200-01**

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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**Matrix Spike (B042587-MS1) Source: 0092629-01**

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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**Matrix Spike (B042587-MS2) Source: 0100200-02**

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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**Batch B043117 - Default Prep Wet Chem**

**Blank (B043117-BLK1)**

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

**Blank (B043117-BLK2)**

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK3)**

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Total Alkalinity	254	4	mg/L	235		108	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Total Alkalinity	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	281	4	mg/L		268			4.88	10	
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043187 - Default Prep Wet Chem

LCS (B043187-BS1)

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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Duplicate (B043187-DUP1) Source: 0092629-01

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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Duplicate (B043187-DUP2) Source: 0102262-01

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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Batch B043582 - Default Prep Wet Chem

Blank (B043582-BLK1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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LCS (B043582-BS1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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Duplicate (B043582-DUP1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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Matrix Spike (B043582-MS1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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Matrix Spike Dup (B043582-MSD1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043121 - Default Prep IC**

**Blank (B043121-BLK1)**

Prepared: 10/20/2020 22:42, Analyzed: 10/20/2020 22:42

Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U

**LCS (B043121-BS1)**

Prepared: 10/20/2020 22:25, Analyzed: 10/20/2020 22:25

Fluoride	9.25		mg/L	10.0		92.5	90-110			
Sulfate	9.2		mg/L	10.0		91.8	90-110			
Chloride	9.4		mg/L	10.0		93.7	90-110			

**Matrix Spike (B043121-MS1)**

Source: 0092635-01

Prepared: 10/21/2020 5:58, Analyzed: 10/21/2020 5:58

Fluoride	9.28		mg/L	10.0	0.19	90.9	80-120			
Chloride	48.6		mg/L	10.0	68.0	NR	80-120			M2
Sulfate	242		mg/L	10.0	593	NR	80-120			M2

**Matrix Spike Dup (B043121-MSD1)**

Source: 0092635-01

Prepared: 10/21/2020 6:15, Analyzed: 10/21/2020 6:15

Fluoride	9.21		mg/L	10.0	0.19	90.2	80-120	0.811	20	
Sulfate	240		mg/L	10.0	593	NR	80-120	0.795	20	M2
Chloride	48.1		mg/L	10.0	68.0	NR	80-120	1.05	10	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0092630**

Shipped By: Client

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-4D Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): [Signature]

Compliance Monitoring? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
<b>0092630</b>	(mm/dd/yy):	Time (24 hr):					
Sample ID#							
0092630-01 E	<u>10/13/20</u>	<u>1520</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4D	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092630-01 F	<u>10/13/20</u>	<u>1520</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4D	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092630-01 G	<u>10/13/20</u>	<u>1520</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW4D	g / c	Radium Total (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092630-01 H	<u>10/13/20</u>	<u>1520</u>	AG 250mL pH<2 w/H2SO4	1	MW4D	g / c	TOC
			Preservation Check: pH :	<input checked="" type="checkbox"/>			

Preservation Check Performed by: N24

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/13/20 Time (24 hr) 1520

pH 6.47 Cond <sup>ms/cm</sup> 396 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 20.19 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 10-14-20 Time (24 hr) 0838

# Chain of Custody



Scheduled for: **09/07/2020**

Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-4D Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092630 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092630-01 A	<u>10/13/20</u>	<u>1520</u>	Plastic 1L	1	MW4D	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092630-01 B	<u>10/13/20</u>	<u>1520</u>	Plastic 500mL pH<2 w/HNO3	1	MW4D	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092630-01 C	<u>10/13/20</u>	<u>1520</u>	Plastic 500mL pH<2 w/H2SO4	1	MW4D	g / c	COD TOC
0092630-01 D	<u>10/13/20</u>	<u>1520</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4D	g / c	Radium 226 (sub)

Preservation Check: pH:

Preservation Check: pH:

Preservation Check: pH:

Preservation Check Performed by: NOY

Field data collected by: <u>Phillip Hill</u>	Date (mm/dd/yy) <u>10/13/20</u>	Time (24 hr) <u>1520</u>
pH <u>8.47</u>	Cond. (umho/cm) <u>3.96</u>	Res Cl (mg/L) _____
Temp (oC) <u>20.19</u>	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Total Cl (mg/L) _____		Free Cl (mg/L) _____
DO (mg/L) _____		Turb. (NTU) _____

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0838</u>
--	--	------------------------------------	-----------------------------

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92630  
Pace Project No.: 30387824

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 92630  
Pace Project No.: 30387824

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92630  
Pace Project No.: 30387824

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387824001	0092630-01	Water	10/13/20 15:20	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92630  
Pace Project No.: 30387824

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387824001	0092630-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92630  
Pace Project No.: 30387824

**Sample: 0092630-01**      **Lab ID: 30387824001**      Collected: 10/13/20 15:20      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.268 ± 0.350 (0.577)</b> <b>C:NA T:93%</b>	pCi/L	11/04/20 12:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.44 ± 0.536 (0.787)</b> <b>C:67% T:87%</b>	pCi/L	10/30/20 12:03	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.71 ± 0.886 (1.36)</b>	pCi/L	11/04/20 14:03	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92630  
Pace Project No.: 30387824

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387824001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387824001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92630  
Pace Project No.: 30387824

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387824001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387824001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92630  
Pace Project No.: 30387824

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody

Workorder: 92630      Workorder Name: MW-4D Wilson 092-00004      Owner Received Date: 10/14/2020      Results Requested By:

Report To:	Subcontract To:	Requested Analysis
------------	-----------------	--------------------

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

NO#: 30387824

30387824

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc		
1					Ground				
2	0092630-01		10/13/20 15:20	IR44-McCoy	Water			X	
3								X	LAB USE ONLY 001
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>[Signature]</i>	10/15/20	0925
2					
3					

Cooler Temperature on Receipt	SLW °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact Y or N
***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC This chain of custody is considered complete as is since this information is available in the owner laboratory.				



**SUBCONTRACT ORDER**

Pace Analytical Services, LLC Kentucky  
0092630

# 30387824


**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Analysis	Expires	Laboratory ID	Comments
Sample ID: 0092630-01	Water	Sampled:10/13/2020 15:20	Specific Method
Radium Total (sub)	04/11/2021 15:20	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 15:20	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 15:20	EPA 903.1	

Released By  Date 10-14-20 Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387824

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other

Tracking #: 1107 3386 9238/9256/9271

Label	<u>BUM</u>
LIMS Login	<u>BUM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4 °C  
 Temp should be above freezing to 6°C

Comments: 

pH paper Lot#	<u>1000401</u>
Date and initials of person examining contents:	<u>10/16/20 OVB</u>

Comments:	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. <u>not time/date on containers</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PH12</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u> Date: <u>10/16/20</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

---

**Certificate of Analysis**  
**0092623**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:25

---

Project Name: MW-102 Wilson 092-00004

Workorder: 0092623

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



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Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092623-01	MW102/	Groundwater	10/13/2020 15:40	10/14/2020 8:38	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092623-01	Field Conductance				1200
	Field pH				6.33
	Field Temp (C)				16.80

### ANALYTICAL RESULTS

Lab Sample ID: **0092623-01**  
Description: **MW102**

Sample Collection Date Time: 10/13/2020 15:40  
Sample Received Date Time: 10/14/2020 08:38

#### Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
<b>Arsenic</b>	<b>0.0036</b>		mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
<b>Barium</b>	<b>0.058</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 14:57	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
<b>Calcium</b>	<b>86.8</b>	D2	mg/L	4.00	1.30	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:24	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
Copper	ND	B, u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
<b>Iron</b>	<b>4.48</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:24	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
<b>Magnesium</b>	<b>36.9</b>	D2	mg/L	2.00	0.900	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:24	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
<b>Nickel</b>	<b>0.002</b>	J	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
<b>Potassium</b>	<b>2.52</b>	L1	mg/L	0.50	0.22	SW846 6010 B	10/15/2020 07:52	10/20/2020 14:57	DMH
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
<b>Sodium</b>	<b>131</b>	D1	mg/L	26.0	10.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:27	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:31	CAM

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>292</b>		mg/L	4		2320 B-2011	10/21/2020 16:59	10/21/2020 16:59	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 16:59	10/21/2020 16:59	HMF
<b>Total Alkalinity</b>	<b>292</b>		mg/L	4		2320 B-2011	10/21/2020 16:59	10/21/2020 16:59	HMF
<b>Chemical Oxygen Demand</b>	<b>6</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:28	HMF
<b>Specific Conductance (Lab)</b>	<b>1210</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:41	10/20/2020 15:41	CML
<b>Hardness as CaCO3</b>	<b>376</b>		mg/L	1	1	2340 C (as HACH 8226)	10/19/2020 11:14	10/19/2020 11:14	CLL
<b>Total Dissolved Solids</b>	<b>836</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>1.5</b>		mg/L	0.5		5310 C-2011	10/17/2020 19:53	10/17/2020 19:53	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.195</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>0.546</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>0.741</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>32.9</b>	D	mg/L	1.0	0.7	EPA 300.0 REV 2.1	10/20/2020 18:21	10/20/2020 18:21	CSC
<b>Fluoride</b>	<b>0.30</b>		mg/L	0.20		EPA 300.0 REV 2.1	10/20/2020 18:04	10/20/2020 18:04	CSC
<b>Sulfate</b>	<b>261</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	10/20/2020 18:38	10/20/2020 18:38	CSC

**Notes for work order 0092623**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
  - Results contained in this report are only representative of the samples received.
  - PACE does not provide interpretation of these results unless otherwise stated .
  - All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
  - All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
  - Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
  - The Chain of Custody document is included as part of this report.
  - All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.
- Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting		Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
		Limit	Units							

**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042498 - Default Prep Wet Chem**

**Blank (B042498-BLK1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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**LCS (B042498-BS1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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**Duplicate (B042498-DUP1) Source: 0092629-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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**Duplicate (B042498-DUP2) Source: 0102128-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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**Batch B042577 - Default Prep Wet Chem**

**Blank (B042577-BLK1)**

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B042577-BS1)**

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B042577-DUP1) Source: 0100778-02**

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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**Matrix Spike (B042577-MS1) Source: 0100778-02**

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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**Batch B042587 - Default Prep Wet Chem**

**Blank (B042587-BLK1)**

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B042587 - Default Prep Wet Chem</b>										
<b>LCS (B042587-BS1)</b>										
Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47										
Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
<b>Duplicate (B042587-DUP1) Source: 0092628-01</b>										
Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24										
Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
<b>Duplicate (B042587-DUP2) Source: 0100200-01</b>										
Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41										
Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
<b>Matrix Spike (B042587-MS1) Source: 0092629-01</b>										
Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45										
Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
<b>Matrix Spike (B042587-MS2) Source: 0100200-02</b>										
Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02										
Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
<b>Batch B043117 - Default Prep Wet Chem</b>										
<b>Blank (B043117-BLK1)</b>										
Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14										
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
<b>Blank (B043117-BLK2)</b>										
Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13										
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
<b>Blank (B043117-BLK3)</b>										
Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043117 - Default Prep Wet Chem

LCS (B043117-BS1)

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

LCS (B043117-BS2)

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	254	4	mg/L	235		108	80-120			

Duplicate (B043117-DUP1)

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Total Alkalinity	295	4	mg/L		283			4.39	10	
Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

Duplicate (B043117-DUP2)

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	
Total Alkalinity	281	4	mg/L		268			4.88	10	

Matrix Spike (B043117-MS1)

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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Matrix Spike (B043117-MS2)

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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Batch B043187 - Default Prep Wet Chem

Blank (B043187-BLK1)

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043187 - Default Prep Wet Chem**

**LCS (B043187-BS1)**

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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**Duplicate (B043187-DUP1) Source: 0092629-01**

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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**Duplicate (B043187-DUP2) Source: 0102262-01**

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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**Batch B043582 - Default Prep Wet Chem**

**Blank (B043582-BLK1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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**LCS (B043582-BS1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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**Duplicate (B043582-DUP1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
------------------------	---	---	------	--	----	--	--	--	----	--

**Matrix Spike (B043582-MS1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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**Matrix Spike Dup (B043582-MSD1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043120 - Default Prep IC**

**Blank (B043120-BLK1)**

Prepared: 10/20/2020 15:45, Analyzed: 10/20/2020 15:45

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B043120-BS1)**

Prepared: 10/20/2020 15:27, Analyzed: 10/20/2020 15:27

Fluoride	9.42		mg/L	10.0		94.2	90-110			
Sulfate	9.4		mg/L	10.0		93.7	90-110			
Chloride	9.5		mg/L	10.0		95.4	90-110			

**Matrix Spike (B043120-MS1)**

Source: 0092620-01

Prepared: 10/20/2020 21:50, Analyzed: 10/20/2020 21:50

Fluoride	12.3		mg/L	10.0	0.00	123	80-120			M1
Chloride	12.4		mg/L	10.0	0.2	122	80-120			M1
Sulfate	12.3		mg/L	10.0	0.05	122	80-120			M1

**Matrix Spike Dup (B043120-MSD1)**

Source: 0092620-01

Prepared: 10/20/2020 22:07, Analyzed: 10/20/2020 22:07

Chloride	11.7		mg/L	10.0	0.2	115	80-120	5.59	10	
Sulfate	11.6		mg/L	10.0	0.05	116	80-120	5.62	20	
Fluoride	11.7		mg/L	10.0	0.00	117	80-120	4.70	20	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0092623**

Shipped By: Pace Analytical Services LL

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-102 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): *Traavis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder # 0092623 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):					
0092623-01 A	<u>10-13-20</u>	<u>15:40</u>	Plastic 1L	1	MW102	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092623-01 B	<u>10-13-20</u>	<u>15:40</u>	Plastic 500mL pH<2 w/HNO3	1	MW102	g / c	Beryllium Tot 6020 Lead Tot: 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tct 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092623-01 C	<u>10-13-20</u>	<u>15:40</u>	Plastic 500mL pH<2 w/H2SO4	1	MW102	g / c	COD TOC
0092623-01 D	<u>10-13-20</u>	<u>15:40</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW102	g / c	Radium 226 (sub)

Preservation Check: pH:

Preservation Check: pH:

Preservation Check: pH:

Preservation Check Performed by: NOY

Field data collected by: Traavis Sneed Date (mm/dd/yy) 10-13-20 Time (24 hr) 15:40  
pH 6.33 Cond <sup>MS</sup> 1.20 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 16.80 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Traavis Sneed</i></u>	Received by: (Signature) <u><i>NOY</i></u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0838</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody



**Scheduled for: 09/07/2020**

**Client: Big Rivers Electric Corporation Wilson Station**

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station

**Project: MW-102 Wilson 092-00004**

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000

PWS ID#:

State: KY

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes  No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092623 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092623-01 E	<u>10-13-20</u>	<u>15:40</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW102	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092623-01 F	<u>10-13-20</u>	<u>15:40</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW102	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092623-01 G	<u>10-13-20</u>	<u>15:40</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW102	g / c	Radium Total (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
0092623-01 H	<u>10-13-20</u>	<u>15:40</u>	AG 250mL pH<2 w/H2SO4	1	MW102	g / c	TOC
			Preservation Check: pH :	<input checked="" type="checkbox"/>			

Preservation Check Performed by: NOY

Field data collected by: <u>Travis Speed</u>	Date (mm/dd/yy) <u>10-13-20</u>	Time (24 hr) <u>15:40</u>
pH <u>6.33</u>	Cond (umho) <u>1.20</u>	Res Cl (mg/L) _____
Temp (oC) <u>16.80</u>	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Total Cl (mg/L) _____		Free Cl (mg/L) _____
DO (mg/L) _____		Turb. (NTU) _____

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0835</u>
_____	_____	_____	_____
_____	_____	_____	_____

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92623  
Pace Project No.: 30387817

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 92623  
Pace Project No.: 30387817

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92623  
Pace Project No.: 30387817

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387817001	0092623-01	Water	10/13/20 15:40	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92623  
Pace Project No.: 30387817

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387817001	0092623-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92623  
Pace Project No.: 30387817

**Sample: 0092623-01**      **Lab ID: 30387817001**      Collected: 10/13/20 15:40      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.195 ± 0.235 (0.359)</b> <b>C:NA T:101%</b>	pCi/L	11/04/20 12:44	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.546 ± 0.404 (0.794)</b> <b>C:71% T:89%</b>	pCi/L	10/30/20 12:00	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.741 ± 0.639 (1.15)</b>	pCi/L	11/04/20 14:03	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92623  
Pace Project No.: 30387817

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387817001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387817001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92623  
Pace Project No.: 30387817

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387817001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387817001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92623  
Pace Project No.: 30387817

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

Chain of Custody



Workorder: 92623      Workorder Name: MW-102 Wilson 092-0000      Owner Received Date: 10/14/2020      Results Requested By: Requested Analysis

Subcontract To:

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

WO#: 30387817



Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		LAB USE ONLY
						EPA 903.1	EPA 904.0 Radium Sum Calc	
1					Ground			
2	0092623-01		10/13/20 15:40	IR44-McCoy	Water		X	001
3								
4								
5								
6								
7								
8								
9								
10								

Transfers Released By	Date/Time	Received By	Date/Time	Comments
		<i>[Signature]</i>	10/19/2017	
1				
2				
3				

Cooler Temperature on Receipt 4W °C      Custody Seal Y or N      Received on 10/19/2017      Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**0092623**

**# 30387817**

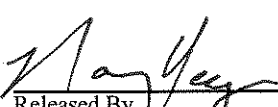
**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0092623-01</b>	<b>Water</b>	<b>Sampled:10/13/2020 15:40</b>	<b>Specific Method</b>
Radium Total (sub)	04/11/2021 15:40	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 15:40	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 15:40	EPA 903.1	

Released By  Date 10-14-20 Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387817

Courier:  Fed Ex  UPS  USPS  client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 9238/9256/9271

Label BUM  
LIMS Login BUM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4  
Temp should be above freezing to 6°C

Comments: 

Yes	No	N/A
-----	----	-----

pH paper Lot#	Date and Initials of person examining contents:
<u>10DD0401</u>	<u>10/16/20 OVB</u>

Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. <u>10/16/20</u> <u>no time/date on container</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PHC2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u> Date/time of preservation: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u> Date: <u>10/16/20</u>

Client Notification/ Resolution:  
Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_  
Comments/ Resolution: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, Incorrect containers)  
\*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



---

**Certificate of Analysis**  
**0092624**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:27

---

Project Name: MW-104 Wilson 092-00004

Workorder: 0092624

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



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Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092624-01	MW104/	Groundwater	10/13/2020 14:55	10/14/2020 8:38	Travis sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092624-01	Field Conductance				1940
	Field pH				6.41
	Field Temp (C)				17.33



### ANALYTICAL RESULTS

Lab Sample ID: **0092624-01**  
 Description: **MW104**

Sample Collection Date Time: 10/13/2020 14:55  
 Sample Received Date Time: 10/14/2020 08:38

#### Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
<b>Arsenic</b>	<b>0.0006</b>	J	mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
<b>Barium</b>	<b>0.047</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:00	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
<b>Calcium</b>	<b>267</b>	D1	mg/L	40.0	13.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:33	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
Copper	ND	B, u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
<b>Iron</b>	<b>3.58</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:30	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
<b>Magnesium</b>	<b>69.7</b>	D2	mg/L	2.00	0.900	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:30	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
Nickel	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
<b>Potassium</b>	<b>8.26</b>	L1	mg/L	0.50	0.22	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:00	DMH
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
<b>Sodium</b>	<b>85.5</b>	D2	mg/L	2.60	1.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:30	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:34	CAM

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>405</b>		mg/L	4		2320 B-2011	10/21/2020 17:04	10/21/2020 17:04	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 17:04	10/21/2020 17:04	HMF
<b>Total Alkalinity</b>	<b>405</b>		mg/L	4		2320 B-2011	10/21/2020 17:04	10/21/2020 17:04	HMF
<b>Chemical Oxygen Demand</b>	<b>5</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:28	HMF
<b>Specific Conductance (Lab)</b>	<b>1900</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:42	10/20/2020 15:42	CML
<b>Hardness as CaCO3</b>	<b>1040</b>	D	mg/L	2	2	2340 C (as HACH 8226)	10/19/2020 11:18	10/19/2020 11:18	CLL
<b>Total Dissolved Solids</b>	<b>1590</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>0.9</b>		mg/L	0.5		5310 C-2011	10/17/2020 20:14	10/17/2020 20:14	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.616</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>1.26</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>1.88</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>11.4</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	10/20/2020 19:31	10/20/2020 19:31	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	10/20/2020 19:31	10/20/2020 19:31	CSC
<b>Sulfate</b>	<b>628</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	10/20/2020 19:48	10/20/2020 19:48	CSC

**Notes for work order 0092624**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
  - Results contained in this report are only representative of the samples received.
  - PACE does not provide interpretation of these results unless otherwise stated .
  - All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
  - All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
  - Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
  - The Chain of Custody document is included as part of this report.
  - All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.
- Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042498 - Default Prep Wet Chem**

**Blank (B042498-BLK1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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**LCS (B042498-BS1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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**Duplicate (B042498-DUP1) Source: 0092629-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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**Duplicate (B042498-DUP2) Source: 0102128-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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**Batch B042577 - Default Prep Wet Chem**

**Blank (B042577-BLK1)**

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B042577-BS1)**

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B042577-DUP1) Source: 0100778-02**

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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**Matrix Spike (B042577-MS1) Source: 0100778-02**

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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**Batch B042587 - Default Prep Wet Chem**

**Blank (B042587-BLK1)**

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B042587 - Default Prep Wet Chem

LCS (B042587-BS1)

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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Duplicate (B042587-DUP1) Source: 0092628-01

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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Duplicate (B042587-DUP2) Source: 0100200-01

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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Matrix Spike (B042587-MS1) Source: 0092629-01

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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Matrix Spike (B042587-MS2) Source: 0100200-02

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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Batch B043117 - Default Prep Wet Chem

Blank (B043117-BLK1)

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

Blank (B043117-BLK2)

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK3)

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			
Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Total Alkalinity	254	4	mg/L	235		108	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Total Alkalinity	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Total Alkalinity	281	4	mg/L		268			4.88	10	
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043187 - Default Prep Wet Chem**

**LCS (B043187-BS1)**

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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**Duplicate (B043187-DUP1) Source: 0092629-01**

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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**Duplicate (B043187-DUP2) Source: 0102262-01**

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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**Batch B043582 - Default Prep Wet Chem**

**Blank (B043582-BLK1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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**LCS (B043582-BS1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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**Duplicate (B043582-DUP1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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**Matrix Spike (B043582-MS1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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**Matrix Spike Dup (B043582-MSD1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	RPD Limits	RPD RPD	Notes
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**Batch B043120 - Default Prep IC**

**Blank (B043120-BLK1)**

Prepared: 10/20/2020 15:45, Analyzed: 10/20/2020 15:45

Fluoride	ND	0.20	mg/L						U
Chloride	ND	0.5	mg/L						U
Sulfate	ND	1.0	mg/L						U

**LCS (B043120-BS1)**

Prepared: 10/20/2020 15:27, Analyzed: 10/20/2020 15:27

Fluoride	9.42		mg/L	10.0		94.2	90-110		
Chloride	9.5		mg/L	10.0		95.4	90-110		
Sulfate	9.4		mg/L	10.0		93.7	90-110		

**Matrix Spike (B043120-MS1)**

Source: 0092620-01

Prepared: 10/20/2020 21:50, Analyzed: 10/20/2020 21:50

Sulfate	12.3		mg/L	10.0	0.05	122	80-120		M1
Fluoride	12.3		mg/L	10.0	0.00	123	80-120		M1
Chloride	12.4		mg/L	10.0	0.2	122	80-120		M1

**Matrix Spike Dup (B043120-MSD1)**

Source: 0092620-01

Prepared: 10/20/2020 22:07, Analyzed: 10/20/2020 22:07

Chloride	11.7		mg/L	10.0	0.2	115	80-120	5.59	10
Sulfate	11.6		mg/L	10.0	0.05	116	80-120	5.62	20
Fluoride	11.7		mg/L	10.0	0.00	117	80-120	4.70	20

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	



**Sample Acceptance Checklist for Work Order 0092624**

Shipped By: Client

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **MW-104 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): *T. Davis*  
\*required information\*

Compliance Monitoring? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes  No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092624 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092624-01 A	<u>10-13-20</u>	<u>14:55</u>	Plastic 1L	1	MW104	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092624-01 B	<u>10-13-20</u>	<u>14:55</u>	Plastic 500mL pH<2 w/HNO3	1	MW104	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092624-01 C	<u>10-13-20</u>	<u>14:56</u>	Plastic 500mL pH<2 w/H2SO4	1	MW104	g / c	COD TOC
0092624-01 D	<u>10-13-20</u>	<u>14:55</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW104	g / c	Radium 226 (sub)

Preservation Check: pH: J  
J  
J

Preservation Check Performed by: NOY

Field data collected by: T. Davis Date (mm/dd/yy) 10-13-20 Time (24 hr) 14:55  
pH 6.41 Cond <sup>MS</sup> 1.94 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 17.37 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>T. Davis</i></u>	Received by: (Signature) <u><i>M. J. ...</i></u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0838</u>
--	---	------------------------------------	-----------------------------

# Chain of Custody

**Scheduled for: 09/07/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

**Project:** MW-104 Wilson 092-00004

Phone: (270) 844-6000

PWS ID#:

State: KY

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
0092624	(mm/dd/yy):	Time (24 hr):					
0092624-01 E	<u>10-13-20</u>	<u>14:55</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW104	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
0092624-01 F	<u>10-13-20</u>	<u>14:55</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW104	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
0092624-01 G	<u>10-13-20</u>	<u>14:55</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW104	g / c	Radium Total (sub)
			Preservation Check: pH: <u>✓</u>				
0092624-01 H	<u>10-13-20</u>	<u>14:55</u>	AG 250mL pH<2 w/H2SO4	1	MW104	g / c	TOC
			Preservation Check: pH: <u>✓</u>				

Preservation Check Performed by: Noy

Field data collected by: Travis Speed Date (mm/dd/yy) 10-13-20 Time (24 hr) 14:55

pH 6.41 Cond <sup>MS</sup> 1.94 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 17.33 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
<u>[Signature]</u>	<u>[Signature]</u>	<u>10-14-20</u>	<u>0838</u>

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92624  
Pace Project No.: 30387818

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 92624  
Pace Project No.: 30387818

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92624  
Pace Project No.: 30387818

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387818001	0092624-01	Water	10/13/20 14:55	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 92624  
Pace Project No.: 30387818

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387818001	0092624-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92624  
Pace Project No.: 30387818

**Sample: 0092624-01**      **Lab ID: 30387818001**      Collected: 10/13/20 14:55      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.616 ± 0.431 (0.520)</b> <b>C:NA T:87%</b>	pCi/L	11/04/20 12:44	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.26 ± 0.555 (0.946)</b> <b>C:73% T:85%</b>	pCi/L	10/30/20 12:00	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.88 ± 0.986 (1.47)</b>	pCi/L	11/04/20 14:03	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92624  
Pace Project No.: 30387818

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387818001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387818001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92624  
Pace Project No.: 30387818

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387818001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387818001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92624  
Pace Project No.: 30387818

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody

Workorder: 92624      Workorder Name: MW-104 Wilson 092-0000      Owner Received Date: 10/14/2020      Results Requested By:

Report To: \_\_\_\_\_ Subcontract To: \_\_\_\_\_ Requested Analysis

**WO# : 30387818**  
  
**30387818**

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		LAB USE ONLY
						EPA 903.1	EPA 904.0 Radium Sum Calc	
1					Ground			
2	0092624-01		10/13/20 14:55	IR44-McCoy	Water		X	001
3								
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>[Signature]</i>	10/15/20 09:25	
2					
3					

Cooler Temperature on Receipt 5.0 °C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N

\*\*\* In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**0092624**

**# 30387818**

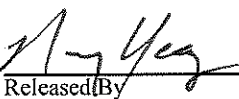
**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 Phone :(724) 850-5615  
 Fax:

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0092624-01</b>	<b>Water</b>	<b>Sampled:10/13/2020 14:55</b>	<b>Specific Method</b>
Radium Total (sub)	04/11/2021 14:55	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 14:55	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 14:55	EPA 903.1	

Released By  Date 10-17-20 Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt

#-30387818



Client Name: Pace Madisonville

Project # \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 9238/9256/9271

Label	<u>BUM</u>
LIMS Login	<u>BUM</u>

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4 °C  
 Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and initials of person examining contents:
				<u>1000401</u>	<u>10/16/20 OVB</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>no time/date on container</u>	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>PHC2</u>	
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u>	Date/time of preservation: _____
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lot # of added preservative: _____	
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u>	Date: <u>10/16/20</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0092625

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:30

Project Name: MW-105 Wilson 092-00004

Workorder: 0092625

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

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#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

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**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092625-01	MW105/	Groundwater	10/13/2020 13:20	10/14/2020 8:38	Phillip Hill
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092625-01	Field Conductance				642
	Field pH				8.02
	Field Temp (C)				19.75



**ANALYTICAL RESULTS**

Lab Sample ID: **0092625-01**  
Description: **MW105**

Sample Collection Date Time: 10/13/2020 13:20  
Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Barium</b>	<b>0.256</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Boron</b>	<b>0.37</b>		mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:13	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Calcium</b>	<b>49.2</b>	D2	mg/L	4.00	1.30	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:37	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
Copper	ND	B, u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Iron</b>	<b>1.21</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:37	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Lithium</b>	<b>0.02</b>		mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Magnesium</b>	<b>16.4</b>	D2	mg/L	2.00	0.900	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:37	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Nickel</b>	<b>0.001</b>	J	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Potassium</b>	<b>6.87</b>	L1	mg/L	0.50	0.22	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:13	DMH
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
<b>Sodium</b>	<b>154</b>	D1	mg/L	26.0	10.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:40	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:56	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>415</b>		mg/L	4		2320 B-2011	10/21/2020 17:11	10/21/2020 17:11	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 17:11	10/21/2020 17:11	HMF
<b>Total Alkalinity</b>	<b>415</b>		mg/L	4		2320 B-2011	10/21/2020 17:11	10/21/2020 17:11	HMF
<b>Chemical Oxygen Demand</b>	<b>5</b>		mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:29	HMF
<b>Specific Conductance (Lab)</b>	<b>970</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:43	10/20/2020 15:43	CML
<b>Hardness as CaCO3</b>	<b>242</b>		mg/L	1	1	2340 C (as HACH 8226)	10/19/2020 11:20	10/19/2020 11:20	CLL
<b>Total Dissolved Solids</b>	<b>550</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>1.3</b>		mg/L	0.5		5310 C-2011	10/17/2020 20:35	10/17/2020 20:35	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.281</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>1.02</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>1.30</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>8.7</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	10/20/2020 20:05	10/20/2020 20:05	CSC
<b>Fluoride</b>	<b>0.61</b>		mg/L	0.20		EPA 300.0 REV 2.1	10/20/2020 20:05	10/20/2020 20:05	CSC
<b>Sulfate</b>	<b>75.4</b>	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	10/20/2020 20:23	10/20/2020 20:23	CSC

**Notes for work order 0092625**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting		Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
		Limit	Units							

**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042498 - Default Prep Wet Chem**

**Blank (B042498-BLK1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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**LCS (B042498-BS1)**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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**Duplicate (B042498-DUP1) Source: 0092629-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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**Duplicate (B042498-DUP2) Source: 0102128-01**

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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**Batch B042577 - Default Prep Wet Chem**

**Blank (B042577-BLK1)**

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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**LCS (B042577-BS1)**

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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**Duplicate (B042577-DUP1) Source: 0100778-02**

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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**Matrix Spike (B042577-MS1) Source: 0100778-02**

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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**Batch B042587 - Default Prep Wet Chem**

**Blank (B042587-BLK1)**

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B042587 - Default Prep Wet Chem

LCS (B042587-BS1)

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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Duplicate (B042587-DUP1) Source: 0092628-01

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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Duplicate (B042587-DUP2) Source: 0100200-01

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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Matrix Spike (B042587-MS1) Source: 0092629-01

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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Matrix Spike (B042587-MS2) Source: 0100200-02

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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Batch B043117 - Default Prep Wet Chem

Blank (B043117-BLK1)

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK2)

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK3)

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	254	4	mg/L	235		108	80-120			

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Total Alkalinity	295	4	mg/L		283			4.39	10	
Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	
Total Alkalinity	281	4	mg/L		268			4.88	10	

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043187 - Default Prep Wet Chem

LCS (B043187-BS1)

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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Duplicate (B043187-DUP1) Source: 0092629-01

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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Duplicate (B043187-DUP2) Source: 0102262-01

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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Batch B043582 - Default Prep Wet Chem

Blank (B043582-BLK1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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LCS (B043582-BS1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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Duplicate (B043582-DUP1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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Matrix Spike (B043582-MS1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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Matrix Spike Dup (B043582-MSD1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043120 - Default Prep IC**

**Blank (B043120-BLK1)**

Prepared: 10/20/2020 15:45, Analyzed: 10/20/2020 15:45

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B043120-BS1)**

Prepared: 10/20/2020 15:27, Analyzed: 10/20/2020 15:27

Fluoride	9.42		mg/L	10.0		94.2	90-110			
Sulfate	9.4		mg/L	10.0		93.7	90-110			
Chloride	9.5		mg/L	10.0		95.4	90-110			

**Matrix Spike (B043120-MS1)**

Source: 0092620-01

Prepared: 10/20/2020 21:50, Analyzed: 10/20/2020 21:50

Fluoride	12.3		mg/L	10.0	0.00	123	80-120			M1
Chloride	12.4		mg/L	10.0	0.2	122	80-120			M1
Sulfate	12.3		mg/L	10.0	0.05	122	80-120			M1

**Matrix Spike Dup (B043120-MSD1)**

Source: 0092620-01

Prepared: 10/20/2020 22:07, Analyzed: 10/20/2020 22:07

Chloride	11.7		mg/L	10.0	0.2	115	80-120	5.59	10	
Sulfate	11.6		mg/L	10.0	0.05	116	80-120	5.62	20	
Fluoride	11.7		mg/L	10.0	0.00	117	80-120	4.70	20	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0092625**

Shipped By: Client

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

### Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **MW-105 Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092625 Sample ID#	*required information* Date (mm/dd/yy): 10/13/20 Collection Time (24 hr): 1320	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092625-01 A	10/13/20 1320	Plastic 1L	1	MW105	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092625-01 B	10/13/20 1320	Plastic 500mL pH<2 w/HNO3	1	MW105	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092625-01 C	10/13/20 1320	Plastic 500mL pH<2 w/H2SO4	1	MW105	g / c	COD TOC
0092625-01 D	10/13/20 1320	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW105	g / c	Radium 226 (sub)

Preservation Check: pH:

Preservation Check: pH:

Preservation Check: pH:

Preservation Check Performed by: NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/13/20 Time (24 hr) 1320  
pH 8.02 Cond <sup>mS/cm</sup> 0.642 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 19.75 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 10-14-20 Time (24 hr) 0838



# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
**Big Rivers Electric Corporation Wilson Station**  
**Mike Galbraith**  
**PO Box 24**  
**Henderson, KY 42419**

Invoice To:  
**Big Rivers Electric Corporation Wilson Station**  
**Brian Edwards**  
**PO Box 24**  
**Henderson, KY 42419**

Project: **MW-105 Wilson 092-00004**

Phone: **(270) 844-6000**  
PWS ID#: \_\_\_\_\_  
State: **KY**

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

*[Signature]*

Collected by (Signature): \_\_\_\_\_  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
<b>0092625</b>	(mm/dd/yy):	Time (24 hr):					
Sample ID#							
0092625-01 E	<u>10/13/20</u>	<u>1320</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW105	g / c	Radium 228 (sub)
			Preservation Check: pH :	✓			
0092625-01 F	<u>10/13/20</u>	<u>1320</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW105	g / c	Radium 228 (sub)
			Preservation Check: pH :	✓			
0092625-01 G	<u>10/13/20</u>	<u>1320</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW105	g / c	Radium Total (sub)
			Preservation Check: pH :	✓			
0092625-01 H	<u>10/13/20</u>	<u>1320</u>	AG 250mL pH<2 w/H2SO4	1	MW105	g / c	TOC
			Preservation Check: pH :	✓			

Preservation Check Performed by: Nb4

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/13/20 Time (24 hr) 1320

pH 8.02 Cond <sup>ms/cm</sup> 0.642 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 19.75 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
<i>[Signature]</i>	<i>[Signature]</i>	<u>10.14.20</u>	<u>0838</u>
_____	_____	_____	_____
_____	_____	_____	_____

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92625  
Pace Project No.: 30387819

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 92625  
Pace Project No.: 30387819

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92625  
Pace Project No.: 30387819

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387819001	0092625-01	Water	10/13/20 13:20	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 92625  
Pace Project No.: 30387819

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387819001	0092625-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92625  
Pace Project No.: 30387819

**Sample: 0092625-01**      **Lab ID: 30387819001**      Collected: 10/13/20 13:20      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.281 ± 0.259 (0.152)</b> <b>C:NA T:91%</b>	pCi/L	11/04/20 12:44	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.02 ± 0.509 (0.896)</b> <b>C:72% T:79%</b>	pCi/L	10/30/20 12:00	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.30 ± 0.768 (1.05)</b>	pCi/L	11/04/20 14:03	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92625  
Pace Project No.: 30387819

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387819001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387819001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92625  
Pace Project No.: 30387819

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387819001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387819001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92625  
Pace Project No.: 30387819

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 92625      Workorder Name: MW-105 Wilson 092-0000      Owner Received Date: 10/14/2020      Results Requested By:

Report To:	Subcontract To:	Requested Analysis
------------	-----------------	--------------------

McCoy & McCoy Labs  
P.O. Box 907  
Madisonville, KY 42409  
270-821-7375  
rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
(724) 850-5615

**WO#: 30387819**

30387819

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		LAB USE ONLY
						EPA 903.1	EPA 904.0 Radium Sum Calc	
1					ST-stand			
2	0092625-01		10/13/20 13:20	IR44-McCoy	Water		X	∞
3								
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>Jenifer B</i>	10/15/20 09:25	
2					
3					

Cooler Temperature on Receipt	50W °C	Custody Seal	Y or N	Received on	10/15/20	Y or N	Sample Intact	Y or N
-------------------------------	--------	--------------	--------	-------------	----------	--------	---------------	--------

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

**SUBCONTRACT ORDER**

**Pace Analytical Services, LLC Kentucky  
0092625**

**# 30387819**

**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
Phone :(724) 850-5615  
Fax:

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0092625-01</b>	<b>Water</b>	<b>Sampled:10/13/2020 13:20</b>	<b>Specific Method</b>
Radium Total (sub)	04/11/2021 13:20	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 13:20	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 13:20	EPA 903.1	

*Ang Key* 10.14.20  
Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387819

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other

Tracking #: 1107 3386 9238/9256/9271

Label	<u>BUM</u>
LIMS Login	<u>BUM</u>

Custody Seal on Cooler/Box Present:  yes  no    Seals intact:  yes  no

Thermometer Used 9    Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 7.5/7.7 °C    Correction Factor: -0.1 °C    Final Temp: 7.4/7.4 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# <u>1000401</u>	Date and initials of person examining contents: <u>10/16/20 OUB</u>
-----------	-----	----	-----	------------------------------	---

Comments:	Yes	No	N/A		
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.	
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.	
Sample Labels match COC: -Includes date/time/ID      Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.	<u>no time / date containers</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.	
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.	
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.	
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.	
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.	
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.	
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.	
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.	
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.	<u>PHL2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OUB</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.	
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.	
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OUB</u>	Date: <u>10/16/20</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

## Certificate of Analysis 0092626

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:32

Project Name: MW-110 Wilson 092-00004

Workorder: 0092626

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092626-01	MW110/	Groundwater	10/13/2020 14:05	10/14/2020 8:38	Phillip Hill
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092626-01	Field Conductance				337
	Field pH				6.87
	Field Temp (C)				20.67

**ANALYTICAL RESULTS**

Lab Sample ID: **0092626-01**  
Description: **MW110**

Sample Collection Date Time: 10/13/2020 14:05  
Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
<b>Arsenic</b>	<b>0.0011</b>		mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
<b>Barium</b>	<b>0.053</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:16	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
<b>Calcium</b>	<b>37.9</b>	D2	mg/L	4.00	1.30	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:52	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
Copper	ND	B, u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
<b>Iron</b>	<b>4.24</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:52	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
<b>Magnesium</b>	<b>18.5</b>	D2	mg/L	2.00	0.900	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:52	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
Nickel	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
<b>Potassium</b>	<b>0.91</b>	L1	mg/L	0.50	0.22	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:16	DMH
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
<b>Sodium</b>	<b>31.3</b>	D2	mg/L	2.60	1.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 13:52	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:59	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>146</b>		mg/L	4		2320 B-2011	10/21/2020 17:18	10/21/2020 17:18	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	10/21/2020 17:18	10/21/2020 17:18	HMF
<b>Total Alkalinity</b>	<b>146</b>		mg/L	4		2320 B-2011	10/21/2020 17:18	10/21/2020 17:18	HMF
Chemical Oxygen Demand	ND	u	mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:29	HMF
<b>Specific Conductance (Lab)</b>	<b>465</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:44	10/20/2020 15:44	CML
<b>Hardness as CaCO3</b>	<b>184</b>		mg/L	1	1	2340 C (as HACH 8226)	10/19/2020 11:22	10/19/2020 11:22	CLL
<b>Total Dissolved Solids</b>	<b>278</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>1.9</b>		mg/L	0.5		5310 C-2011	10/17/2020 20:56	10/17/2020 20:56	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.669</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>0.823</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>1.49</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>10.5</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	10/20/2020 20:40	10/20/2020 20:40	CSC
<b>Fluoride</b>	<b>0.24</b>		mg/L	0.20		EPA 300.0 REV 2.1	10/20/2020 20:40	10/20/2020 20:40	CSC
<b>Sulfate</b>	<b>56.0</b>	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	10/20/2020 20:58	10/20/2020 20:58	CSC



**Notes for work order 0092626**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting		Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
		Limit	Units							

**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B042498 - Default Prep Wet Chem

Blank (B042498-BLK1)

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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LCS (B042498-BS1)

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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Duplicate (B042498-DUP1) Source: 0092629-01

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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Duplicate (B042498-DUP2) Source: 0102128-01

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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Batch B042577 - Default Prep Wet Chem

Blank (B042577-BLK1)

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B042577-BS1)

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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Duplicate (B042577-DUP1) Source: 0100778-02

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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Matrix Spike (B042577-MS1) Source: 0100778-02

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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Batch B042587 - Default Prep Wet Chem

Blank (B042587-BLK1)

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B042587 - Default Prep Wet Chem

LCS (B042587-BS1)

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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Duplicate (B042587-DUP1) Source: 0092628-01

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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Duplicate (B042587-DUP2) Source: 0100200-01

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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Matrix Spike (B042587-MS1) Source: 0092629-01

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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Matrix Spike (B042587-MS2) Source: 0100200-02

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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Batch B043117 - Default Prep Wet Chem

Blank (B043117-BLK1)

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK2)

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U

Blank (B043117-BLK3)

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Total Alkalinity	254	4	mg/L	235		108	80-120			

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Total Alkalinity	295	4	mg/L		283			4.39	10	
Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	
Total Alkalinity	281	4	mg/L		268			4.88	10	

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043187 - Default Prep Wet Chem

LCS (B043187-BS1)

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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Duplicate (B043187-DUP1) Source: 0092629-01

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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Duplicate (B043187-DUP2) Source: 0102262-01

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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Batch B043582 - Default Prep Wet Chem

Blank (B043582-BLK1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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LCS (B043582-BS1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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Duplicate (B043582-DUP1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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Matrix Spike (B043582-MS1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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Matrix Spike Dup (B043582-MSD1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043120 - Default Prep IC**

**Blank (B043120-BLK1)**

Prepared: 10/20/2020 15:45, Analyzed: 10/20/2020 15:45

Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U

**LCS (B043120-BS1)**

Prepared: 10/20/2020 15:27, Analyzed: 10/20/2020 15:27

Fluoride	9.42		mg/L	10.0		94.2	90-110			
Sulfate	9.4		mg/L	10.0		93.7	90-110			
Chloride	9.5		mg/L	10.0		95.4	90-110			

**Matrix Spike (B043120-MS1)**

Source: 0092620-01

Prepared: 10/20/2020 21:50, Analyzed: 10/20/2020 21:50

Fluoride	12.3		mg/L	10.0	0.00	123	80-120			M1
Chloride	12.4		mg/L	10.0	0.2	122	80-120			M1
Sulfate	12.3		mg/L	10.0	0.05	122	80-120			M1

**Matrix Spike Dup (B043120-MSD1)**

Source: 0092620-01

Prepared: 10/20/2020 22:07, Analyzed: 10/20/2020 22:07

Chloride	11.7		mg/L	10.0	0.2	115	80-120	5.59	10	
Sulfate	11.6		mg/L	10.0	0.05	116	80-120	5.62	20	
Fluoride	11.7		mg/L	10.0	0.00	117	80-120	4.70	20	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

<b>Sample Acceptance Checklist for Work Order 0092626</b>	
Shipped By: Client	Temperature: 1.00° Celcius
<b>Condition</b>	
Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 09/07/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station

**Project:** MW-110 Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#: \_\_\_\_\_  
State: KY

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092626 Sample ID#	*required information* Date (mm/dd/yy): <u>10/13/20</u>	Collection Time (24 hr): <u>1405</u>	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092626-01 A	<u>10/13/20</u>	<u>1405</u>	Plastic 1L	1	MW110	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092626-01 B	<u>10/13/20</u>	<u>1405</u>	Plastic 500mL pH<2 w/HNO3	1	MW110	g / c	Beryllium Tot 6020 Lead Tot: 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tct 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092626-01 C	<u>10/13/20</u>	<u>1405</u>	Plastic 500mL pH<2 w/H2SO4	1	MW110	g / c	COD TOC
0092626-01 D	<u>10/13/20</u>	<u>1405</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW110	g / c	Radium 226 (sub)

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check Performed by: Noy

Field data collected by: Phillip HS4 Date (mm/dd/yy) 10/13/20 Time (24 hr) 1405  
pH 6.87 Cond 0.337 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 20.67 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 10-14-20 Time (24 hr) 0838

# Chain of Custody

**Scheduled for: 09/07/2020**



**Client: Big Rivers Electric Corporation Wilson Station**

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

**Project: MW-110 Wilson 092-00004**

Phone: (270) 844-6000

PWS ID#: KY

State: KY

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): \_\_\_\_\_  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092626-01 E	<u>10/13/20</u>	<u>1405</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW110	g / c	Radium 228 (sub)
			Preservation Check: pH : <u>✓</u>				
0092626-01 F	<u>10/13/20</u>	<u>1405</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW110	g / c	Radium 228 (sub)
			Preservation Check: pH : <u>✓</u>				
0092626-01 G	<u>10/13/20</u>	<u>1405</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW110	g / c	Radium Total (sub)
			Preservation Check: pH : <u>✓</u>				
0092626-01 H	<u>10/13/20</u>	<u>1405</u>	AG 250mL pH<2 w/H2SO4	1	MW110	g / c	TOC
			Preservation Check: pH : <u>✓</u>				

Preservation Check Performed by: NDV

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/12/20 Time (24 hr) 1405

pH 6.87 Cond <sup>ml/cm</sup> 0.337 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 20.67 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0838</u>
_____	_____	_____	_____
_____	_____	_____	_____

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92626  
Pace Project No.: 30387820

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 92626  
Pace Project No.: 30387820

### **Pace Analytical Services Pennsylvania**

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92626  
Pace Project No.: 30387820

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387820001	0092626-01	Water	10/13/20 14:05	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92626  
Pace Project No.: 30387820

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387820001	0092626-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92626  
Pace Project No.: 30387820

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.669 ± 0.399 (0.379)</b> <b>C:NA T:97%</b>	pCi/L	11/04/20 12:44	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.823 ± 0.514 (0.974)</b> <b>C:70% T:74%</b>	pCi/L	10/30/20 12:00	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.49 ± 0.913 (1.35)</b>	pCi/L	11/04/20 14:03	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92626  
Pace Project No.: 30387820

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387820001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387820001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92626  
Pace Project No.: 30387820

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387820001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387820001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92626  
Pace Project No.: 30387820

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

Chain of Custody



Workorder: 92626      Workorder Name: MW-110 Wilson 092-0000      Owner Received Date: 10/14/2020      Results Requested By: Requested Analysis

Report To: Subcontract To:

McCoy & McCoy Labs  
P.O. Box 907  
Madisonville, KY 42409  
270-821-7375  
rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
1638 Rosey Town Rd Suite 2,3,4  
Greensburg, PA 15601  
(724) 850-5615

WO#: 30387820



Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	EPA 903.1	EPA 904.0 Radium Sum Calc	LAB USE ONLY
1					Ground	X		
2	0092626-01		10/13/20 14:05	IR44-McCoy	Water	X		001
3								
4								
5								
6								
7								
8								
9								
10								

Transfers Released By	Date/Time	Received By	Date/Time	Comments
		<i>[Signature]</i>	10/15/20 0925	
1				
2				
3				

Cooler Temperature on Receipt 5°C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC. This chain of custody is considered complete as is since this information is available in the owner laboratory.



**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**0092626**

**#-30387820**

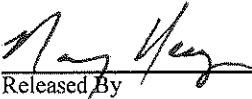
**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 Phone :(724) 850-5615  
 Fax:

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0092626-01</b>	<b>Water</b>	<b>Sampled:10/13/2020 14:05</b>	<b>Specific Method</b>
Radium Total (sub)	04/11/2021 14:05	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 14:05	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 14:05	EPA 903.1	

Released By  Date 10-14-20 Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387820

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 9238/9256/9271

Label BUM  
LIMS Login BUM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4  
Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D0401</u>	<u>10/16/20 OVB</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.	
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.	
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.	
Sample Labels match COC: -includes date/time/ID Matrix: <u>WT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.	<u>notice / date on containers</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.	
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.	
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.	
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.	
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.	
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.	
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.	
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.	
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.	<u>PHL2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.	
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.	
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OVB</u>	Date: <u>10/16/20</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

---

**Certificate of Analysis**  
**0092635**

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/09/2020 09:39

---

Project Name: Well Duplicate Wilson 092-00004

Workorder: 0092635

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.



#460210 Madisonville, KY  
#460293 Pikeville, KY



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Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

270.821.7375

[www.pacelabs.com](http://www.pacelabs.com)

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092635-01	Well Duplicate/	Groundwater	10/13/2020 12:25	10/14/2020 8:38	Phillip Hill
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
0092635-01	Field Conductance				1250
	Field pH				6.81
	Field Temp (C)				18.87

**ANALYTICAL RESULTS**

Lab Sample ID: **0092635-01**

Description: **Well Duplicate**

Sample Collection Date Time: 10/13/2020 12:25

Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	u	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Arsenic</b>	<b>0.0025</b>		mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Barium</b>	<b>0.017</b>		mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Boron</b>	<b>0.76</b>		mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/20/2020 15:54	DMH
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Calcium</b>	<b>259</b>	D1	mg/L	40.0	13.0	SW846 6010 B	10/15/2020 07:52	10/15/2020 15:11	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Cobalt</b>	<b>0.008</b>		mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
Copper	ND	u, B	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Iron</b>	<b>6.34</b>	D2	mg/L	1.00	0.500	SW846 6010 B	10/15/2020 07:52	10/15/2020 15:08	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Magnesium</b>	<b>64.6</b>	D2	mg/L	2.00	0.900	SW846 6010 B	10/15/2020 07:52	10/15/2020 15:08	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Molybdenum</b>	<b>0.003</b>	J	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Nickel</b>	<b>0.006</b>		mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Potassium</b>	<b>6.65</b>	D2	mg/L	5.00	2.20	SW846 6010 B	10/15/2020 07:52	10/16/2020 10:54	dmh
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
<b>Sodium</b>	<b>36.4</b>	D2	mg/L	2.60	1.00	SW846 6010 B	10/15/2020 07:52	10/15/2020 15:08	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 19:50	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>268</b>	M3	mg/L	4		2320 B-2011	10/21/2020 19:16	10/21/2020 19:16	HMF
Carbonate Alkalinity as CaCO3	ND	u, M3	mg/L	4		2320 B-2011	10/21/2020 19:16	10/21/2020 19:16	HMF
<b>Total Alkalinity</b>	<b>268</b>	M3	mg/L	4		2320 B-2011	10/21/2020 19:16	10/21/2020 19:16	HMF
Chemical Oxygen Demand	ND	u	mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:32	HMF
<b>Specific Conductance (Lab)</b>	<b>1700</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 16:02	10/20/2020 16:02	CML
<b>Hardness as CaCO3</b>	<b>792</b>	D	mg/L	2	2	2340 C (as HACH 8226)	10/19/2020 12:06	10/19/2020 12:06	CLL
<b>Total Dissolved Solids</b>	<b>1400</b>		mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
<b>Total Organic Carbon</b>	<b>0.9</b>		mg/L	0.5		5310 C-2011	10/18/2020 01:51	10/18/2020 01:51	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.151</b>	_Sub	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>2.64</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>2.79</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx



**Pace Analytical Services, LLC**

P.O. Box 907

Madisonville, KY 42431

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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>75.6</b>	D, M2	mg/L	5.0	3.6	EPA 300.0 REV 2.1	10/21/2020 11:19	10/21/2020 11:19	CSC
<b>Fluoride</b>	<b>0.21</b>	M2	mg/L	0.20		EPA 300.0 REV 2.1	10/21/2020 04:31	10/21/2020 04:31	CSC
<b>Sulfate</b>	<b>659</b>	D, M2	mg/L	50.0	25.0	EPA 300.0 REV 2.1	10/21/2020 04:48	10/21/2020 04:48	CSC

**Notes for work order 0092635**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.  
Concentrations reported are estimated values.

**Qualifiers**

_Sub	See subcontractors report.
B	Target analyte detected in method blank at or above the method reporting limit.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
U	Target analyte was analyzed for , but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
Y1	Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronymns**

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4)**

**Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2)**

**Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1

**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B042498 - Default Prep Wet Chem</b>										
<b>Blank (B042498-BLK1)</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (B042498-BS1)</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
<b>Duplicate (B042498-DUP1) Source: 0092629-01</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
<b>Duplicate (B042498-DUP2) Source: 0102128-01</b>										
Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00										
Total Dissolved Solids	364	50	mg/L		370			1.63	10	
<b>Batch B042577 - Default Prep Wet Chem</b>										
<b>Blank (B042577-BLK1)</b>										
Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58										
Hardness as CaCO3	ND	1	mg/L							U
<b>LCS (B042577-BS1)</b>										
Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00										
Hardness as CaCO3	230	1	mg/L	225		102	80-120			
<b>Duplicate (B042577-DUP1) Source: 0100778-02</b>										
Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16										
Hardness as CaCO3	268	1	mg/L		260			3.03	10	
<b>Matrix Spike (B042577-MS1) Source: 0100778-02</b>										
Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18										
Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
<b>Batch B042587 - Default Prep Wet Chem</b>										
<b>Blank (B042587-BLK1)</b>										
Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08										
Total Organic Carbon	ND	0.5	mg/L							U

**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B042587 - Default Prep Wet Chem</b>										
<b>LCS (B042587-BS1)</b>										
Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47										
Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
<b>Duplicate (B042587-DUP1) Source: 0092628-01</b>										
Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24										
Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
<b>Duplicate (B042587-DUP2) Source: 0100200-01</b>										
Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41										
Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
<b>Matrix Spike (B042587-MS1) Source: 0092629-01</b>										
Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45										
Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
<b>Matrix Spike (B042587-MS2) Source: 0100200-02</b>										
Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02										
Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
<b>Batch B043117 - Default Prep Wet Chem</b>										
<b>Blank (B043117-BLK1)</b>										
Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
<b>Blank (B043117-BLK2)</b>										
Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
<b>Blank (B043117-BLK3)</b>										
Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40										
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043117 - Default Prep Wet Chem

LCS (B043117-BS1)

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			
Total Alkalinity	249	4	mg/L	235		106	80-120			

LCS (B043117-BS2)

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			
Total Alkalinity	254	4	mg/L	235		108	80-120			

Duplicate (B043117-DUP1)

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Total Alkalinity	295	4	mg/L		283			4.39	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	

Duplicate (B043117-DUP2)

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	281	4	mg/L		268			4.88	10	

Matrix Spike (B043117-MS1)

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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Matrix Spike (B043117-MS2)

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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Batch B043187 - Default Prep Wet Chem

Blank (B043187-BLK1)

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND	1	umhos/cm							U
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B043187 - Default Prep Wet Chem

LCS (B043187-BS1)

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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Duplicate (B043187-DUP1) Source: 0092629-01

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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Duplicate (B043187-DUP2) Source: 0102262-01

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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Batch B043582 - Default Prep Wet Chem

Blank (B043582-BLK1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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LCS (B043582-BS1)

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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Duplicate (B043582-DUP1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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Matrix Spike (B043582-MS1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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Matrix Spike Dup (B043582-MSD1) Source: 0092635-01

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043121 - Default Prep IC**

**Blank (B043121-BLK1)**

Prepared: 10/20/2020 22:42, Analyzed: 10/20/2020 22:42

Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U

**LCS (B043121-BS1)**

Prepared: 10/20/2020 22:25, Analyzed: 10/20/2020 22:25

Chloride	9.4		mg/L	10.0		93.7	90-110			
Sulfate	9.2		mg/L	10.0		91.8	90-110			
Fluoride	9.25		mg/L	10.0		92.5	90-110			

**Matrix Spike (B043121-MS1)**

Source: 0092635-01

Prepared: 10/21/2020 5:58, Analyzed: 10/21/2020 5:58

Chloride	48.6		mg/L	10.0	68.0	NR	80-120			M2
Sulfate	242		mg/L	10.0	593	NR	80-120			M2
Fluoride	9.28		mg/L	10.0	0.19	90.9	80-120			

**Matrix Spike Dup (B043121-MSD1)**

Source: 0092635-01

Prepared: 10/21/2020 6:15, Analyzed: 10/21/2020 6:15

Fluoride	9.21		mg/L	10.0	0.19	90.2	80-120	0.811	20	
Sulfate	240		mg/L	10.0	593	NR	80-120	0.795	20	M2
Chloride	48.1		mg/L	10.0	68.0	NR	80-120	1.05	10	M2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO3	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 0092635**

Shipped By: Client

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 09/07/2020**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

**Project:** Well Duplicate Wilson 092-00004

Phone: (270) 844-6000  
PWS ID#: \_\_\_\_\_  
State: KY

PO#: \_\_\_\_\_  
Quote#: \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_  
Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
0092635	(mm/dd/yy):	Time (24 hr):					
0092635-01 A	<u>10/13/20</u>	<u>1225</u>	Plastic 1L	1	Well Duplicate	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092635-01 B	<u>10/13/20</u>	<u>1225</u>	Plastic 500mL pH<2 w/HNO3	1	Well Duplicate	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092635-01 C	<u>10/13/20</u>	<u>1225</u>	Plastic 500mL pH<2 w/H2SO4	1	Well Duplicate	g / c	COD TOC
0092635-01 D	<u>10/13/20</u>	<u>1225</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	Well Duplicate	g / c	Radium 226 (sub)

Preservation Check: pH: ✓  
Preservation Check: pH: ✓  
Preservation Check: pH: ✓

Preservation Check Performed by: NOY

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/13/20 Time (24 hr) 1225  
pH 6.81 Cond <sup>us/cm</sup> 1.25 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 18.87 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 10-14-20 Time (24 hr) 0838

# Chain of Custody



**Scheduled for: 09/07/2020**

**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Wilson Station

**Project:** Well Duplicate Wilson 092-00004

Brian Edwards  
PO Box 24  
Henderson, KY 42419

Phone: (270) 844-6000

PWS ID#: KY  
State: KY

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

*[Signature]*

Collected by (Signature): \_\_\_\_\_  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
0092635	(mm/dd/yy):	Time (24 hr):					
0092635-01 E	<u>10/13/20</u>	<u>1225</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	Well Duplicate	g / c	Radium 228 (sub)
			Preservation Check: pH : <u>✓</u>				
0092635-01 F	<u>10/13/20</u>	<u>1225</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	Well Duplicate	g / c	Radium 228 (sub)
			Preservation Check: pH : <u>✓</u>				
0092635-01 G	<u>10/13/20</u>	<u>1225</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	Well Duplicate	g / c	Radium Total (sub)
			Preservation Check: pH : _____				
0092635-01 H	<u>10/13/20</u>	<u>1225</u>	AG 250mL pH<2 w/H2SO4	1	Well Duplicate	g / c	TOC
			Preservation Check: pH : <u>✓</u>				

Preservation Check Performed by: NOY

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/13/20 Time (24 hr) 1225  
pH 6.81 Cond <sup>micm</sup> 1.25 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 18.87 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>10-14-20</u>	Time (24 hr) <u>0835</u>
_____	_____	_____	_____
_____	_____	_____	_____

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92635  
Pace Project No.: 30387830

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 92635  
Pace Project No.: 30387830

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92635  
Pace Project No.: 30387830

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30387830001	0092635-01	Water	10/13/20 12:25	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92635  
Pace Project No.: 30387830

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387830001	0092635-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92635  
Pace Project No.: 30387830

**Sample: 0092635-01**      **Lab ID: 30387830001**      Collected: 10/13/20 12:25      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.151 ± 0.230 (0.370)</b> <b>C:NA T:104%</b>	pCi/L	11/04/20 13:13	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>2.64 ± 0.734 (0.801)</b> <b>C:66% T:87%</b>	pCi/L	10/30/20 12:01	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>2.79 ± 0.964 (1.17)</b>	pCi/L	11/04/20 14:23	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92635  
Pace Project No.: 30387830

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387830001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387830001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92635  
Pace Project No.: 30387830

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387830001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387830001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92635  
Pace Project No.: 30387830

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

Chain of Custody



Workorder: 92635      Workorder Name: Well Duplicate Wilson 092      Owner Received Date: 10/14/2020      Results Requested By:

Report To:      Subcontract To:      Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

**WO# : 30387830**  
  
 30387830

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Date/Time	Comments
						EPA 903.1	EPA 904.0 Radium Sum Calc		
1	0092635-01		10/13/20 12:25	IR44-McCoy	Ground Water	X	X	10/15/20 0925	
2									
3									
4									
5									
6									
7									
8									
9									
10									

LAB USE ONLY  
001

Cooler Temperature on Receipt 5°C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**0092635**

# **30387830**


**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 Phone :(724) 850-5615  
 Fax:

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0092635-01</b>	<b>Water</b>	<b>Sampled:10/13/2020 12:25</b>	<b>Specific Method</b>
Radium Total (sub)	04/11/2021 12:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 12:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 12:25	EPA 903.1	


10-14-20

---

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

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Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387830

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other

Tracking #: 1107 3386 9238/9256/9271

Label BUM  
LIMS Login BUM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4  
Temp should be above freezing to 6°C

Comments: pH paper Lot# 1000401 Date and initials of person examining contents: 10/16/20 OUB

Comments:	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. <u>no date time on containers</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OUB</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>OUB</u> Date: <u>10/16/20</u>

Client Notification/ Resolution:  
Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_  
Comments/ Resolution: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)  
\*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.





## Certificate of Analysis 0092620

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 11/05/2020 13:17

Project Name: Field Blank Wilson 092-00004

Workorder: 0092620

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 10/14/2020 08:38.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

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Rob Whittington, Project Manager

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



Pace Analytical Services, LLC

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### SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0092620-01	Field Blank/	Water	10/13/2020 11:55	10/14/2020 8:38	Travis Sneed



**ANALYTICAL RESULTS**

Lab Sample ID: **0092620-01**  
 Description: **Field Blank**

Sample Collection Date Time: 10/13/2020 11:55  
 Sample Received Date Time: 10/14/2020 08:38

**Metals by SW846 6000 Series Methods**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Barium	ND	U	mg/L	0.004	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Boron	ND	M4, U	mg/L	0.10	0.10	SW846 6010 B	10/15/2020 07:52	10/15/2020 12:59	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Calcium	ND	M4, U	mg/L	0.40	0.13	SW846 6010 B	10/15/2020 07:52	10/15/2020 12:59	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Copper	ND	B, U	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	10/15/2020 07:52	10/15/2020 12:59	AKB
<b>Lead</b>	<b>0.0005</b>	<b>J</b>	mg/L	0.002	0.0005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Lithium	ND	U	mg/L	0.02	0.005	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Magnesium	ND	M4, U	mg/L	0.200	0.090	SW846 6010 B	10/15/2020 07:52	10/15/2020 12:59	AKB
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Nickel	ND	U	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Potassium	ND	L1, M4, U	mg/L	0.50	0.22	SW846 6010 B	10/15/2020 07:52	10/15/2020 12:59	AKB
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Sodium	ND	M4, U	mg/L	0.26	0.10	SW846 6010 B	10/15/2020 07:52	10/15/2020 12:59	AKB
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM
Zinc	ND	M4, U	mg/L	0.02	0.02	SW846-6020 A	10/15/2020 07:52	10/20/2020 18:20	CAM

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	10/21/2020 16:49	10/21/2020 16:49	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	10/21/2020 16:49	10/21/2020 16:49	HMF
Total Alkalinity	ND	U	mg/L	4		2320 B-2011	10/21/2020 16:49	10/21/2020 16:49	HMF
Chemical Oxygen Demand	ND	U	mg/L	5	5	HACH 8000	10/23/2020 13:24	10/23/2020 15:28	HMF
<b>Specific Conductance (Lab)</b>	<b>4</b>		umhos/cm	1	1	2510 B-2011	10/20/2020 15:38	10/20/2020 15:38	CML
<b>Hardness as CaCO3</b>	<b>24</b>		mg/L	1	1	2340 C (as HACH 8226)	10/19/2020 11:02	10/19/2020 11:02	CLL
Total Dissolved Solids	ND	U	mg/L	50	50	2540 C-2011	10/16/2020 11:40	10/19/2020 17:00	DJK
Total Organic Carbon	ND	U	mg/L	0.5		5310 C-2011	10/17/2020 18:50	10/17/2020 18:50	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>-0.112</b>	<b>_Sub</b>	pCi/L			EPA 903.1	11/04/2020 00:00	11/04/2020 00:00	xxx
<b>Radium-228</b>	<b>0.751</b>	<b>_Sub</b>	pCi/L			EPA 904.0 Radium Sum Calc	10/30/2020 00:00	10/30/2020 00:00	xxx
<b>Radium</b>	<b>0.751</b>	<b>_Sub</b>	pCi/L			EPA 904.0 Radium Sum Calc	11/04/2020 00:00	11/04/2020 00:00	xxx

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	M1, U	mg/L	0.5	0.4	EPA 300.0 REV 2.1	10/20/2020 16:02	10/20/2020 16:02	CSC
Fluoride	ND	M1, U	mg/L	0.20		EPA 300.0 REV 2.1	10/20/2020 16:02	10/20/2020 16:02	CSC
Sulfate	ND	M1, U	mg/L	1.0	0.5	EPA 300.0 REV 2.1	10/20/2020 16:02	10/20/2020 16:02	CSC

**Notes for work order 0092620**

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
  - Results contained in this report are only representative of the samples received.
  - PACE does not provide interpretation of these results unless otherwise stated .
  - All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
  - All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
  - Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
  - The Chain of Custody document is included as part of this report.
  - All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra.
- Concentrations reported are estimated values.

**Qualifiers**

- \_Sub See subcontractors report.
- B Target analyte detected in method blank at or above the method reporting limit.
- D2 Sample required dilution due to matrix interference.
- J Estimated value.
- L1 The associated blank spike recovery was above method acceptance limits.
- M1 Matrix spike recovery was high; the method control sample recovery was acceptable.
- M3 The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
- M4 The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
- U Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
- Y1 Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

- MDL Method Detection Limit
- MRL Minimum Reporting Limit
- ND Not Detected
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- % Rec Percent Recovery
- RPD Relative Percent Difference
- > Greater than
- < Less than

**Results relate only to the items tested.**



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:52

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (B042261-BLK2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:10

Potassium	ND	0.50	mg/L							U
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**Blank (B042261-BLK3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:36

Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.003	0.003	mg/L							B
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	ND	0.02	mg/L							U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Blank (B042261-BLK4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:43

Molybdenum	ND	0.01	mg/L							U
Copper	0.003	0.003	mg/L							B
Selenium	ND	0.003	mg/L							U

**LCS (B042261-BS1)**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 12:56

Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.42	0.40	mg/L	6.25		103	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Magnesium	5.31	0.200	mg/L	6.25		85.0	85-115			
Potassium	8.21	0.50	mg/L	6.25		131	85-115			L1
Sodium	6.41	0.26	mg/L	6.25		103	85-115			

**LCS (B042261-BS2)**

Prepared: 10/15/2020 7:52, Analyzed: 10/16/2020 10:13

Potassium	6.67	0.50	mg/L	6.25		107	85-115			
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**LCS (B042261-BS3)**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 16:40

Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Antimony	0.072	0.005	mg/L	0.0625		115	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Arsenic	0.0657	0.0010	mg/L	0.0625		105	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0647	0.0020	mg/L	0.0625		103	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0682	0.0020	mg/L	0.0625		109	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.068	0.003	mg/L	0.0625		109	85-115			B
Lead	0.065	0.002	mg/L	0.0625		104	85-115			
Lithium	0.07	0.02	mg/L	0.0625		107	85-115			
Nickel	0.066	0.003	mg/L	0.0625		106	85-115			
Selenium	0.066	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0663	0.0020	mg/L	0.0625		106	85-115			
Zinc	0.07	0.02	mg/L	0.0625		106	85-115			



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**LCS (B042261-BS4)**

Prepared: 10/15/2020 7:52, Analyzed: 10/21/2020 12:47

Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Copper	0.067	0.003	mg/L	0.0625		107	85-115			B
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			

**Matrix Spike (B042261-MS1)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:14

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120			D2, M4, U
Iron	5.57	10.0	mg/L	6.25	ND	89.1	80-120			D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120			D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120			D2, M4, U

**Matrix Spike (B042261-MS2)**

Source: 0092629-01

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:21

Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	394	40.0	mg/L	6.25	384	166	80-120			D2, M1
Iron	15.8	10.0	mg/L	6.25	9.29	105	80-120			D2
Magnesium	147	20.0	mg/L	6.25	97.9	790	80-120			D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M4, U
Sodium	81.5	26.0	mg/L	6.25	72.3	146	80-120			D2, M1

**Matrix Spike (B042261-MS3)**

Source: 0092620-01

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 19:57

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120			D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120			D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	112	80-120			D2, J
Arsenic	0.0695	0.0100	mg/L	0.0625	ND	111	80-120			D2
Barium	0.066	0.040	mg/L	0.0625	ND	105	80-120			D2
Beryllium	0.0628	0.0200	mg/L	0.0625	ND	101	80-120			D2
Cadmium	0.0649	0.0100	mg/L	0.0625	ND	104	80-120			D2
Chromium	0.0659	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120			D2
Copper	0.065	0.030	mg/L	0.0625	ND	104	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.06	0.20	mg/L	0.0625	ND	102	80-120			D2, J
Nickel	0.066	0.030	mg/L	0.0625	ND	105	80-120			D2
Selenium	0.070	0.030	mg/L	0.0625	ND	112	80-120			D2
Thallium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U





**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike (B042261-MS4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:04

Mercury	0.0028	0.0050	mg/L	0.00250	ND	110	80-120			D2, J
Molybdenum	0.07	0.10	mg/L	0.0625	ND	115	80-120			D2, J
Antimony	0.075	0.050	mg/L	0.0625	ND	121	80-120			D2, M1
Arsenic	0.0732	0.0100	mg/L	0.0625	ND	117	80-120			D2
Barium	0.082	0.040	mg/L	0.0625	0.014	108	80-120			D2
Beryllium	0.0639	0.0200	mg/L	0.0625	ND	102	80-120			D2
Cadmium	0.0656	0.0100	mg/L	0.0625	ND	105	80-120			D2
Chromium	0.0654	0.0200	mg/L	0.0625	ND	105	80-120			D2
Cobalt	0.082	0.040	mg/L	0.0625	ND	132	80-120			D2, M1
Copper	0.061	0.030	mg/L	0.0625	ND	98.3	80-120			D2, B
Lead	0.065	0.020	mg/L	0.0625	ND	104	80-120			D2
Lithium	0.11	0.20	mg/L	0.0625	ND	175	80-120			D2, M1, J
Nickel	0.089	0.030	mg/L	0.0625	0.022	107	80-120			D2
Selenium	0.069	0.030	mg/L	0.0625	ND	111	80-120			D2
Thallium	0.0647	0.0200	mg/L	0.0625	ND	104	80-120			D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120			D2, M4, U

**Matrix Spike Dup (B042261-MSD1) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:17

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	ND	40.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120	6.26	20	D2, J
Magnesium	ND	20.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	ND	26.0	mg/L	6.25	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD2) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:24

Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	414	40.0	mg/L	6.25	384	484	80-120	4.92	20	D2, M1
Iron	16.4	10.0	mg/L	6.25	9.29	114	80-120	3.84	20	D2
Magnesium	155	20.0	mg/L	6.25	97.9	913	80-120	5.08	20	D2, M1
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M4, U
Sodium	85.4	26.0	mg/L	6.25	72.3	209	80-120	4.70	20	D2, M1



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Matrix Spike Dup (B042261-MSD3) Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:00

Antimony	0.071	0.050	mg/L	0.0625	ND	114	80-120	2.25	20	D2
Mercury	0.0027	0.0050	mg/L	0.00250	ND	107	80-120	3.90	20	D2, J
Molybdenum	0.06	0.10	mg/L	0.0625	ND	104	80-120	4.25	20	D2, J
Arsenic	0.0678	0.0100	mg/L	0.0625	ND	109	80-120	2.47	20	D2
Barium	0.065	0.040	mg/L	0.0625	ND	104	80-120	1.34	20	D2
Beryllium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.33	20	D2
Cadmium	0.0632	0.0100	mg/L	0.0625	ND	101	80-120	2.66	20	D2
Chromium	0.0643	0.0200	mg/L	0.0625	ND	103	80-120	2.48	20	D2
Cobalt	0.065	0.040	mg/L	0.0625	ND	104	80-120	0.325	20	D2
Copper	0.062	0.030	mg/L	0.0625	ND	98.8	80-120	4.81	20	D2, B
Lead	0.064	0.020	mg/L	0.0625	ND	103	80-120	1.15	20	D2
Lithium	0.06	0.20	mg/L	0.0625	ND	99.1	80-120	2.77	20	D2, J
Nickel	0.063	0.030	mg/L	0.0625	ND	101	80-120	4.21	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	108	80-120	3.49	20	D2
Thallium	0.0644	0.0200	mg/L	0.0625	ND	103	80-120	1.56	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U

**Matrix Spike Dup (B042261-MSD4) Source: 0092629-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:08

Antimony	0.073	0.050	mg/L	0.0625	ND	116	80-120	3.64	20	D2
Molybdenum	0.07	0.10	mg/L	0.0625	ND	108	80-120	6.82	20	D2, J
Mercury	0.0028	0.0050	mg/L	0.00250	ND	111	80-120	0.768	20	D2, J
Arsenic	0.0721	0.0100	mg/L	0.0625	ND	115	80-120	1.40	20	D2
Barium	0.080	0.040	mg/L	0.0625	0.014	105	80-120	2.21	20	D2
Beryllium	0.0622	0.0200	mg/L	0.0625	ND	99.6	80-120	2.65	20	D2
Cadmium	0.0628	0.0100	mg/L	0.0625	ND	100	80-120	4.34	20	D2
Chromium	0.0645	0.0200	mg/L	0.0625	ND	103	80-120	1.44	20	D2
Cobalt	0.081	0.040	mg/L	0.0625	ND	130	80-120	1.84	20	D2, M1
Copper	0.059	0.030	mg/L	0.0625	ND	93.7	80-120	4.77	20	D2, B
Lead	0.063	0.020	mg/L	0.0625	ND	101	80-120	2.71	20	D2
Lithium	0.11	0.20	mg/L	0.0625	ND	179	80-120	2.20	20	D2, M1, J
Nickel	0.088	0.030	mg/L	0.0625	0.022	106	80-120	0.909	20	D2
Selenium	0.067	0.030	mg/L	0.0625	ND	107	80-120	2.91	20	D2
Thallium	0.0641	0.0200	mg/L	0.0625	ND	103	80-120	0.991	20	D2
Zinc	ND	0.20	mg/L	0.0625	ND		80-120		20	D2, M4, U



**Metals by SW846 6000 Series Methods - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042261 - EPA 200.2**

**Post Spike (B042261-PS1)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/15/2020 15:27

Boron	113		ug/L	125	-0.57	90.4	75-125			D2
Calcium	6400		ug/L	6250	39.0	102	75-125			D2
Iron	5840		ug/L	6250	-0.050	93.5	75-125			D2
Magnesium	6590		ug/L	6250	2.27	105	75-125			D2
Potassium	6300		ug/L	6250	9.60	101	75-125			D2
Sodium	6100		ug/L	6250	21.6	97.3	75-125			D2

**Post Spike (B042261-PS2)**

**Source: 0092620-01**

Prepared: 10/15/2020 7:52, Analyzed: 10/20/2020 20:11

Antimony	70.5		ug/L	62.5	0.083	113	75-125			D2
Molybdenum	67.2		ug/L	62.5	0.04	107	75-125			D2
Mercury	2.75		ug/L	2.50	0.0323	109	75-125			D2
Arsenic	71.3		ug/L	62.5	-0.0088	114	75-125			D2
Barium	63.7		ug/L	62.5	0.095	102	75-125			D2
Beryllium	65.4		ug/L	62.5	-0.0105	105	75-125			D2
Cadmium	63.6		ug/L	62.5	0.0157	102	75-125			D2
Chromium	65.6		ug/L	62.5	0.355	104	75-125			D2
Cobalt	63.7		ug/L	62.5	-0.003	102	75-125			D2
Copper	60.7		ug/L	62.5	-1.80	97.1	75-125			D2, B
Lead	64.8		ug/L	62.5	0.522	103	75-115			D2
Lithium	64.9		ug/L	62.5	0.04	104	75-125			D2
Nickel	63.8		ug/L	62.5	-0.079	102	75-125			D2
Selenium	67.6		ug/L	62.5	0.009	108	75-125			D2
Thallium	64.7		ug/L	62.5	0.00002	104	75-125			D2
Zinc	77.9		ug/L	62.5	3.15	120	75-125			D2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B042498 - Default Prep Wet Chem

Blank (B042498-BLK1)

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	ND	25	mg/L							U
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LCS (B042498-BS1)

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	1490	25	mg/L	1500		99.6	80-120			
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Duplicate (B042498-DUP1) Source: 0092629-01

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	2240	50	mg/L		2290			2.56	10	
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Duplicate (B042498-DUP2) Source: 0102128-01

Prepared: 10/16/2020 11:40, Analyzed: 10/19/2020 17:00

Total Dissolved Solids	364	50	mg/L		370			1.63	10	
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Batch B042577 - Default Prep Wet Chem

Blank (B042577-BLK1)

Prepared: 10/19/2020 10:58, Analyzed: 10/19/2020 10:58

Hardness as CaCO3	ND	1	mg/L							U
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LCS (B042577-BS1)

Prepared: 10/19/2020 11:00, Analyzed: 10/19/2020 11:00

Hardness as CaCO3	230	1	mg/L	225		102	80-120			
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Duplicate (B042577-DUP1) Source: 0100778-02

Prepared: 10/19/2020 12:16, Analyzed: 10/19/2020 12:16

Hardness as CaCO3	268	1	mg/L		260			3.03	10	
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Matrix Spike (B042577-MS1) Source: 0100778-02

Prepared: 10/19/2020 12:18, Analyzed: 10/19/2020 12:18

Hardness as CaCO3	648	1	mg/L	318	260	122	80-120			Y1
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Batch B042587 - Default Prep Wet Chem

Blank (B042587-BLK1)

Prepared: 10/17/2020 18:08, Analyzed: 10/17/2020 18:08

Total Organic Carbon	ND	0.5	mg/L							U
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**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B042587 - Default Prep Wet Chem**

**LCS (B042587-BS1)**

Prepared: 10/17/2020 17:47, Analyzed: 10/17/2020 17:47

Total Organic Carbon	4.7	0.5	mg/L	5.00		94.1	80-120			
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**Duplicate (B042587-DUP1) Source: 0092628-01**

Prepared: 10/17/2020 23:24, Analyzed: 10/17/2020 23:24

Total Organic Carbon	0.9	0.5	mg/L		1.0			8.76	25	
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**Duplicate (B042587-DUP2) Source: 0100200-01**

Prepared: 10/18/2020 4:41, Analyzed: 10/18/2020 4:41

Total Organic Carbon	2.5	0.5	mg/L		2.4			2.64	25	
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**Matrix Spike (B042587-MS1) Source: 0092629-01**

Prepared: 10/17/2020 23:45, Analyzed: 10/17/2020 23:45

Total Organic Carbon	3.9	0.5	mg/L	2.50	1.6	93.3	80-120			
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**Matrix Spike (B042587-MS2) Source: 0100200-02**

Prepared: 10/18/2020 5:02, Analyzed: 10/18/2020 5:02

Total Organic Carbon	6.5	0.5	mg/L	5.00	1.8	94.8	80-120			
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**Batch B043117 - Default Prep Wet Chem**

**Blank (B043117-BLK1)**

Prepared: 10/21/2020 16:14, Analyzed: 10/21/2020 16:14

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK2)**

Prepared: 10/21/2020 18:13, Analyzed: 10/21/2020 18:13

Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

**Blank (B043117-BLK3)**

Prepared: 10/21/2020 19:40, Analyzed: 10/21/2020 19:40

Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U



**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043117 - Default Prep Wet Chem**

**LCS (B043117-BS1)**

Prepared: 10/21/2020 18:06, Analyzed: 10/21/2020 18:06

Total Alkalinity	249	4	mg/L	235		106	80-120			
Carbonate Alkalinity as CaCO3	231	4	mg/L	225		103	0-200			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U

**LCS (B043117-BS2)**

Prepared: 10/21/2020 19:35, Analyzed: 10/21/2020 19:35

Total Alkalinity	254	4	mg/L	235		108	80-120			
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L	0.106			0-200			U
Carbonate Alkalinity as CaCO3	227	4	mg/L	225		101	0-200			

**Duplicate (B043117-DUP1)**

Source: 0092629-01

Prepared: 10/21/2020 17:38, Analyzed: 10/21/2020 17:38

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	295	4	mg/L		283			4.39	10	
Bicarbonate Alkalinity as CaCO3	295	4	mg/L		283			4.39	10	

**Duplicate (B043117-DUP2)**

Source: 0092635-01

Prepared: 10/21/2020 19:24, Analyzed: 10/21/2020 19:24

Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	281	4	mg/L		268			4.88	10	
Total Alkalinity	281	4	mg/L		268			4.88	10	

**Matrix Spike (B043117-MS1)**

Source: 0092629-01

Prepared: 10/21/2020 18:03, Analyzed: 10/21/2020 18:03

Total Alkalinity	331	4	mg/L	49.4	283	98.6	80-120			
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**Matrix Spike (B043117-MS2)**

Source: 0092635-01

Prepared: 10/21/2020 19:30, Analyzed: 10/21/2020 19:30

Total Alkalinity	301	4	mg/L	49.4	268	66.2	80-120			M3
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**Batch B043187 - Default Prep Wet Chem**

**Blank (B043187-BLK1)**

Prepared: 10/20/2020 15:36, Analyzed: 10/20/2020 15:36

Specific Conductance (Lab)	ND		1 umhos/cm							U
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**Conventional Chemistry Analyses Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043187 - Default Prep Wet Chem**

**LCS (B043187-BS1)**

Prepared: 10/20/2020 15:37, Analyzed: 10/20/2020 15:37

Specific Conductance (Lab)	1420		umhos/cm	1410		101	80-120			
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**Duplicate (B043187-DUP1) Source: 0092629-01**

Prepared: 10/20/2020 15:54, Analyzed: 10/20/2020 15:54

Specific Conductance (Lab)	2600	1	umhos/cm		2610			0.307	1.24	
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**Duplicate (B043187-DUP2) Source: 0102262-01**

Prepared: 10/20/2020 16:09, Analyzed: 10/20/2020 16:09

Specific Conductance (Lab)	354	1	umhos/cm		351			0.851	1.24	
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**Batch B043582 - Default Prep Wet Chem**

**Blank (B043582-BLK1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	ND	5	mg/L							U
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**LCS (B043582-BS1)**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:21

Chemical Oxygen Demand	121	5	mg/L	125		96.8	90-110			
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**Duplicate (B043582-DUP1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:32

Chemical Oxygen Demand	5	5	mg/L		ND				25	
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**Matrix Spike (B043582-MS1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	260	5	mg/L	250	ND	104	90-110			
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**Matrix Spike Dup (B043582-MSD1) Source: 0092635-01**

Prepared: 10/23/2020 13:24, Analyzed: 10/23/2020 15:33

Chemical Oxygen Demand	257	5	mg/L	250	ND	103	90-110	1.21	10	
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**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B043120 - Default Prep IC**

**Blank (B043120-BLK1)**

Prepared: 10/20/2020 15:45, Analyzed: 10/20/2020 15:45

Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U

**LCS (B043120-BS1)**

Prepared: 10/20/2020 15:27, Analyzed: 10/20/2020 15:27

Sulfate	9.4		mg/L	10.0		93.7	90-110			
Fluoride	9.42		mg/L	10.0		94.2	90-110			
Chloride	9.5		mg/L	10.0		95.4	90-110			

**Matrix Spike (B043120-MS1)**

Source: 0092620-01

Prepared: 10/20/2020 21:50, Analyzed: 10/20/2020 21:50

Fluoride	12.3		mg/L	10.0	0.00	123	80-120			M1
Sulfate	12.3		mg/L	10.0	0.05	122	80-120			M1
Chloride	12.4		mg/L	10.0	0.2	122	80-120			M1

**Matrix Spike Dup (B043120-MSD1)**

Source: 0092620-01

Prepared: 10/20/2020 22:07, Analyzed: 10/20/2020 22:07

Fluoride	11.7		mg/L	10.0	0.00	117	80-120	4.70	20	
Chloride	11.7		mg/L	10.0	0.2	115	80-120	5.59	10	
Sulfate	11.6		mg/L	10.0	0.05	116	80-120	5.62	20	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	



**Sample Acceptance Checklist for Work Order 0092620**

Shipped By: Other

Temperature: 1.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **09/07/2020**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419

Project: **Field Blank Wilson 092-00004**

Phone: (270) 844-6000

PWS ID#:

State:   KY  

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature):   *T. Ma...*    
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092620 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0092620-01 E	<u>10-17-20</u>	<u>11:55</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	Field Blank	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>  /  </u>			
0092620-01 F	<u>10-17-20</u>	<u>11:55</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	Field Blank	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>  /  </u>			
0092620-01 G	<u>10-17-20</u>	<u>11:55</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	Field Blank	g / c	Radium Total (sub)
			Preservation Check: pH :	<u>  /  </u>			
0092620-01 H	<u>10-17-20</u>	<u>11:55</u>	AG 250mL pH<2 w/H2SO4	1	Field Blank	g / c	TOC
			Preservation Check: pH :	<u>  /  </u>			

Preservation Check Performed by:   NDY  

Field data collected by: <u>  <i>T. Travis Sneed</i>  </u>	Date (mm/dd/yy) <u>  10-17-20  </u>	Time (24 hr) <u>  11:55  </u>
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
	Tot Cl (mg/L) _____	Free Cl (mg/L) _____
	DO (mg/L) _____	Turb. (NTU) _____

Relinquished by: (Signature) <u>  <i>T. Travis Sneed</i>  </u>	Received by: (Signature) <u>  <i>NDY</i>  </u>	Date (mm/dd/yy) <u>  10-14-20  </u>	Time (24 hr) <u>  0838  </u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody



Scheduled for: **09/07/2020**

Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
Big Rivers Electric Corporation Wilson Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419

Invoice To:  
Big Rivers Electric Corporation Wilson Station

Project: **Field Blank Wilson 092-00004**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

Brian Edwards  
PO Box 24  
Henderson, KY 42419

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Traavis Sneed*  
\*required information\*

Compliance Monitoring? Yes  No

Samples Chlorinated? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 0092620 Sample ID#	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
	Date (mm/dd/yy):	Collection Time (24 hr):					
0092620-01 A	<u>10-13-20</u>	<u>11:55</u>	Plastic 1L	1	Field Blank	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
0092620-01 B	<u>10-13-20</u>	<u>11:55</u>	Plastic 500mL pH<2 w/HNO3	1	Field Blank	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
0092620-01 C	<u>10-13-20</u>	<u>11:55</u>	Plastic 500mL pH<2 w/H2SO4	1	Field Blank	g / c	COD TOC
0092620-01 D	<u>10-13-20</u>	<u>11:55</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	Field Blank	g / c	Radium 226 (sub)

Preservation Check: pH:   
Preservation Check: pH:   
Preservation Check: pH:

Preservation Check Performed by: Noy

Field data collected by: Traavis Sneed Date (mm/dd/yy) 10-13-20 Time (24 hr) 11:55

pH \_\_\_\_\_ Cond (umho) \_\_\_\_\_ Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) \_\_\_\_\_ or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Traavis Sneed* Received by: (Signature) *MJG* Date (mm/dd/yy) 10-14-20 Time (24 hr) 0838

November 04, 2020

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 92620  
Pace Project No.: 30387814

Dear Rob Whittington:

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

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

- Pace Analytical Services - Greensburg

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 92620  
Pace Project No.: 30387814

### **Pace Analytical Services Pennsylvania**

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Florida: Cert E871149 SEKS WET  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 92620  
Pace Project No.: 30387814

<b>Lab ID</b>	<b>Sample ID</b>	<b>Matrix</b>	<b>Date Collected</b>	<b>Date Received</b>
30387814001	0092620-01	Water	10/13/20 11:55	10/15/20 09:25

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 92620  
Pace Project No.: 30387814

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30387814001	0092620-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 92620  
Pace Project No.: 30387814

**Sample: 0092620-01**      **Lab ID: 30387814001**      Collected: 10/13/20 11:55      Received: 10/15/20 09:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>-0.112 ± 0.268 (0.670)</b> <b>C:NA T:87%</b>	pCi/L	11/04/20 12:44	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.751 ± 0.479 (0.912)</b> <b>C:69% T:81%</b>	pCi/L	10/30/20 12:00	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.751 ± 0.747 (1.58)</b>	pCi/L	11/04/20 14:03	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92620  
Pace Project No.: 30387814

QC Batch: 419199	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387814001

METHOD BLANK: 2026443 Matrix: Water

Associated Lab Samples: 30387814001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0904 ± 0.280 (0.637) C:NA T:89%	pCi/L	11/04/20 12:44	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 92620  
Pace Project No.: 30387814

QC Batch: 419200	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30387814001

METHOD BLANK: 2026444 Matrix: Water

Associated Lab Samples: 30387814001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.598 ± 0.458 (0.907) C:69% T:82%	pCi/L	10/30/20 12:00	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 92620  
Pace Project No.: 30387814

### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody

Workorder: 92620      Workorder Name: Field Blank Wilson 092-00      Owner Received Date: 10/14/2020      Results Requested By:

Report To: \_\_\_\_\_ Subcontract To: \_\_\_\_\_ Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

**WO# : 30387814**  
  
**30387814**

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		LAB USE ONLY
						EPA 903.1	EPA 904.0 Radium Sum Calc	
1					Ground Water			
2	0092620-01		10/13/20 11:55	IR44-McCoy			X	
3								BB
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>[Signature]</i>	10/15/2025	
2					
3					

Cooler Temperature on Receipt 50W °C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N

\*\*\* In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC. This chain of custody is considered complete as is since this information is available in the owner laboratory.

**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**0092620**

# 30387814


**SENDING LABORATORY:**

Pace Analytical Services, LLC Kentucky  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Rob Whittington

**RECEIVING LABORATORY:**

Pace Analytical Services LLC Greensburg PA  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 Phone :(724) 850-5615  
 Fax:

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 0092620-01</b>	<b>Water</b>	<b>Sampled:10/13/2020 11:55</b>	<b>Specific Method</b>
Radium Total (sub)	04/11/2021 11:55	EPA 904.0 Radium Sum C	
Radium 228 (sub)	04/11/2021 11:55	EPA 904.0 Radium Sum C	
Radium 226 (sub)	04/11/2021 11:55	EPA 903.1	


10-14-20

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Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

---

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Madisonville

Project # 30387814

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3386 9238/9256/9271

Label BM  
LIMS Login BM

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 7.5/7.7 °C Correction Factor: -0.1 °C Final Temp: 7.4/7.4/7.7  
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents:
	Yes	No	N/A	
Chain of Custody Present:	/			10/16/20 <u>OB</u>  <u>no date/time on containers</u>  <u>PHV2</u>
Chain of Custody Filled Out:	/			
Chain of Custody Relinquished:	/			
Sampler Name & Signature on COC:		/		
Sample Labels match COC:		/		
-includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			
Short Hold Time Analysis (<72hr remaining):	/			
Rush Turn Around Time Requested:	/			
Sufficient Volume:	/			
Correct Containers Used:	/			
-Pace Containers Used:	/			
Containers Intact:	/			
Orthophosphate field filtered			/	
Hex Cr Aqueous sample field filtered			/	
Organic Samples checked for dechlorination:			/	
Filtered volume received for Dissolved tests			/	
All containers have been checked for preservation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				
All containers meet method preservation requirements.	/			
			Initial when completed <u>OB</u> Date/time of preservation	
			Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/	
Trip Blank Present:			/	
Trip Blank Custody Seals Present			/	
Rad Samples Screened < 0.5 mrem/hr	/			
			Initial when completed: <u>OB</u> Date: <u>10/16/20</u>	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

# Appendix C

## Statistical Evaluation

**WILSON PHASE II LANDFILL STATISTICAL ANALYSIS**  
**2020 Annual Groundwater Monitoring Report**

**1.0 INTRODUCTION**

Previous statistical analysis of Wilson Phase II Landfill groundwater monitoring data has indicated that certain 40 CFR Part 257 Appendix III constituents at downgradient monitoring wells MW-5, MW-6, MW-7, and MW-10 occur at statistically significant higher concentrations than in background monitoring well MW-8. Based on these results, assessment monitoring is conducted for both 40 CFR Part 257 Appendix III and IV parameters.

The 40 CFR Part 257 Appendix III and IV 2020 groundwater monitoring data at the Wilson Phase II Landfill were evaluated to determine the occurrence of any statistically significant increases over background (SSIs) and whether or not any of the SSIs for Appendix IV parameters occurred at a statistically significant level (SSL) above the groundwater protection standard as defined at 40 CFR.95(h).

**2.0 STATISTICAL ANALYSIS**

A determination of whether SSIs have occurred is required by 40 CFR 257.93(h)(2) for each semiannual monitoring event. The occurrence of SSIs was evaluated using an *interwell* prediction limit approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at the background monitoring well. For the Wilson Phase II Landfill, monitoring well MW-8 is designated as the background well, whereas monitoring wells MW-5, MW-6, MW-7, and MW-10 are designated downgradient detection monitoring wells.

The statistical analyses were performed in accordance with the U.S. Environmental Protection Agency's Final CCR Rule 40 CFR Parts 257.93(f), 257.93(g), and 257.93(h), the Groundwater Monitoring System and Statistical Methods Certification, and following guidance presented in ASTM D6312-17 *Standard Guide for Developing Appropriate Statistical Approaches for Ground-Water Detection Monitoring Programs*, and US EPA (2009) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. The test procedures were designed to balance facility-wide false positive rate and statistical power.

Site data are maintained in a Sanitas™ statistical evaluation database that was used to conduct the analyses presented herein.

**2.1 Prediction Limits**

Appropriate statistical prediction limits (PLs) were developed for each of the 21 Appendix III and Appendix IV monitoring constituents, as outline below, and followed the following general procedures.

1. Analytical Data Review
2. Goodness-of-Fit Testing
3. Perform adjustments to data based on the frequency on non-detect values
4. Comparison to interstation background

The background data set for the statistical analyses consisted of analytical measurements at MW-8 from April 2016 to April 2020 for the April monitoring event. The background utilized for the October September 2020 analysis was updated to include the data from that event.

**2.2 Analytical Data Review**

Analytical data were reviewed for consistency with historic data prior to any statistical evaluation. Background data were checked for high or low outliers that were removed following EPA (1989) procedures prior to statistical analysis. Outliers include some previous values with elevated detection limits.



### 2.2.1 Goodness-of-Fit Testing

Four types of background monitoring data sets.

1. Normally distributed (or transformed normal) data sets with the frequency of censored (non-detect) values less than 50 percent
2. Non-normal (or transformed non-normal) data sets with the frequency of censored values less than 50 percent
3. Data sets for which the population distribution is not known due to the frequency of censored values greater than 50 percent
4. Data consisting of 100 percent censored values

The appropriate statistical comparison depends on the type of data set under consideration. Parametric test procedures are utilized wherever possible to increase statistical power. In general, parametric tests are utilized where the data distribution may be assumed to be normal, or transformed normal (data set 1, above). Non-parametric procedures are used where data may not confidently be assumed to be normal (data set 2, above), or where the frequency of non-detect values precludes the testing of normality (data set 3, above). Finally, it is recognized that for 100 percent non-detect data (data set 4, above) no valid statistical comparison may be made, and comparisons must be made to fixed, arbitrary values, such as the analytical method detection or quantitation limit.

To determine the type of dataset, goodness-of-fit testing was performed on both the raw data and natural logarithm of the raw greater than detection limit values using the Shapiro-Wilk W-test as recommended by US EPA (1992) and Gilbert (1987). The tests were conducted at a 95 percent confidence level with outliers removed from the dataset.

Data sets that could not confidently be determined to be normally or log normally distributed were used to determine *nonparametric* prediction limits. Data that were normally or log normally distributed were considered as a basis for calculating *parametric* prediction limits, providing that the percentage of less than detection limit values was greater than 50 percent.

### 2.2.2 Adjustments to Data Based on the Frequency of Non-Detect Values

After goodness-of-fit testing was completed, the frequency of less than detection limit (left censored) values was evaluated. If the degree of left-censoring was greater than 15%, Aitchison's adjustment was used to obtain adjusted estimates of the sample mean and standard deviation. These adjusted values were then used to calculate the upper prediction limit for those data determined to be normally or log normally distributed during goodness-of-fit testing. For the statistical analysis, non-detect values were represented as one-half the detection limit.

If the degree of censoring is 50% to 100%, no method exists to reasonably estimate the sample mean and standard deviation. In this case, non-parametric procedures are utilized. If the degree of censoring is 100%, as is commonly the case with volatile organic compounds, no estimates of statistics can be calculated. In this case, a simple comparison to method reporting limit (RL) of the individual analyte is employed as the initial statistical evaluation.

### 2.2.3 Comparison to Background

Based on the results for goodness-of-fit testing and the degree of censoring of the various data sets, comparisons to background were made using prediction limit procedures (US EPA, 2009). Parametric prediction limits were utilized where the data may be assumed to be normally or log normally distributed.

If the data are determined to be not normal or log normal, or the frequency of non-detect values is greater than 50%, nonparametric upper prediction limits were calculated, as recommended by US EPA (2009).

The prediction limit comparisons balance statistical power and false positive rate, as recommended by US EPA (1992, 2009) and ASTM D6312-17 using verification resampling as discussed below.

## 2.2.4 False Positive Rate Control

A groundwater monitoring event involves a large number of individual statistical comparisons. For normal prediction limits, if the significance level of an individual statistical comparison (test) is  $\alpha$  (defined as the *per-test* false positive rate), the *annual* false positive rate ( $\alpha^*$ ) is given by (Gibbons 1994):

Equation 1

$$\alpha^* = 1 - (1-\alpha)^r$$

where,

$r$  = the number of annual statistical comparisons to be made  
(downgradient monitoring stations  $\times$  analytes  $\times$  events per year).

For a typical monitoring scenario, the per-test  $\alpha$  is held to a value *no less* than 0.01 (40 CFR 257.93(g)(2)). Limiting  $\alpha$  to the minimum value of 0.01 guards against an excessive false negative rate, or Type II error, but may result in too large an *event-wide* false positive rate. For each of the 2020 monitoring events there are 21 parameters requiring statistical evaluation (Table C1,  $c=21$ ). There are four downgradient detection monitoring wells in the evaluation (Table C1,  $w=4$ ). Assuming two annual statistical evaluations, one associated with each semiannual sample event ( $n_E=2$ ), the number of annual statistical comparisons ( $r$ ) is equal to  $c \times w \times n_E = 168$ . From Equation 1, the annual false positive rate for the two sampling events is about 0.82 (Table C1, Row 1). Thus, during each sampling year there would be about an 82 percent probability that a statistically significant result would be obtained even though no real statistical exceedance occurred.

To limit the annual false positive rate to 0.1, as suggested by EPA (2009) (or to a corresponding event-wide false positive rate of 0.05 for semiannual sampling per 40 CFR 257.93(g)(2)), Equation 1 indicates that individual tests would have to be conducted at a significance levels of about 0.00063 (Table C1, Row 2). Very large statistical limits would have to be employed, and the individual *false negative* rate would be unacceptably high at this significance level.

Alternatively, a *verification resampling* strategy is employed to limit the annual-wide false positive rate while maintaining adequate statistical power (EPA 1992, 2009; Gibbons 1994; ASTM 2017). A *statistically significant increase is not declared until both the original sample and some number of verification resamples fail the statistical test procedures*. For the case of one or two verification resampling events, and assuming independence of measurements,  $\alpha^*$  may be calculated as (EPA 2009):

Equation 2

$$\alpha^* = 1 - (1-\alpha^m)^r$$

where,

$m$  = the sum of the original sample and number of retest verification samples (1 or 2).

Passing any resample passes the statistical evaluation procedure.

Table C1 Row 3 illustrate a single resample strategy with the resample required to pass. Table C1 Row 4 Row 4 illustrate the case of two verification resamples with one of the two required to pass.

EPA (2009) and 40 CFR 257.93(g)(2) defines two criteria applicable to statistical analysis of groundwater monitoring data:

1. The per-event false positive rate ( $\alpha^*$ ) shall be no less than 0.05 per event, or 0.1 annually, and,
2. The per-test false positive rate ( $\alpha$ ) shall be no less than 0.01.

These criteria were deemed by EPA to provide acceptable balance between false positive rate control and statistical power and are used for this project. The single verification sample resampling strategy (Table C1, Row 3) fits the EPA criteria and minimizes sampling and analytical cost. A single verification resampling strategy (referred to as "Pass 1 of 2") using a per-test significance level of 0.02504 was

therefore used for this statistical analysis. An SSI does not occur unless the original sample and the verification resample both fail the statistical testing.

### 2.3 Comparison to Groundwater Protection Standard

Appendix IV well / constituents with SSIs indicated by the PL analysis were further evaluated to determine whether they are present at statistically significant levels (SSLs) over the groundwater protection standards (GWPSs). This evaluation was conducted by calculating the parametric or non-parametric 95% confidence limits for each well / constituent identified as an SSI using the baseline, detection, and assessment monitoring results collected to date. For a constituent to be present at an SSL over the GWPS, its 95% lower mean confidence limit must be greater than the GWPS.

### 3.0 RESULTS

Prediction limit results for the two 2020 sampling events are provided in Tables C2 (April) and C3 (October). Interwell exceedances of the relevant PL values are highlighted. Time series plots showing prediction limit results are provided for each downgradient well / parameter in Attachment 1 (April 22, 2020 event) and Attachment 2 (October 13 22 event). Plots in the attachments are arranged in the constituent order listed in the tables.

Comparison to groundwater protection standard results are provided in Tables C4 and C5.

#### 3.1 Exceedances of Background

The following SSIs were noted for the April 22 event (Table C2) with Appendix IV constituents shown in boldface.

MW-5	boron, calcium, chloride, <b>cobalt, lithium</b> , sulfate, total dissolved solids
MW-6	boron, calcium, chloride, <b>cobalt, lithium</b> , sulfate, total dissolved solids
MW-7	boron, calcium, chloride, <b>chromium, cobalt, lead, lithium</b> , pH (field), total dissolved solids
MW-10	boron, calcium, chloride, <b>cobalt</b> , sulfate, total dissolved solids

Similar results were noted for the October 13 event with exceedances for the following (Table C3).

MW-5	boron, calcium, chloride, <b>cobalt, lithium</b> , pH (field), sulfate, total dissolved solids
MW-6	boron, calcium, chloride, <b>cobalt, lead, lithium</b> , sulfate, total dissolved solids
MW-7	boron, calcium, chloride, <b>lithium</b> , total dissolved solids
MW-10	boron, calcium, chloride, <b>cobalt</b> , total dissolved solids

Results for exceedances of background were generally consistent between the two events and consistent with the 2019 results. A number of Appendix III parameters showed SSIs: boron (all wells), calcium (all wells), chloride (all wells), field pH (MW-5, MW-7), sulfate (MW-5, MW-6, MW-10), and total dissolved solids (all wells). The boron exceedances at MW-5, MW-6, and MW-10 were not noted in the November 2019 analysis because of the higher detection limits used for those analyses. The calcium SSIs at MW-7 did not occur in 2019. Inspection of the time series plot for this well suggests an increasing calcium trend in recent monitoring.

Appendix IV SSIs were largely similar to November 2019 with the exception of new SSIs for lead and chromium at MW-7 in April. Inspection of the time series plots for these analytes suggests anomalously high values were reported for the April event. These exceedances were not confirmed in the October event.

### 3.2 Comparison to Groundwater Protection Standards

Pursuant to 40 CFR 257.95(f) Appendix IV well / parameters with 2020 SSIs were further evaluated to determine whether they are present at a statistically significant level over the groundwater protection standard. This analysis was conducted by calculating the appropriate parametric or nonparametric 95 percent lower confidence limit (95% LCL) for each well / parameter identified as an SSI for each 2020 event.

The nine Appendix IV SSIs occurring in April are listed in Table C4 showing the 95% LCL computation results compared to the relevant GWPS. The seven Appendix IV SSIs occurring in October are similarly listed in Table C5. The only exceedances of GWPSs for either 2020 sampling event are for cobalt at MW-5, MW-6, and MW-10, and for lithium at MW-6. The exceedances for cobalt at MW-5 and MW-6 are new and not occur in 2019. Cobalt concentrations at these wells have recently been consistently above the GWPS and thereby increasing the 95% LCL values to points where they exceed the GWPS value of 6 ug/L.

For the assessment wells (MW-102, MW-104, MW-105, MW-110, and MW-4D) the only 2020 GWPS exceedances were for cobalt and lithium at MW-4D.

### 4.0 REFERENCES

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## Tables

**Table C1**  
**2020 Annual Monitoring Report**  
**BREC Wilson LF**  
**Calculation of False Positive Rates**

<i>Row Number</i>	<i>Number of Downgradient Stations (w)</i>	<i>Number of Constituents (c)</i>	<i>Number of Annual Evaluations (n<sub>E</sub>)</i>	<i>Number of Annual Comparisons (r = w x c x n<sub>E</sub>)</i>	<i>Target Annual False Positive Rate (α*)</i>	<i>Retest Strategy (1 of m)</i>	<i>Individual Comparison False Positive Rate (α)</i>
1	4	21	2	168	0.82	1	0.01016
2	4	21	2	168	0.1	1	0.00063
3	4	21	2	168	0.1	2	0.02504
4	4	21	2	168	0.1	3	0.08559

**Table C2: 2020 Annual Monitoring Report, BREC Wilson Landfill, April 2020 Prediction Limit Results**

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Antimony (mg/L)	MW-5	0.001	n/a	4/22/2020	0.001ND	No	13	MW-8	n/a	n/a	46.15	n/a	n/a	0.06487	NP Inter (xform)
Antimony (mg/L)	MW-6	0.001	n/a	4/22/2020	0.001ND	No	13	MW-8	n/a	n/a	46.15	n/a	n/a	0.06487	NP Inter (xform)
Antimony (mg/L)	MW-7	0.001	n/a	4/22/2020	0.001ND	No	13	MW-8	n/a	n/a	46.15	n/a	n/a	0.06487	NP Inter (xform)
Antimony (mg/L)	MW-10	0.001	n/a	4/22/2020	0.001ND	No	13	MW-8	n/a	n/a	46.15	n/a	n/a	0.06487	NP Inter (xform)
Arsenic (ug/L)	MW-5	9.588	n/a	4/22/2020	2.5	No	14	MW-8	1.844	0.1862	0	None	ln(x)	0.02504	Param Inter
Arsenic (ug/L)	MW-6	9.588	n/a	4/22/2020	5	No	14	MW-8	1.844	0.1862	0	None	ln(x)	0.02504	Param Inter
Arsenic (ug/L)	MW-7	9.588	n/a	4/22/2020	7.5	No	14	MW-8	1.844	0.1862	0	None	ln(x)	0.02504	Param Inter
Arsenic (ug/L)	MW-10	9.588	n/a	4/22/2020	1.1	No	14	MW-8	1.844	0.1862	0	None	ln(x)	0.02504	Param Inter
Barium (ug/L)	MW-5	26.93	n/a	4/22/2020	11	No	13	MW-8	22.18	2.102	0	None	No	0.02504	Param Inter
Barium (ug/L)	MW-6	26.93	n/a	4/22/2020	12	No	13	MW-8	22.18	2.102	0	None	No	0.02504	Param Inter
Barium (ug/L)	MW-7	26.93	n/a	4/22/2020	25	No	13	MW-8	22.18	2.102	0	None	No	0.02504	Param Inter
Barium (ug/L)	MW-10	26.93	n/a	4/22/2020	8	No	13	MW-8	22.18	2.102	0	None	No	0.02504	Param Inter
Beryllium (ug/L)	MW-5	1	n/a	4/22/2020	0.5ND	No	11	MW-8	n/a	n/a	100	n/a	n/a	0.07461	NP Inter (NDs)
Beryllium (ug/L)	MW-6	1	n/a	4/22/2020	0.5ND	No	11	MW-8	n/a	n/a	100	n/a	n/a	0.07461	NP Inter (NDs)
Beryllium (ug/L)	MW-7	1	n/a	4/22/2020	0.5ND	No	11	MW-8	n/a	n/a	100	n/a	n/a	0.07461	NP Inter (NDs)
Beryllium (ug/L)	MW-10	1	n/a	4/22/2020	0.5ND	No	11	MW-8	n/a	n/a	100	n/a	n/a	0.07461	NP Inter (NDs)
<b>Boron (ug/L)</b>	<b>MW-5</b>	<b>54.67</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>660</b>	<b>Yes</b>	<b>11</b>	<b>MW-8</b>	<b>41.55</b>	<b>5.644</b>	<b>9.091</b>	<b>None</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Boron (ug/L)</b>	<b>MW-6</b>	<b>54.67</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>310</b>	<b>Yes</b>	<b>11</b>	<b>MW-8</b>	<b>41.55</b>	<b>5.644</b>	<b>9.091</b>	<b>None</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Boron (ug/L)</b>	<b>MW-7</b>	<b>54.67</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>1580</b>	<b>Yes</b>	<b>11</b>	<b>MW-8</b>	<b>41.55</b>	<b>5.644</b>	<b>9.091</b>	<b>None</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Boron (ug/L)</b>	<b>MW-10</b>	<b>54.67</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>280</b>	<b>Yes</b>	<b>11</b>	<b>MW-8</b>	<b>41.55</b>	<b>5.644</b>	<b>9.091</b>	<b>None</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
Cadmium (ug/L)	MW-5	0.1	n/a	4/22/2020	0.05ND	No	11	MW-8	n/a	n/a	100	n/a	n/a	0.07461	NP Inter (NDs)
Cadmium (ug/L)	MW-6	0.1	n/a	4/22/2020	0.05ND	No	11	MW-8	n/a	n/a	100	n/a	n/a	0.07461	NP Inter (NDs)
Cadmium (ug/L)	MW-7	0.1	n/a	4/22/2020	0.05ND	No	11	MW-8	n/a	n/a	100	n/a	n/a	0.07461	NP Inter (NDs)
Cadmium (ug/L)	MW-10	0.1	n/a	4/22/2020	0.05ND	No	11	MW-8	n/a	n/a	100	n/a	n/a	0.07461	NP Inter (NDs)
<b>Calcium (ug/L)</b>	<b>MW-5</b>	<b>329000</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>600000</b>	<b>Yes</b>	<b>14</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0609</b>	<b>NP Inter</b>
<b>Calcium (ug/L)</b>	<b>MW-6</b>	<b>329000</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>511000</b>	<b>Yes</b>	<b>14</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0609</b>	<b>NP Inter</b>
<b>Calcium (ug/L)</b>	<b>MW-7</b>	<b>329000</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>369000</b>	<b>Yes</b>	<b>14</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0609</b>	<b>NP Inter</b>
<b>Calcium (ug/L)</b>	<b>MW-10</b>	<b>329000</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>415000</b>	<b>Yes</b>	<b>14</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0609</b>	<b>NP Inter</b>
Chloride (mg/L)	MW-5	5.534	n/a	4/22/2020	208	Yes	14	MW-8	4.466	0.4774	0	None	No	0.02504	Param Inter
Chloride (mg/L)	MW-6	5.534	n/a	4/22/2020	10.2	Yes	14	MW-8	4.466	0.4774	0	None	No	0.02504	Param Inter
Chloride (mg/L)	MW-7	5.534	n/a	4/22/2020	40	Yes	14	MW-8	4.466	0.4774	0	None	No	0.02504	Param Inter
Chloride (mg/L)	MW-10	5.534	n/a	4/22/2020	68.6	Yes	14	MW-8	4.466	0.4774	0	None	No	0.02504	Param Inter
Chromium (ug/L)	MW-5	1.14	n/a	4/22/2020	0.3ND	No	12	MW-8	n/a	n/a	50	n/a	n/a	0.0694	NP Inter
Chromium (ug/L)	MW-6	1.14	n/a	4/22/2020	0.3ND	No	12	MW-8	n/a	n/a	50	n/a	n/a	0.0694	NP Inter
<b>Chromium (ug/L)</b>	<b>MW-7</b>	<b>1.14</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>5.3</b>	<b>Yes</b>	<b>12</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>50</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0694</b>	<b>NP Inter</b>
Chromium (ug/L)	MW-10	1.14	n/a	4/22/2020	0.3ND	No	12	MW-8	n/a	n/a	50	n/a	n/a	0.0694	NP Inter
<b>Cobalt (ug/L)</b>	<b>MW-5</b>	<b>1.669</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>8</b>	<b>Yes</b>	<b>14</b>	<b>MW-8</b>	<b>1.082</b>	<b>0.2627</b>	<b>28.57</b>	<b>Kaplan-Meie</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Cobalt (ug/L)</b>	<b>MW-6</b>	<b>1.669</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>9</b>	<b>Yes</b>	<b>14</b>	<b>MW-8</b>	<b>1.082</b>	<b>0.2627</b>	<b>28.57</b>	<b>Kaplan-Meie</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Cobalt (ug/L)</b>	<b>MW-7</b>	<b>1.669</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>6</b>	<b>Yes</b>	<b>14</b>	<b>MW-8</b>	<b>1.082</b>	<b>0.2627</b>	<b>28.57</b>	<b>Kaplan-Meie</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Cobalt (ug/L)</b>	<b>MW-10</b>	<b>1.669</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>82</b>	<b>Yes</b>	<b>14</b>	<b>MW-8</b>	<b>1.082</b>	<b>0.2627</b>	<b>28.57</b>	<b>Kaplan-Meie</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
Fluoride (mg/L)	MW-5	1.21	n/a	4/22/2020	0.09ND	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Fluoride (mg/L)	MW-6	1.21	n/a	4/22/2020	0.21	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Fluoride (mg/L)	MW-7	1.21	n/a	4/22/2020	0.27	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Fluoride (mg/L)	MW-10	1.21	n/a	4/22/2020	0.09ND	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Lead (ug/L)	MW-5	0.5	n/a	43943	0.25ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter
Lead (ug/L)	MW-6	0.5	n/a	43943	0.5	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter
<b>Lead (ug/L)</b>	<b>MW-7</b>	<b>0.5</b>	<b>n/a</b>	<b>4/22/2020</b>	<b>4</b>	<b>Yes</b>	<b>12</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>83.33</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0694</b>	<b>NP Inter</b>
Lead (ug/L)	MW-10	0.5	n/a	43943	0.25ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter

**Table C2: 2020 Annual Monitoring Report, BREC Wilson Landfill, April 2020 Prediction Limit Results**

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Lithium (ug/L)	MW-5	15.48	n/a	4/22/2020	30	Yes	14	MW-8	10.35	2.293	28.57	Kaplan-Meier	No	0.02504	Param Inter
Lithium (ug/L)	MW-6	15.48	n/a	4/22/2020	40	Yes	14	MW-8	10.35	2.293	28.57	Kaplan-Meier	No	0.02504	Param Inter
Lithium (ug/L)	MW-7	15.48	n/a	4/22/2020	30	Yes	14	MW-8	10.35	2.293	28.57	Kaplan-Meier	No	0.02504	Param Inter
Lithium (ug/L)	MW-10	15.48	n/a	4/22/2020	6	No	14	MW-8	10.35	2.293	28.57	Kaplan-Meier	No	0.02504	Param Inter
Mercury (ug/L)	MW-5	0.2	n/a	4/22/2020	0.1ND	No	12	MW-8	n/a	n/a	100	n/a	n/a	0.0694	NP Inter (NDs)
Mercury (ug/L)	MW-6	0.2	n/a	4/22/2020	0.1ND	No	12	MW-8	n/a	n/a	100	n/a	n/a	0.0694	NP Inter (NDs)
Mercury (ug/L)	MW-7	0.2	n/a	4/22/2020	0.1ND	No	12	MW-8	n/a	n/a	100	n/a	n/a	0.0694	NP Inter (NDs)
Mercury (ug/L)	MW-10	0.2	n/a	4/22/2020	0.1ND	No	12	MW-8	n/a	n/a	100	n/a	n/a	0.0694	NP Inter (NDs)
Molybdenum (ug/L)	MW-5	20.3	n/a	4/22/2020	4	No	14	MW-8	13.96	2.836	0	None	No	0.02504	Param Inter
Molybdenum (ug/L)	MW-6	20.3	n/a	4/22/2020	6	No	14	MW-8	13.96	2.836	0	None	No	0.02504	Param Inter
Molybdenum (ug/L)	MW-7	20.3	n/a	4/22/2020	3	No	14	MW-8	13.96	2.836	0	None	No	0.02504	Param Inter
Molybdenum (ug/L)	MW-10	20.3	n/a	4/22/2020	1ND	No	14	MW-8	13.96	2.836	0	None	No	0.02504	Param Inter
pH [Field] (SU)	MW-5	6.795	5.952	4/30/2020	6.71	No	14	MW-8	6.374	0.1607	0	None	No	0.01252	Param Inter
pH [Field] (SU)	MW-6	6.795	5.952	4/22/2020	6.21	No	14	MW-8	6.374	0.1607	0	None	No	0.01252	Param Inter
pH [Field] (SU)	MW-7	6.795	5.952	4/22/2020	6.9	Yes	14	MW-8	6.374	0.1607	0	None	No	0.01252	Param Inter
pH [Field] (SU)	MW-10	6.795	5.952	4/22/2020	6.26	No	14	MW-8	6.374	0.1607	0	None	No	0.01252	Param Inter
Radium 226 + 228 (pCi/L)	MW-5	2.8	n/a	4/22/2020	1.22	No	13	MW-8	n/a	n/a	0	n/a	n/a	0.06487	NP Inter
Radium 226 + 228 (pCi/L)	MW-6	2.8	n/a	4/22/2020	0.804	No	13	MW-8	n/a	n/a	0	n/a	n/a	0.06487	NP Inter
Radium 226 + 228 (pCi/L)	MW-7	2.8	n/a	4/22/2020	1.05	No	13	MW-8	n/a	n/a	0	n/a	n/a	0.06487	NP Inter
Radium 226 + 228 (pCi/L)	MW-10	2.8	n/a	4/22/2020	0.414	No	13	MW-8	n/a	n/a	0	n/a	n/a	0.06487	NP Inter
Selenium (ug/L)	MW-5	0.501	n/a	4/22/2020	0.5ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter
Selenium (ug/L)	MW-6	0.501	n/a	4/22/2020	0.5ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter
Selenium (ug/L)	MW-7	0.501	n/a	4/22/2020	0.5ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter
Selenium (ug/L)	MW-10	0.501	n/a	4/22/2020	0.5ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter
Sulfate (mg/L)	MW-5	1480	n/a	4/22/2020	2820	Yes	14	MW-8	n/a	n/a	0	n/a	n/a	0.0609	NP Inter
Sulfate (mg/L)	MW-6	1480	n/a	4/22/2020	2370	Yes	14	MW-8	n/a	n/a	0	n/a	n/a	0.0609	NP Inter
Sulfate (mg/L)	MW-7	1480	n/a	4/22/2020	1310	No	14	MW-8	n/a	n/a	0	n/a	n/a	0.0609	NP Inter
Sulfate (mg/L)	MW-10	1480	n/a	4/22/2020	3580	Yes	14	MW-8	n/a	n/a	0	n/a	n/a	0.0609	NP Inter
Thallium (ug/L)	MW-5	0.1	n/a	4/22/2020	0.05ND	No	12	MW-8	n/a	n/a	91.67	n/a	n/a	0.0694	NP Inter
Thallium (ug/L)	MW-6	0.1	n/a	4/22/2020	0.05ND	No	12	MW-8	n/a	n/a	91.67	n/a	n/a	0.0694	NP Inter
Thallium (ug/L)	MW-7	0.1	n/a	4/22/2020	0.05ND	No	12	MW-8	n/a	n/a	91.67	n/a	n/a	0.0694	NP Inter
Thallium (ug/L)	MW-10	0.1	n/a	4/22/2020	0.05ND	No	12	MW-8	n/a	n/a	91.67	n/a	n/a	0.0694	NP Inter
Total Dissolved Solids (mg/L)	MW-5	1691	n/a	4/22/2020	3460	Yes	14	MW-8	1559	58.9	0	None	No	0.02504	Param Inter
Total Dissolved Solids (mg/L)	MW-6	1691	n/a	4/22/2020	2750	Yes	14	MW-8	1559	58.9	0	None	No	0.02504	Param Inter
Total Dissolved Solids (mg/L)	MW-7	1691	n/a	4/22/2020	1910	Yes	14	MW-8	1559	58.9	0	None	No	0.02504	Param Inter
Total Dissolved Solids (mg/L)	MW-10	1691	n/a	4/22/2020	3170	Yes	14	MW-8	1559	58.9	0	None	No	0.02504	Param Inter

Notes:

Concentration units are as specified in Column 1.

mg/L - milligram per liter

ug/L - microgram per liter

Inter - Parametric interstation prediction limit

n/a - not applicable

ND - Compound not detected, preceding number is one-half the reporting limit.

NP Inter - Non-parametric interstation prediction limit. Text in parenthesis indicates reason for non-parametric determination, as follows.

NDs - background data contain too high a percentage of non-detect values.

Param - Parametric Prediction Limit



**Table C3: 2020 Annual Monitoring Report, BREC Wilson Landfill, October 2020 Prediction Limit Results**

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Antimony (mg/L)	MW-5	0.001	n/a	10/13/2020	0.001ND	No	14	MW-8	n/a	n/a	50	n/a	n/a	0.0609	NP Inter (xform)
Antimony (mg/L)	MW-6	0.001	n/a	10/13/2020	0.001ND	No	14	MW-8	n/a	n/a	50	n/a	n/a	0.0609	NP Inter (xform)
Antimony (mg/L)	MW-7	0.001	n/a	10/13/2020	0.001ND	No	14	MW-8	n/a	n/a	50	n/a	n/a	0.0609	NP Inter (xform)
Antimony (mg/L)	MW-10	0.001	n/a	10/13/2020	0.001ND	No	14	MW-8	n/a	n/a	50	n/a	n/a	0.0609	NP Inter (xform)
Arsenic (ug/L)	MW-5	9.588	n/a	10/13/2020	2.9	No	14	MW-8	1.844	0.1862	0	None	ln(x)	0.02504	Param Inter
Arsenic (ug/L)	MW-6	9.588	n/a	10/13/2020	5.4	No	14	MW-8	1.844	0.1862	0	None	ln(x)	0.02504	Param Inter
Arsenic (ug/L)	MW-7	9.588	n/a	10/13/2020	3.6	No	14	MW-8	1.844	0.1862	0	None	ln(x)	0.02504	Param Inter
Arsenic (ug/L)	MW-10	9.588	n/a	10/13/2020	0.9	No	14	MW-8	1.844	0.1862	0	None	ln(x)	0.02504	Param Inter
Barium (ug/L)	MW-5	26.93	n/a	10/13/2020	11	No	13	MW-8	22.18	2.102	0	None	No	0.02504	Param Inter
Barium (ug/L)	MW-6	26.93	n/a	10/13/2020	13	No	13	MW-8	22.18	2.102	0	None	No	0.02504	Param Inter
Barium (ug/L)	MW-7	26.93	n/a	10/13/2020	13	No	13	MW-8	22.18	2.102	0	None	No	0.02504	Param Inter
Barium (ug/L)	MW-10	26.93	n/a	10/13/2020	10	No	13	MW-8	22.18	2.102	0	None	No	0.02504	Param Inter
Beryllium (ug/L)	MW-5	1	n/a	10/13/2020	0.5ND	No	13	MW-8	n/a	n/a	100	n/a	n/a	0.06487	NP Inter
Beryllium (ug/L)	MW-6	1	n/a	10/13/2020	0.5ND	No	13	MW-8	n/a	n/a	100	n/a	n/a	0.06487	NP Inter
Beryllium (ug/L)	MW-7	1	n/a	10/13/2020	0.5ND	No	13	MW-8	n/a	n/a	100	n/a	n/a	0.06487	NP Inter
Beryllium (ug/L)	MW-10	1	n/a	10/13/2020	0.5ND	No	13	MW-8	n/a	n/a	100	n/a	n/a	0.06487	NP Inter
<b>Boron (ug/L)</b>	<b>MW-5</b>	<b>51.8</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>690</b>	<b>Yes</b>	<b>13</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>15.38</b>	<b>n/a</b>	<b>n/a</b>	<b>0.06487</b>	<b>NP Inter</b>
<b>Boron (ug/L)</b>	<b>MW-6</b>	<b>51.8</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>340</b>	<b>Yes</b>	<b>13</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>15.38</b>	<b>n/a</b>	<b>n/a</b>	<b>0.06487</b>	<b>NP Inter</b>
<b>Boron (ug/L)</b>	<b>MW-7</b>	<b>51.8</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>2260</b>	<b>Yes</b>	<b>13</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>15.38</b>	<b>n/a</b>	<b>n/a</b>	<b>0.06487</b>	<b>NP Inter</b>
<b>Boron (ug/L)</b>	<b>MW-10</b>	<b>51.8</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>390</b>	<b>Yes</b>	<b>13</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>15.38</b>	<b>n/a</b>	<b>n/a</b>	<b>0.06487</b>	<b>NP Inter</b>
Cadmium (ug/L)	MW-5	0.4	n/a	10/13/2020	0.05ND	No	12	MW-8	n/a	n/a	91.67	n/a	n/a	0.0694	NP Inter (NDs)
Cadmium (ug/L)	MW-6	0.4	n/a	10/13/2020	0.05ND	No	12	MW-8	n/a	n/a	91.67	n/a	n/a	0.0694	NP Inter (NDs)
Cadmium (ug/L)	MW-7	0.4	n/a	10/13/2020	0.05ND	No	12	MW-8	n/a	n/a	91.67	n/a	n/a	0.0694	NP Inter (NDs)
Cadmium (ug/L)	MW-10	0.4	n/a	10/13/2020	0.05ND	No	12	MW-8	n/a	n/a	91.67	n/a	n/a	0.0694	NP Inter (NDs)
<b>Calcium (ug/L)</b>	<b>MW-5</b>	<b>329000</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>571000</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.05738</b>	<b>NP Inter</b>
<b>Calcium (ug/L)</b>	<b>MW-6</b>	<b>329000</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>483000</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.05738</b>	<b>NP Inter</b>
<b>Calcium (ug/L)</b>	<b>MW-7</b>	<b>329000</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>350000</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.05738</b>	<b>NP Inter</b>
<b>Calcium (ug/L)</b>	<b>MW-10</b>	<b>329000</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>404000</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.05738</b>	<b>NP Inter</b>
Chloride (mg/L)	MW-5	5.524	n/a	10/13/2020	199	Yes	15	MW-8	4.415	0.5008	0	None	No	0.02504	Param Inter
Chloride (mg/L)	MW-6	5.524	n/a	10/13/2020	18.9	Yes	15	MW-8	4.415	0.5008	0	None	No	0.02504	Param Inter
Chloride (mg/L)	MW-7	5.524	n/a	10/13/2020	45	Yes	15	MW-8	4.415	0.5008	0	None	No	0.02504	Param Inter
Chloride (mg/L)	MW-10	5.524	n/a	10/13/2020	89.2	Yes	15	MW-8	4.415	0.5008	0	None	No	0.02504	Param Inter
Chromium (ug/L)	MW-5	2.5	n/a	10/13/2020	0.3ND	No	13	MW-8	n/a	n/a	53.85	n/a	n/a	0.06487	NP Inter (NDs)
Chromium (ug/L)	MW-6	2.5	n/a	10/13/2020	0.7	No	13	MW-8	n/a	n/a	53.85	n/a	n/a	0.06487	NP Inter (NDs)
Chromium (ug/L)	MW-7	2.5	n/a	10/13/2020	0.3ND	No	13	MW-8	n/a	n/a	53.85	n/a	n/a	0.06487	NP Inter (NDs)
Chromium (ug/L)	MW-10	2.5	n/a	10/13/2020	0.7	No	13	MW-8	n/a	n/a	53.85	n/a	n/a	0.06487	NP Inter (NDs)
<b>Cobalt (ug/L)</b>	<b>MW-5</b>	<b>2.034</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>10</b>	<b>Yes</b>	<b>13</b>	<b>MW-8</b>	<b>0.8324</b>	<b>0.5317</b>	<b>23.08</b>	<b>Aitchison's</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Cobalt (ug/L)</b>	<b>MW-6</b>	<b>2.034</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>9</b>	<b>Yes</b>	<b>13</b>	<b>MW-8</b>	<b>0.8324</b>	<b>0.5317</b>	<b>23.08</b>	<b>Aitchison's</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
Cobalt (ug/L)	MW-7	2.034	n/a	10/13/2020	2ND	No	13	MW-8	0.8324	0.5317	23.08	Aitchison's	No	0.02504	Param Inter
<b>Cobalt (ug/L)</b>	<b>MW-10</b>	<b>2.034</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>78</b>	<b>Yes</b>	<b>13</b>	<b>MW-8</b>	<b>0.8324</b>	<b>0.5317</b>	<b>23.08</b>	<b>Aitchison's</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
Fluoride (mg/L)	MW-5	1.21	n/a	10/13/2020	0.09ND	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Fluoride (mg/L)	MW-6	1.21	n/a	10/13/2020	0.09ND	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Fluoride (mg/L)	MW-7	1.21	n/a	10/13/2020	0.22	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Fluoride (mg/L)	MW-10	1.21	n/a	10/13/2020	0.09ND	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Lead (ug/L)	MW-5	0.5	n/a	10/13/2020	0.25ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter
<b>Lead (ug/L)</b>	<b>MW-6</b>	<b>0.5</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>0.6</b>	<b>Yes</b>	<b>12</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>83.33</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0694</b>	<b>NP Inter</b>
Lead (ug/L)	MW-7	0.5	n/a	10/13/2020	0.25ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter
Lead (ug/L)	MW-10	0.5	n/a	10/13/2020	0.25ND	No	12	MW-8	n/a	n/a	83.33	n/a	n/a	0.0694	NP Inter

**Table C3: 2020 Annual Monitoring Report, BREC Wilson Landfill, October 2020 Prediction Limit Results**

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
<b>Lithium (ug/L)</b>	<b>MW-5</b>	<b>22.69</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>30</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>8.947</b>	<b>6.205</b>	<b>26.67</b>	<b>Aitchison's</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Lithium (ug/L)</b>	<b>MW-6</b>	<b>22.69</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>40</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>8.947</b>	<b>6.205</b>	<b>26.67</b>	<b>Aitchison's</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Lithium (ug/L)</b>	<b>MW-7</b>	<b>22.69</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>30</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>8.947</b>	<b>6.205</b>	<b>26.67</b>	<b>Aitchison's</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
Lithium (ug/L)	MW-10	22.69	n/a	10/13/2020	8	No	15	MW-8	8.947	6.205	26.67	Aitchison's	No	0.02504	Param Inter
Mercury (ug/L)	MW-5	0.2	n/a	10/13/2020	0.1ND	No	13	MW-8	n/a	n/a	100	n/a	n/a	0.06487	NP Inter (NDs)
Mercury (ug/L)	MW-6	0.2	n/a	10/13/2020	0.1ND	No	13	MW-8	n/a	n/a	100	n/a	n/a	0.06487	NP Inter (NDs)
Mercury (ug/L)	MW-7	0.2	n/a	10/13/2020	0.1ND	No	13	MW-8	n/a	n/a	100	n/a	n/a	0.06487	NP Inter (NDs)
Mercury (ug/L)	MW-10	0.2	n/a	10/13/2020	0.1ND	No	13	MW-8	n/a	n/a	100	n/a	n/a	0.06487	NP Inter (NDs)
Molybdenum (ug/L)	MW-5	20.16	n/a	10/13/2020	4	No	15	MW-8	13.7	2.918	0	None	No	0.02504	Param Inter
Molybdenum (ug/L)	MW-6	20.16	n/a	10/13/2020	7	No	15	MW-8	13.7	2.918	0	None	No	0.02504	Param Inter
Molybdenum (ug/L)	MW-7	20.16	n/a	10/13/2020	5	No	15	MW-8	13.7	2.918	0	None	No	0.02504	Param Inter
Molybdenum (ug/L)	MW-10	20.16	n/a	10/13/2020	1ND	No	15	MW-8	13.7	2.918	0	None	No	0.02504	Param Inter
<b>pH [Field] (SU)</b>	<b>MW-5</b>	<b>6.804</b>	<b>5.967</b>	<b>10/13/2020</b>	<b>5.95</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>6.385</b>	<b>0.1615</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01252</b>	<b>Param Inter</b>
pH [Field] (SU)	MW-6	6.804	5.967	10/13/2020	6.72	No	15	MW-8	6.385	0.1615	0	None	No	0.01252	Param Inter
pH [Field] (SU)	MW-7	6.804	5.967	10/13/2020	6.02	No	15	MW-8	6.385	0.1615	0	None	No	0.01252	Param Inter
pH [Field] (SU)	MW-10	6.804	5.967	10/13/2020	6.16	No	15	MW-8	6.385	0.1615	0	None	No	0.01252	Param Inter
Radium 226 + 228 (pCi/L)	MW-5	2.94	n/a	10/13/2020	1.7	No	14	MW-8	n/a	n/a	0	n/a	n/a	0.0609	NP Inter
Radium 226 + 228 (pCi/L)	MW-6	2.94	n/a	10/13/2020	0.568	No	14	MW-8	n/a	n/a	0	n/a	n/a	0.0609	NP Inter
Radium 226 + 228 (pCi/L)	MW-7	2.94	n/a	10/13/2020	0.967	No	14	MW-8	n/a	n/a	0	n/a	n/a	0.0609	NP Inter
Radium 226 + 228 (pCi/L)	MW-10	2.94	n/a	10/13/2020	0.944	No	14	MW-8	n/a	n/a	0	n/a	n/a	0.0609	NP Inter
Selenium (ug/L)	MW-5	0.501	n/a	10/13/2020	0.5ND	No	13	MW-8	n/a	n/a	84.62	n/a	n/a	0.06487	NP Inter
Selenium (ug/L)	MW-6	0.501	n/a	10/13/2020	0.5ND	No	13	MW-8	n/a	n/a	84.62	n/a	n/a	0.06487	NP Inter
Selenium (ug/L)	MW-7	0.501	n/a	10/13/2020	0.5ND	No	13	MW-8	n/a	n/a	84.62	n/a	n/a	0.06487	NP Inter
Selenium (ug/L)	MW-10	0.501	n/a	10/13/2020	0.5ND	No	13	MW-8	n/a	n/a	84.62	n/a	n/a	0.06487	NP Inter
<b>Sulfate (mg/L)</b>	<b>MW-5</b>	<b>1480</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>1800</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.05738</b>	<b>NP Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-6</b>	<b>1480</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>1750</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.05738</b>	<b>NP Inter</b>
Sulfate (mg/L)	MW-7	1480	n/a	10/13/2020	1050	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Sulfate (mg/L)	MW-10	1480	n/a	10/13/2020	1380	No	15	MW-8	n/a	n/a	0	n/a	n/a	0.05738	NP Inter
Thallium (ug/L)	MW-5	0.2	n/a	10/13/2020	0.05ND	No	13	MW-8	n/a	n/a	84.62	n/a	n/a	0.06487	NP Inter
Thallium (ug/L)	MW-6	0.2	n/a	10/13/2020	0.05ND	No	13	MW-8	n/a	n/a	84.62	n/a	n/a	0.06487	NP Inter
Thallium (ug/L)	MW-7	0.2	n/a	10/13/2020	0.05ND	No	13	MW-8	n/a	n/a	84.62	n/a	n/a	0.06487	NP Inter
Thallium (ug/L)	MW-10	0.2	n/a	10/13/2020	0.05ND	No	13	MW-8	n/a	n/a	84.62	n/a	n/a	0.06487	NP Inter
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-5</b>	<b>1711</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>3770</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>1567</b>	<b>64.75</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-6</b>	<b>1711</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>3030</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>1567</b>	<b>64.75</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-7</b>	<b>1711</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>1950</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>1567</b>	<b>64.75</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>
<b>Total Dissolved Solids (mg/L)</b>	<b>MW-10</b>	<b>1711</b>	<b>n/a</b>	<b>10/13/2020</b>	<b>3290</b>	<b>Yes</b>	<b>15</b>	<b>MW-8</b>	<b>1567</b>	<b>64.75</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.02504</b>	<b>Param Inter</b>

Notes:

Concentration units are as specified in Column 1.

mg/L - milligram per liter

ug/L - microgram per liter

Inter - Parametric interstation prediction limit

n/a - not applicable

ND - Compound not detected, preceding number is one-half the reporting limit.

NP Inter - Non-parametric interstation prediction limit. Text in parenthesis indicates reason for non-parametric determination, as follows.

NDs - background data contain too high a percentage of non-detect values.

Param - Parametric Prediction Limit

**Table C4: 2020 Annual Monitoring Report, BREC Wilson Landfill, April 2020 Comparison of 95% LCL to GWPS**

Constituent Name	Well	Upper Limit	Lower Limit	GWPS	Exceeds	N	Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transform	Alpha	Method
Chromium (ug/L)	MW-7	2.5	0.1695	100	No	13	2.992	6.706	61.54	None	No	0.05	NP (NDs)
<b>Cobalt (ug/L)</b>	<b>MW-5</b>	<b>7.74</b>	<b>6.333</b>	<b>6</b>	<b>Yes</b>	<b>14</b>	<b>7.036</b>	<b>1.486</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Cobalt (ug/L)</b>	<b>MW-6</b>	<b>7.484</b>	<b>6.578</b>	<b>6</b>	<b>Yes</b>	<b>14</b>	<b>7.031</b>	<b>0.957</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Cobalt (ug/L)	MW-7	5.418	3.834	6	No	14	4.626	1.673	7.143	None	No	0.05	Param.
<b>Cobalt (ug/L)</b>	<b>MW-10</b>	<b>117.4</b>	<b>87.48</b>	<b>6</b>	<b>Yes</b>	<b>14</b>	<b>102.5</b>	<b>31.65</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Lead (ug/L)	MW-7	0.25	0.03375	15	No	13	0.4612	1.097	69.23	None	No	0.05	NP (NDs)
Lithium (ug/L)	MW-5	38.92	32.56	40	No	14	35.74	6.719	0	None	No	0.05	Param.
<b>Lithium (ug/L)</b>	<b>MW-6</b>	<b>47.12</b>	<b>42.26</b>	<b>40</b>	<b>Yes</b>	<b>14</b>	<b>44.69</b>	<b>5.137</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Lithium (ug/L)	MW-7	29.01	25.88	40	No	14	27.44	3.31	0	None	No	0.05	Param.

Notes:

Concentration units are as specified in Column 1.

ug/L - microgram per liter

ln(x) - logarithmic transform applied

NP - Non-parametric Confidence Limit

Param - Parametric Confidence Limit

**Table C5: 2020 Annual Monitoring Report, BREC Wilson Landfill, October 2020 Comparison of 95% LCL to GWPS**

Constituent Name	Well	Upper Limit	Lower Limit	GWPS	Exceeds	N	Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transform	Alpha	Method
<b>Cobalt (ug/L)</b>	<b>MW-5</b>	<b>7.972</b>	<b>6.496</b>	<b>6</b>	<b>Yes</b>	<b>15</b>	<b>7.234</b>	<b>1.623</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Cobalt (ug/L)</b>	<b>MW-6</b>	<b>7.641</b>	<b>6.683</b>	<b>6</b>	<b>Yes</b>	<b>15</b>	<b>7.162</b>	<b>1.053</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Cobalt (ug/L)</b>	<b>MW-10</b>	<b>115</b>	<b>86.66</b>	<b>6</b>	<b>Yes</b>	<b>15</b>	<b>100.8</b>	<b>31.14</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Lead (ug/L)	MW-6	0.5178	0.2481	15	No	14	0.4681	0.3627	14.29	None	ln(x)	0.05	Param.
Lithium (ug/L)	MW-5	38.38	32.34	40	No	15	35.36	6.642	0	None	No	0.05	Param.
<b>Lithium (ug/L)</b>	<b>MW-6</b>	<b>46.7</b>	<b>42.06</b>	<b>40</b>	<b>Yes</b>	<b>15</b>	<b>44.38</b>	<b>5.096</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Lithium (ug/L)	MW-7	29.09	26.13	40	No	15	27.61	3.257	0	None	No	0.05	Param.

Notes:

Concentration units are as specified in Column 1.

ug/L - microgram per liter

ln(x) - logarithmic transform applied

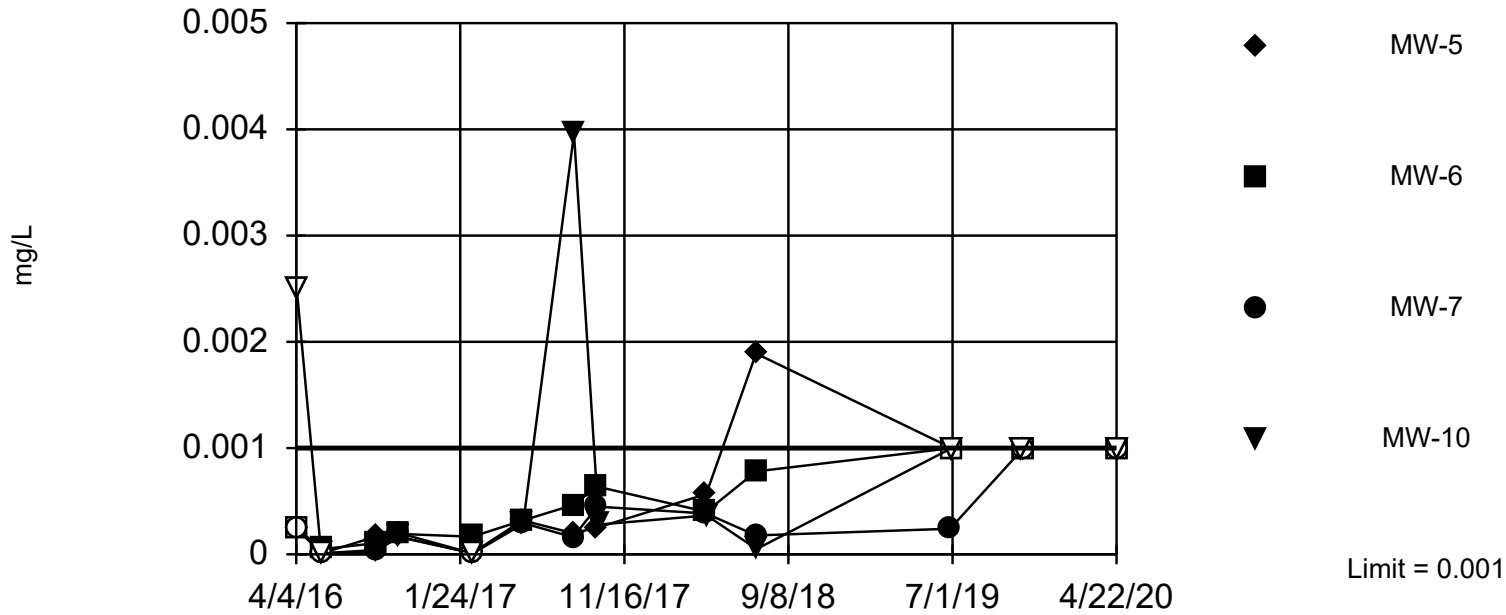
Param - Parametric Confidence Limit

**Attachment 1**  
**April 2020 Time Series Plots**  
**and Prediction Limit Results**

Within Limit

### Prediction Limit

Interwell Non-parametric



Non-parametric test used after natural log transformation resulted in a parametric limit of 278.8, which exceeds 10 times the highest background value (user-adjustable cutoff). Limit is highest of 13 background values. 46.15% NDs. Report alpha = 0.2353. Individual comparison alpha = 0.06487. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

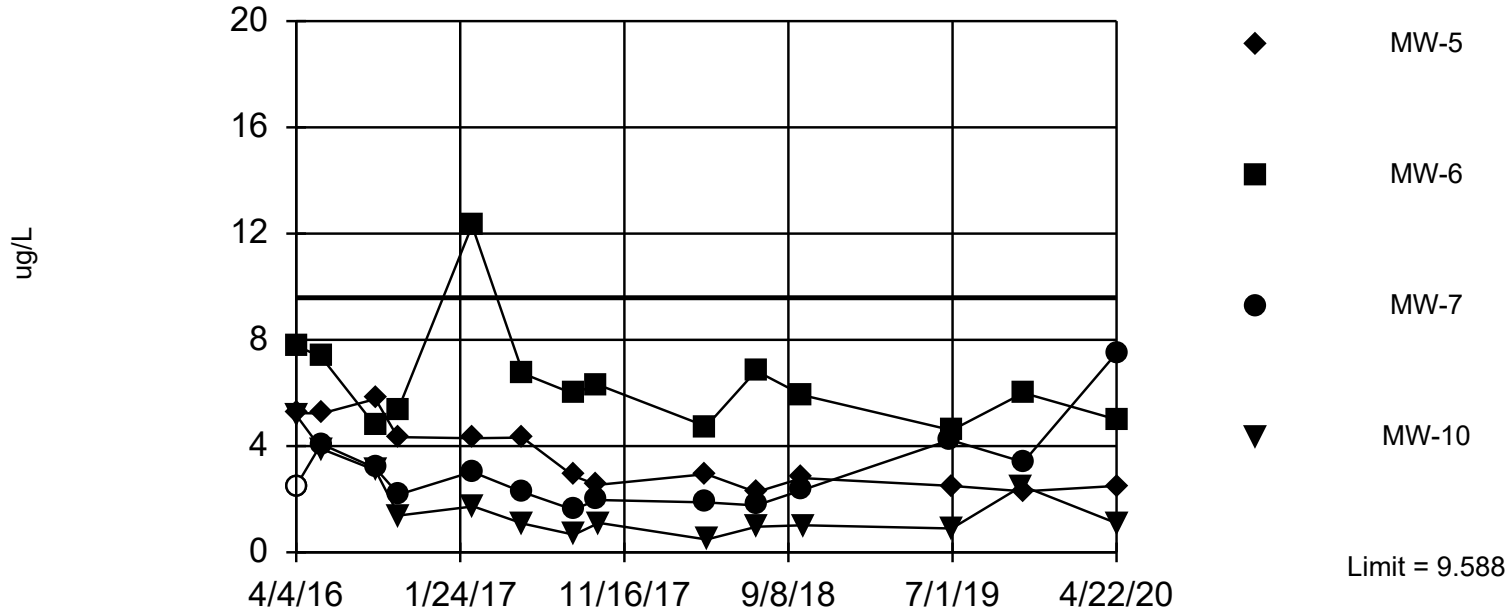
Constituent: Antimony Analysis Run 12/16/2020 12:30 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=1.844, Std. Dev.=0.1862, n=14. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

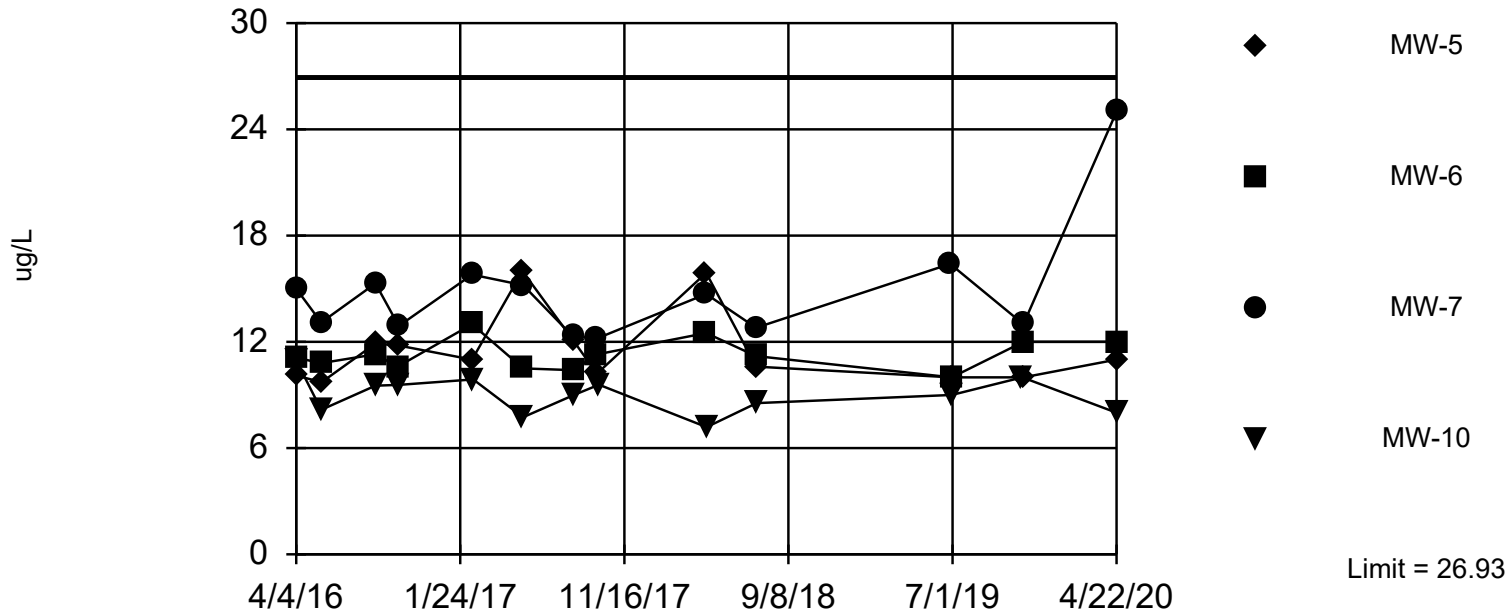
Constituent: Arsenic Analysis Run 12/16/2020 12:36 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=22.18, Std. Dev.=2.102, n=13. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Barium Analysis Run 12/16/2020 12:39 PM

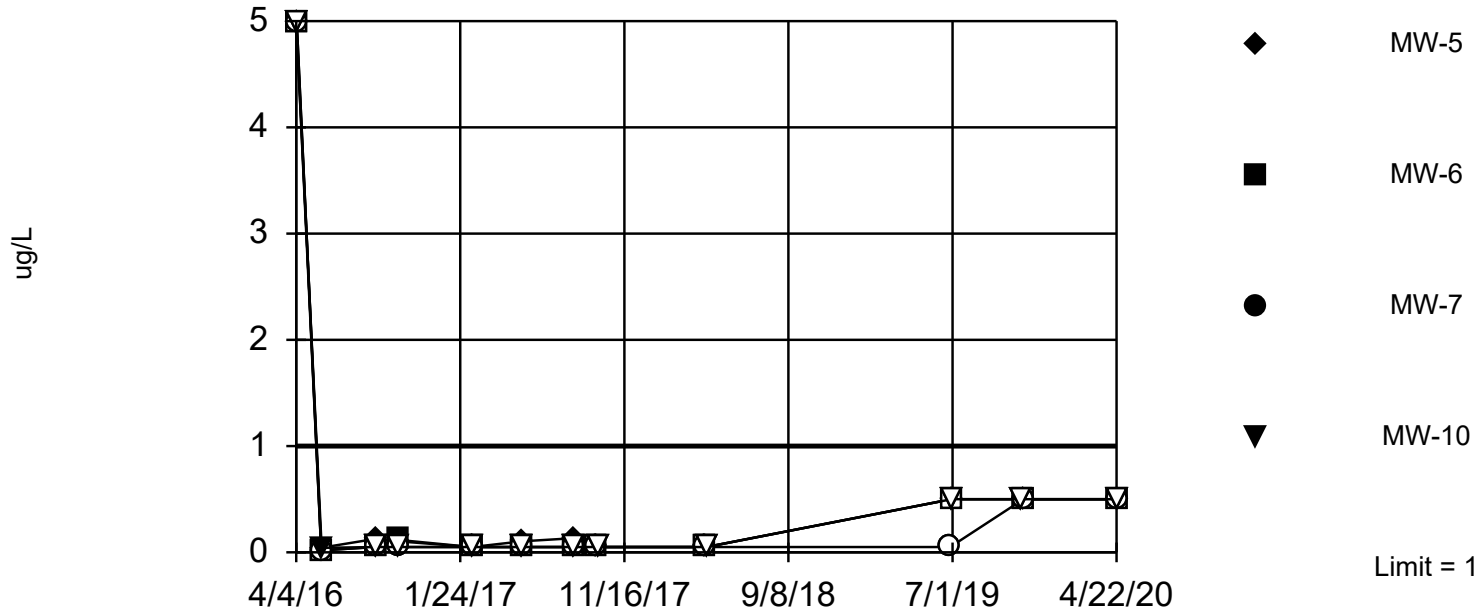
Facility: BREC Wilson LF Data File: Wilson All Data



Within Limit

Prediction Limit

Interwell Non-parametric



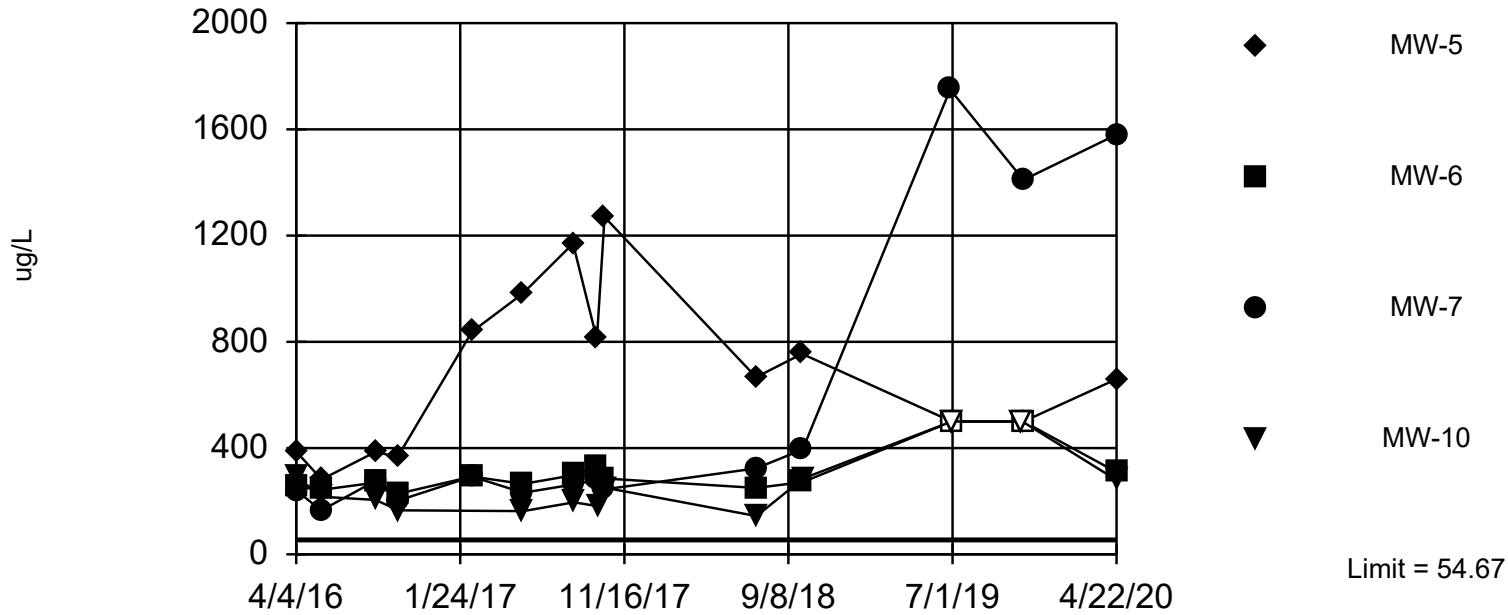
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 11) were censored; limit is most recent reporting limit. Report alpha = 0.2667. Individual comparison alpha = 0.07461. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: <10 (4/4/2016).

Constituent: Beryllium Analysis Run 12/16/2020 12:42 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

### Prediction Limit Interwell Parametric



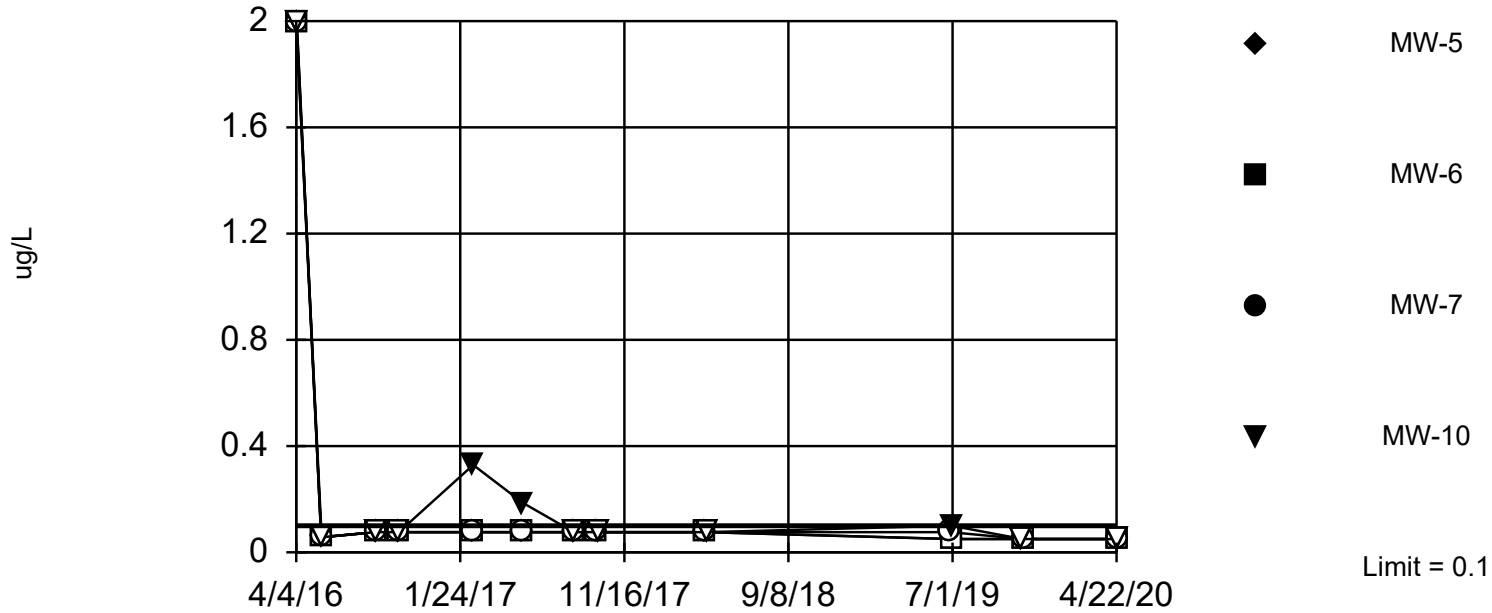
Background Data Summary: Mean=41.55, Std. Dev.=5.644, n=11, 9.091% NDs. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 20.7 (9/28/2017).

Constituent: Boron Analysis Run 12/16/2020 12:52 PM  
Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Non-parametric



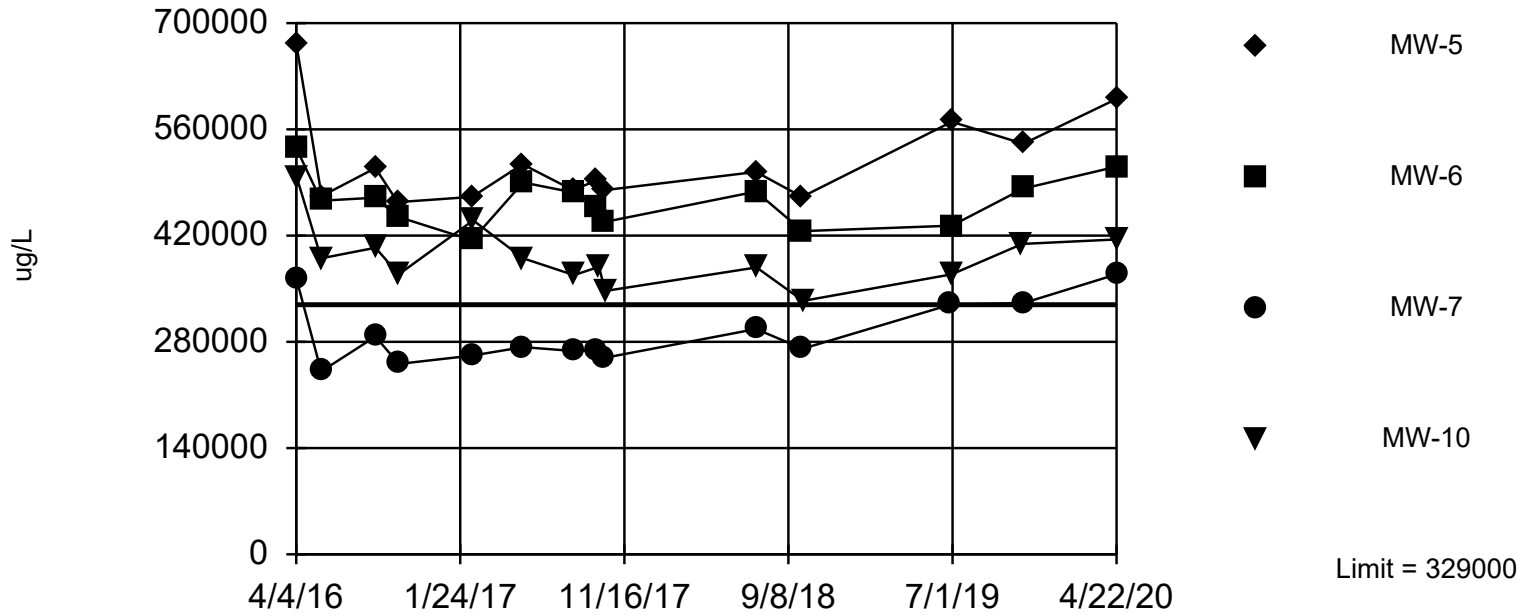
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 11) were censored; limit is most recent reporting limit. Report alpha = 0.2667. Individual comparison alpha = 0.07461. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: <4 (4/4/2016).

Constituent: Cadmium Analysis Run 12/16/2020 1:00 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit  
Interwell Non-parametric

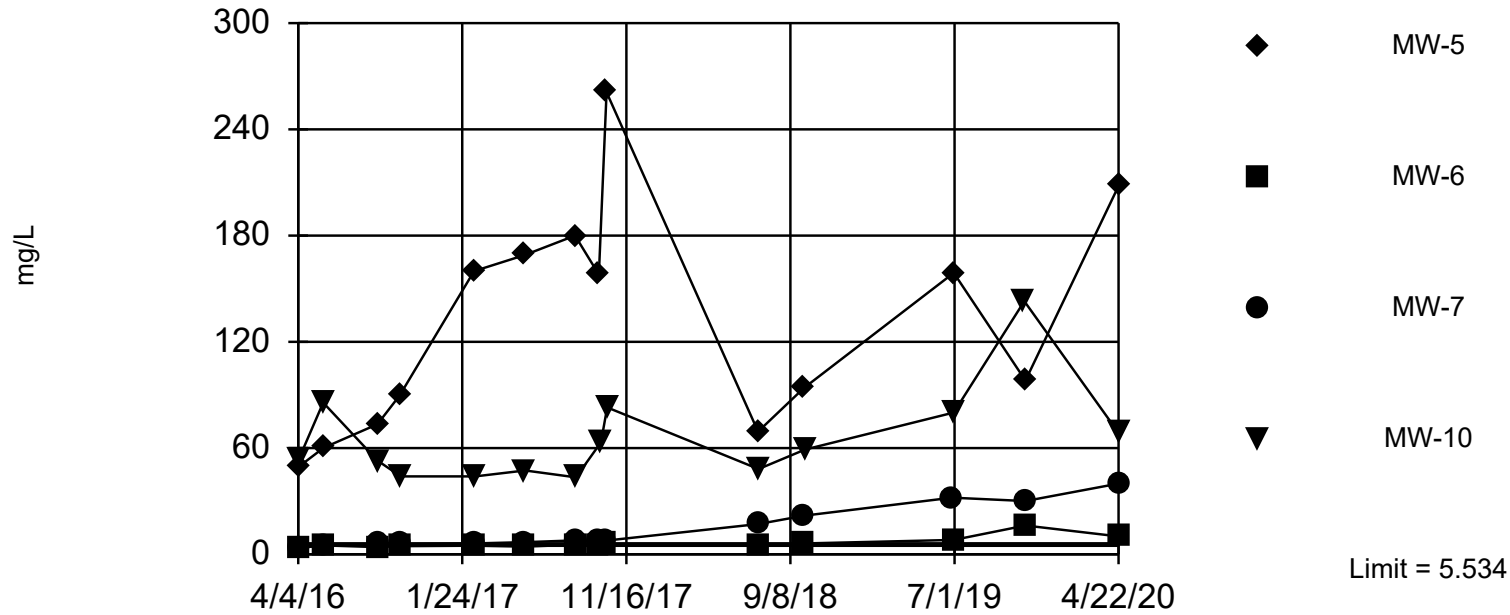


NP test selected by user. Limit is highest of 14 background values. Report alpha = 0.2222. Individual comparison alpha = 0.0609. Most recent point for each compliance well compared to limit.

Constituent: Calcium Analysis Run 12/16/2020 1:08 PM  
Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit  
Interwell Parametric



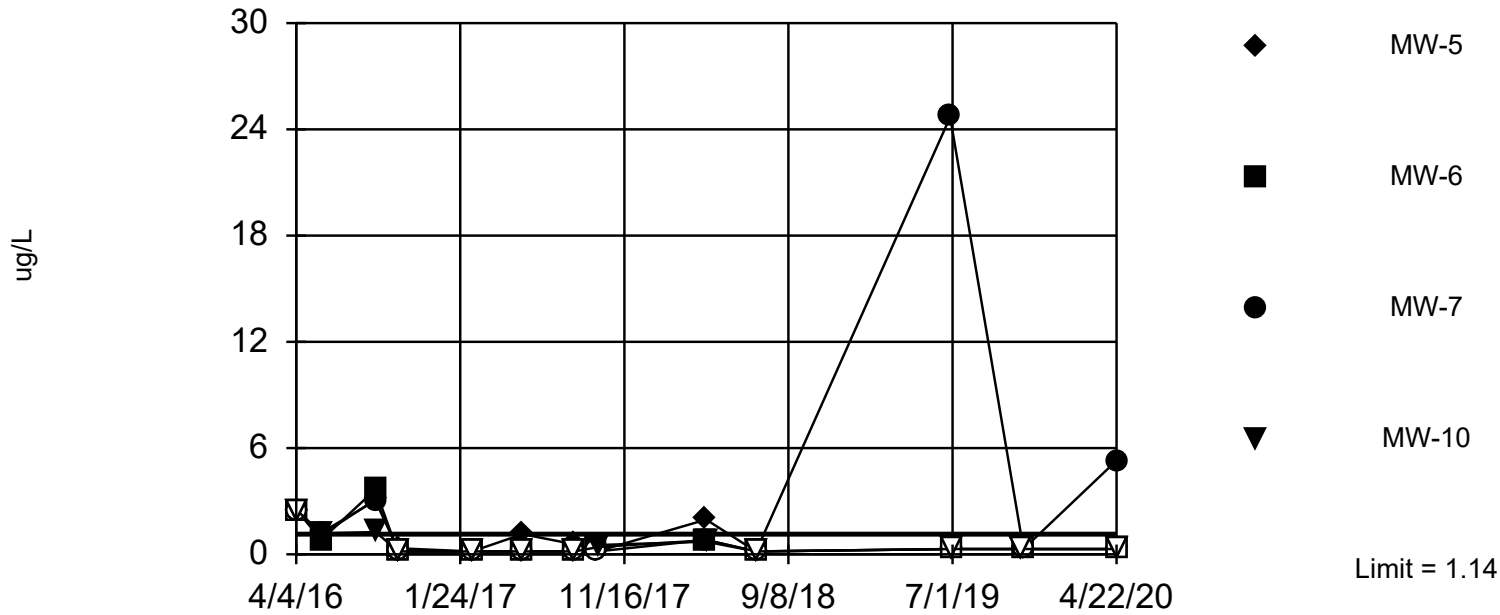
Background Data Summary: Mean=4.466, Std. Dev.=0.4774, n=14. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Chloride Analysis Run 12/16/2020 1:12 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-7

### Prediction Limit Interwell Non-parametric



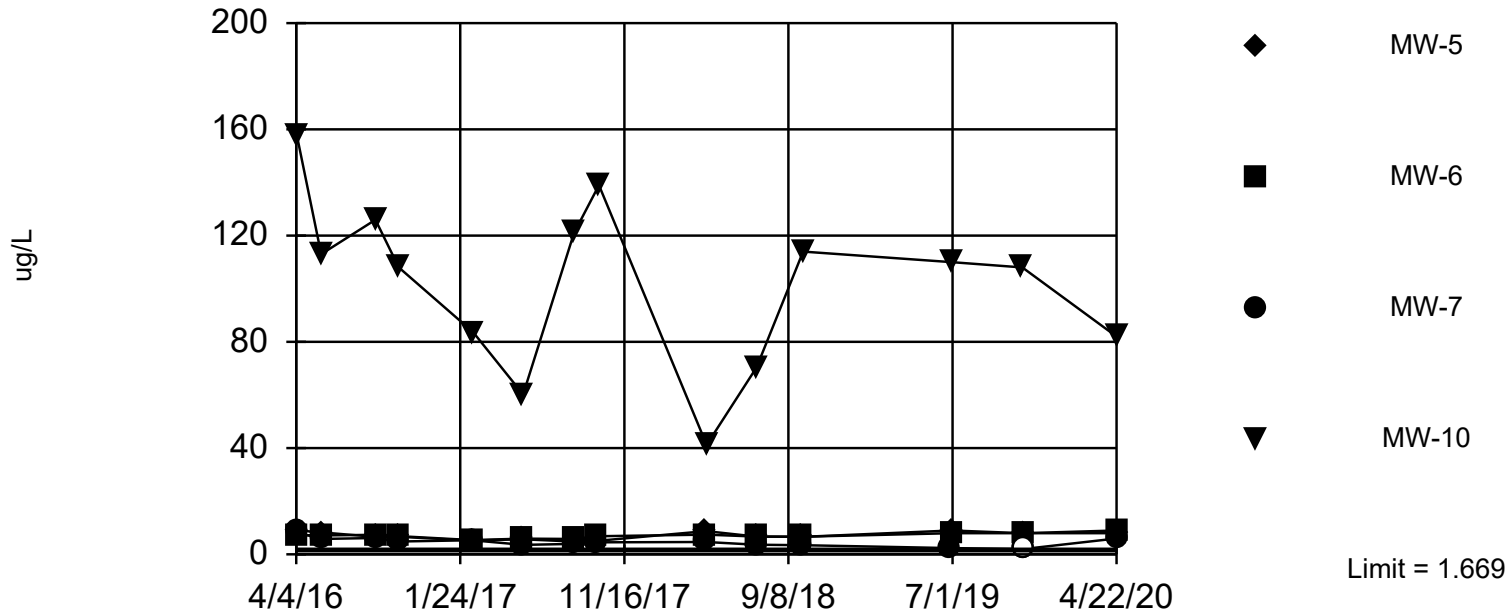
NP test selected by user. Limit is highest of 12 background values. 50% NDs. Report alpha = 0.25. Individual comparison alpha = 0.0694. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Chromium Analysis Run 12/16/2020 1:23 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

### Prediction Limit Interwell Parametric



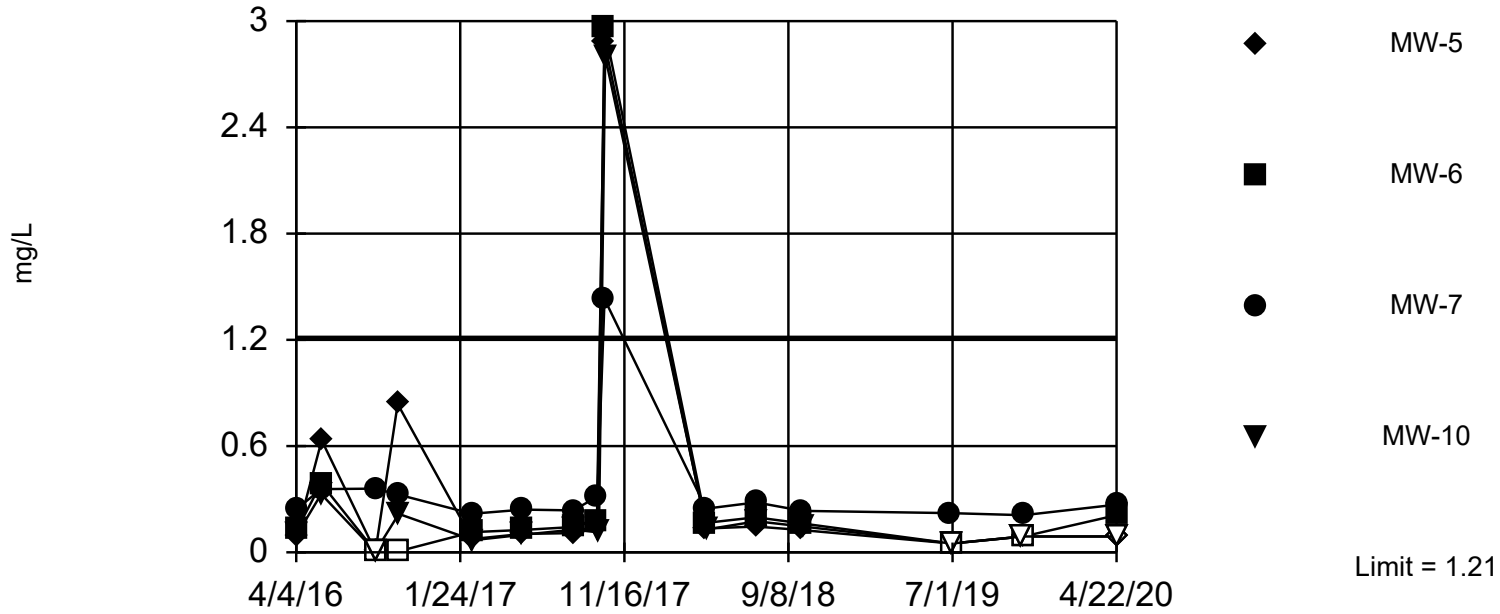
Background Data Summary (after Kaplan-Meier Adjustment): Mean=1.082, Std. Dev.=0.2627, n=14, 28.57% NDs. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Cobalt Analysis Run 12/16/2020 1:27 PM  
Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 15 background values. Report alpha = 0.2105. Individual comparison alpha = 0.05738. Most recent point for each compliance well compared to limit.

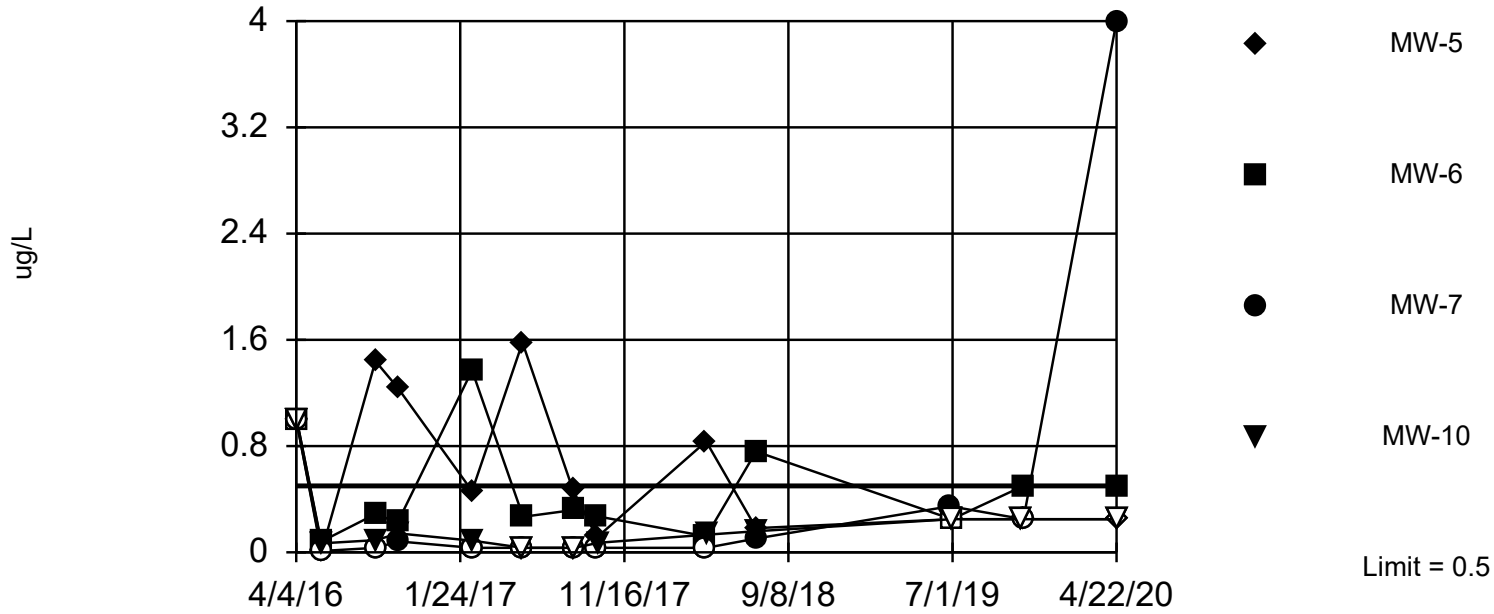
Constituent: Fluoride Analysis Run 12/16/2020 1:35 PM

Facility: BREC Wilson LF Data File: Wilson All Data



Exceeds Limit: MW-7

### Prediction Limit Interwell Non-parametric



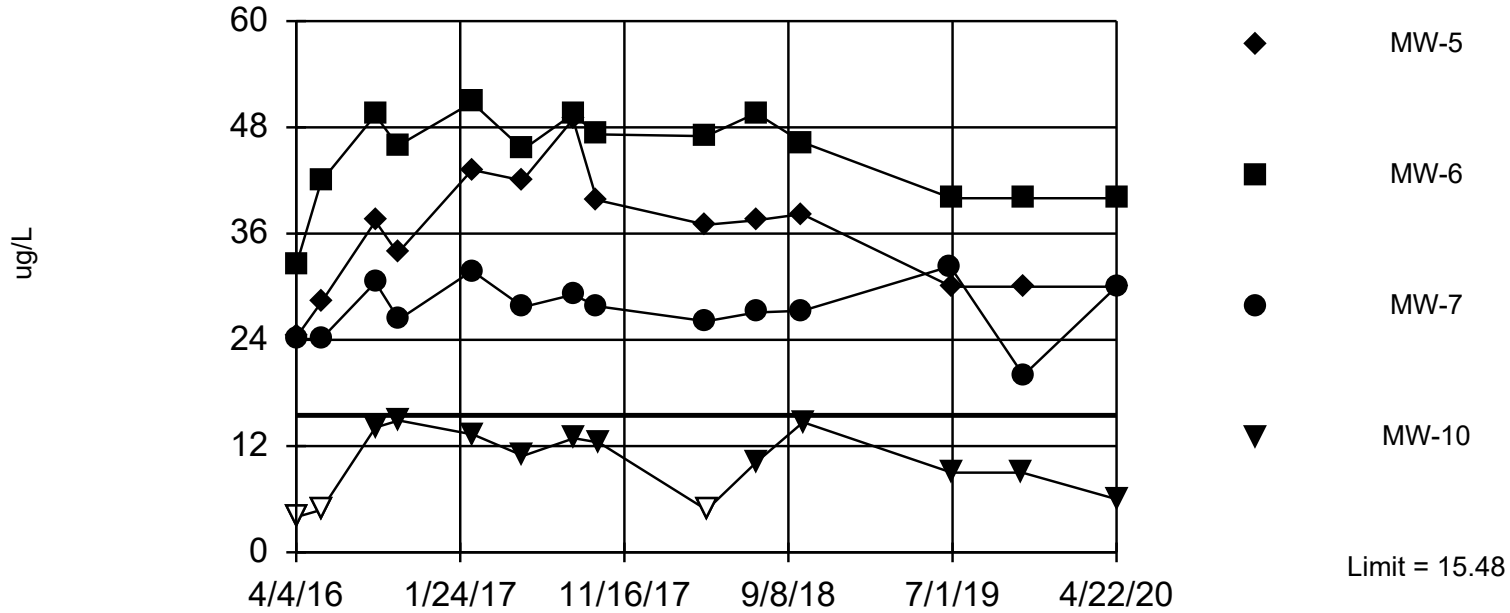
NP test selected by user. Limit is highest of 12 background values. 83.33% NDs. Report alpha = 0.25. Individual comparison alpha = 0.0694. Most recent point for each compliance well compared to limit.

Constituent: Lead Analysis Run 12/16/2020 1:46 PM  
Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7

Prediction Limit

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=10.35, Std. Dev.=2.293, n=14, 28.57% NDs. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

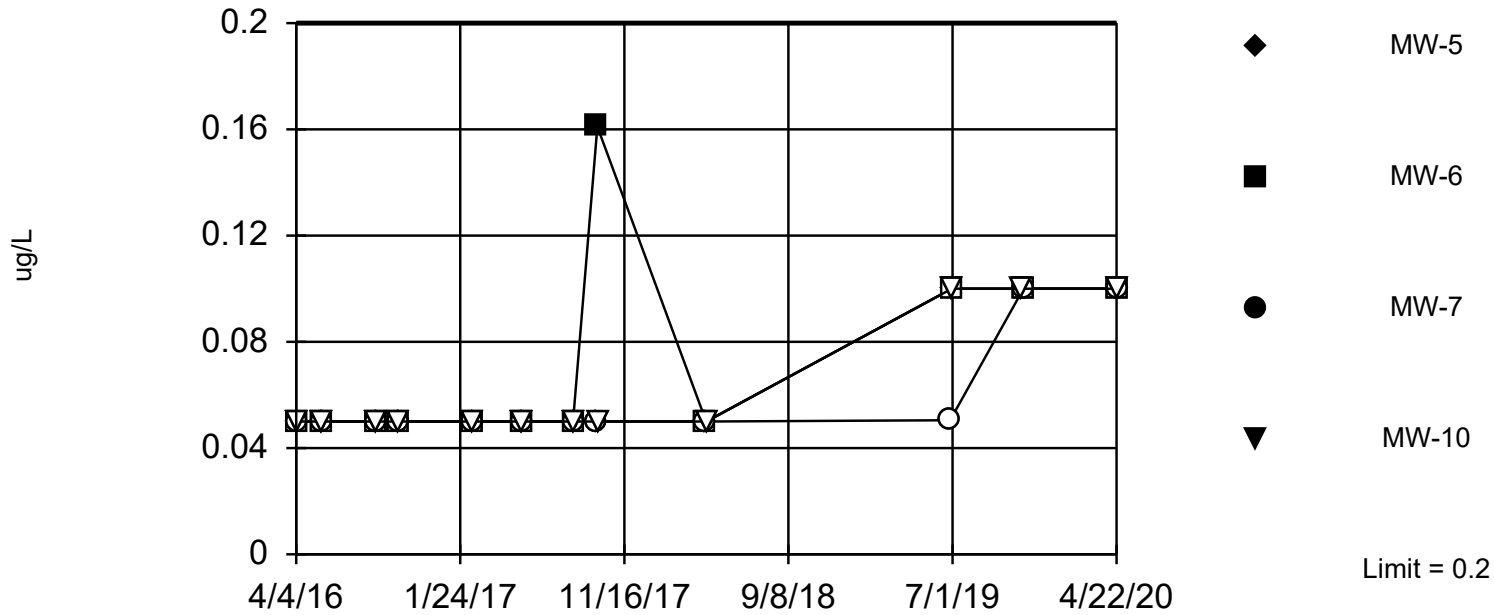
Constituent: Lithium Analysis Run 12/16/2020 1:50 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 12) were censored; limit is most recent reporting limit. Report alpha = 0.25. Individual comparison alpha = 0.0694. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

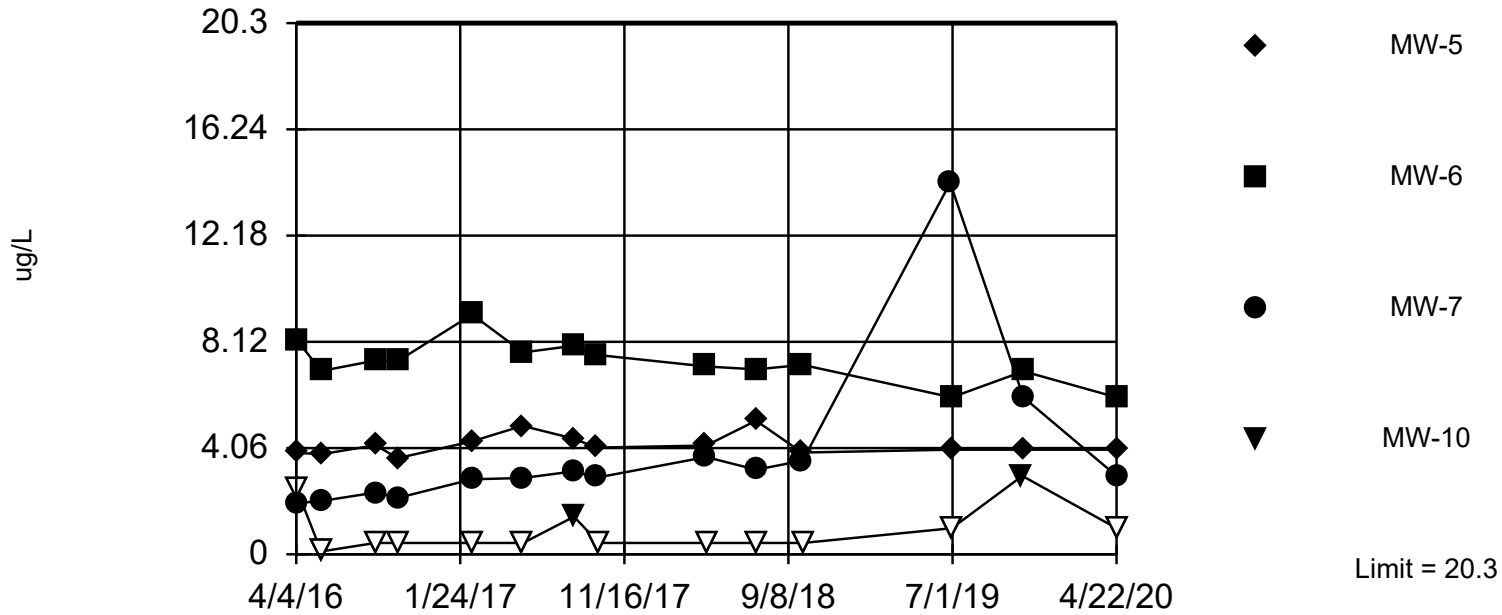
Constituent: Mercury Analysis Run 12/16/2020 1:54 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=13.96, Std. Dev.=2.836, n=14. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

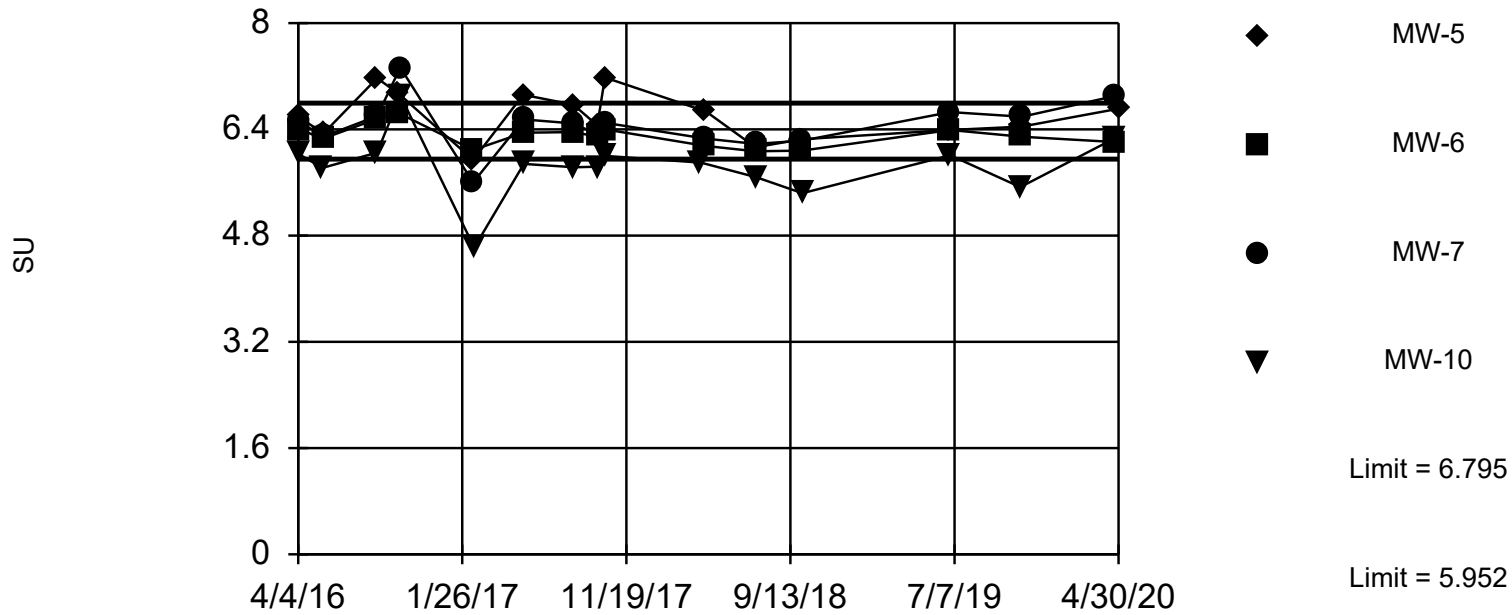
Constituent: Molybdenum Analysis Run 12/16/2020 1:57 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limits: MW-7

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=6.374, Std. Dev.=0.1607, n=14. Report alpha = 0.09646. Individual comparison alpha = 0.01252. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 4.91 (2/15/2017).

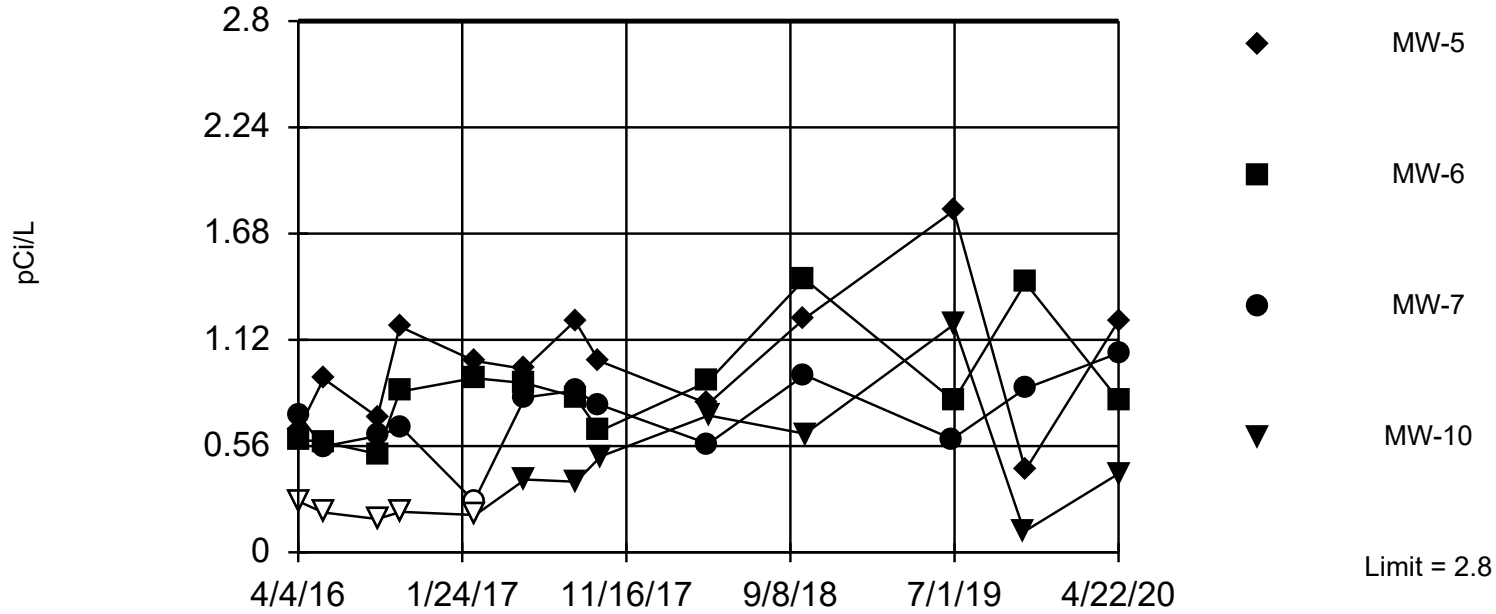
Constituent: pH [Field] Analysis Run 12/16/2020 2:59 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

### Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 13 background values. Report alpha = 0.2353. Individual comparison alpha = 0.06487. Most recent point for each compliance well compared to limit.

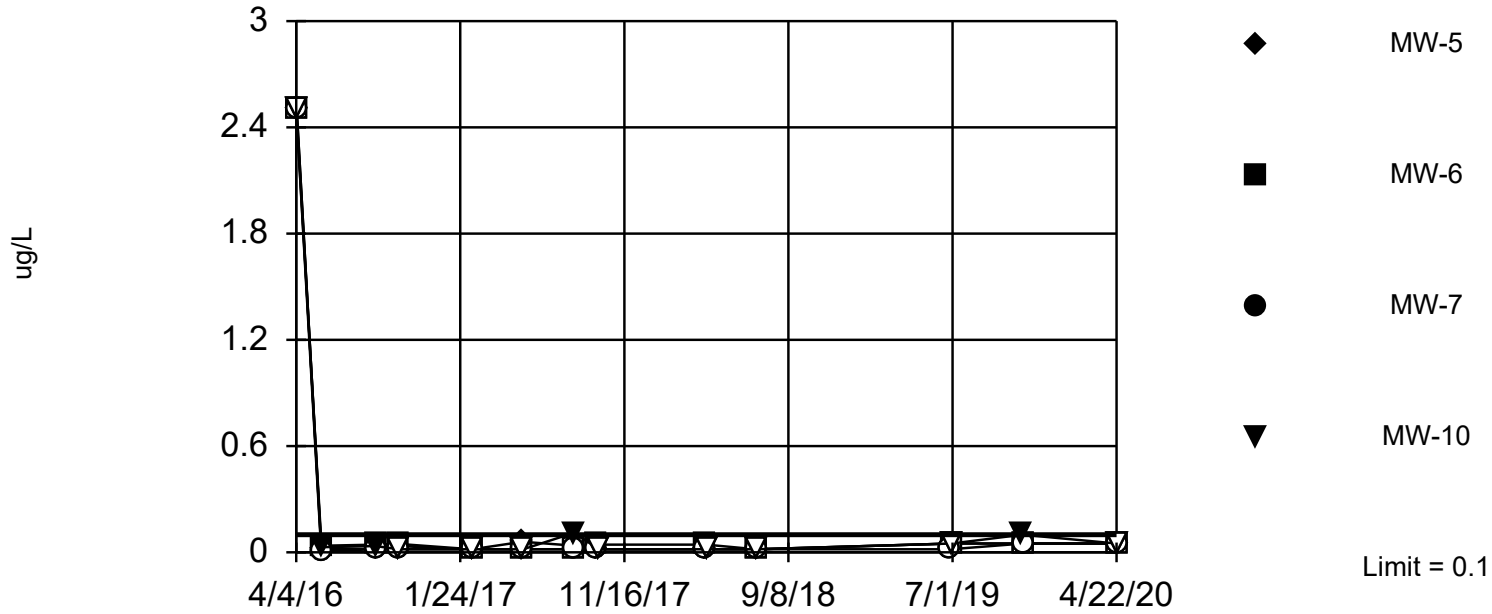
Constituent: Radium 226 + 228 Analysis Run 12/16/2020 3:10 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

### Prediction Limit

Interwell Non-parametric



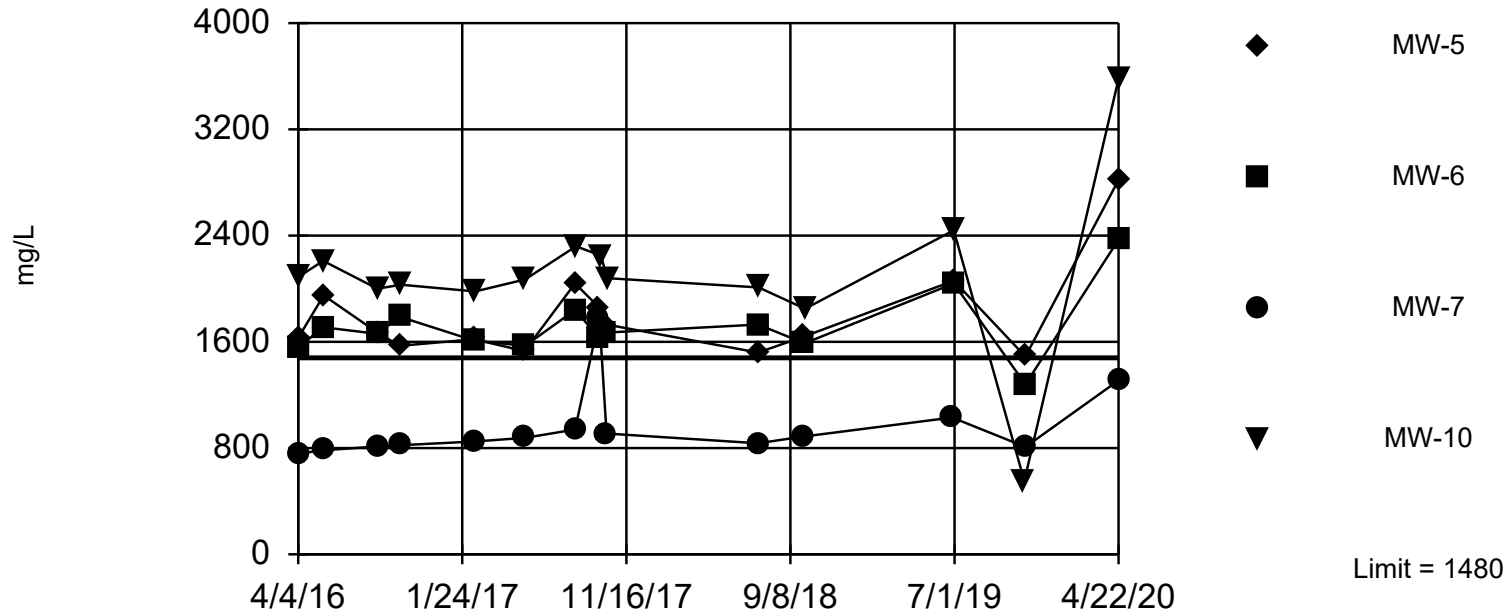
NP test selected by user. Limit is highest of 12 background values. 91.67% NDs. Report alpha = 0.25. Individual comparison alpha = 0.0694. Most recent point for each compliance well compared to limit.

Constituent: Thallium Analysis Run 12/16/2020 3:22 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-10

Prediction Limit  
Interwell Non-parametric



NP test selected by user. Limit is highest of 14 background values. Report alpha = 0.2222. Individual comparison alpha = 0.0609. Most recent point for each compliance well compared to limit.

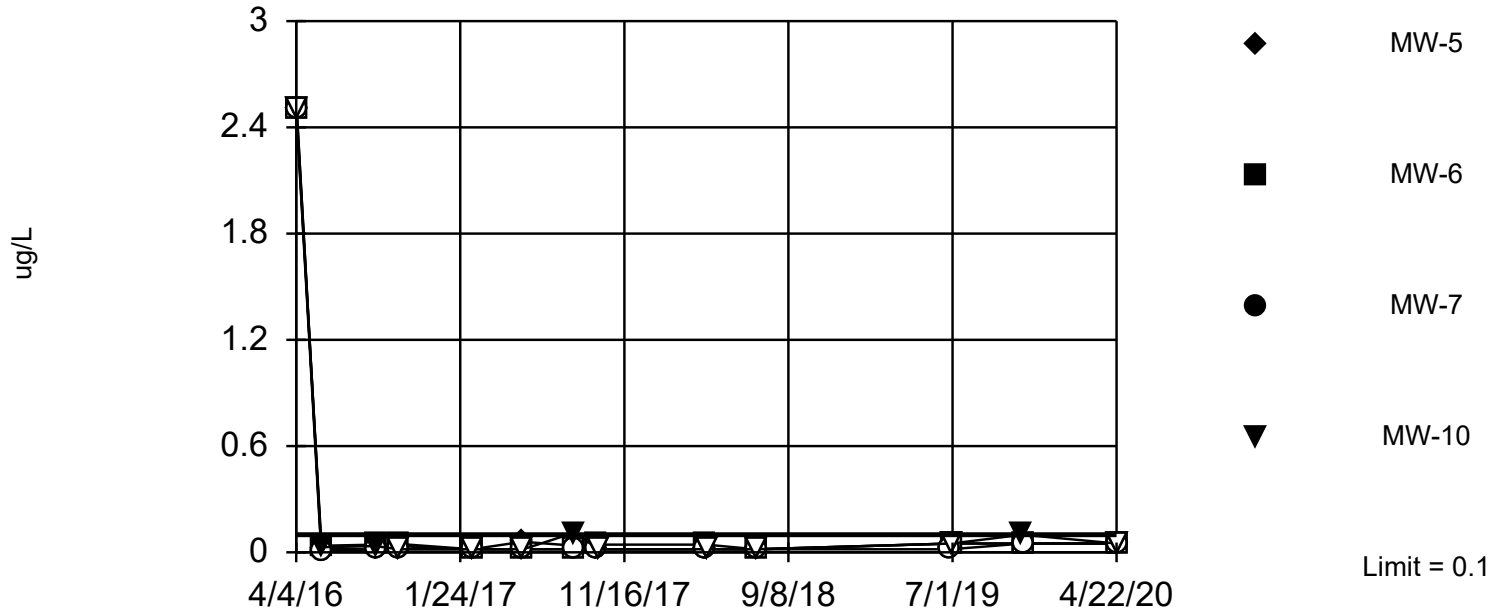
Constituent: Sulfate Analysis Run 12/16/2020 3:18 PM  
Facility: BREC Wilson LF Data File: Wilson All Data



Within Limit

Prediction Limit

Interwell Non-parametric



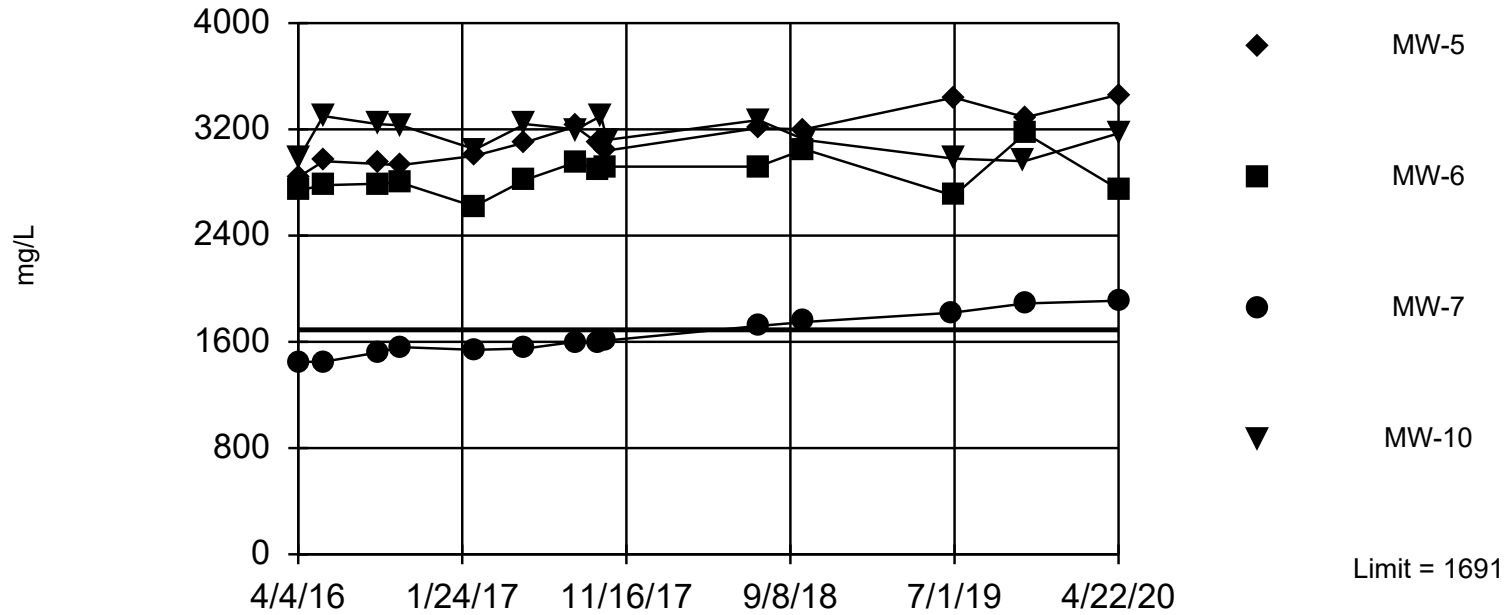
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 91.67% NDs. Report alpha = 0.25. Individual comparison alpha = 0.0694. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Thallium Analysis Run 12/17/2020 9:19 AM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit  
Interwell Parametric



Background Data Summary: Mean=1559, Std. Dev.=58.9, n=14. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Total Dissolved Solids Analysis Run 12/16/2020 3:24 PM

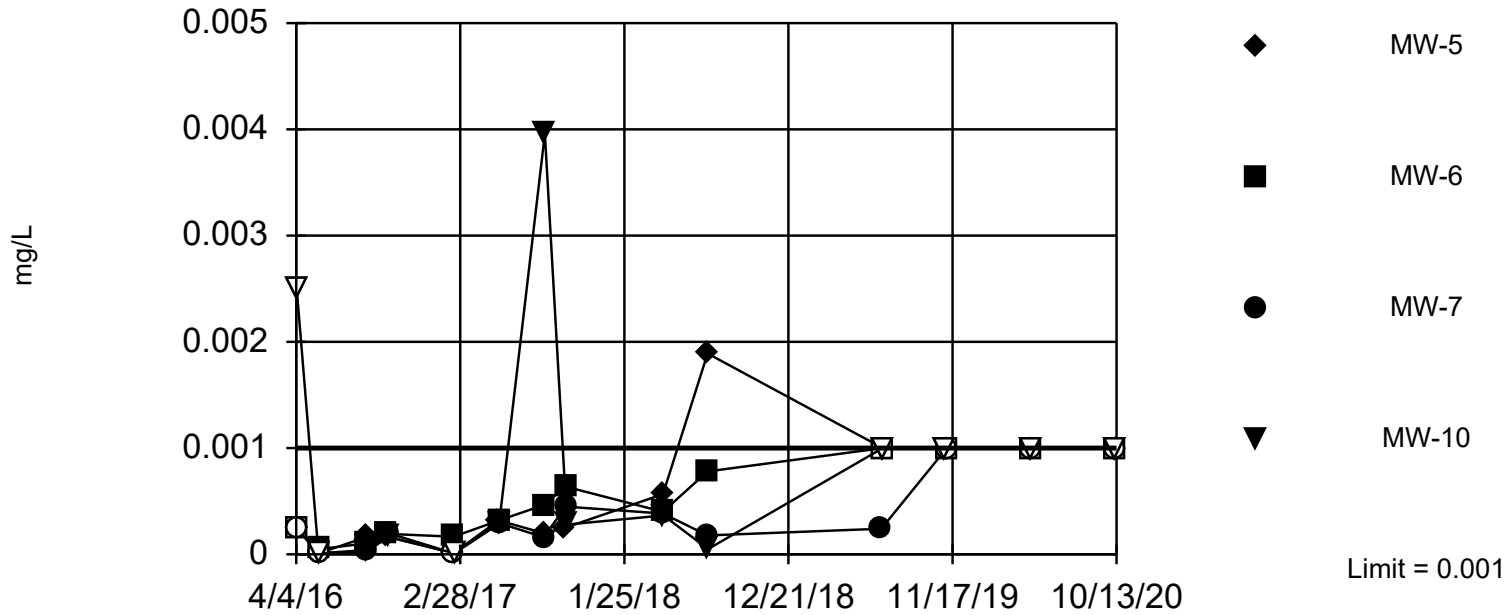
Facility: BREC Wilson LF Data File: Wilson All Data

**Attachment 2**  
**October 2020 Time Series Plots**  
**and Prediction Limit Results**

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used after natural log transformation resulted in a parametric limit of 346.9, which exceeds 10 times the highest background value (user-adjustable cutoff). Limit is highest of 14 background values. 50% NDs. Report alpha = 0.2222. Individual comparison alpha = 0.0609. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

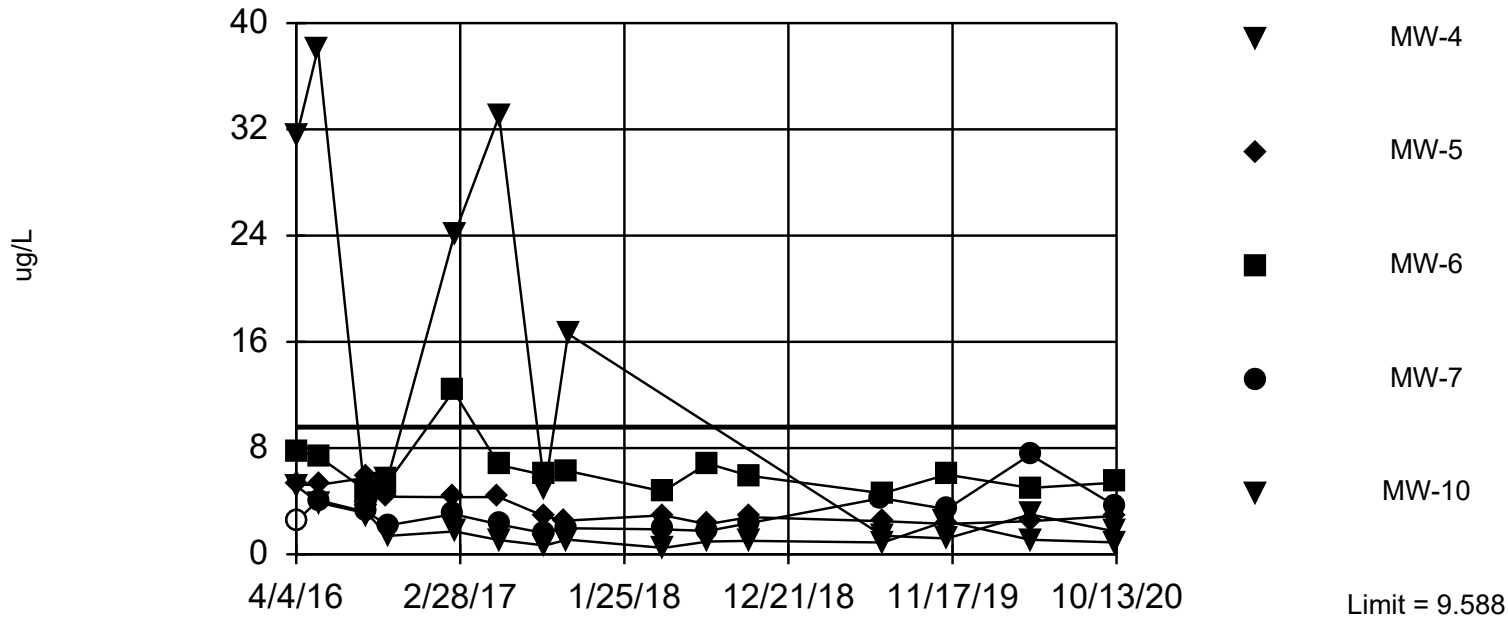
Constituent: Antimony Analysis Run 12/14/2020 12:01 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=1.844, Std. Dev.=0.1862, n=14. Report alpha = 0.1191. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 14.4 (10/13/2020).

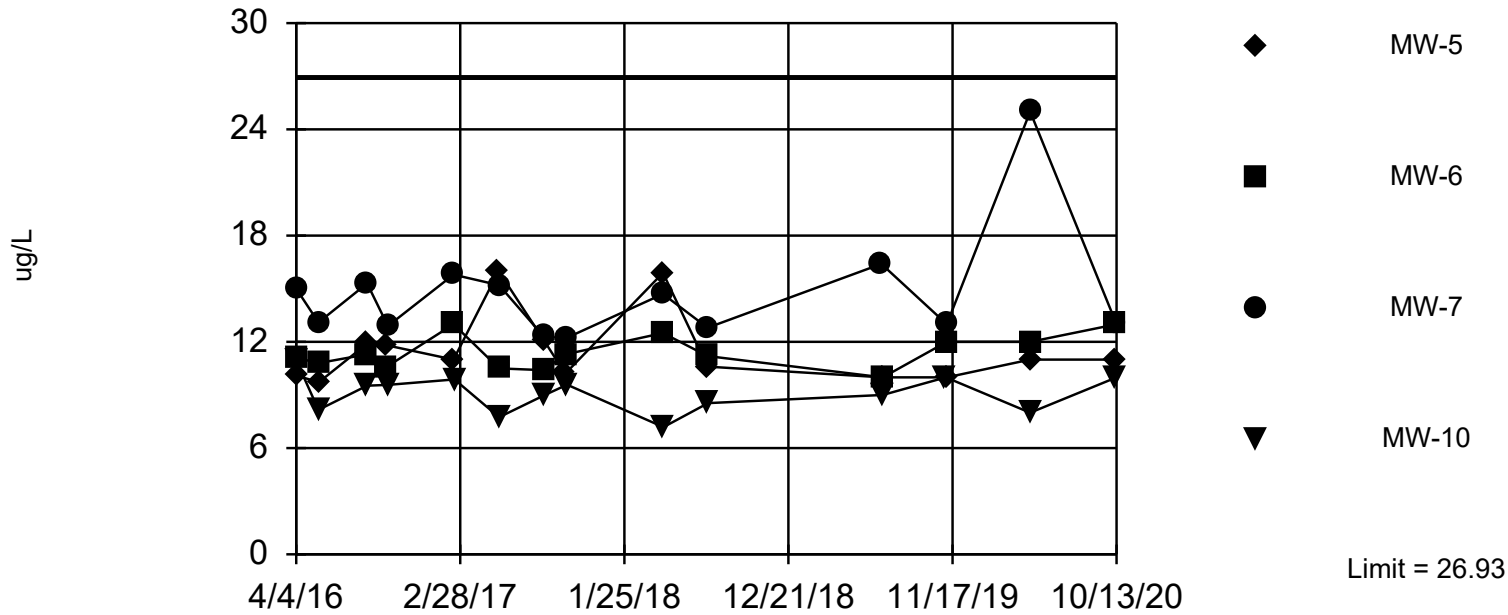
Constituent: Arsenic Analysis Run 12/14/2020 12:21 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Parametric



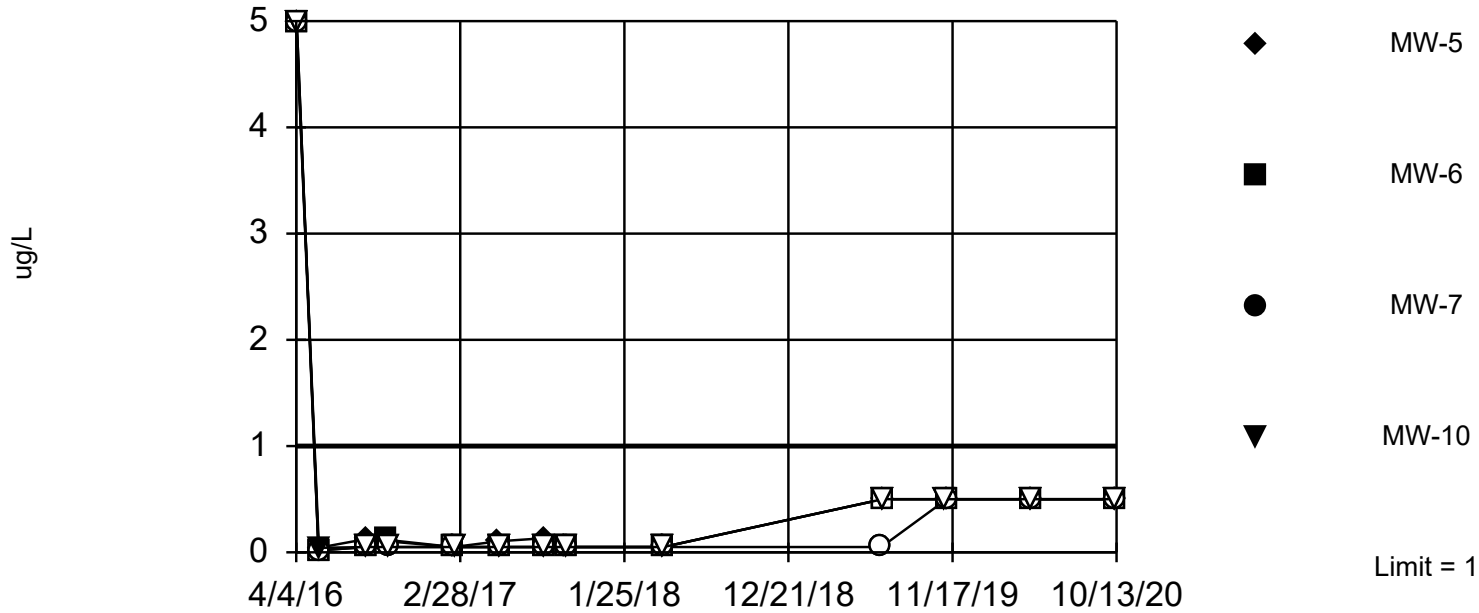
Background Data Summary: Mean=22.18, Std. Dev.=2.102, n=13. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Barium Analysis Run 12/14/2020 12:30 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

### Prediction Limit Interwell Non-parametric



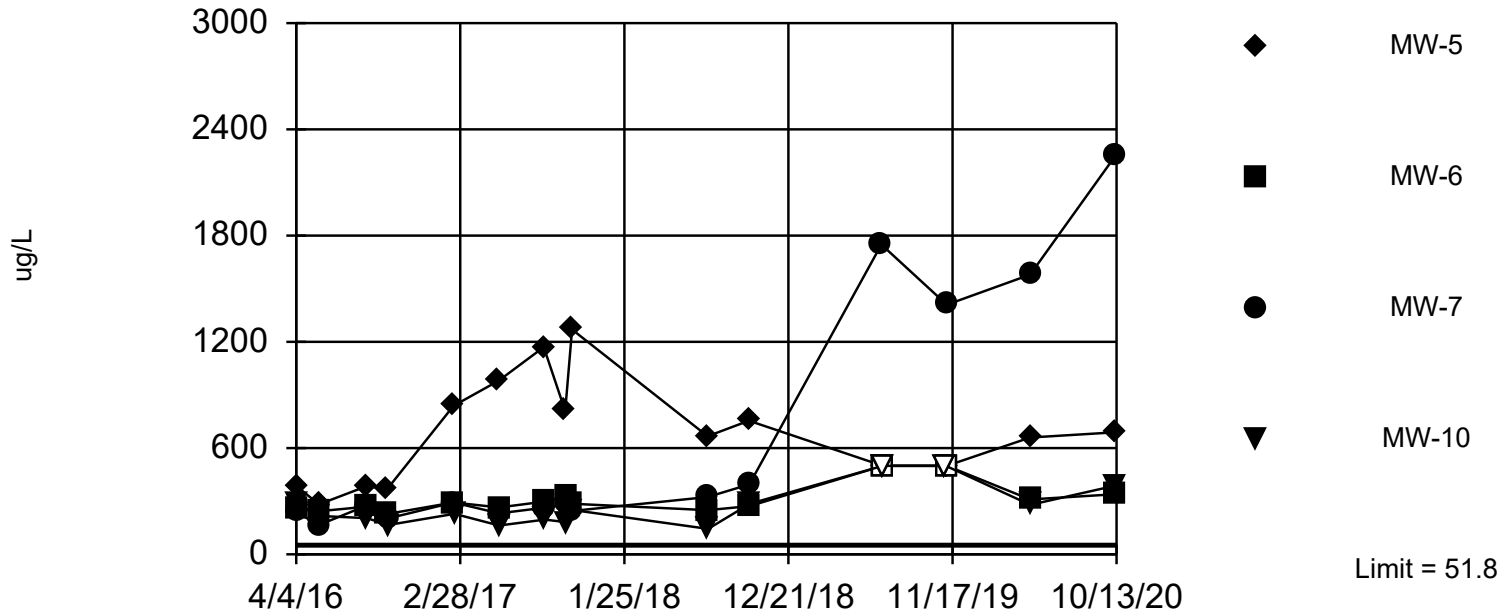
NP test selected by user. All background values (n = 13) were censored; limit is most recent reporting limit. Report alpha = 0.2353. Individual comparison alpha = 0.06487. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Beryllium Analysis Run 12/14/2020 12:37 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

### Prediction Limit Interwell Non-parametric

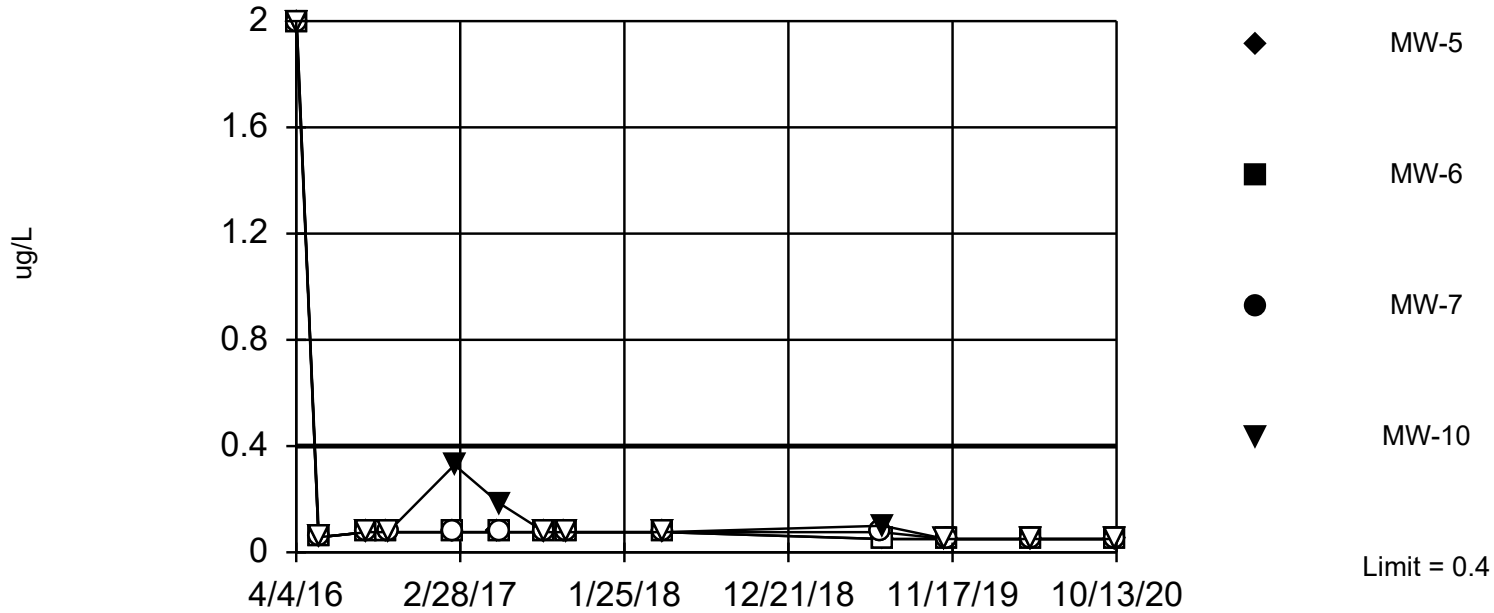




Within Limit

### Prediction Limit

Interwell Non-parametric



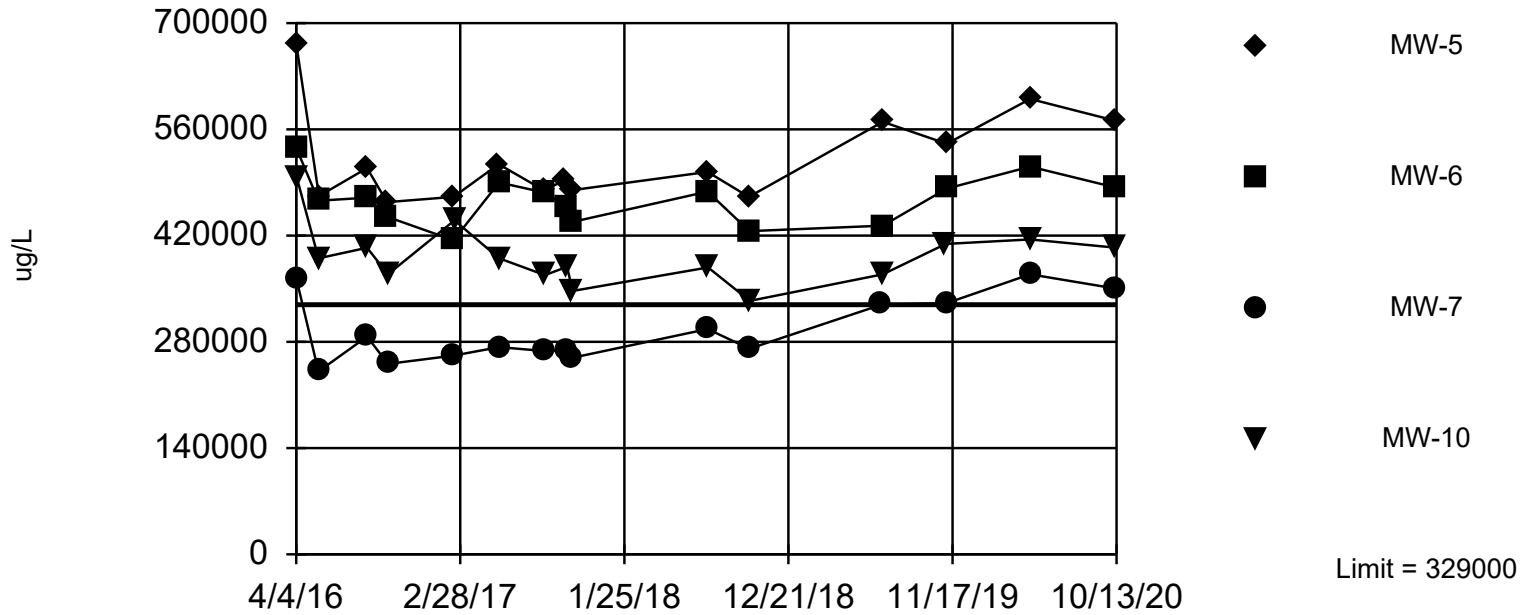
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 91.67% NDs. Report alpha = 0.25. Individual comparison alpha = 0.0694. Most recent point for each compliance well compared to limit.

Constituent: Cadmium Analysis Run 12/14/2020 1:31 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit  
Interwell Non-parametric

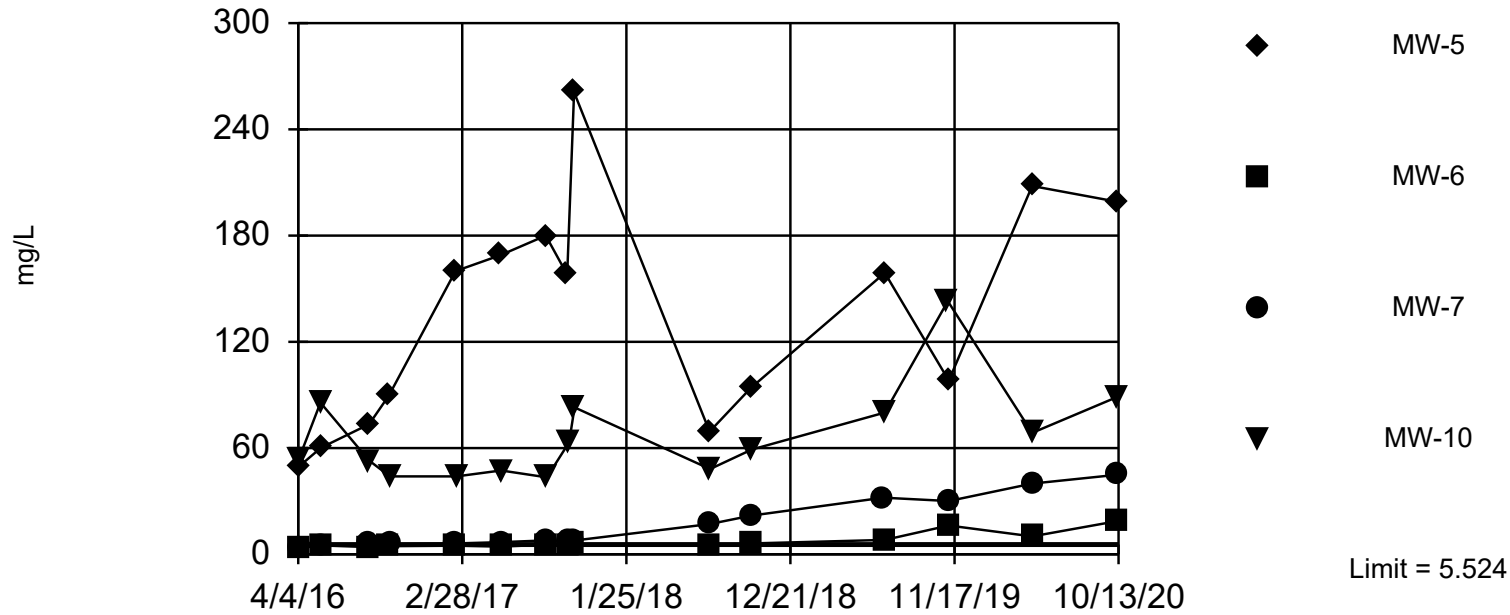


NP test selected by user. Limit is highest of 15 background values. Report alpha = 0.2105. Individual comparison alpha = 0.05738. Most recent point for each compliance well compared to limit.

Constituent: Calcium Analysis Run 12/14/2020 1:38 PM  
Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit  
Interwell Parametric



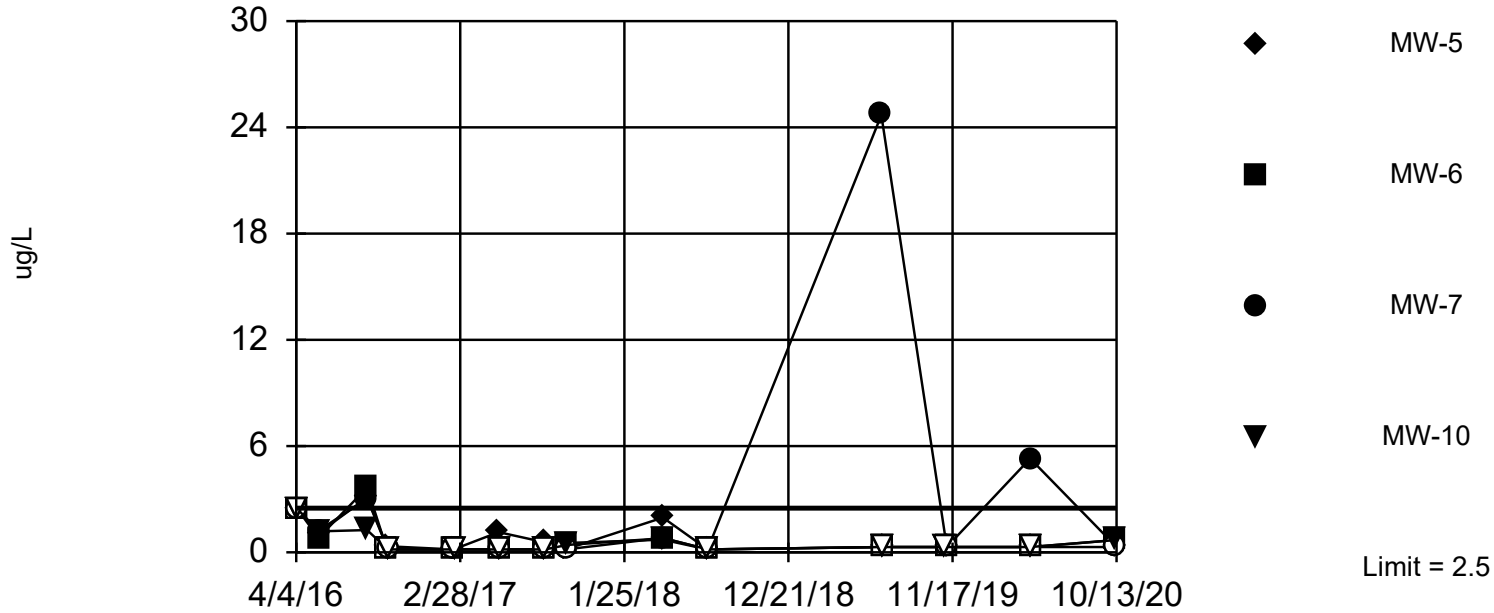
Background Data Summary: Mean=4.415, Std. Dev.=0.5008, n=15. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Chloride Analysis Run 12/14/2020 1:45 PM  
 Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

### Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 53.85% NDs. Report alpha = 0.2353. Individual comparison alpha = 0.06487. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: 22.4 (10/13/2020).

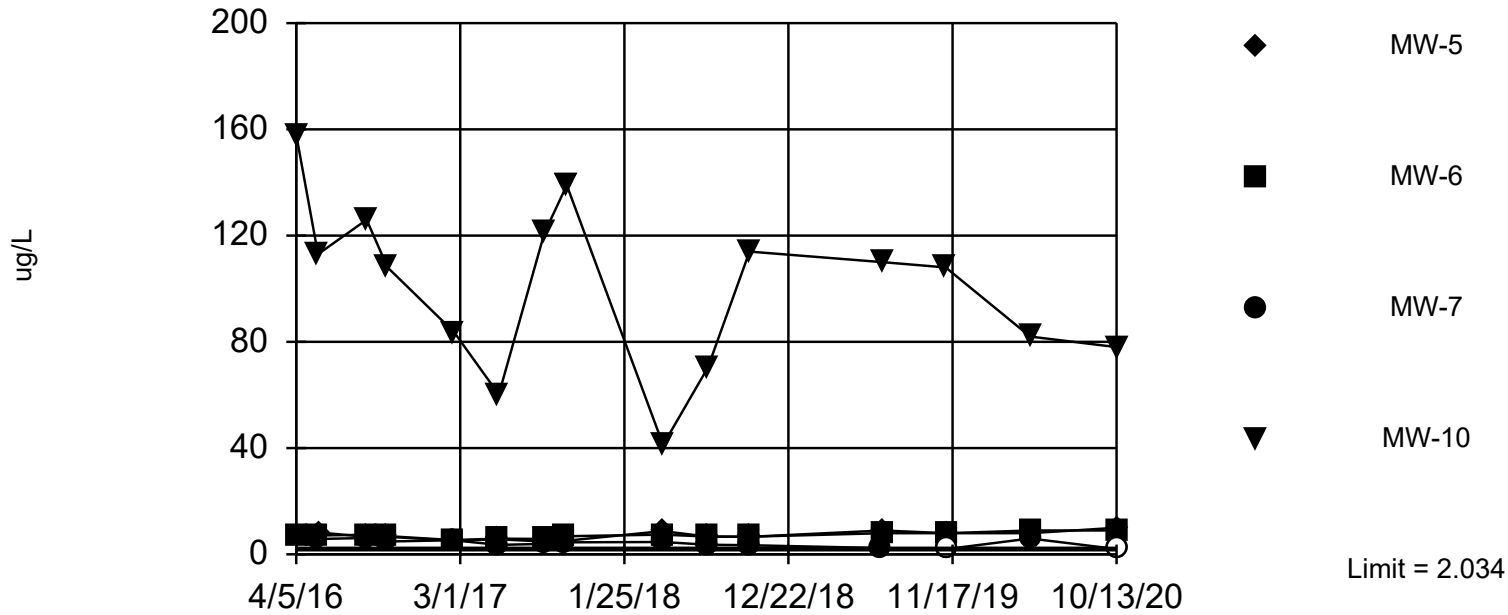
Constituent: Chromium Analysis Run 12/14/2020 1:59 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary (after Aitchison's Adjustment): Mean=0.8324, Std. Dev.=0.5317, n=13, 23.08% NDs. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 15 (10/13/2020).

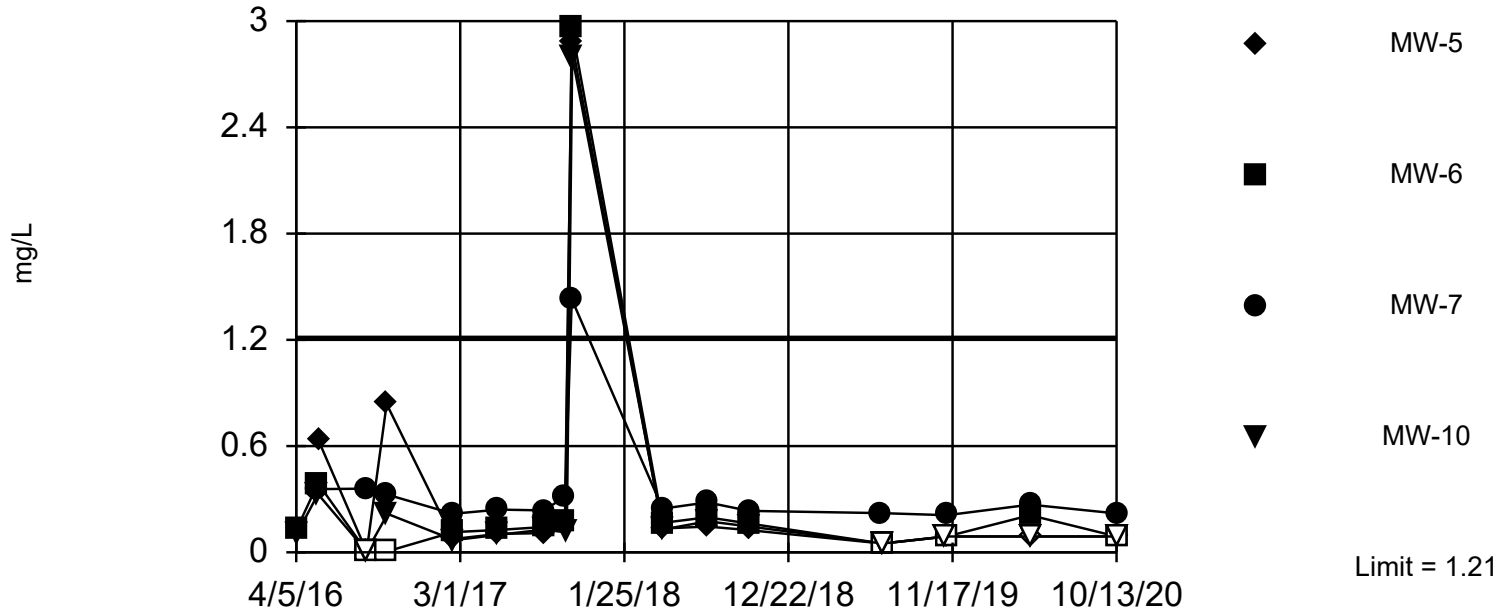
Constituent: Cobalt Analysis Run 12/14/2020 2:08 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Non-parametric



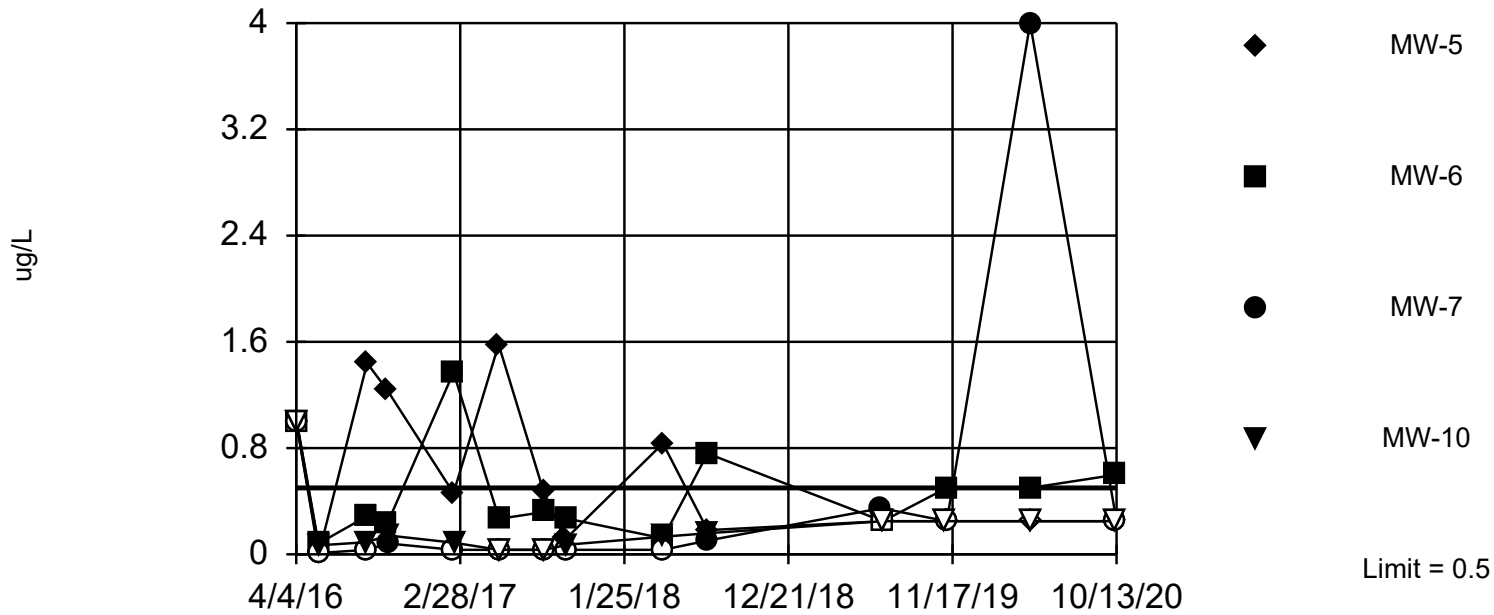
NP test selected by user. Limit is highest of 15 background values. Report alpha = 0.2105. Individual comparison alpha = 0.05738. Most recent point for each compliance well compared to limit.

Constituent: Fluoride Analysis Run 12/14/2020 2:20 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-6

### Prediction Limit Interwell Non-parametric



NP test selected by user. Limit is highest of 12 background values. 83.33% NDs. Report alpha = 0.25. Individual comparison alpha = 0.0694. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: 12 (10/13/2020).

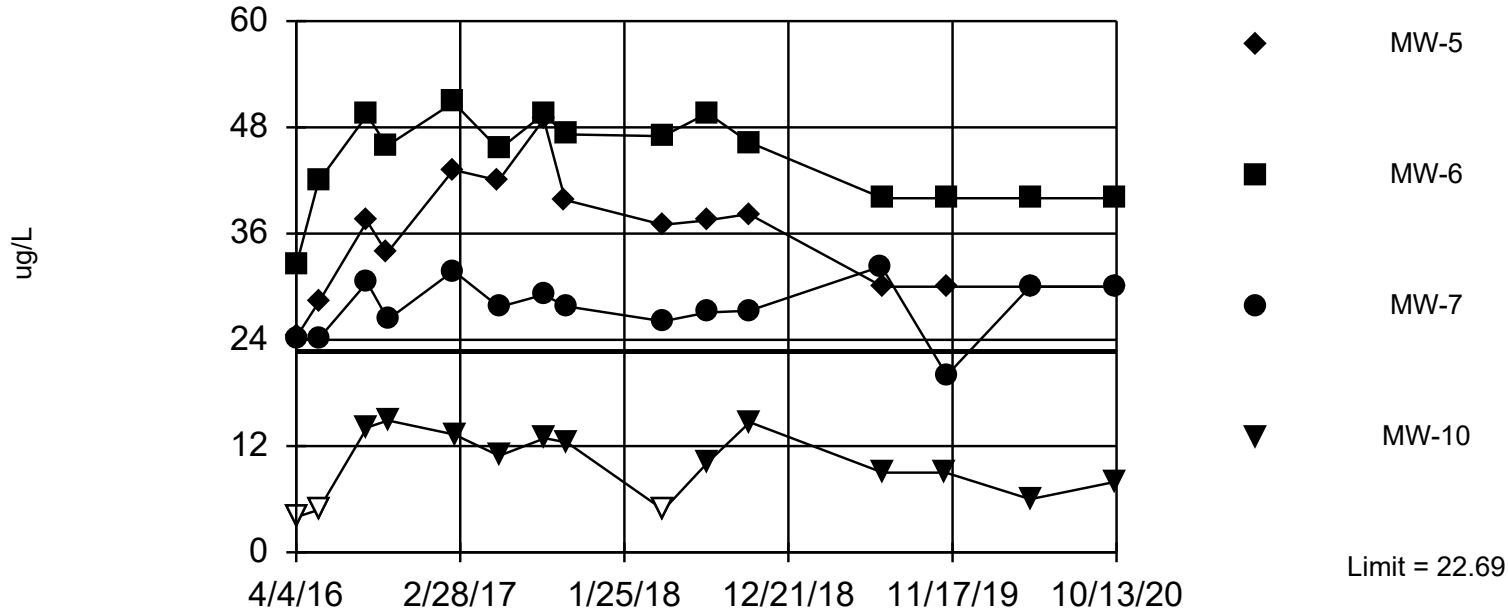
Constituent: Lead Analysis Run 12/15/2020 9:16 AM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7

Prediction Limit

Interwell Parametric



Background Data Summary (after Aitchison's Adjustment): Mean=8.947, Std. Dev.=6.205, n=15, 26.67% NDs. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Lithium Analysis Run 12/15/2020 9:26 AM

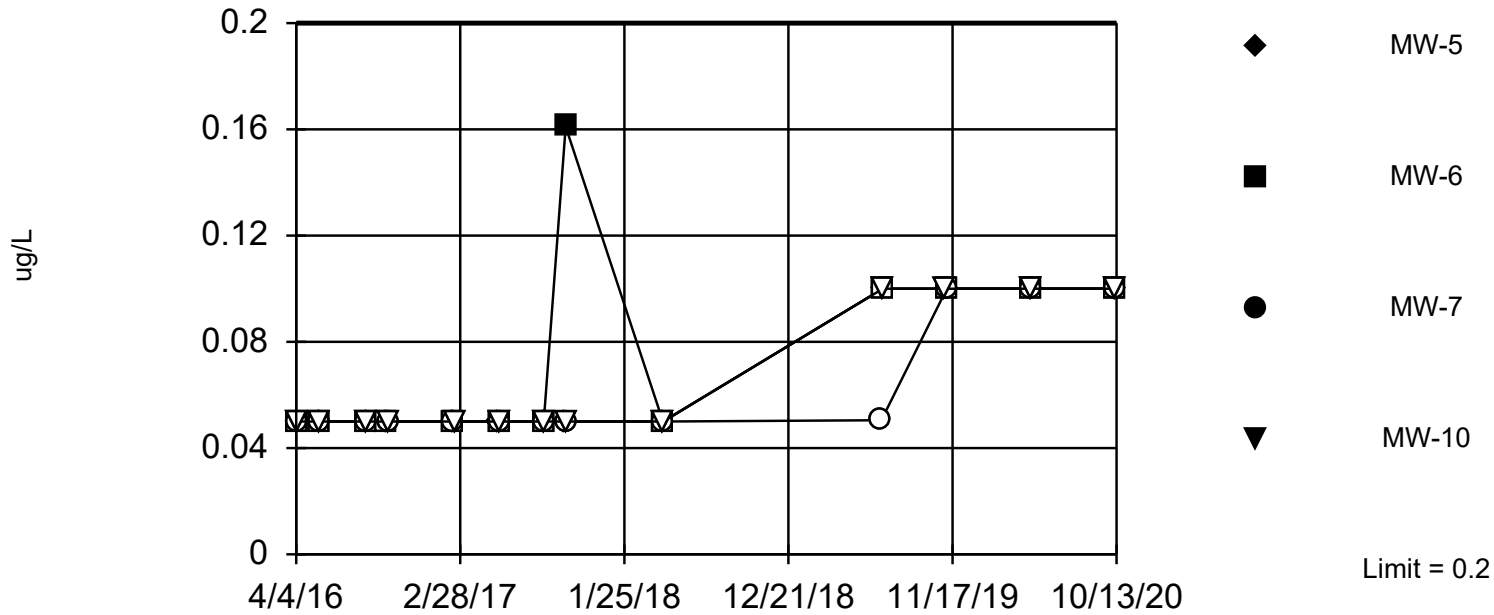
Facility: BREC Wilson LF Data File: Wilson All Data



Within Limit

### Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 13) were censored; limit is most recent reporting limit. Report alpha = 0.2353. Individual comparison alpha = 0.06487. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

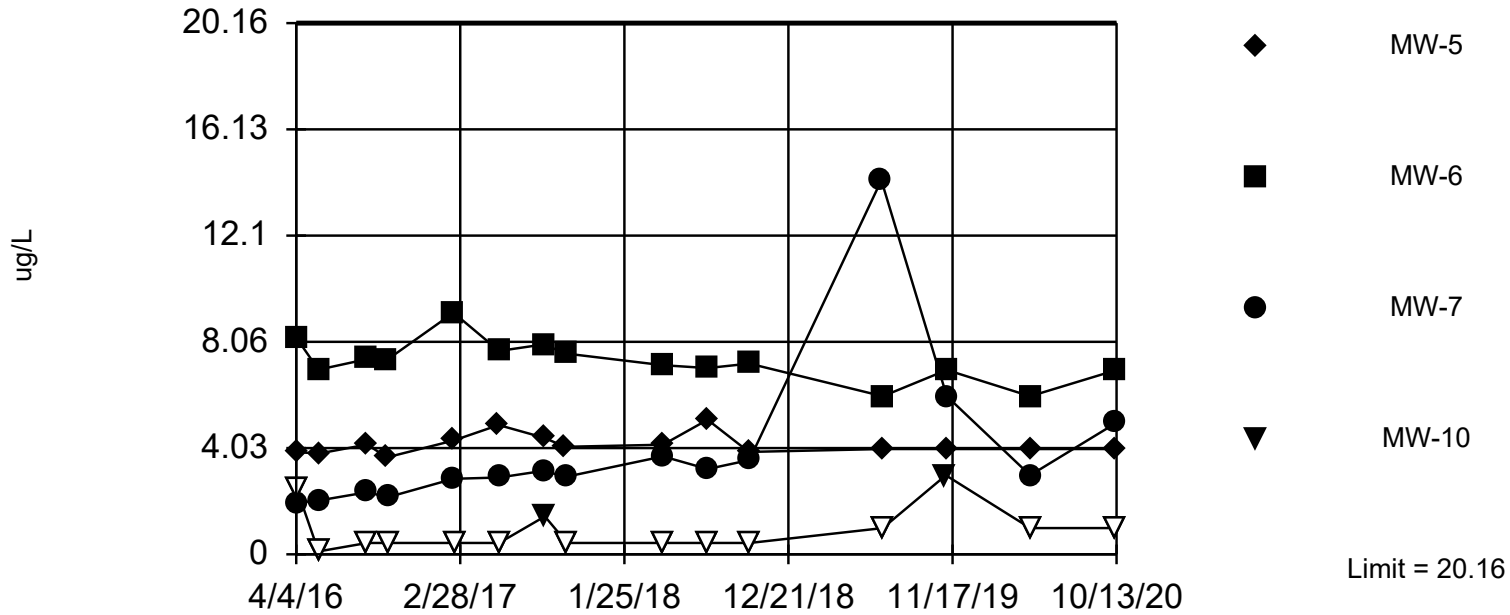
Constituent: Mercury Analysis Run 12/15/2020 9:36 AM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=13.7, Std. Dev.=2.918, n=15. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

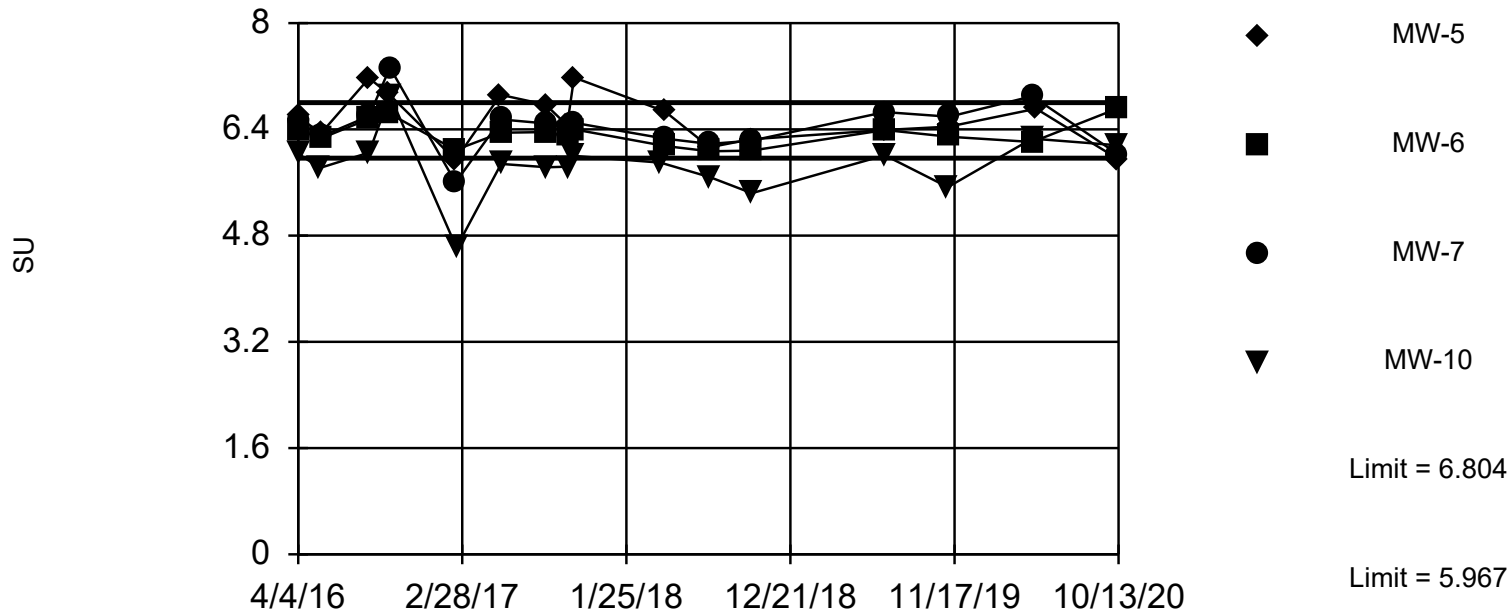
Constituent: Molybdenum Analysis Run 12/15/2020 9:42 AM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limits: MW-5

Prediction Limit

Interwell Parametric



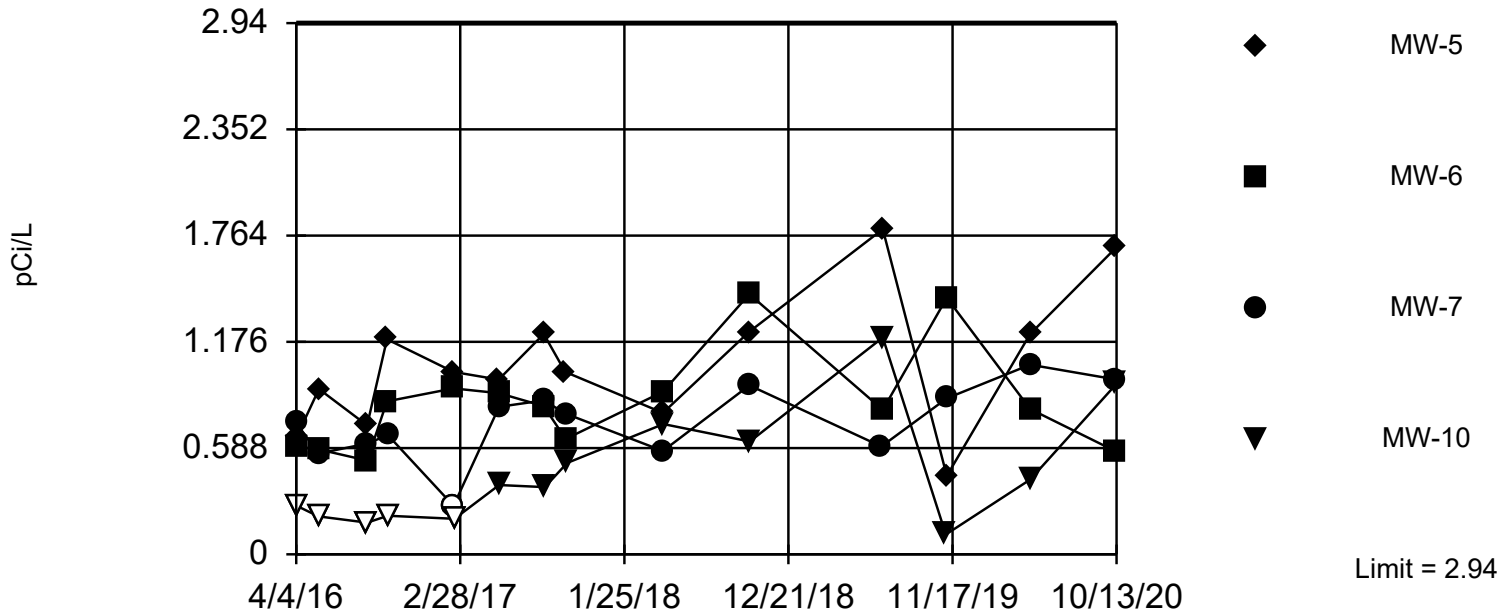
Background Data Summary: Mean=6.385, Std. Dev.=0.1615, n=15. Report alpha = 0.09646. Individual comparison alpha = 0.01252. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 4.91 (2/15/2017).

Constituent: pH [Field] Analysis Run 12/16/2020 2:54 PM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

### Prediction Limit Interwell Non-parametric



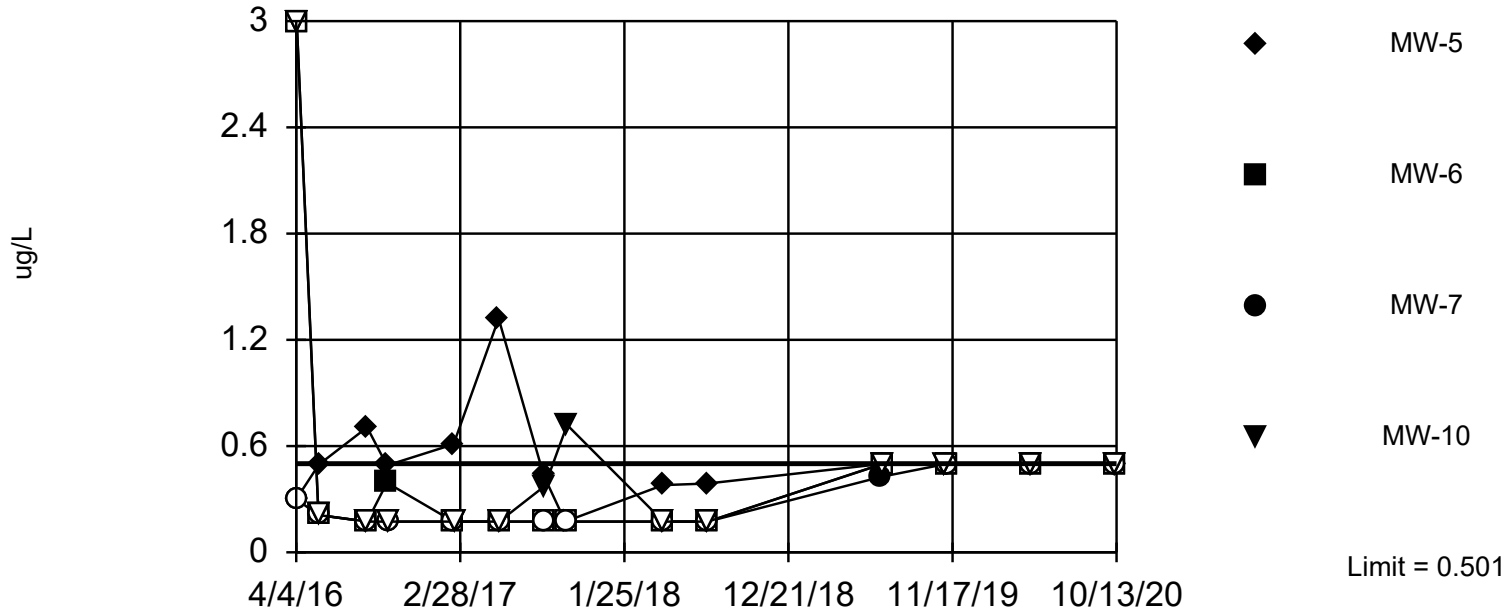
NP test selected by user. Limit is highest of 14 background values. Report alpha = 0.2222. Individual comparison alpha = 0.0609. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Radium 226 + 228 Analysis Run 12/15/2020 9:57 AM

Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

### Prediction Limit Interwell Non-parametric



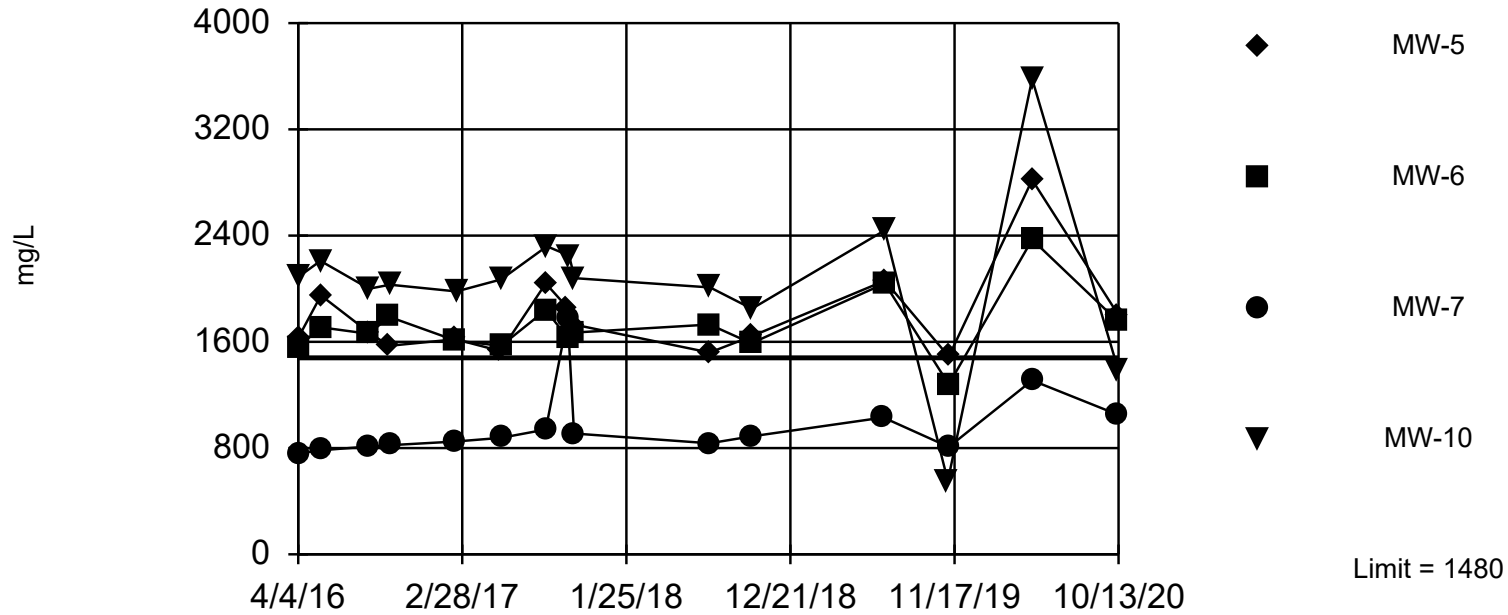
NP test selected by user. Limit is highest of 13 background values. 84.62% NDs. Report alpha = 0.2353. Individual comparison alpha = 0.06487. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Selenium Analysis Run 12/15/2020 10:10 AM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6

Prediction Limit  
Interwell Non-parametric



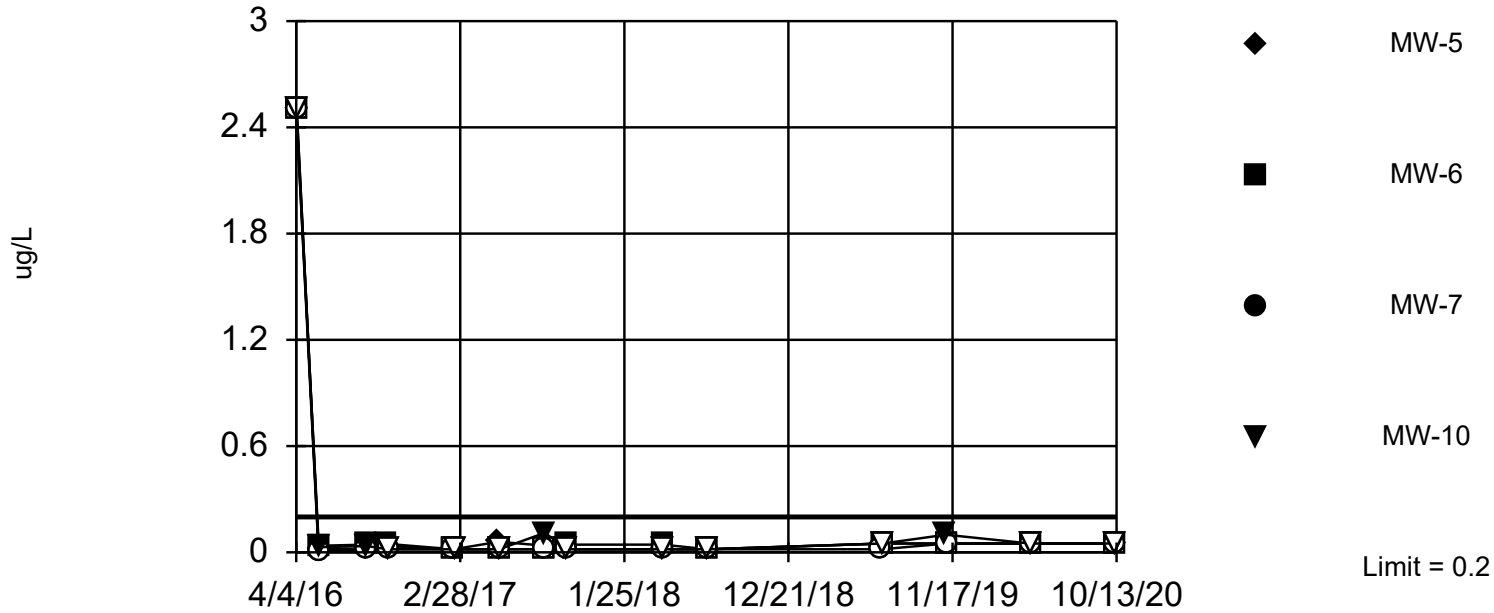
NP test selected by user. Limit is highest of 15 background values. Report alpha = 0.2105. Individual comparison alpha = 0.05738. Most recent point for each compliance well compared to limit.

Constituent: Sulfate Analysis Run 12/15/2020 10:20 AM  
Facility: BREC Wilson LF Data File: Wilson All Data

Within Limit

Prediction Limit

Interwell Non-parametric



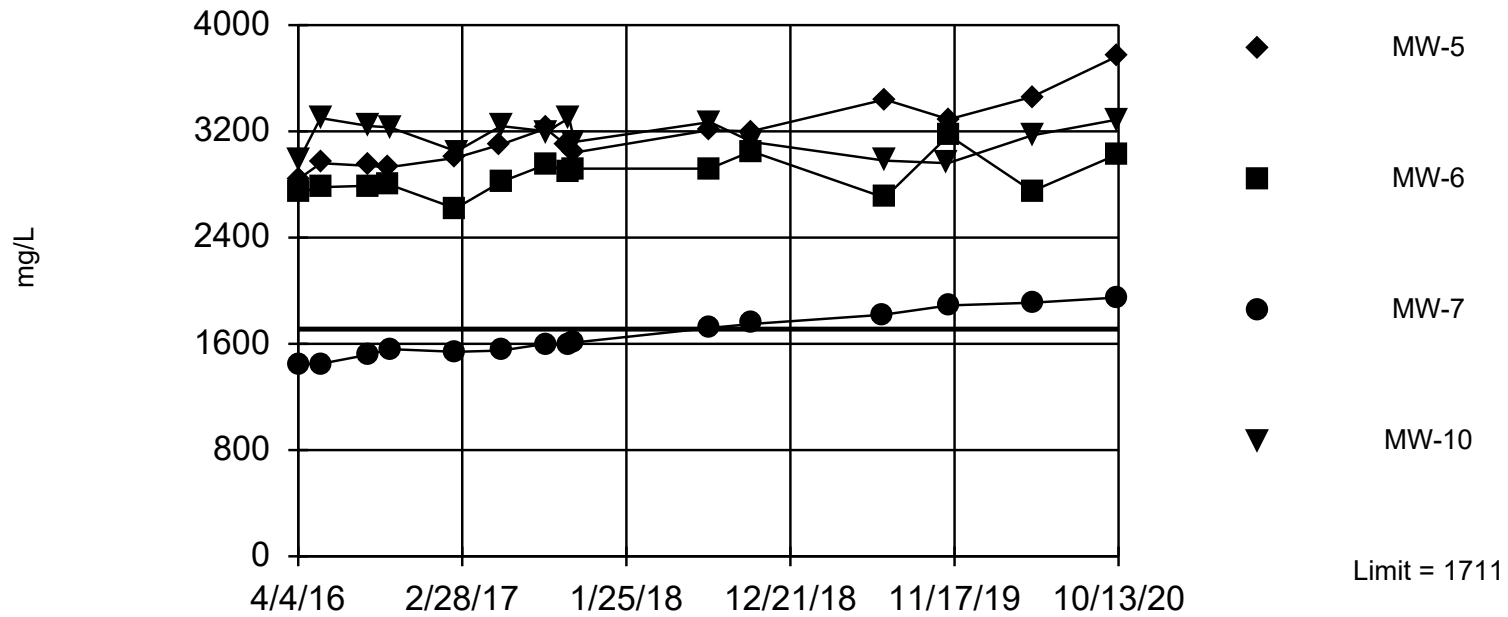
NP test selected by user. Limit is highest of 13 background values. 84.62% NDs. Report alpha = 0.2353. Individual comparison alpha = 0.06487. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: <5 (4/4/2016).

Constituent: Thallium Analysis Run 12/15/2020 10:36 AM

Facility: BREC Wilson LF Data File: Wilson All Data

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit  
Interwell Parametric



Background Data Summary: Mean=1567, Std. Dev.=64.75, n=15. Report alpha = 0.09646. Individual comparison alpha = 0.02504. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Total Dissolved Solids    Analysis Run 12/15/2020 10:56 AM  
 Facility: BREC Wilson LF    Data File: Wilson All Data



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