# 2020 Annual Groundwater Monitoring Report Per EPA CCR Rule (CFR § 257.90-.98)

# Asbury Generating Station CCR Impoundment Jasper County, MO

January 2021

**Prepared For:** 

The Empire District Electric Company 602 S. Joplin Avenue Joplin, Missouri 64801







# **CERTIFICATE OF COMPLIANCE**

Annual Groundwater Monitoring Report for Existing CCR Surface Impoundments EPA CCR Rule Section 40 CFR 257.90 (e) Empire District Electric Company – Asbury Power Plant Asbury, Missouri

The following presents the Annual Groundwater Monitoring Report for the Empire District Electric Company's CCR Impoundment at the Asbury Power Plant. This serves as certification that the facility is in compliance with 40 CFR 257.90 (e) of the EPA CCR.

#### 40 CFR 257.90 (e) states:

(e) Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report.

#### **CERTIFICATION 257.90 (e)**

The undersigned Professional Engineer (P.E.) is familiar with the requirements of 40 CFR Part 257. The above summarizes the status of the Groundwater Monitoring for the Empire District Electric Company's CCR Impoundment at the Asbury Power Plant. I hereby certify that the facility is in compliance with 40 CFR 257.90 (e) and all information has been placed in the Operating Record. Notification of availability of this document should be provided to the State Director as required in section 257.107(h).

Name:	Anika	Careaga,	P.F.
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Signature:

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Date:

Registration Number: 2005022085

State: Missouri





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# **1.0 INTRODUCTION**

The EPA Coal Combustion Residual Regulations (40 CFR Part 257) (CCR Rule) require groundwater monitoring of CCR impoundment. This Asbury Generating Station CCR impoundment groundwater monitoring sampling report is in accordance with the EPA CCR Rule.

In accordance with the EPA CCR Rule (§ 257.90-.98) the status of the Groundwater Monitoring was placed on-line October 17, 2017, as required by the EPA CCR rule. On November 2, 2017 the facility received approval from Missouri Department of Natural Resources (MDNR) of their groundwater system (included in **Appendix 1**). Empire notified the MDNR "State Director" via e-mail when this document was posted on-line, as required in the CCR rule.

The EPA CCR Rule requires the annual groundwater report be prepared by January 31<sup>st</sup> of the following year. The first report was due January 31, 2018. This report was prepared in general accordance with the EPA CCR Rule for groundwater requirements. These regulations outline groundwater monitoring requirements and data evaluation methods. The annual groundwater report for the 2020 sampling events will be posted on-line within 30 days of placement in the operating record.

The purpose of the groundwater monitoring plan is to monitor the ground water quality surrounding the facility and to evaluate potential impacts and/or releases from facility operations. Background groundwater data was collected from January 2016 to August 2017. After the background data plus the first semi-annual sampling events, a reduced sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will generally be completed during the months of May and November. Statistical analysis for EPA Appendix III began after the first semi-annual sampling event was collected on October 4, 2017 to determine if a statistically significant increase (SSI) has occurred. If an SSI is verified, additional evaluation is required to determine if the SSI was caused by the CCR impoundment.

On May 13, 2020, a semi-annual sampling event was conducted per the EPA CCR Rule (§ 257.90-.98). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. For quality assurance and quality control measures, a duplicate sample at MW-7 was taken. These samples were preserved and submitted directly to the laboratory.

This report is a summary of the May 2020 sampling event and the findings of the statistical analysis of the results of the groundwater monitoring program at the Asbury Generating Station CCR Impoundment. Specific information of each sampling event can be obtained from the individual report which is part of the Asbury Operating Record.



Four more sets of background data were available to add to the background data set for the November 2019 sampling event. The analysis of the additional data for the background data set was conducted and is included in the November 2019 Report in **Appendix B**. No trending was found in the additional four sets of data so they were added to the baseline data set to increase the statistical power of the background data.

#### 3.0 MAY 2020 SAMPLING EVENT

On May 13, 2020, a semi-annual detection monitoring sampling event was conducted per the EPA CCR Rule (§ 257.94). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. For quality assurance and quality control measures, a duplicate sample at MW-7 was taken.

	Table 1 – Constituents Identified Above Laboratory Reporting Limits During May 2020 Sampling Event									
Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.16	0.1	<0.08J	0.27	0.91	0.32	0.42	0.26
Calcium	mg/L	NA	38	100	270	100	260	250	190	480
Chloride	mg/L	NA	110	57	9.7	5.8	75	14	19	44
Fluoride	mg/L	4.0	0.42	0.17	0.12	0.34	0.45	0.27	0.34	<0.25J
рН	SU	NA	6.77	5.77	6.49	6.59	6.38	6.33	6.13	6.3
Sulfate	mg/L	NA	46	460	540	130	1200	880	710	1600
Total Dissolved Solids	mg/L	NA	560	910	1500	570	2100	1600	1400	2800

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

J = Trace value seen above minimum detection limit but below reporting limit (trace)

The results of the EPA requested interwell prediction limit statistical analysis of the May 2020 sampling event indicate that the site is in compliance. The results for boron (MW-5A and MW-6A) and fluoride (MW-5A) indicated an initial interwell prediction limit exceedance for the listed monitoring well during May 2020 sampling event. There is a current primary (health based) MCL for fluoride of 4.0 mg/L but the result is below the limit. Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L but all results were below that limit. Trending was found to be significant for boron (MW-5A) but not significant in boron (MW-6A) and fluoride (MW-5A). Boron is also trending upward in MW-2 which is an up-gradient well. The facility plans to resample as part of the November 2020 sampling event. **Appendix A** contains the complete report for the May 2020 sampling event.

During the November 2019 sampling event, Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted. However, these initial prediction limit exceedances were not confirmed during the May 2020 sampling event. Therefore, the site will continue with the detection monitoring program per the EPA CCR Rule (§ 257.94) on a semi-annual basis for the November 2020 sampling event.



#### 4.0 NOVEMBER 2020 SAMPLING EVENT

On November 10, 2020, a semi-annual detection monitoring sampling event was conducted per the EPA CCR Rule (§ 257.94). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. For quality assurance and quality control measures, a duplicate sample at MW-5 was taken.

	Table 2 – Constituents Identified Above Laboratory Reporting Limits									
During November 2020 Sampling Event										
Constituent	Units	MCL	MW-2 (up)	MW-3 (up)	MW-4 (down)	MW-5 (down)	MW-5A (down)	MW-6 (down)	MW-6A (down)	MW-7 (side)
Appendix III										
Boron	mg/L	NA	0.16	<0.08J	<0.08J	0.25	1.9	0.32	0.38	0.22
Calcium	mg/L	NA	37	92	230	71	380	240	170	460
Chloride	mg/L	NA	120	62	4.4	6.4	170	13	25	39
Fluoride	mg/L	4.0	0.39	0.14	<0.1J	0.27	<0.1J	0.22	0.3	<0.1J
рН	SU	NA	6.51	5.68	6.8	7.6	6.72	6.96	7.09	6.81
Sulfate	mg/L	NA	56	530	550	160	2300	1200	850	2200
Total Dissolved Solids	mg/L	NA	430	860	1800	510	3200	1700	1500	2800

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

J = Trace value seen above minimum detection limit but below reporting limit (trace)

No constituents were detected above the Federal Safe Drinking Water maximum contaminant level (MCL) during the sampling event. The results of the EPA requested interwell prediction limit statistical analysis of the November 2020 sampling event indicate a confirmed exceedance for Boron (MW-5A). Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L which the results were below. The facility will conduct an alternative source demonstration in the next 90 days per the EPA CCR Rule (§ 257.94).

The results for pH (MW-5, MW-6 and MW-6A) and total dissolved solids (MW-5A) indicated initial interwell prediction limit exceedances for the listed monitoring well during November 2020 sampling event. There are no current primary (health based) MCLs for pH or total dissolved solids. The facility plans to resample as part of the May 2021 sampling event. During the May 2020 sampling event, Initial interwell prediction exceedances in boron (MW-5A and MW-6A) and fluoride (MW-5A) were noted. However, the initial prediction limit exceedances of boron (MW-6A) and fluoride (MW-5A) were not confirmed during the November 2020 sampling event. **Appendix B** contains the full report for the November 2020 sampling event.

#### **5.0 EXCUTIVE SUMMARY**

This report is a summary of the 2020 sampling events and the findings of the statistical analysis of the results of the groundwater detection monitoring program at the Asbury Generating Station CCR Impoundment. Specific information of each sampling event can be obtained from the individual reports which are included as appendices and have been placed in the Asbury Operating Record. Statistical analysis will continue utilizing interwell prediction limits per EPA's request.

The results of the alternative source demonstration will determine if the site continues with the detection monitoring program on a semi-annual basis or moves into assessment monitoring per the EPA CCR Rule (§ 257.94).



**APPENDIX A** 

May 2020 Sampling Event

# 2020 Groundwater Monitoring, Sampling & Statistics Per EPA CCR Rule (CFR § 257.90-.98)

**May Sampling Event** 

# Asbury Generating Station CCR Impoundment Jasper County, MO

July 2020

**Prepared For:** The Empire District Electric Company 602 S. Joplin Avenue Joplin, Missouri 64801





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# **1.0 INTRODUCTION**

The EPA Coal Combustion Residual Regulations (40 CFR Part 257) (CCR Rule) require groundwater monitoring of CCR impoundment. This Asbury Generating Station CCR impoundment groundwater monitoring sampling report is in accordance with the EPA CCR Rule.

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The purpose of the groundwater monitoring plan is to monitor the ground water quality surrounding the facility and to evaluate potential impacts and/or releases from facility operations. Background groundwater data was collected from January 2016 to August 2017. After the background data plus the first semi-annual sampling events, a reduced sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will generally be completed during the months of May and November. Statistical analysis for EPA Appendix III began after the first semi-annual sampling event was collected on October 4, 2017 to determine if a statistically significant increase (SSI) has occurred. If an SSI is verified, additional evaluation is required to determine if the SSI was caused by the CCR impoundment.

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# 2.0 SITE LOCATION

The site occupies the north half of Section 17, Township 30 North, and Range 33 West on the Asbury 7.5-Minute Quadrangle Map as seen in **Figure 1**. The site is located approximately 5.5 miles north-northeast of Asbury, Missouri, about 14 miles north-northwest of Joplin, Missouri. A map showing the locations of the monitoring wells is on **Figure 2**.

# 2.1 History

In March 1996, five (5) groundwater monitoring wells, MW-1 through MW-5, were installed around the perimeter of the Asbury Generating Station CCR impoundment. Monitoring wells MW-1, MW-2 and MW-3 were installed to a total depth of between 27.0 to 28.5 feet below ground surface (bgs). Monitoring wells MW-4 and MW-5 were installed to a total depth of 48 feet bgs. Each of the five monitoring wells was equipped with 10.0-foot well screens. The five wells were then developed, purged, and sampled in 1996.

In 2003, two (2) additional groundwater monitoring wells were installed and identified as MW-6 and MW-7. Both wells had 2-inch diameter PVC well casings installed to an approximate total depth of 44 feet below ground surface. Both wells were installed with an above ground steel protective cover. No other construction details such as well screen lengths were available for these two (2) wells. In December 2015, two (2) additional groundwater monitoring wells were installed and identified as MW-5A and MW-6A.

All wells are registered with MDNR – Missouri Geological Survey Program.

#### 2.2 Site Geology

Drilling and subsurface investigation activities at the Site and as part of the MDNR approved CCR landfill Detailed Site Investigation (DSI) for the adjacent landfill area identified three (3) primary geologic units at the Site. These geologic units include the surficial soil layer, Warner Sandstone (uppermost aquifer), and Riverton Shale (confining unit). The information presented herein includes the primary elements of a site characterization work plan consistent with the MDNR guidance.

<u>Surficial Soil</u>. Soils at the site consist of a surficial unit of cohesive soils (e.g., CL, SC, ML, and CH) underlain by Pennsylvanian-age bedrock. Soil thickness at the Site ranges from approximately 15-25 feet.

<u>Warner Sandstone</u>. The Warner Sandstone (Sandstone) is the uppermost bedrock unit in south portion of the Site. In the north area of the Site, the Sandstone is overlain by the Riverton Shale (Shale). Based on the DSI information, the Sandstone and Shale can occur as alternating layers. The Sandstone and Shale are gradational in places and transition from shaley sandstone to sandy shale. According to the MDNR publication on the Pennsylvanian Subsystem in Missouri, the Warner Sandstone formation is described as follows: "Generally, the lower part is interbedded, very fine grained sandstone and claystone. The upper part is largely medium-bedded to massive channel fill sandstone. In places, the Warner consists primarily of shale and claystone, with only minor amounts of sandstone" and "ranges in thickness from 0 to 15m (49.2 ft.)."

The Sandstone is more than 25-30 feet thick in places and is generally medium hard and thin to medium bedded with occasional shale partings. The degree of induration of the Sandstone varies and generally increases with depth. Slug tests performed at selected DSI piezometers screened in



the Sandstone exhibited hydraulic conductivities ranging from approximately 1.3x10-4 cm/sec to 5.9x10-6 cm/sec. The slug test results are consistent with values for sandstone and shaley sandstone. The groundwater gradient is towards the east and Blackberry Creek.

<u>Riverton Shale</u>. Layers of the Riverton Shale (Shale) exhibited thicknesses ranging from approximately one foot to more than 10 feet. The Shale is generally dark gray to light gray. The Shale is mainly thin bedded with hardness ranging from soft to hard. Six packer tests were performed during the DSI to assess the hydraulic conductivity of the Shale. The packer test results ranged from approximately  $3.2 \times 10^{-6}$  cm/sec to  $4.9 \times 10^{-8}$  cm/sec. The packer test data indicates that the Shale is an effective confining unit.

According to the MDNR publication on the Pennsylvanian Subsystem in Missouri, the Riverton Shale formation is described as "dark gray to black, fine-grained, relatively brittle shale and contains as many as three coal beds, each of which is underlain by underclay" and "varies in thickness from a featheredge to more than 90 feet".

<u>Unnamed Coal</u>. The Shale includes coal seams in places that range in thickness from a few inches to approximately 1.5 feet. The coal is generally black to dark gray.

#### 2.3 Groundwater Monitoring Network Design

The groundwater monitoring system for the CCR impoundment consists of nine (9) groundwater monitoring wells. Two (2) wells are considered upgradient. Two (2) wells are considered sidegradient; one is only monitored for groundwater elevation. The remaining five (5) wells are considered downgradient.

The groundwater monitoring wells (MWs) at the Asbury Generating Station are equipped with individual dedicated poly tubing to be connected to a peristaltic pump/controller at the surface. Low-flow, micro-purge and sampling techniques and technology are utilized to collect groundwater samples from the subject wells. The groundwater sampling procedures are discussed in further detail below.

#### 2.4 Groundwater Monitoring Network

The locations of the monitoring wells are shown on **Figure 2**. The groundwater monitoring system for the site consists of the following monitoring wells:

- MW-1 Sidegradient (water level only)
- MW-2 Upgradient
- MW-3 Upgradient
- MW-4 Downgradient
- MW-5 Downgradient
- MW-5A Downgradient
- MW-6 Downgradient
- MW-6A Downgradient
- MW-7 Sidegradient

#### 2.5 Seasonal Variation

Historical groundwater elevation data has been limited. However, adequate lengths of well screen have been utilized during the construction of the wells to accommodate typical seasonal groundwater elevation variations seen in southwest Missouri.



# 2.6 Groundwater Flow Direction

Historically, the seasonally high potentiometric surface indicated the groundwater flow direction to the east. **Figure 3** is a potentiometric map for this May 2018 sampling event.

Originally MW-7 was thought to be a downgradient well but review of the potentiometric mapping from the eight background sampling events revealed that the well is actually a sidegradient well. Therefore, the designation for MW-7 has been changed from a downgradient to a sidegradient well for compliance monitoring.



# **3.0 BASELINE GROUNDWATER DATA**

# **3.1 Baseline Data Collection**

Per EPA CCR Rule § 257.94(b), the site initiated the detection monitoring program in January 2016 to include obtaining a minimum of eight (8) independent samples for each background and downgradient well. The eight (8) independent groundwater samples were obtained and analyzed as required by the CCR Rule under per the baseline groundwater monitoring plan. Background groundwater data was collected from January 2016 to August 2017.

Groundwater Monitoring Reports were completed for each sampling event and have been placed in the Operating Record. Summary tables of the results from each event are included in **Appendix 2**. A listing of each event is below:

- January 2016
- March 2016
- May 2016
- August 2016
- October 2016
- March 2017
- June 2017
- August 2017

Initial baseline monitoring was required at all monitoring wells. The sampling frequency was quarterly or more frequently for the first two (2) years. After the background data plus the first semi-annual sampling events, a reduced lower sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will be completed during the months of May and October.

The initial two (2) years of baseline and the first semi-annual detection monitoring included parameters listed in Appendix III and Appendix IV of the EPA CCR Rule. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. **Appendix 2** contains the list of constituents.

#### **3.2 Background Data Analysis**

Sanitas<sup>™</sup> for Ground Water Version 9.2.13 was used to run the statistical analyses with settings used as recommended by the Sanitas<sup>™</sup> training course and user manual. The background data consisted of eight sampling events between January 2016 and August 2017 for both the Appendix III and IV constituents. Eight background events are needed for statistical analysis. An analysis of the Appendix III background data was conducted and is included in **Appendix 5**. Trending was found in Boron (MW-3) and Total Dissolved Solids (MW-3). MW-3 is an up-gradient well. Trending was not removed at that time; otherwise the site would be below the minimum of eight background samples needed to run statistics.

Four more sets of background data were available to add to the background data set for the November 2019 sampling event. The analysis of the additional data for the background data set was conducted and is included in **Appendix 5**. No trending was found in the additional four sets of data so they were added to the baseline data set to increase the statistical power of the background data.



#### 4.0 GROUNDWATER SAMPLING EVENT

On May 13, 2020, eight (8) groundwater monitoring wells were sampled by Midwest Environmental Consultants (MEC) for the EPA CCR Rule Appendix III parameters. For quality assurance and quality control measures, a duplicate sample was taken at MW-7. The sampling protocol and methodology was to be conducted in accordance to the facility's Sampling and Analysis Plan. **Table 1** provides a list of the analytical methods employed by the subcontracted laboratory.

Table 1 – Analytical Methods				
Method	Description			
9056A	Anions, Ion Chromatography			
6020A	Metals (ICP/MS)			
SM 2540C	Solids, Total Dissolved (TDS)			
Field Sampling	Field Sampling			

**Appendix 3** includes Monitoring Well Field Inspection sheets and field notes. The physical integrity of the wells was good. During sample collection each of the wells was monitored for pump discharge and formation recharge. Initially, a static water level for each well was recorded (**Table 2**). To ensure sufficient recharge while sampling, static water levels were collected during pumping. Prior to sample collection, field parameters for each well were measured with a flow-through meter. When the field parameters stabilized, samples for analytical testing were collected and placed on ice for hand delivery to the laboratory. At the conclusion of sample collection from each well, a final static water level measurement was obtained. The samples were collected in the appropriately pre-preserved sample containers and placed on ice for delivery.

Table 2 - Groundwater Sampling Field Parameters Summary During May 2020 Sampling Event						
WELL	STATIC WA (ft-B		PURGE RATE	STABILIZED		
ID	Initial	Final	(mL/min)	рН		
MW-1*	NT	NA	NA	NA		
MW-2	1.04	3.20	200	6.77		
MW-3	0.00	0.50	200	5.77		
MW-4	5.26	9.94	200	6.49		
MW-5	0.99	6.02	200	6.59		
MW-5A	8.38	15.81	200	6.38		
MW-6	8.11	12.45	200	6.33		
MW-6A	7.38	11.78	200	6.13		
MW-7	2.56	2.74	200	6.30		
* Water Level Only	NA Not Applicab	lo NT Not Test	ad (inaccossible)			

\* Water Level Only NA – Not Applicable NT – Not Tested (inaccessible)

**Appendix 4** includes the initial analytical results for the sampling event. Included with this analytical report are sample information; chain of custody; wet chemistry data; and volatile data.



#### 5.0 DATA VALIDATION PROCEDURES FOR GROUNDWATER MONITORING DATA

Midwest Environmental Consultants receives Data Packages from the analytical laboratory (Test America). The internal quality control/quality assurance case narratives and reported data are then reviewed. Generally the data validation procedures established by the U.S. Environmental Protection Agency *Contract Laboratory Program Functional Guidelines for Organic Data Review* and *Functional Guidelines for Inorganic Data Review* is followed. These guidelines are used to assign data qualifiers to the data. A formal data validation report for the site is not prepared; however, any significant issues are noted in the groundwater monitoring report.

MEC evaluates the data set for precision, accuracy, representativeness, comparability, and completeness (PARCC).

#### 5.1 Precision

<u>Laboratory Precision</u>. Laboratory quality control procedures to measure precision consist of laboratory control sample (LCS) analysis and analysis of matrix spike/matrix spike duplicates (MS/MSD). These analyses are used to define analytical variability.

<u>Field Precision</u>. Analyses of duplicate samples are used to define the total variability (replicability) of the sampling/analytical system as a whole. Field replicates are collected at a rate of one per sampling event.

#### 5.2 Accuracy

Accuracy is determined by calculating the percent recoveries for analyses of surrogate compounds, LCSs, continuing calibration check standards, and matrix spike samples. Acceptable percent recoveries are established for SW-846 and EPA methods. Field and laboratory blank analysis are also used to address measurement bias.

<u>Field Blanks.</u> Field blanks consisted of a trip blank and a field blank. One trip blank per cooler accompanies samples for volatile organic analyses.

<u>Laboratory Blanks.</u> Method blanks, artificial, matrix-less samples, are analyzed to monitor the laboratory analysis system for interferences and contamination from glassware, reagents, etc. Method blanks are taken through the entire sample preparation process. They are included with each batch of extractions or digestions prepared, or with each 20 samples, whichever is more frequent.

#### **5.3 Representativeness**

Representativeness expresses the degree to which sample data accurately and precisely reflect site condition. Representativeness of the data is determined by comparing actual sampling procedures to those delineated in the field sampling plan, comparing results from field replicate samples and reviewing the results of field blanks. Field notes are reviewed as part of our data validation process.

#### 5.4 Comparability

Comparability expresses the confidence with which one data set can be compared to another data set measuring the same property. Comparability is ensured by using established and approved sample collection techniques and analytical methods, consistent basis of analysis, consistent reporting units, and analyzing standard reference materials.



# 5.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected under controlled laboratory conditions. Completeness is defined as the valid data percentage of the total tests requested. Valid data are defined as those where the sample arrived at the laboratory intact, properly preserved, in sufficient quantity to perform the requested analyses, and accompanied by a completed chain-of-custody form. Furthermore, the sample must have been analyzed within the specified holding time and in such a manner that analytical QC acceptance criteria were met.



# 6.0 STATISTICAL ANALYSIS

### 6.1 Sampling Results

The constituents with results above the laboratory reporting limits are included in **Table 3**. The Test America laboratory analytical results are included in **Appendix 4**.

	Table 3 – Constituents Identified Above Laboratory Reporting Limits									
	During May 2020 Sampling Event									
Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.16	0.1	<0.08J	0.27	0.91	0.32	0.42	0.26
Calcium	mg/L	NA	38	100	270	100	260	250	190	480
Chloride	mg/L	NA	110	57	9.7	5.8	75	14	19	44
Fluoride	mg/L	4.0	0.42	0.17	0.12	0.34	0.45	0.27	0.34	<0.25J
рН	SU	NA	6.77	5.77	6.49	6.59	6.38	6.33	6.13	6.3
Sulfate	mg/L	NA	46	460	540	130	1200	880	710	1600
Total Dissolved Solids	mg/L	NA	560	910	1500	570	2100	1600	1400	2800

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

J = Trace value seen above minimum detection limit but below reporting limit (trace)

No constituents were detected above the Federal Safe Drinking Water maximum contaminant level (MCL) during the sampling event.

# 6.2 Statistical Analysis

The November 2019 sampling event report indicated confirmed intrawell prediction limits exceedances. Intrawell prediction limits were utilized per the facility's 2018 Groundwater Statistical Analysis Plan. The Annual Report recommending the site move into assessment monitoring was stamped on January 23, 2020 and submitted to the facility. However, in February MEC received an email from the facility. MDNR had forwarded EPA correspondence requesting that the site change their statistical evaluation method to interwell prediction limits. EPA CCR Rule 40 CFR § 257.94(e)(2) allows at alternative source demonstration to be completed if the statistically significant increases are result of the statistical evaluation rather than from a release from the facility. **Appendix 1** contains the MDNR/EPA correspondence.

Prediction interval analyses compare one or more observations to a limit set by background data. Interwell analyses compare observations from background wells, which include upgradient and sidegradient wells per EPA Unified Guidance definitions, and their relation to the observations for the downgradient wells. Intrawell analyses compare background observations to current observations of the same well. In order to appropriately characterize the groundwater beneath the site, the statistical methods utilized at the facility consider the following facts as they relate to site:

- Potential differences in geochemical characteristics of the groundwater caused by the differing lithologies in contact with the screened interval from well to well.
- Potential impacts of surface infiltration into the groundwater environment.

Due to varying geology in the state of Missouri, intrawell analyses had initially been deemed a more appropriate method. Municipal and demolition waste landfills in Missouri typically utilize intrawell prediction limits per MDNR. However, it was noted that the power curve for these



analyses was not considered strong yet. The data set consisted of only 13 sampling events from January 2016 to November 2019. EPA Unified Guidance recommends 20 or more sampling events for background data for intrawell prediction limits. A small data set triggers an SSI when there is even a slight increase in concentration. Sanitas also note to each exceedance "*Insufficient data to test for seasonality: data were not deseasonalized.*" Minor increases in concentration noted in the May and November 2019 sampling events did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated.

The EPA Unified Guidance Chapter 5.2.3 states "In groundwater data collection and testing, background conditions may not be static over time. Caution should be observed in removing observations which may signal a change in natural groundwater quality. Even when conditions have not changed, an apparently extreme measurement may represent nothing more than a portion of the background distribution that has yet to be observed. This is particularly true if the background data set contains fewer than 20 samples." Chapter 5.2.4 states "With such a small background sample, it can be difficult to develop an adequately powerful intrawell prediction level or control chart, even when retesting is employed (Chapter 19). Thus, additional background data will be needed to augment compliance well samples". Minor increases in concentrations did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated.

	Table 4 – EPA Review of Groundwater Reports
Facility	Asbury Power Plant
Location	Asbury, MO
Owner	Empire District Electric Company
Units	Upper Pond-unlined, South Pond-unlined, Lower Pond-unlined
	Surficial unit of clay, clayey sand, and silt approximately 15 to 25 feet
Goology	thick underlain by Warner Sandstone approximately 25-30 feet thick in
Geology	the southern portion of the site and the Riverton Shale in the northern
	area of the site
	Analytical results indicate consistent differences in contaminant
Problematic Use of	concentrations between upgradient and downgradient wells.
Intra Well	Consequently, inter well comparisons are feasible and would be
Comparisons	preferable in the absence of compelling reasons to use intra well
	analysis
<b>Problematic Alternate</b>	
Source Determination	
	While there are no boring logs in the documents to confirm that the
	wells are screened in the same geologic unit, consistency in the field
	parameters and the description of the geology suggest that the wells
Conclusions	are screened in the sandstone. The analytical results indicate
Conclusions	consistent differences in contaminant concentrations between
	upgradient and downgradient wells, consequently, interwell
	comparisons are feasible and would be preferable in the absence of
	compelling reasons to use intra wells analyses

MDNR made several requests per EPA in the correspondence located in **Appendix 1** which included the EPA review of the groundwater reports as seen in **Table 4**.



Sanitas<sup>™</sup> for Ground Water Version 9.6.25 was used to run the statistical analyses with settings used as recommended by the Sanitas<sup>™</sup> training course and user manual. Interwell prediction intervals were run per EPA's request. The Sanitas<sup>™</sup> output is included in **Appendix 5**.

Statistical analysis was performed on the Appendix III constituents from the May 2020 sampling event compared to the updated background dataset. Prediction interval analyses compare one or more observations to a limit set by background data. Interwell analyses compare observations from upgradient background wells and their relation to the observations for the downgradient wells. Intrawell analyses compare background observations to current observations of the same well. Due to varying geology in the state of Missouri, intrawell analyses had initially been deemed a more appropriate method. However, EPA has requested the site utilize interwell prediction limits.

Statistical analysis results are presented below for those constituents determined to have an exceeded a prediction limit. However, EPA's "Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities," March 2009, EPA 530/R-09-007 is referenced multiple times in the preamble of the EPA CCR regulations for groundwater sampling and analysis requirements. According to the EPA Unified Guidance, a prediction limit exceedance is not considered a statistically significant increase (SSI) until it is confirmed through retesting. SSIs generated by non-detectable results or with less than eight background events are considered statistically invalid.

**Table 5** lists the parameters with exceedances of prediction limits during the May 2020 sampling event, the associated monitoring wells, if the exceedance is initial versus confirmed, the predicted limit, the measured concentration, and the MCL set forth in the National Drinking Water Regulations. The MCL is the highest level of a contaminant that is allowed in drinking water.

Table 5 – Interwell Prediction Limit Exceedances Observed During May 2020 Sampling Event						
Constituent	Monitoring Well	Initial vs. Confirmed	Predicted Limit (mg/L)	Measured Concentration (mg/L)	Drinking Water MCLs (mg/L)	
Boron	MW-5A	Initial	0.4147	0.91	NA/4.0 GWPS*	
Boron	MW-6A	Initial	0.4147	0.42	NA/4.0 GWPS*	
Fluoride	MW-5A	Initial	0.4053	0.45	4.0	

NA = Not Applicable \*EPA proposed groundwater protection standard

#### 6.3 Results Interpretation

The results of the EPA requested interwell prediction limit statistical analysis of the May 2020 sampling event indicate that the site is in compliance. The results for boron (MW-5A and MW-6A) and fluoride (MW-5A) indicated an initial interwell prediction limit exceedance for the listed monitoring well during May 2020 sampling event. There is a current primary (health based) MCL for fluoride of 4.0 mg/L but the result is below the limit. Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L but all results were below that limit. Trending was found to be significant for boron (MW-5A) but not significant in boron (MW-6A) and fluoride (MW-5A). Boron is also trending upward in MW-2 which is an up-gradient well. The facility plans to resample as part of the November 2020 sampling event.



During the November 2019 sampling event, Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted. However, these initial prediction limit exceedances were not confirmed during the May 2020 sampling event. Below is a discussion of the previous results for comparison.

#### November 2019

The result for Chloride (MW-5A), pH (MW-4) and Sulfate (MW-5A) indicated an initial intra-well prediction limit exceedance for the listed monitoring well during the November 2019 sampling event. There is no current primary (health based) MCL for chloride, pH or sulfate.

During the May 2019, the result for Boron (MW-5A) indicated an initial intra-well prediction limit exceedance and Total Dissolved Solids (MW-5A) indicated a confirmed intra-well prediction limit exceedance. There is no current primary (health based) MCL for boron and total dissolved solids. These prediction limit exceedances were confirmed during the November 2019 sampling event. A resample of MW-5A was conducted on December 11, 2019. The results of the resample confirmed the exceedances and the site planned to move into assessment monitoring.

		December 2019 esult Compariso	n	
Constituent	Units	MCL	MW-5A	MW-5A Resample
	Арр	endix III	-	
Boron	mg/L	NA	0.82	1.0
Calcium	mg/L	NA	240	270
Chloride	mg/L	NA	69	82
Fluoride	mg/L	4.0	<0.5J	0.26
рН	SU	NA	7.2	7
Sulfate	mg/L	NA	1200	1300
Total Dissolved Solids	mg/L	NA	2000	2200

However, in February MEC received an email from the facility. MDNR had forwarded EPA correspondence requesting that the site change their statistical evaluation method to interwell prediction limits. EPA CCR Rule 40 CFR § 257.94(e)(2) allows at alternative source demonstration to be completed if the statistically significant increases are result of the statistical evaluation rather than from a release from the facility. **Appendix 1** contains the MDNR/EPA correspondence.

The results of the EPA requested interwell prediction limit statistical analysis of the November 2019 sampling event indicate that the site is in compliance. Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted but have not been confirmed. There is no current primary (health based) Maximum Contamination Level (MCL) for pH. Trending was not found to be significant for pH in any well during the analysis of the background data set.

#### May 2019

The result for Boron (MW-5A) and pH (MW-3(u), MW-5A, MW-6 and MW-6A) indicated an initial intra-well prediction limit exceedance for the listed monitoring well during the May 2019 sampling event. There is no current primary (health based) MCL boron or pH. The facility plans to resample as part of the November 2019 sampling event.



During the November 2018, the result for Total Dissolved Solids (MW-5A) indicated an initial intrawell prediction limit exceedance. There is no current primary (health based) MCL for total dissolved solids. This initial prediction limit exceedances was confirmed during the May 2019 sampling event. However, it should be noted that the power curve for these analyses is not considered strong. A small data set triggers an SSI when there is even a slight increase in concentration. The EPA Unified Guidance Chapter 5.2.4 states "With such a small background sample, it can be difficult to develop an adequately powerful intrawell prediction level or control chart, even when retesting is employed (Chapter 19). Thus, additional background data will be needed to augment compliance well samples".

Minor increases in concentrations did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated. It was also noted that higher levels of total dissolved solids were seen in the side-gradient well MW-7 demonstrating that a there was likely not a release from the facility. Therefore, the site will continue with detection monitoring on a semi-annual basis at this time.

#### November 2018

The result for Total Dissolved Solids (MW-5A) indicated an initial intra-well prediction limit exceedance for the listed monitoring well during the November 2018 sampling event. There is no current primary (health based) MCL for total dissolved solids. The facility plans to resample MW-5A for Total Dissolved Solids as part of the May 2019 sampling event.

During the May 2018, no intra-well prediction limits were exceeded. Therefore, there were no initial prediction limit exceedances to confirm during the November 2018 sampling event.

#### May 2018

No intra-well prediction limits were exceeded during the May 2018 sampling event. The October 2017 results for Total Dissolved Solids (MW-7) indicated an exceedance of the predicted limit for the listed monitoring wells. However, this initial prediction limit exceedance was not confirmed during the May 2018 sampling event.

#### October 2017

The result for Total Dissolved Solids (MW-7) indicated an initial intra-well prediction limit exceedance for the listed monitoring wells during the October 2017 sampling event. However, the result was below the tolerance limit. There is no current primary (health based) MCL for total dissolved solids.

Review of the Total Dissolved Solids in the duplicate sample taken from the same well (MW-7) shows a result of 3,000 mg/L, which would not be an exceedance of the intra-well prediction limit of 3,069 mg/L. Due to the variances between the sample and the duplicate, the site will re-evaluate MW-7 for Total Dissolved Solids during the next sampling event.

MW-7 is considered a sidegradient well, therefore no further action is needed for exceedances in sidegradient or upgradient wells.

#### 6.4 Proposed Actions

The site will continue with the detection monitoring program on a semi-annual basis. However, the constituents listed in Appendix IV will remain eliminated from the overall semi-annual



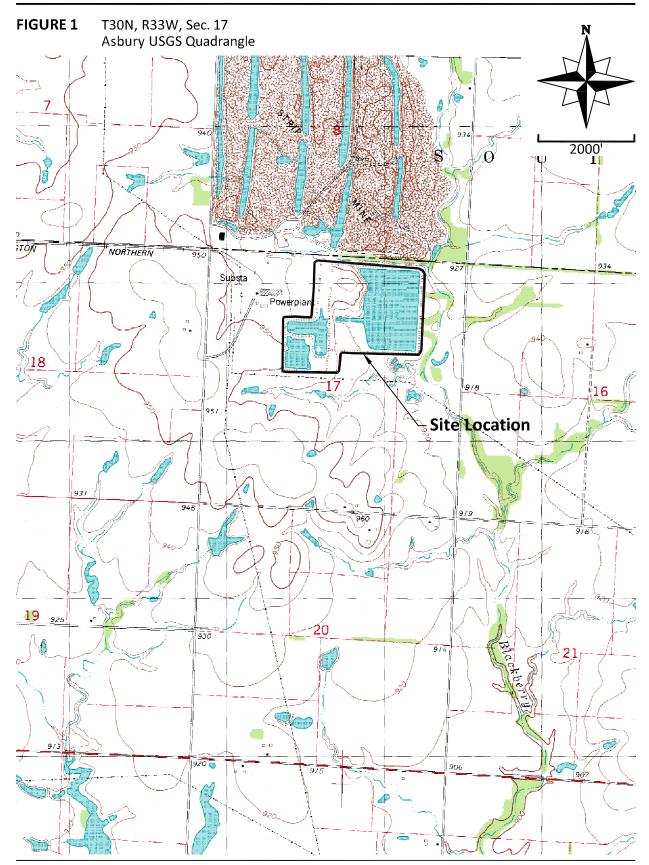
detection monitoring plan after this review of the semi-annual groundwater sampling event analytical results, according to the EPA CCR Rule. Statistical analysis will be completed with interwell prediction limits per EPA's request.



**FIGURES** 



**Asbury Generating Station CCR Impoundment** Groundwater Sampling Event - May 2020 Site Location Map



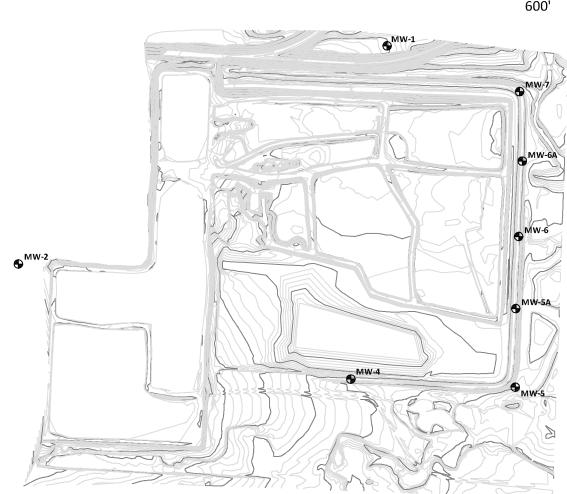
July 2020



**Asbury Generating Station CCR Impoundment** Groundwater Sampling Event - May 2020 Groundwater Monitoring System

# FIGURE 2





мw-3

Well ID	Northing	Easting
MW-1	435791.18*	2765165.35
MW-2	434428.46	2762861.37
MW-3	432842.77	2762720.80
MW-4	433709.99	2764938.99
MW-5	433659.27	2765966.23
MW-5A	434150.04	2765969.78
MW-6	434600.46	2765987.98
MW-6A	435071.44	2766010.46
MW-7	435505.42	2765993.13

\* Coordinate location is approximate

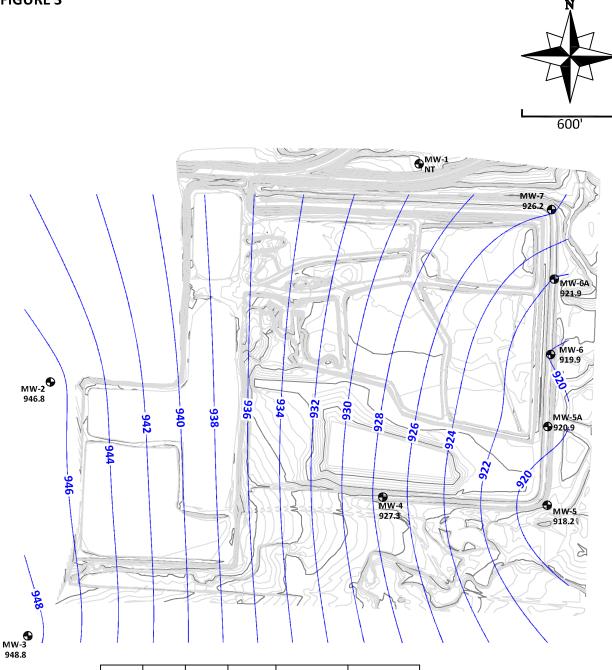
Legend

Monitoring Well



# **Asbury Generating Station CCR Impoundment** Groundwater Sampling Event - May 2020 Groundwater Piezometric Surface Map

#### FIGURE 3



Well ID Northing		Easting	Top Of Casing	Static Water Level (BTOC)	Static Water Level	
MW-1	435791.18	2765165.35	933.4	NT	NT	
MW-2	434428.46	2762861.37	947.8	1.0	946.8	
MW-3	432842.77	2762720.80	948.8	0.0	948.8	
MW-4	433709.99	2764938.99	932.6	5.3	927.3	
MW-5	433659.27	2765966.23	919.2	1.0	918.2	
MW-5A	434150.04	2765969.78	929.3	8.4	920.9	
MW-6	434600.46	2765987.98	928.0	8.1	919.9	
MW-6A	435071.44	2766010.46	929.3	7.4	921.9	
MW-7	435505.42 2765993.13		928.8	2.6	926.2	

Legend	
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€

Monitoring Well



**APPENDIX 1** 

**EPA/MDNR Correspondence** 

# **Drew Landoll**

From:	Snellen, Greg <greg.snellen@dnr.mo.gov></greg.snellen@dnr.mo.gov>
Sent:	Tuesday, January 21, 2020 3:34 PM
То:	Drew Landoll
Cc:	aston.robert@epa.gov; Nagel, Chris; Snellen, Greg
Subject:	RE: EPA Request for Information regarding CCR Units

Good afternoon Drew,

The Environmental Protection Agency (EPA) has been working to verify data on facility specific CCR websites required by 40 CFR 257 at the national level. EPA headquarters provided a list of inquiries to the EPA regions and requested they work with the states to answer their questions. States were given a choice as to the amount of involvement they could have with the information gathering. Missouri elected to take the lead on contacting the facilities in the state, providing the information requested by the EPA and relaying the answers back.

For your company, the EPA has questions about facilities and units which may be seeking an extension under the alternate closure provisions in 2020 and what type of extension may be requested.

They provided the following list of units:

		Part A	Plant			Ор	Unit	NOI	NOI	Alterr
Region	State	Extension	Name	Unit Name	Unit Type	Status	Class	Туре	Date	NOI
					Surface					
7	MO		Asbury	Lower Pond	Impoundment	Active	Existing			
					Surface					
7	MO		Asbury	Upper Pond	Impoundment	Active	Existing			
					Surface					
7	MO		Asbury	South Pond	Impoundment	Active	Existing			

EPA has requested a response on extensions by February 14, 2020.

Additionally, the EPA has the following question related to groundwater monitoring:

Facility	Location	Owner	Units	Geology	Problematic Use of Intra Well Comparisons	Problematic Alternate Source Determinations	Conclusions
Asbury Power Plant	Asbury MO	Empire District Electric Company	Upper Pond- unlined South Pond- unlined Lower Pond- unlined	Surficial unit of clay, clayey sand, and silt approximately 15 to 25 feet thick underlain by Warner Sandstone approximately 25- 30 feet thick in the southern portion of the site and the Riverton Shale in the northern area of the site	Analytical results indicate consistent differences in contaminant concentrations between upgradient and downgradient wells. Consequently, inter well comparisons are feasible and would be preferable in the absence of compelling reasons to use intra well analysis		While there are no boring logs in the documents to confirm that the wells are screened in the same geologic unit, consistency in the field parameters and the description of the geology suggest that the wells are screened in the sandstone. The analytical results indicate consistent differences in contaminant concentrations

Facility	Location	Owner	Units	Geology	Problematic Use of Intra Well Comparisons	Problematic Alternate Source Determinations	Conclusions
							between upgradient and downgradient wells, consequently, interwell comparisons are feasible and would be preferable in the absence of compelling reasons to use intra wells analyses

At this time, there is not a deadline for this request.

Please let the Department know if you have any questions. You can also direct inquires to Bob Aston with EPA Region 7 who is copied on this email.

Thank you

Greg Snellen Environmental Supervisor Waste Management Program 573-526-8779

We'd like your feedback on the service you received from the Missouri Department of Natural Resources. Please consider taking a few minutes to complete the department's Customer Satisfaction Survey at <a href="https://www.surveymonkey.com/r/MoDNRsurvey">https://www.surveymonkey.com/r/MoDNRsurvey</a>. Thank you.

From: Aston, Robert
Sent: Friday, January 10, 2020 7:48 AM
To: Nagel, Chris <<u>Christopher.Nagel@dnr.mo.gov</u>>; Snellen, Greg <<u>greg.snellen@dnr.mo.gov</u>>
Cc: Martin, Mike <<u>Martin.Mike@epa.gov</u>>; Kloeckner, Jane <<u>Kloeckner.Jane@epa.gov</u>>; Catlin, Kelley
<<u>Catlin.Kelley@epa.gov</u>>; Werner, Leslye <<u>Werner.Leslye@epa.gov</u>>; Hayworth, Brad <<u>Hayworth.Brad@epa.gov</u>>
Subject: CCR workload

Chris and Greg,

As a follow-up to our call on Wednesday

On Monday December 2, 2019 EPA published in the Federal Register a proposed rule for the Disposal of Coal Combustion Residuals From Electric Utilities: A Holistic Approach to Closure Part A: Deadline To Initiate Closure. The major elements of this proposed rule include:

- Definition of Lined Unit (removing a clay-lined unit from the definition),
- New initiation of Closure and Cease Receipt of Waste Deadline of August 31, 2020,
- New Alternate Closure Provisions for surface impoundment: Extensions to the initiation of closure

Nationally, EPA is gathering data to determine the number of facilities and units which may be seeking an extension under the alternate closure provisions in 2020 and is tasking the regions to work with our state partners and the facilities to determine the number of such facilities and units and what type of extension may be requested. Region 7 is seeking the state's assistance in gathering this information.

To be eligible for an extension the surface impoundment needs to be:

- An existing surface impoundment (eligible inactive surface impoundments should already be closing)
- An unlined or "clay-lined" surface impoundment
- Passed all location restrictions or only failed the uppermost aquifer restriction
  - Those that failed multiple location restrictions or did not post should have ceased receipt of waste in April 2019

This proposed rule offers facilities three options with regards to an extension

- 1.) Three month self-implementing extension (§ 257.103(e)(1)). Under this provision the surface impoundment must cease receipt of waste no later than November 30, 2020, and the facility must document certain conditions and certify "that the CCR and/or non-CCR waste streams must continue to be managed in that CCR surface impoundment to allow the facility to complete the measures necessary to provide alternative disposal capacity, either on-site or off-site of the facility" on its publicly available website no later than August 31, 2020.
- 2.) Site specific alternative to initiation of closure deadline due to lack of disposal capacity (§ 257.103(f)(1)). This provision allows facilities to submit demonstrations to EPA for approval for a specific amount of time to be able to continue to use their surface impoundment while developing alternate capacity for the CCR and non-CCR waste streams. This extension allows the facility to continue to use a unit (surface impoundment) for a maximum of 5 years, until October 15, 2023. Under this extension, facilities are required to submit their demonstrations to EPA no later than June 30, 2020.
- 3.) Site specific alternative to initiation of closure deadline due to Permanent Cessation of Coal Fired Boiler(s) by a Date Certain (§ 257.103(f)(2)): If a facility is ceasing generation of coal fired boiler(s) by a date certain, then the facility must complete closure by October 17, 2023 for surface impoundments less than 40 acres and by October 17, 2028 for surface impoundments larger than 40 acres. The facility is required to submit a demonstration to EPA for approval to continue to use their CCR surface impoundments. Under this extension, demonstrations are required to be submitted to EPA for approval no later than May 15, 2020.

As you can see above, the deadlines for requesting extensions are approaching quickly and will become effective when the proposed rule is final. EPA is requesting assistance from the regions, states, and facilities to estimate the number and types of extensions facility owners/operators may be requesting. EPA headquarters has developed a list (attached) of facilities which may be eligible for extensions by EPA Region and State. This list was developed by examining information included on individual facility web sites which are required as part of the CCR regulations. The list of potential sites in Missouri has been attached (attached Excel file) to this email. EPA headquarters has requested that individual regions reach out to their state counterparts to identify facility contacts and reach out to those contacts to determine which facilities and units may be requesting an extension and which type of extension may be requested. EPA headquarters has requested that this information be collected by February 14, 2020.

As part of the effort to determine what type of an extension a facility may need, EPA would also like the state's assistance in obtaining input regarding an estimate of the length of the extension that may be requested by the facility owners/operators. As part of the discussions, we need an estimate regarding the length of the extension. For example, EPA needs to estimate the following:

- Facilities that will not need an extension
- Facilities that will only need till November 2020 (short term extension)
- Longer than November need about 6 months more
- Longer than November need about 1 year
- Longer than November need longer than 18 months

EPA is collecting this data in order to estimate the potential workload which could be associated with reviewing the above mentioned extension requests.

In addition, EPA headquarters routinely reviews the information posted on individual facility web sites. As part of that review EPA headquarters has identified sites in each region where specific facility information which is required to be posted is either missing, incomplete or technical questions exist. As part of this review EPA has developed two lists. See attached. One list deals with compliance issues related to documents which are, or in some cases are not, posted on the specific facility websites. The second list deals with groundwater questions related to Alternate Source Demonstrations and Intrawell analyses. With regards to the list dealing with compliance issues related to documents, EPA headquarters has requested that the regions work with their state counterparts to identify the appropriate facility contact. The plan is that EPA Headquarters would take the lead in coordination with the regions and states to contact the facilities to discuss and remedy the identified issues. With regards to the second list dealing with Alternate Source Demonstrations, EPA headquarters has requested that the regions work with their state counterparts to identify the appropriate facility contact. The plan is that EPA Headquarters would take the lead in coordination with the regions and states to contact the facilities to discuss and remedy the identified issues. With regards to the second list dealing with Alternate Source Demonstrations, EPA headquarters has requested that the regions work with their state counterparts to identify the appropriate facility contacts. The regions and or the states would then take the lead to address any identified issues. No specific timeframe has been established to address the questions related to either of the above lists. Region 7 anticipates working closely with the state in addressing these issues.

It should be noted that EPA headquarters routinely reviews CCR facility websites and could identify additional questions. If that should occur Region 7 would again reach out to the states.

At your convenience I would like to follow-up with you on the above issues sometime next week to discuss Missouri's perspective and any comments you may have. If you have any questions please do not hesitate to call or email me.

Thanks

Bob Aston USEPA Region 7 (913)551-7392

Regic	n State	Part A Extension	Plant Name	Unit Name	Unit Type	Op Status	Unit Class	NOI Type	Alternative NOI _Closure_ Date Provisions	Liner Type	Liner_ Posting_ Date	Location Restrictions	Groundwater Monitoring Status
	7 MO		Achura	Lower Dond	Surface Impoundment	Activo	Evicting		NOI	Unlined		Fail Aquifor Only	Detection Monitoring No SSIC
	7 MO		Asbury Asbury		Surface Impoundment Surface Impoundment		Existing Existing			Unlined	• •	•	Detection Monitoring - No SSIs Detection Monitoring - No SSIs
	7 MO		Asbury	South Pond	Surface Impoundment	Active	Existing			Unlined	10/17/2016	Fail Aquifer Only	Detection Monitoring - No SSIs



NOV 0 2 2017

Mr. Kavan Stull, Senior Environmental Coordinator Empire District 602 South Joplin Avenue Joplin, MO 64802

RE: Site Characterization Workplan

Dear Mr. Stull:

The Missouri Department of Natural Resources has reviewed the document "Site Characterization Workplan" dated May 16, 2017. The site has undergone extensive characterization regarding construction of a coal combustion residual (CCR) landfill near the CCR impoundments. The department's Water Protection Program has determined, through consulting with the Missouri Geological Survey, this characterization is sufficient and may be used in whole to complete the required monitoring of the sub-surface conditions at the site. Additional submittal of site characterization is not necessary, as the previous submittal meets the requirement for special condition 19(b) of the Missouri State Operating Permit MO-0095362. The facility may proceed with the next step laid out in the permit; special condition 19(c). Enclosed is the Missouri Geological Survey concurrence.

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to 10 CSR 20 1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Contact information for the AHC is by mail at Administrative Hearing Commission, United States Post Office Building, Third Floor, 131 West High Street, P.O. Box 1557, Jefferson City, MO 65102, by phone at 573-751-2422, by fax at 573-751-5018, and by website at <u>www.oa.mo.gov/ahc</u>.



Mr. Kavan Stull Page 2

If you have any questions, please do not hesitate to contact Ms. Pam Hackler by mail at Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176, by phone at 573-526-3386; or by email at <u>pam.hackler@dnr.mo.gov</u>. Thank you.

Sincerely,

WATER PROTECTION PROGRAM

lies

Michael J. Abbott, Chief Operating Permits Section

MJA/php

Enclosure

c: Mr. Randall Willoughby, Southwest Regional Office



#### MEMORANDUM

TO: Pam Hackler- WPP- Industrial Wastewater Unit

FROM: Fletcher N. Bone, Geologist, Environmental Geology Section, Geological Survey Program, MGS

hon n. Bono

SUBJECT:

Site characterization for existing CCR impoundments Asbury Power Plant Site Characterization Work Plan- CCR 37 21 22.66 Latitude, -94 35 4.79 Longitude, Jasper County, Missouri



SWR18011 Jasper County

October 18, 2017

The Missouri Geological Survey (MGS) has reviewed the documents titled, 'NPDES Permit MO-0095362 Asbury Power Plant, Jasper County, Missouri, Site Characterization Work Plan', prepared by Empire District Electric Company, dated September 8, 2017 and 'Site Characterization Work Plan, Coal Combustion Residuals Impoundments, Empire Electric Facility - Permit MO-0095362, Jasper County, Missouri, Geotechnology Project No. J021738.03', prepared by Geotechnology Inc., dated May 16, 2017. The MGS offers the following comment.

General Comment:

The MGS agrees that the existing Coal Combustion Residuals (CCR) impoundments (site 1) do not need further site characterization, at this time. The site characterization performed, as described in the Detailed Site Investigation Report (DSI), dated January 21, 2015, at the proposed CCR impoundment (site 2) that is approximately 1,000 feet south of the existing CCR impoundments (site 1), coupled with the geologic and hydrologic data provided that pertains to the existing CCR impoundments (site 1) (1996 to present data), provides adequate characterization of the geology and hydrology of the site 1. The geologic and hydrologic settings of both sites are similar, with geologic boring logs and potentiometric data of both sites being compared. The hydraulic conductivity testing conducted at the proposed CCR site (site 2) has demonstrated that there is a low potential for groundwater contamination for this area.

If you are in need of further assistance from our office or have questions regarding this evaluation please feel free to contact me at (573) 368-2161.



**APPENDIX 2** 

**Baseline Sampling Information** 

#### **EPA CCR Rule**

Appendix III to Part 257—Constituents for Detection Monitoring Boron Calcium Chloride Fluoride pH Sulfate Total Dissolved Solids (TDS)

#### Appendix IV to Part 257—Constituents for Assessment Monitoring

Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Lead Lithium Mercury Molybdenum Selenium Thallium Radium 226 and 228 combined

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
				Append	lix III						
Boron	mg/L	NA	0.33	<0.5 J	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	
Calcium	mg/L	NA	57	74	220	84	200	250	140	570	
Chloride	mg/L	NA	140	83	120	4.7	28	10	38	38	
Fluoride	mg/L	4	0.43	0.47	0.31	0.28	0.30	0.24	0.35	<0.2 J	
рН	SU NA 6.33 5.81 6.31 7.33 7.09 6.97									6.51	
Sulfate	Ilfate mg/L NA 260 360 1100 140 800								600	1800	
Total Dissolved Solids	mg/L	NA	690	790	1900	590	1500	1800	1300	2800	
				Append	ix IV						
Antimony         mg/L         0.006         <0.002         <0.002 J         <0.0											
Arsenic	mg/L	0.01	<0.002 J	0.01	<0.01 J	<0.02 J	<0.01	<0.01	<0.01	<0.01	
Barium	mg/L	2	0.044	0.0099	0.065	0.086	0.036	0.02	0.042	0.011	
Beryllium	mg/L	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Cadmium	mg/L	0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002 J	<0.002 J	<0.01 J	<0.01 J	<0.01 J	<0.01 J	<0.01	<0.01	
Cobalt	mg/L	NA	<0.01 J	<0.01 J	0.046	<0.002 J	0.018	0.0022	0.02	0.014	
Lead	mg/L	0.015	<0.002 J	<0.002	<0.01 J	<0.002 J	<0.002	<0.002	<0.002	<0.002 J	
Lithium	mg/L	NA	0.057	0.15	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.002	<0.002 J	<0.002 J	<0.002 J	<0.01 J	<0.002	<0.01 J	<0.002	
Selenium	mg/L	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Thallium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Combined Radium	pCi/L	5	<0.477 J	<0.427 J	<2.08	<0.563 J	<0.392 J	<0.446 J	<0.306 J	<0.279 J	

#### 1<sup>st</sup> Baseline Event – January 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
				Append	dix III				1		
Boron	mg/L	NA	0.90	0.060	<0.25	0.29	0.29	0.34	0.34	0.29	
Calcium	mg/L	NA	120	92	260	94	190	250	160	620	
Chloride	mg/L	NA	180	70	15	4.4	23	9.0	36	34	
Fluoride	mg/L	4	0.28	0.28	0.10	0.38	0.31	0.23	0.31	0.16	
рН	SU         NA         5.82         5.68         6.72         7.15         6.94         6.79									6.22	
Sulfate	ate mg/L NA 570 400 570 140 710 970								550	1800	
Total Dissolved Solids	mg/L	NA	1300	840	1600	590	1500	1800	1200	2900	
			-	Append	lix IV						
Antimony mg/L 0.006 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 J <0.002 J <0.002 J <0.002 J <0.002 J <0.002 J											
Arsenic	mg/L	0.01	<0.002 J	0.024	0.0038	<0.002 J	0.0038	0.0026	0.0025	0.004	
Barium	mg/L	2	0.060	0.012	0.034	0.047	0.042	0.026	0.051	0.0089	
Beryllium	mg/L	0.004	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Cadmium	mg/L	0.005	0.0028	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002	<0.002 J	0.0034	<0.002	<0.002	<0.002	<0.002	<0.002	
Cobalt	mg/L	NA	0.017	0.0095	0.021	<0.002 J	0.02	0.0061	0.0063	0.016	
Lead	mg/L	0.015	<0.002 J	<0.002 J	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	
Lithium	mg/L	NA	0.20	0.15	0.074	0.074	0.14	0.22	0.14	0.30	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.002	<0.002 J	<0.002	<0.002 J	0.0041	<0.002 J	0.0038	<0.002	
Selenium	mg/L	0.05	<0.002	<0.002	<0.002	0.0021	0.0028	0.0031	0.0031	<0.002	
Thallium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Combined Radium	pCi/L	5	<0.337 J	<0.389 J	<0.84 J	<0.315 J	<0.336 J	<0.319 J	<0.348 J	<0.329 J	

#### 2<sup>nd</sup> Baseline Event – March 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
				Append	lix III						
Boron	mg/L	NA	0.21	0.044	0.027	0.24	0.26	0.25	0.23	0.29	
Calcium	mg/L	NA	130	100	91	5	59	11	90	36	
Chloride	mg/L	NA	140	83	120	4.7	28	10	38	38	
Fluoride	mg/L	4	0.28	0.27	0.22	0.55	0.35	0.26	0.43	0.18	
рН	SU NA 5.30 4.37 5.97 6.43 6.60 6.51									5.82	
Sulfate	lfate mg/L NA 160 540 820 150 920 140								620	2400	
Total Dissolved Solids	mg/L	NA	500	800	1700	590	1500	1800	1100	2900	
			-	Append	lix IV						
Antimony         mg/L         0.006         <0.002 J         <0											
Arsenic	mg/L	0.01	0.0013	0.027	0.01	0.0043	0.01	0.007	0.0037	0.0082	
Barium	mg/L	2	0.021	0.01	0.025	0.045	0.037	0.041	0.04	0.021	
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	mg/L	0.005	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002 J	<0.002 J	0.0025	<0.002 J					
Cobalt	mg/L	NA	0.0072	0.0073	0.0071	<0.0005J	0.00081	0.0035	<0.0005J	0.0037	
Lead	mg/L	0.015	<0.001 J	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001	<0.001 J	<0.001 J	
Lithium	mg/L	NA	<0.05 J	0.15	<0.05 J	0.074	0.16	0.31	0.12	0.22	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	0.0052	<0.005	<0.005	
Selenium	mg/L	0.05	<0.005	<0.005	<0.005 J	<0.005	<0.005 J	<0.005 J	<0.005	<0.005	
Thallium	mg/L	0.002	<0.001 J	<0.001	<0.001	<0.001	<0.001 J	<0.001 J	<0.001	< 0.001	
Combined Radium	pCi/L	5	<0.355	<0.427 J	<0.386 J	<0.402 J	<0.377 J	<0.357 J	<0.334 J	<0.333 J	

#### 3<sup>rd</sup> Baseline Event – May 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
				Append	lix III						
Boron	mg/L	NA	0.19	0.057	0.067	0.27	0.27	0.29	0.27	0.22	
Calcium	mg/L	NA	38	79	110	74	180	220	130	430	
Chloride	mg/L	NA	120	77	35	6	35	12	65	49	
Fluoride										0.22	
рН	0H SU NA 6.04 5.73 7 7.17 7.04 6.88 7.1										
Sulfate	Sulfate mg/L NA <0.005 J <0.00									<0.005 J	
Total Dissolved Solids mg/L NA 460 850 730 540 1500 1800									1100	2900	
	•			Append	lix IV						
Antimony mg/L 0.006 <0.002 J											
Arsenic	mg/L	0.01	<0.001 J	0.013	<0.001 J	<0.001 J	0.001	<0.001 J	<0.001 J	<0.001 J	
Barium	mg/L	2	0.023	<0.01 J	0.012	0.035	0.031	0.014	0.037	<0.01 J	
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	mg/L	0.005	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	
Cobalt	mg/L	NA	0.0052	0.0088	0.0038	<0.0005J	0.00075	<0.0005J	<0.0005J	0.015	
Lead	mg/L	0.015	<0.001 J	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001	<0.001 J	<0.001	
Lithium	mg/L	NA	<0.05 J	0.16	<0.05 J	0.078	0.16	0.22	0.11	0.34	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	<0.005	0.0067	<0.005	
Selenium	mg/L	0.05	<0.005 J	<0.005	<0.005 J	<0.005 J					
Thallium	mg/L	0.002	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Combined Radium	pCi/L	5	<0.424 J	<0.465 J	<0.833	<0.441 J	<0.435 J	<0.45 J	<0.484 J	<0.418 J	

#### 4<sup>th</sup> Baseline Event – August 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
				Append	lix III					
Boron	mg/L	NA	0.2	0.053	0.047	0.24	0.33	0.34	0.31	0.26
Calcium	mg/L	NA	43	91	100	94	220	260	130	490
Chloride	mg/L	NA	130	65	74	6	29	13	65	56
Fluoride	mg/L	4	0.28	0.18	0.28	0.31	0.39	0.25	0.41	0.28
рН	SU NA 6.59 5.95 7.21 7.51 8								7.85	6.75
Sulfate	ate mg/L NA 99 470 120 120 1100							1100	570	1400
Total Dissolved Solids	mg/L	NA	460	850	580	570	1500	1700	1100	2800
				Append	dix IV					
Antimony mg/L 0.006 <0.002 <0.002 <0.002 J <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <										
Arsenic	mg/L	0.01	<0.001	0.014	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001 J	<0.001 J
Barium	mg/L	2	0.028	<0.01 J	0.02	0.03	0.033	0.013	0.037	<0.01 J
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.0051	0.0095	0.0013	0.00073	0.0072	<0.0005J	<0.0005J	0.014
Lead	mg/L	0.015	<0.001 J	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05 J	0.17	<0.05	0.078	0.17	0.24	0.12	0.32
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	0.0066	<0.005	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005J	<0.005
Thallium	mg/L	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.436J	<0.478J	<0.535J	<0.503J	<0.498J	<0.464J	<0.453J	<0.424J

#### 5<sup>th</sup> Baseline Event – October 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
				Append	dix III						
Boron	mg/L	NA	0.22	0.052	0.057	0.23	0.29	0.33	0.36	0.26	
Calcium	mg/L	NA	38	93	250	86	200	260	170	500	
Chloride	mg/L	NA	130	52	19	5.3	29	11	19	39	
Fluoride	mg/L	4	0.21	0.12	<0.1 J	0.29	0.29	0.19	0.3	0.12	
рН	SU NA 6.07 5.84 6.67 7.32 7.38 7.15									6.40	
Sulfate	lfate mg/L NA 130 540 630 150 1100 10								720	1900	
Total Dissolved Solids	mg/L	NA	500	940	1600	620	1700	1900	1400	3000	
			-	Append	lix IV						
Antimony mg/L 0.006 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002											
Arsenic	mg/L	0.01	<0.001	0.037	0.0022	0.0013	0.0014	<0.001 J	0.0043	<0.001 J	
Barium	mg/L	2	0.021	0.011	0.021	0.033	0.026	0.015	0.027	<0.01 J	
Beryllium	mg/L	0.004	<0.001 J	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001 J	
Cadmium	mg/L	0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002 J								
Cobalt	mg/L	NA	0.0071	0.0097	0.0096	<0.0005J	0.0022	0.0024	0.0017	0.014	
Lead	mg/L	0.015	<0.001	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	
Lithium	mg/L	NA	<0.05 J	0.17	0.072	0.076	0.16	0.23	0.14	0.32	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005 J	<0.005 J	<0.005	<0.005	<0.005 J	<0.005	<0.005 J	<0.005	
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Thallium	mg/L	0.002	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Combined Radium	pCi/L	5	0.575	1.63	0.287	1.50	0.803	2.68	1.73	1.62	

#### 6<sup>th</sup> Baseline Event – March 2017 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
				Append	dix III						
Boron	mg/L	NA	<0.08J	<0.08J	0.034	0.27	0.31	0.37	0.36	0.26	
Calcium	mg/L	NA	42	100	300	89	200	260	160	470	
Chloride	mg/L	NA	130	54	110	5.4	23	12	26	48	
Fluoride	mg/L	4	0.43	0.19	0.18	0.35	0.42	0.3	0.42	0.21	
рН	H SU NA 6.35 5.78 6.62 7.22 7.04									6.41	
Sulfate	ulfate mg/L NA 78 650 1400 180 940 1									2400	
Total Dissolved Solids	mg/L	NA	450	950	2000	610	1600	1800	1400	2900	
				Append	lix IV						
Antimony mg/L 0.006 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002 <0.002											
Arsenic	mg/L	0.01	<0.001J	0.1	0.0032	<0.001J	0.0037	<0.001	0.0018	<0.001	
Barium	mg/L	2	0.03	0.016	0.048	0.04	0.026	0.017	0.025	<0.01J	
Beryllium	mg/L	0.004	<0.001	0.0031	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	mg/L	0.005	<0.001J	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002	<0.002	<0.002J	<0.002	<0.002	<0.002	<0.002	<0.002	
Cobalt	mg/L	NA	0.004	0.0088	0.0042	<0.0005J	0.0045	0.00087	0.0059	0.0015	
Lead	mg/L	0.015	0.0033	0.001	0.0074	<0.001	<0.001	<0.001	<0.001	<0.001	
Lithium	mg/L	NA	<0.05J	0.18	0.053	0.085	0.18	0.25	0.15	0.34	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005	<0.005J	<0.005	<0.005	<0.005J	<0.005	<0.005J	<0.005	
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Thallium	mg/L	0.002	<0.001	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	
Combined Radium	pCi/L	5	<0.397J	<0.337J	<0.403	<0.291J	<0.343J	<0.414J	<0.33J	<0.314J	

#### 7<sup>th</sup> Baseline Event – June 2017 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7				
Appendix III														
Boron	mg/L	NA	0.16	<0.08J	<0.08J	0.28	0.33	0.34	0.38	0.27				
Calcium	mg/L	NA	43	98	83	57	220	250	180	510				
Chloride	mg/L	NA	130	45	8.1	5.3	23	12	26	38				
Fluoride										0.22				
рН														
Sulfate	5													
Total Dissolved Solids         mg/L         NA         450         960         450         530         1600         1800										2900				
				Append	lix IV									
Antimony         mg/L         0.006         <0.002J         <0														
Arsenic	mg/L	0.01	<0.001J	0.013	<0.001J	0.002	<0.001J	<0.001J	<0.001J	<0.001J				
Barium	mg/L	2	0.024	0.01	0.018	0.027	0.023	0.018	0.021	<0.01J				
Beryllium	mg/L	0.004	< 0.001	<0.001J	< 0.001	<0.001	<0.001	< 0.001	< 0.001	<0.001J				
Cadmium	mg/L	0.005	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Chromium	mg/L	0.1	<0.002J	<0.002	0.0026	<0.002	<0.002	<0.002	<0.002	<0.002				
Cobalt	mg/L	NA	0.0036	0.01	0.00067	<0.0005J	0.0023	<0.0005J	0.0051	0.014				
Lead	mg/L	0.015	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001				
Lithium	mg/L	NA	<0.05J	0.17	<0.05J	0.073	0.18	0.22	0.15	0.32				
Mercury	mg/L	0.002	< 0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002				
Molybdenum	mg/L	NA	<0.005	<0.005J	<0.005	<0.005J	<0.005J	<0.005J	<0.005J	<0.005				
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				
Thallium	mg/L	0.002	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Combined Radium	pCi/L	5	<0.42J	<0.417J	<0.473	<0.476J	<0.383J	<0.389J	<0.291J	<0.346J				

#### 8<sup>th</sup> Baseline Event – August 2017 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>



#### **APPENDIX 3**

Monitoring Well Field Inspection Sheets and Field Notes

			Field Sa	ampling	Log		0				
Facility:	Asbury CCR (Perm	it #	)		oring Well	ID: MW-	Iplicate	Field Blar	1k		
Purge Information:       Method of Well Purge:       Peristaltic Pump with 3/8 - inch Diameter Tubing         Actual Purge Volume Removed: $\underline{\mathcal{MM}}$ mL post pump calibration.         Date / Time Initiated: $5 - (3 - 20)$ @ $(2 + 2 + 2)$ Well Purged To Dryness?:       Y / M         Purge Data:       Petroleum or Gas Detected?       Y / M											
Time	Purge Rate (mL/min) (mL 200 /2C 166 200 200 200 200	Temp.         (°C)           0         (°C)           0         (°C)           0         (°C)	рн (SU) 7.03 6:88 6.75 6.75	Specifi Conduct (mS/c	ivity	issolved Oxygen (mg/L)			Other (Color, Clarity, Odor)		
		10.00			ld Inspectio	2n	<u>6600</u> G	Fair F	Poor P		
Time sa Weathe	mpled	(,	9W 50	Pac Cas Loc Ris Fie We	cess Condition Sing Conditi Cking Cap & er Conditio Id Inspections Il ID Visible	ion Lock n <u>on</u>	GGGGG	, F F F F	P P P <u>N/A</u> N/A		
Water I	Level Start	20'	ck Elgin	Cle Me Spl Ma De Eq	contaminat uipment Ca	ls int vith MDNR Performed tion Normal Ilibration No		Z = Z = Z = Z	N/A N/A N/A N/A N/A T N/A		
Sample	er Signature	Do	Ť	An	y deviation	nt Needed s from SAP ckness Chec	Y Y ked Y		N/A N/A		
Histori	cal Data: Average of far	pling events	[	B 4141 4	BALAZ O	MW-4	MW-5	MW-5A	MW-6		
	tituent T	Units	MW-1	MW-2	MW-3		6.83	6.82	6.72		
рН		S.U.	NO TEST	5.83	5.08	6.30		1.769	1.900		
	ific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1./03	1.500		
	Well Depth	ft	Level				6.00	6.02	7.85		
	age GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86		
	age GW Drop	ft									
	stem Volumes	mL	DON'T	800	800	800	800	800	800		

SAMPLE

mL

(Min Purged Amount)

### Field Sampling Log

Sample	Facility: <u>Asbury CCR (Permit #</u> ) Monitoring Well ID: <u>MW-</u> Sample X Blind Duplicate Field Blank												
Actual Purge Volume Removed: $\underline{D.B.C.Oml. post pump calibration.}$ Date / Time Initiated: $\underline{S-1}$ $\underline{O}$ $\underline{D}$ Well Purged To Dryness?:       Y       Y       Petroleum or Gas Detected?       Y         Purge Data:       Purge Cumulative Volume       Temp.       PH       Specific Onductivity Organ       ORP       Closer, Clairly, Odor)         1/2:00       200       / 000       9,055,777       /,213,572       C       C         1/3:01       (M)       (M)       Office       (Conductivity Organ)       (M)       Odor)         1/2:02       200       / 000       9,055,777       /,2272       3,47       /,23,2       C         1/3:01       (M)       Q       9,055,777       /,2271       3,47       /,23,5       V         1/3:01       (M)       Q       9,055,777       /,2271       3,47       /,23,5       V         1/3:01       (M)       Q       0,00       8,075,5       1       2,027       -       /,23,5       V         1/3:01       (M)       (M)       (M)       (M)       (M)       (M)       (M)       (M)       (M)         1/4:02       (M)       (M)       (M)       <		istaltic Pumn with	3/8 - inch Di	amotor Ti		X Blind	Duplicate	Field I	Blank				
Date / Time Initiated: $5 - 12 - 20 \oplus 1/1^2 S^2$ Date / Time Completed: $5 - 12 - 20 \oplus$ Well Purged To Dryness?: Y (N)         Petroleum or Gas Detected? Y (N)         Purge Data:         Other Time (mt/min) (mt) (C) (Color, (Cloiry, Clarity, Oxygen (mt/min)) (MV)         Quinter temp.       pH       Specific Conductivity Oxygen (mt/min) (MV)         Quinter temp.       pH       Comulative (Color, (Cloiry, Oxygen (mt/min)) (MV)         Quinter temp.       pH       Specific Conductivity Oxygen (mt/min)       Other (Cloir, Cloiry, Oddr)         Quinter temp.       pH       Specific Conductivity Oxygen (mt/min)         Quinter temp.       PH       Comulative (Color, (MV)         Quinter temp.       PH         Specific Conductivity Oxygen (mt/min)       Other (MV)         Quinter temp.       PH         Specific Conductivity Oxygen (mt/min)       Other (MV)         Quinter temp.       PH         Add Colspan="2">Clospan="2"         Time sampled       Immer temp. <td></td> <td></td> <td></td> <td></td> <td>~</td> <td></td> <td></td> <td></td> <td></td>					~								
Well Purged To Dryness?:       Y       Petroleum or Gas Detected?       Y       N         Purge Data:       Purge Cumulative Volume (Color, Clarity, Organ, ORP)       Other (Color, Clarity, Organ, ORP)       Other (Color, Clarity, Organ, ORP)       Other (Color, Clarity, Organ, ORP)         2:07       200       / 000       9:05       5:73       / 2:21       3:97       - 235 </td <td>A</td> <td></td> <td></td> <td>T-office -</td> <td></td> <td></td> <td></td> <td></td> <td></td>	A			T-office -									
Purge Data:         Purge Cumulative Name (MLC Field Sampler): Evan Ortbals and Rick Elgin       pH (C)       Specific Conductivity       Dissolved Oxygen (ms/cn)       ORP (MM)       Other (Color, Clarity, Odv)         107       1000       9, 05       5, 73       1, 0, 20       7, 0, 20	Date / Time Initiated: <u>5 –</u>	(X -20 @	11:58	Date /	Time Com	pleted: <u>5</u> -	- 1Q -20	@	-				
Purge Rate (mL/min)         Cumulative (mL/min)         Temp. (mL)         pH (SU)         Specific Conductivity (mS/cm)         Dissolved Oxygen (MV)         ORP (MV)         Other (Color, Clarity, Odor)           2:0         200         / 0.00         9,05         5,77         /,02         2,02         / 25,72         //	Well Purged To Dryness?:	Y /N	Petro	leum or G	as Detecte	ed? Y (N							
Purge Rate (mL/min)         Cumulative Volume         Temp. (°C)         pH (°C)         Specific Conductivity (mS/m)         Dissolved Oxpan         ORP (MV)         (Color, Clarity, Odor)           2:00         / 0:00         9,05         5,712         /,014         0         7.75         /,025         7.75         /,026         /,026,7 <td>Purge Data:</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Purge Data:												
Rate         Outwine         Temp.         pH         Operation         Dissolved (ms/cm)         ORP         Cluttiv, (ms/cm)         ORP           Time         (mL/min)         (mL/min)         (mL/min)         (mL/min)         (ms/cm)         ORP         (luttiv)         ORP         (luttiv)         ORP         (luttiv)         Oddor)           2:00         / 000         9.05         5.77         /p         21.2         5.95         7.7         /p         21.2         7									Other				
Time         (mL/min)         (mL)         (mV)		nulative		Spe	cific	Dissolved			(Color,				
Time (mL/min)<	v v	olume Tem	p. pH	Condu	uctivity		ORP		Clarity,				
Image: Construct the sector of the sector	Time (mL/min) ( r	nL ) (°C)	(SU)	(mS	/cm)				Odor)				
I D TI D Q Q $R_{g}$ 9 5 5 $\cdot$ 77I R 2 Z L $J_{g}$ 47I D J_{g} (Image: Construct the second distribution of the second distresecond distribution distresecond	12:03 200 1000 9.05 5.73 1.212 502 -135.2 C												
Image: Section of the section of th	:05 1400 8.98 5.75 1.218 4.36 -126.4												
Field Inspection       Good       Fair       Poor         Access       Pad Condition       G       F       P         Weather Conditions       0       0       0       0       0       0         Weather Conditions       0       0       0       0       0       0       0         Weather Conditions       0       0       0       0       0       0       0       0         Water Level Start       0													
Field Inspection       Fair       Poor         Time sampled       Image: Stress of the sample													
Time sampled       Access       G       F       P         Weather Conditions       G       F       P         Weather Conditions       G       F       P         Water Level Start       O       O       O       N/A         Water Level Start       O       O       N/A         Water Level Finish       O       O       N/A         Name (MEC Field Sampler): Ryan Ortbale and Rick Elgin       N/A       N/A         Sampler Signature       Sumpler Signature       N/A       N/A         Historical Data: Average of sampling events       S.U       N/V       N/V         Constituent       Units       MW-1       MW-2       MW-3       MW-4       MW-5       MW-5       G/C       7/Z         Specific Conductance       umhos/cm       GW       0.786       1.132       2.083       0.841       1.769       1.900         Total Well Depth       ft       Only       1.24       0.4       5.39       1.32       6.92       7.86         Average GW Drop       ft       Only       1.24       0.4       5.39       1.32       6.92       7.86													
Time sampled       Pad Condition       G       F       P         Weather Conditions       G       F       P         Weather Conditions       G       F       P         Water Level Start       OoOO       G       F       P         Water Level Start       OoOO       Water Level Start       N/A       N/A         Water Level Finish       O.500       Standing Water       N/A       N/A         Vater Level Finish       O.500       N/A       N/A       N/A         Name (MEC Field Sampler): Rvan Ortbals and Rick Elgin       N/A       N/A       N/A         Sampler Signature       Onits       MW-1       MW-2       MW-3       MW-4       MW-5A       MW-6         Mistorical Data: Average of sampling events       S.U.       NO TEST       5.83       5.08       6.30       6.83       6.82       6.72         Specific Conductance       umhos/cm       GW       0.786       1.132       2.083       0.841       1.769       1.900         Total Well Depth       ft       Only       1.24       0.4       5.39       1.32       6.92       7.86         Average GW Drop       ft       Only       1.24       0.4       5.39       1.													
Weather Conditions       G       F       P         Weather Conditions       G       F       P         Water Level Start       O       O       N/A         Water Level Finish       O       O       N/A         Water Level Finish       O       O       N/A         Name (MEC Field Sampler): Rvan Ortbals and Rick Elgin       N/A       N/A         Name (MEC Field Sampler): Rvan Ortbals and Rick Elgin       N/A         Sampler Signature       N/A       N/A         Historical Data: Average of sampling events       NO TEST       5.83       5.08       6.30       6.83       6.82       6.72         Specific Conductance       umhos/cm       GW       0.786       1.132       2.083       0.841       1.769       1.900         Total Well Depth       ft       Level       Hevel       Hevel       Hevel       1.32       6.92       7.86         Average GW Drop       ft       Only       1.24       0.4       5.39       1.32       6.92       7.86 <tr< td=""><td></td><td>12.10</td><td></td><td></td><td></td><td></td><td>1</td><td>1</td><td>Р</td></tr<>		12.10					1	1	Р				
Weather Conditions       Image: Conditis inditis inditions       Image: Conditions<	lime sampled	10-10	1						Р				
Water Level Start       O       O       N/A         Water Level Start       O       O       N/A         Water Level Finish       O       O       N/A         Water Level Finish       O       O       N/A         Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin       N/A       N/A         Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin       N/A         Sampler Signature       N/A       N/A         Historical Data: Average of sampling events       N/A         Constituent       Units       MW-1         PH       S.U.       NO TEST         S.B.2       O.786       1.132         Specific Conductance       umhos/cm         GW       0.786       1.132         Varage GW Depth       ft       O         Average GW Drop       ft       O         Average GW Drop       ft       O         Average GW Drop       ft       O         O       NON'T       000         Start       Start       Start         System Volumes       mul       DON'T         O       800       800	$\bigwedge$ r		Low		-		1 -	· ·	Р				
Water Level Start       O       O       N/A         Water Level Start       O       O       N/A         Water Level Finish       O       O       N/A         Water Level Finish       O       O       N/A         Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin       N/A       N/A         Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin       N/A         Sampler Signature       N/A       N/A         Historical Data: Average of sampling events       N/A         Constituent       Units       MW-1         PH       S.U.       NO TEST         S.B.2       O.786       1.132         Specific Conductance       umhos/cm         GW       0.786       1.132         Varage GW Depth       ft       O         Average GW Drop       ft       O         Average GW Drop       ft       O         Average GW Drop       ft       O         O       NON'T       000         Start       Start       Start         System Volumes       mul       DON'T         O       800       800	Weather Conditions	WINCY	405										
Water Level StartOON/AWater Level StartOSON/AWater Level FinishOSON/AWater Level FinishOSON/AName (MEC Field Sampler): Rvan Ortbals and Rick ElginN/AN/AName (MEC Field Sampler): Rvan Ortbals and Rick ElginN/AN/ASampler SignatureN/AN/ASampler SignatureN/AN/AHistorical Data: Average of sampling eventsN/A TMunch Scher GWO.7861.132ConstituentUnitsMW-1MW-2MW-3MW-4Munch Scher GWO.7861.1322.083O.8411.7691.090ftLongthftLevel0.786Average GW DepthftOnpft2 System VolumesrulNot800Not800NotRole SolutionNotRole SolutionNotSolutionNotNotNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNotSolutionNot							$\cup$	r : Ne	•				
Water Level Start       O       O       N/A         Water Level Finish       O       So       So       N/A         Water Level Finish       O       So       Maintenance Performed       N/A         Split sample with MDNR       Y       N/A       N/A         Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin       N/A       N/A       N/A         Sampler Signature       Any deviations from SAP       Y       N/A         Historical Data: Average of sampling events       NO TEST       5.83       5.08       6.30       6.83       6.82       6.72         Specific Conductance       umhos/cm       GW       0.786       1.132       2.083       0.841       1.769       1.900         Total Well Depth       ft       Only       1.24       0.4       5.39       1.32       6.92       7.86         Average GW Dopp       ft       Only       1.24       0.4       5.39       1.32       6.92       7.86		MAM											
Water Level Finish       O, 50       N       N/A         Water Level Finish       O, 50       N       N/A         Split sample with MDNR       Y       N       N/A         Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin       N       N/A       N/A         Sampler Signature       N       N/A       N/A         Historical Data: Average of sampling events       N       N/A       N/A         Measuring Point       N       N/A       N/A         Maintenance Performed       Y       N       N/A         Decontamination Normal       Y       N       N/A         Redevelopment Needed       Y       N       N/A         Any deviations from SAP       Y       N       N/A         Sediment Thickness Checked       Y       N       N/A         N/A       N       N/A       N/A       N/A         Muter Level       MW-1       MW-2       MW-3       MW-4       MW-5       MW-6         Specific Conductance       Umhos/cm       GW       0.786       1.132       2.083       0.841       1.769       1.900         Total Well Depth       ft       Only       1.24       0.4       5.39       1.32	Water Level Start	0000					×	. Xî	2				
Average GW Depth       Image: Spin Sampler Victor Wich Wich Wich Wich Wich Wich Wich Wich		~ ~ /			-		(Y	ζ N	r -				
Average GW Depth       Image: Spin Sampler Victor Wich Wich Wich Wich Wich Wich Wich Wich		0 60'		M	easuring P	oint	Ű	) N	N/A				
Name (MEC Field Sampler): Rvan Ortbals and Rick ElginDecontamination Normal Equipment Calibration Normal Redevelopment Needed Any deviations from SAP Sediment Thickness Checked YNN/ASampler SignatureVNN/AHistorical Data: Average of sampling eventsMW-1MW-2MW-3MW-4MW-5MW-5AMW-6PHS.U.NO TEST5.835.086.306.836.826.72Specific Conductanceumhos/cmGW0.7861.1322.0830.8411.7691.900Total Well DepthftOnly1.240.45.391.326.927.86Average GW Dropft </td <td>Water Level Finish</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Ý</td> <td>ÍN</td> <td></td>	Water Level Finish						Ý	ÍN					
Name (MEC Field Sampler): Ryan Ortbals and Rick ElginEquipment Calibration NormalYN/ASampler SignatureAny deviations from SAPYNN/ASampler SignatureVNN/AN/AHistorical Data: Average of sampling eventsVNW-1MW-2MW-3MW-4MW-5MW-5AMW-6PHS.U.NO TEST5.835.086.306.836.826.72Specific Conductanceumhos/cmGW0.7861.1322.0830.8411.7691.900Total Well DepthftLevelAverage GW DepthftOnly1.240.45.391.326.927.86Average GW Dropft2 System Volumes								$\tilde{D}$					
Sampler SignatureN/ASampler SignatureN/AHistorical Data: Average of sampling eventsConstituentUnitsMW-1MW-2MW-3MW-4MW-5MW-5AMW-6pHS.U.Specific Conductanceumhos/cmGW0.7861.1322.0830.8411.7691.900Total Well DepthftAverage GW DepthftOnly1.240.45.391.326.927.86Average GW DropftDON'T800800800800800800800800	Namo (MEC Field Sampler)	Quan Octhols and D	iel Elein				Contraction of the second	Ϋ́Ν					
Sampler SignatureAny deviations from SAPYNN/ASampler SignatureAny deviations from SAPYNN/AHistorical Data: Average of sampling eventsConstituentUnitsMW-1MW-2MW-3MW-4MW-5MW-5AMW-6PHS.U.NO TEST5.835.086.306.836.826.72Specific Conductanceumhos/cmGW0.7861.1322.0830.8411.7691.900Total Well DepthftLevel </td <td>wante (MEC Fleid Sampler).</td> <td>Tyall Of that's allo h</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>L.N.</td> <td></td>	wante (MEC Fleid Sampler).	Tyall Of that's allo h						L.N.					
Sampler SignatureSediment Thickness CheckedYNN/AHistorical Data: Average of sampling eventsConstituentUnitsMW-1MW-2MW-3MW-4MW-5MW-5AMW-6pHS.U.NO TEST5.835.086.306.836.826.72Specific Conductanceumhos/cmGW0.7861.1322.0830.8411.7691.900Total Well DepthftLevel </td <td>/</td> <td>AU</td> <td>0</td> <td></td> <td></td> <td></td> <td>v V</td> <td>1</td> <td>1</td>	/	AU	0				v V	1	1				
Historical Data: Average of sampling events         Constituent       Units       MW-1       MW-2       MW-3       MW-4       MW-5       MW-5A       MW-6         pH       S.U.       NO TEST       5.83       5.08       6.30       6.83       6.82       6.72         Specific Conductance       umhos/cm       GW       0.786       1.132       2.083       0.841       1.769       1.900         Total Well Depth       ft       Level              Average GW Depth       ft       Only       1.24       0.4       5.39       1.32       6.92       7.86         Average GW Drop       ft                2 System Volumes       ml       DON'T       800       800       800       800       800	Sampler Signature	100	$\mathcal{I}$				ked Y						
Constituent         Units         MW-1         MW-2         MW-3         MW-4         MW-5         MW-5A         MW-6           pH         S.U.         NO TEST         5.83         5.08         6.30         6.83         6.82         6.72           Specific Conductance         umhos/cm         GW         0.786         1.132         2.083         0.841         1.769         1.900           Total Well Depth         ft         Level   <		K											
pH         S.U.         NO TEST         5.83         5.08         6.30         6.83         6.82         6.72           Specific Conductance         umhos/cm         GW         0.786         1.132         2.083         0.841         1.769         1.900           Total Well Depth         ft         Level                Average GW Depth         ft         Only         1.24         0.4         5.39         1.32         6.92         7.86           Average GW Drop         ft  <													
Specific Conductance         umhos/cm         GW         0.786         1.132         2.083         0.841         1.769         1.900           Total Well Depth         ft         Level													
Total Well Depth         ft         Level <th <="" td=""><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td>1</td><td></td></th>	<td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td>1</td> <td></td>						_		1				
Average GW Depth         ft         Only         1.24         0.4         5.39         1.32         6.92         7.86           Average GW Drop         ft <t< td=""><td></td><td></td><td>-</td><td>U./86</td><td>1.132</td><td>2.083</td><td>0.841</td><td>1.769</td><td>1.900</td></t<>			-	U./86	1.132	2.083	0.841	1.769	1.900				
Average GW Drop         ft         Image GW Drop         ft         ft         ft				1.24	0.4	E 20	4.00	6.00	7.95				
2 System Volumes DON'T 800 800 800 800 800 800			Uniy	1.24	0.4	5.39	1.32	6.92	7.80				
		11	DON'T		800	800	200	000	200				

Field Sampling Log												
Facility	: Asbury	CCR (Pern	nit #	)	M	onitoring W Sample	/ell ID: <u>MV</u>	N-	Eiold F	Blank		
Purge l	nformation:					Jampie		Dupicate				
-	d of Well Purge	e: Peristal	ltic Pump wit	h 3/8 - inch	Diameter T	ubing		1				
	-			•	Δ							
			al Purge Volur		$\omega \omega$	() mL pos	t pump calib	pration .				
	Time Initiated:	1.	3	11:14								
Date /	Fime Initiated:	<u>5-</u> <sup>(</sup>	-20 @	11191	_ Date /	Time Com	pleted: <u>5</u> -	- ( 0 -20	@			
Well Pu	irged To Dryne	ss?: Y/	Ø	Peti	roleum or G	as Detecte	d? Y / N	)				
Purge [	Data:						0					
									1			
	Purge	Cumula	tivo		Sn	ecific				Other		
	Rate	Volun		p. pH			Dissolved			(Color, Clarity,		
Time	(mL/min)	( mL	) (°C			/cm)	Oxygen	ORP		Odor)		
11.50		201	· · · ·		4	/	( mg/L )	(MV)	7			
11.58	200	20		16.3				$\square$	/			
10:00		1201		6.39			$\backslash$	$  \rangle /$				
(0)		1600		111-	2	$\vee$	<u> </u>	$\vdash \lor$	_			
	-			0.7		$A \downarrow$	-/	L_Ă_				
:04		200	) /	6.40	1 /		/ \	$ / \rangle$				
			/		//			1	_			
			Q	1	1	7 10	4					
			$10^{1}$	15		eld Inspect	tion	Good	<u>Fair</u>	Poor		
Time sa	mpled		2.0			ccess ad Conditic		/G	F	P		
nine sa	inpied	01			C	ad Conditional Con		G	) F	P		
		11/2	idel )	INIE	1 /	ocking Cap		G	F	P		
Weathe	r Conditions	(00	ay c	W I		ser Conditi		G	F	P		
		-	11	v .		eld inspect		Yes	No	<u>N/A</u>		
		5.	26		W	ell ID Visib	le	T.	) N	N/A		
Water L	evel Start	<u> </u>	a Q			anding Wa		Y	()	X N/A		
		a	DU			ear of Wee		Y	, N	N/A		
Motor I	evel Finish	11	9-1			easuring P		C	N	~ N/A		
vvalet L							with MDNR Performed	Y	<u>A</u>	S N/A		
							e Performed ation Normal			N/A		
Name (N	/IEC Field Samp	oler): Rvap	Ortibals and	Rick Flgin			alibration No		N.	N/A N/A		
,		1	1211				ent Needed	$\mathcal{C}_{\mathcal{C}}$	N	T N/A		
	/	1	Va	<u> </u>			ns from SAP	Ŷ	N	N/A		
Sampler	Signature/	1	10	5	Se	diment Thi	ckness Chec	ked Y	N N	N/A		
	$\mathcal{C}$	P,										
	al Data: Averag	e of samp	1									
Consti	tuent	ç	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6		
pH	. Canala d		S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72		
	c Conductance		umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900		
	Vell Depth		ft	Level	4.04	0.4	E 60	4.00				
	e GW Depth e GW Drop		ft ft	Only	1.24	0.4	5.39	1.32	6.92	7.86		
Aveidg	e avv biop		п									

DON'T

SAMPLE

mL

800

800

800

800

800

800

2 System Volumes

(Min Purged Amount)

		Field	l Sampli	ng Log							
						Th					
Facility: <u>Asbury CCR (Per</u>	mit #	)	M	onitoring W	ell ID: <b>MV</b>	V-/					
				Sample	X Blind	Duplicate	Field B	llank 📃.			
Purge Information:	lat - m		_								
Method of Well Purge: Perist											
Actu	al Purge Volum	e Removed	200	minos	t pump calib	ration					
		ACOS				-2					
Date / Time Initiated: <u>5 – (</u>	5_20 @	10.30	t Date /	Time Com	pleted: <u>5</u> -	- / -20	0				
	(R)		oleum or G	as Detecte	d? Y /N	)					
Purge Data:											
						1		Other			
Purge Cumu	ative		Spe	ecific	Dissolved			(Color,			
Rate Volu	me Tem	р. рН		uctivity	Oxygen	ORP		Clarity,			
Time (mL/min) ( mL	) (°C)		(mS	j/cm)	(mg/L)	(MV)		Odor)			
10:58 200 80	2	16.6	0	$\setminus$ /	5/	$\neg$					
11 11 150	alt	1		+/+	$-\gamma$						
11.00 120		6.4	9	X	-A						
:12 160	$O \mid Y$	652	5	$\wedge$	/ \	$  \Lambda$					
:04 200		6150	2 7	$\frown$							
		pin	/ /	$\rightarrow$	-+	/					
	/	$\sim$			$\langle \rangle$						
	11,0	/		ield Inspect	tion	Geod	<u>Fair</u>	Poor			
Time sampled	11.0	7		ccess		G	F	P			
	( <del>}</del> ,			ad Conditio asing Condi		G	F	P P			
17.	1/ / 1	1 5/	· · · ·	ocking Condi		G	F	P			
Weather Conditions 000	ay co		/	iser Conditi		G	F	P			
		1	Fi	eld Inspect	ion	Yes	No	N/A			
	0.99	(	W	ell ID Visib	le	$\bigcirc$	N_	N/A			
Water Level Start		/		anding Wa		Ŷ		, i			
	A 0 '	ſ		ear of Wee		Å	(N)	N/A			
Water Level Finish	0.02			leasuring Po	with MDNR	Ŷ					
					Performed	· V.	N	N/A N/A			
					tion Normal	R	$j \subseteq \mathbb{N}$	N/A			
Name (MEC Field Sampler): Rya	Ortbals and R	ick Elgin			alibration No		N	+ N/A			
	190	3			ent Needed	Ý	/ N	N/A			
Samulas Signature	KAS				ns from SAP	Y	/ N	N/A			
Sampler Signature Sediment Thickness Checked Y N N/A											
Historical Data: Average of sam	oling events						<u> </u>				
Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6			
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72			
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900			
Total Well Depth	ft	Level									
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86			

ft Only 1.24 0.4 5.39 1.32 ft

800

800

800

800

800

800

DON'T

SAMPLE

mL

Average GW Drop

2 System Volumes

(Min Purged Amount)

					Field	Sampli	ng Log				
Facility:	Asbury CC	CR (Perm	it #		)	Mo	onitoring W Sample	ell ID: MV	<u>J-</u> 5A Duplicate	Field Bl	ank .
Purge Infor							-				
Method of	Well Purge:	Peristal	tic Pump v	with 3/8	B - inch D	iameter T	ubing				
		Astus	Durne Ve	luma e D		200	0	t pump calib			
		Actua	7 Purge vo	nume ki	emovea:		V mL pos	t pump callb	ration.		
Date / Time	e Initiated:	5- (-	-20 0	all	0:30	Date /	Time Com	pleted: <u>5 –</u>	1. 3-20 0	മ	
			6						0 10		
Well Purge	d To Dryness	?: Y/	N)		Petro	oleum or G	as Detecte	d? Y/N)			
			$\bigcirc$					$\mathcal{O}$			
Purge Data	):					T					
											Other
	Purge	Cumula	tive				ecific	Dissolved			(Color,
	Rate	Volum		emp.	pH	1	uctivity	Oxygen	ORP		Clarity,
	(mL/min)	(mL	)	(°C)	(SU)	(mS	/cm)	( mg/L )	, (MV)	,	Odor)
10:39	200	800		/	6.18			$\setminus$ /	$\langle \rangle$		C
131	1	1201	2 1		6.20			$\langle /$	$ \land / $		
:39		1601	2	$\bigvee$	6,30		/	$\neg \lor / \neg$	X	-	
:41		Doval		A	6.78	$\rightarrow$	$\leftarrow$	-X-	$- \wedge$		
	- 6	reng	++	$\rightarrow$	0.00		$\rightarrow$	-	$\rightarrow \rightarrow$	_	
			1	/							
Time sampl Weather Co		/ ^				. <u>Fi</u>	eld Inspect	tion	<u>6000</u>	<u>Fair</u>	Poor
		$\left( \right)$	.45			A	ccess		' (G	F	Р
lime sampl	ed	10	~			Pa D	ad Conditio		G	F	P
	1		(	.1	51		asing Condi		G	F	P
Weather Co	Indition	00 C	YUU	.W	$\mathcal{I}\mathcal{O}$		ocking Cap iser Conditi		G	F	P P
weather ea		0	01			Fi	eld Inspect		US VOO	No	<u>N/A</u>
		0-	$\mathcal{Y}'$				ell ID Visib				N/A
Water Level	Start	Ovu	$\sim$				anding Wa		Y	Ŕ	N/A
		FE	2/1				ear of Wee		×	N N	) N/A
	/	5,8	1				easuring P		G	N_	N/A
Water Level	l Finish		4				-	with MDNR	Y	(H	N/A
						M	aintenance	Performed	X	5 (N	N/A
						De	econtamina	ation Normal	(Here)	Ň	N/A
Name (MEC	Field Sample	er): Ryan	Ortbals ar	nd Rick E	lgin	Ec	juipment C	alibration No	ormal (Y	A	T N/A
		1	91	2			-	ent Needed	Y	) N	N/A
c	. /	//	X	a -				ns from SAP	Y	/ N	N/A
Sampler Sig		1		T		Se	diment Thi	ckness Checl	ked Y	(N	N/A
Historical Da	ata: Average	of amp	ing events								
Constitue			Units		/IW-1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
рН		C	S.U.		O TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Co	onductance		umhos/c		GW	0.786	1.132	2.083	0.841	1.769	1.900

	Gittes	111144	14144 1	14148 2	TALAN	14144-2	TALAA-2W	14144-0
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

### Field Sampling Log

Facility:	Asbury CC	CR (Perm	it #	)	Mo	nitoring W	ell ID: MV	v- ()		
						Sample	X Blind	Duplicate [	Field B	lank X
	formation:									L \
Method	of Well Purge:	Peristal	tic Pump with	3/8 - inch [	Jiameter Tu	ıbing			11:	30
					7200	)			([+]	
		Actua	l Purge Volum	e Removed	2000	mL pos	t pump calib			
Data / Ti	me Initiated:	- L`	-20 @/	Ding	D . (	- 0		17	20	
Date / II	me initiated:	5- V	-20 @ [	0100	Date /	Time Com	oleted: <u>5</u> -	- / -20 (	<u>@</u>	
Well Pur	ged To Dryness		N	Petr	oleum or G	as Detector				
Tren i dig	Bea to pryness	··· · /(	シ	100						
Purge Da	ata:						Ú			
	Purge	Cumulat	thro		6.00	cific				Other
	Rate	Volum		). рН		ictivity	Dissolved			(Color, Clarity,
Time	(mL/min)	( mL	) (°C)	(SU)		/cm)	Oxygen	ORP		Odor)
		1001		110		/	( mg/L )	(MV)	/	
11:13	200	1000		16.00	7		$\setminus$ /			
:15		1400	$2 \mid \backslash$	621			$\setminus$ /	$  \rangle /$		
.'17		1800	$\gamma \mid \chi$	6.3	5		V	X		
19	b b	200	A	1. 77	7 /		$-\Lambda$	-/+		
.17	¢			0.0	$2 \neq /$		$ \land $			
			1			X	$\langle \rangle$	$\langle \rangle$		
and the second se										
		11	100		( <u>Fi</u>	eld Inspect	tion 1	600g	<u>Fair</u>	Poor
		11	20			eld Inspect	tion	G	<u>Fair</u> F	Poor P
Time sam	npled	11	20		Ad Pa	ccess ad Conditio	n	G G	F F	
Time sam	npled	11	20		Ad Pa Ca	ccess ad Conditio asing Condi	n ition	G G G	F F F	P P P
	(	N 1	20	50	۸۵ Pa Ca ۲۰۰۲ Lo	ccess ad Conditio asing Condi ocking Cap	n ition & Lock	G G G G	F F F	P P P P
	(	N 1	;20 y Cou	, 50	Ac Pa Ca 5 Lo Ri	ccess ad Conditio asing Condi ocking Cap ser Conditi	on ition & Lock on	G G G	F F F F	P P P P
	(	N 1	20 y (m	50	Ac Pa Ca 15 Ri <u>Fid</u>	ccess ad Conditio asing Condi ocking Cap ser Conditi <b>eld Inspect</b>	ition & Lock on <b>.ion</b>	G G G G	F F F	P P P P P <b>N/A</b>
Weather	Conditions	N 1	20 4 Cm	50	Ac Pa Ca 5 <u>5</u> Ri <u>Fic</u> W	ccess ad Conditio asing Condi ocking Cap ser Conditi eld Inspect 'ell ID Visib	n ition & Lock on <u>iton</u> Ie	G G G G	F F F F	P P P P P P N/A
	Conditions	Youd 3.1	y Con	, 50	Ad Pa Ca 15 Lo Ri <u>Fid</u> W	ad Conditio asing Condi ocking Cap ser Conditi <u>eld Inspect</u> 'ell ID Visib anding Wa	on ition & Lock on <u>iton</u> le	G G G G	F F F F	P P P P P <b>N/A</b> N/A
Weather	Conditions	Youd 3.1	y Con	, 50	Ad Pa Ca Lo Ri <u>Fi</u> u W St	ad Conditio asing Condi ocking Cap ser Conditi eld Inspect 'ell ID Visib anding Wa ear of Wee	on & Lock on <u>ilon</u> le ter ds	G G G G G G V Y Y	F F F F	P P P P P P N/A N/A N/A
Weather Water Le	Conditions	N 1	y Con	50	Ad Pa Ca Lo Ri <u>Fid</u> W St Cli M	ccess ad Conditio asing Condi ocking Cap ser Conditi eld Inspect cell ID Visib anding Wa ear of Wee easuring Po	on & Lock on <b>:ion</b> le ter ter ods	G G G G	F F F F	P P P P P N/A N/A N/A
Weather Water Le	Conditions	Youd 3.1	y Con	, 50	Ad Pa Ca Ca Lo Ri Ri W W St Clu Sp	ad Condition asing Condition ocking Cape ser Condition eld Inspect cell ID Visib anding Wa ear of Wee easuring Per- olit sample	on & Lock on <u>ilon</u> le ter ds	G G G G G G V Y Y	F F F F	P P P P N/A N/A N/A N/A
Weather Water Le	Conditions	Youd 3.1	y Con	, 50	Ad Pa Ca Ca Lo Ri Ri W W St Clu M Sp M	ad Conditio asing Condi ocking Cap ser Conditi eld Inspect anding Wa ear of Wee easuring Pa lit sample aintenance	n ition & Lock on <b>ion</b> le ter ter oint with MDNR		F F F F	P P P P P N/A N/A N/A
Weather Water Le Water Le	Conditions	Youd 3. 1 2. 4	y (m 1 5	ick Elgin	Ad Pa Ca Ca Lo Ri <u>Fiv</u> W St Clu St Clu St Clu De	ad Condition asing Condition asing Condition ocking Cap ser Conditi eld Inspect all ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance econtamina	on ition & Lock on <b>ion</b> le ter ter ods oint with MDNR e Performed			P P P P N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le	Conditions	Youd 3. 1 2. 4	y (m 1 5	ick Elgin	Ad Pa Ca Ca Lo Ri Eid W W St Cli M Cli M Cli M Eq Re	ad Condition asing Condition asing Condition ocking Cape ser Condition eld Inspect fell ID Visible anding Wa ear of Wee easuring Po- lit sample aintenance contamina puipment Co development	on & Lock on <u>ion</u> le ter eds oint with MDNR e Performed ation Normal alibration No			P P P P P N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M	Conditions	Youd 3. 1 2. 4	y (m 1 5	ick Elgin	Ad Pa Ca Ca Ca Ca Ca Ca St St Clu M St Clu M Clu Clu M Clu Clu Clu Clu Clu Clu Clu Clu Clu Clu	ad Conditio asing Condi ocking Cap ser Conditi eld Inspect cell ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance contamina upment Co- development y deviation	on ition & Lock on <b>ition</b> le ter oint with MDNR e Performed ation Normal alibration Normal alibration Normal and the strom SAP	G G G G G V Y Y		P P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le	Conditions	Youd 3. 1 2. 4	y (m 1 5	ick Elgin	Ad Pa Ca Ca Ca Ca Ca Ca St St Clu M St Clu M Clu Clu M Clu Clu Clu Clu Clu Clu Clu Clu Clu Clu	ad Conditio asing Condi ocking Cap ser Conditi eld Inspect cell ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance contamina upment Co- development y deviation	on & Lock on <u>ion</u> le ter eds oint with MDNR e Performed ation Normal alibration No	G G G G G V Y Y		P P P P P N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S	Conditions	1000 3, 1 2, 4 4 4	y Gul 5 Orthoals and R	ick Elgin	Ad Pa Ca Ca Ca Ca Ca Ca St St Clu M St Clu M Clu Clu M Clu Clu Clu Clu Clu Clu Clu Clu Clu Clu	ad Conditio asing Condi ocking Cap ser Conditi eld Inspect cell ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance contamina upment Co- development y deviation	on ition & Lock on <b>ition</b> le ter oint with MDNR e Performed ation Normal alibration Normal alibration Normal and the strom SAP	G G G G G V Y Y		P P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S	Conditions	1000 3, 1 2, 4 4 4	y Gul 5 5 ing events	2	Ad Pa Ca Ca Lo Ri W W St Clu M Clu M Clu M Clu Clu Clu Clu Clu Clu Clu Clu Clu Clu	ccess ad Conditio asing Condi ocking Cap ser Conditi eld Inspect fell ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance contamina upment C development by deviation diment Thi	on ition & Lock on <b>:ion</b> le ter eds oint with MDNR e Performed ation Normal alibration No ent Needed hs from SAP ckness Chec	G G G G G V Y V V V V V V V V V V V V V	F F F F F N N Z Z Z Z Z Z Z Z Z Z Z Z Z	P P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S Historical	Conditions	1000 3, 1 2, 4 4 4	y Gul 5 5 ing events Units	MW-1	Ad Pa Ca Ca Ca Ca Ca Si Si WW-2	ccess ad Conditio asing Condi ocking Cap ser Conditi eld Inspect fell ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance contamina upment C development diment Thi	on ition & Lock on iton le ter ods oint with MDNR e Performed ation Normal alibration No ent Needed ns from SAP ckness Chec	G G G G G V Y Y Y Y Y Y Ked Y Ked Y	F F F F NON N N N N N N N N N N N N N N	P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Lee Water Lee Name (M Sampler S Historical PH	Conditions	1000 3, 1 2, 4 4 4	ing events Units S.U.	2	Ad Pa Ca Ca Lo Ri Fid WW St Clu M Sp M De Eq Re An Se MW-2 5.83	ccess ad Conditio asing Condi ocking Cap ser Conditi eld Inspect fell ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance contamina uipment C development diment Thi MW-3 5.08	on ition & Lock on ion le ter oint with MDNR e Performed ation Normal alibration No ent Needed ns from SAP ickness Chec	G G G G G G V Y Y Y Y Y Y Y Y Y Y Y Y Y	F F F F N N N N N N N N N N N N N N N N	P P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Lee Water Lee Name (M Sampler S Historical Constitu PH Specific	Conditions	1000 3, 1 2, 4 4 4	y Gul 5 5 ing events Units	MW-1 NO TEST	Ad Pa Ca Ca Ca Ca Ca Si Si WW-2	ccess ad Conditio asing Condi ocking Cap ser Conditi eld Inspect fell ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance contamina upment C development diment Thi	on ition & Lock on iton le ter ods oint with MDNR e Performed ation Normal alibration No ent Needed ns from SAP ckness Chec	G G G G G V Y Y Y Y Y Y Ked Y Ked Y	F F F F NON N N N N N N N N N N N N N N	P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Lee Water Lee Name (M Sampler S Historical Constitu PH Specific Total W	Conditions	1000 3, 1 2, 4 4 4	ing events Units S.U. umhos/cm	MW-1 NO TEST GW	Ad Pa Ca Ca Lo Ri Fid WW St Clu M Sp M De Eq Re An Se MW-2 5.83	ccess ad Conditio asing Condi ocking Cap ser Conditi eld Inspect fell ID Visib anding Wa ear of Wee easuring Po- lit sample aintenance contamina uipment C development diment Thi MW-3 5.08	on ition & Lock on ion le ter oint with MDNR e Performed ation Normal alibration No ent Needed ns from SAP ickness Chec	G G G G G G V Y Y Y Y Y Y Y Y Y Y Y Y Y	F F F F N N N N N N N N N N N N N N N N	P P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

DON'T

SAMPLE

mL

800

800

800

800

800

2 System Volumes

(Min Purged Amount)

800

		Field	Sampli	ng Log				
Facility:Asbury CCR (Perr	nit #	)	Mo	onitoring W Sample	/ell ID: <b>MV</b>	v- 6A Duplicate	Field Blank	(
Purge Information:				en in pro	4-1-1-1-1			* []·
Method of Well Purge: Perista	ltic Pump with	3/8 - inch E	Diameter Tu	ubing				
Actu	al Purge Volum	e Removed:	180	mL pos	t pump calib	ration.		
Date / Time Initiated: <u>5</u> - (	3 _20 @	9:48	) Date /	Time Com	pleted: <u>5</u> –	B-20- (		-fl (
Well Purged To Dryness?: Y	$(\mathbb{A})$	Petr	oleum or G	as Detecte	d? Y N	) 1	0 4/00	o-thru er
Purge Data:					$\cup$		pre a	
Purge Cumula Rate Volu		). pH		ecific	Dissolved	000		Other (Color, Clarity,
Time (mL/min) ( ml		(SU)	1	/cm)	Oxygen ( mg/L )	ORP (MV)		Odor)
9:51 200 600	2	16.01	$\overline{)}$			$\backslash$		
:53 100	0	6.00						
:55 140	0 1	6.0			X	X		
:57 180	őΛ	6:1	3 /	$\mathbf{X}$		/		
	× / - `		1	$\mathbf{i}$	-	/		
	/	1	Fi	ield Inspect	tion	Good	Fair	Poor
1(	D: A 1			ccess		G	F	P
Time sampled (	2100	1		ad Conditic		G	F	Р
	In IN	NSA		asing Condi		G	F	P
Weather Conditions	in con	$\sim$		ocking Cap iser Conditi		G	F	P P
(	J,			eld Inspect		Yesh	, No	<u>N/A</u>
7-	24'			ell ID Visib		R)	N	N/A
Water Level Start C	~~~			anding Wa		Ý	and the	N/A
1/~	701			ear of Wee		X	(N)	N/A
Water Level Finish	10			leasuring Po	with MDNR	Ŷ	T	N/A N/A
					e Performed	Y ~		N/A
					ation Normal	60		N/A
Name (MEC Field Sampler): Rya	ortbals and R	ick Elgin	Ec	quipment C	alibration No	ormal (Y)	AD	N/A
1	10	. 11			ent Needed	Y	/N	) N/A
Sampler Signature	la			-	ns from SAP ickness Chec	Y ked Y		N/A N/A
							$\bigcirc$	
Historical Data: Average of same								
Constituent	Units	MW-6A	MW-7					
pH Specific Conductorics	S.U.	6.87	6.12					
Specific Conductance Total Well Depth	umhos/cm	1.601	2.699					
Average GW Depth	ft ft	7.28	3.04					
- Average Ow Depth	IL	1.20	5.04					

V

800

800

ft

mL

Average GW Drop

2 System Volumes

(Min Purged Amount)

#### Field Sampling Log

Facility:	Asbury (	CCR (Permi	t#	)	Мо		ell ID: <u>MM</u> Blind D	y- 7 Duplicate	Field Blank	[]
Purge In	nformation:					sampro	X		4	
	of Well Purge	: Peristalt	ic Pump with i	3/8 - inch Di	iameter Tu	bing		8:31	(r	
			····		260 M			0.00		
		Actual	Purge Volume	Removed:	2000	mL pos	t pump calib	ration.		
		1	7	740	· ·			~ <b>7</b>		
Date / T	ime Initiated:	5- lu	5 -20 @	1.27	Date /	Time Com	pleted: <u>5 –</u>	B -20- @	0	
		/	70 2	8:06			2			î
Well Pu	rged To Dryne	ss?: Y//	N)	Petro	oleum or Ga	as Detecte	d?Y//\)	0	- 1	NOC.
		C					$\mathcal{O}$	+17	red e	connect
Purge D	ata:									Connect
										Other
	Purge	Cumulat	ive		Spe	cific	Dissolved			(Color,
	Rate	Volum	e Temp	рН		ictivity	Oxygen	ORP		Clarity,
Time	(mL/min)	(_ml		(SU)		/cm) .	(mg/L)	(MV)		Odor)
1.0		200	0 0 00		11/	00	1 AI	16-0		0
8.10	200	30	0 7, 32	6.34	2.6	18	2.06	10.9		
:12		120	9.87	2 6.31	12.6	97	2.19	-160.3		
110		100	n a gi	6.31	197	AZ	377 -	- 100WA	-148.5	
		160	0 7:11		510 (		0.00	(MOIIP	ITON	
0 6		200	09.91	6.30	207	'lt	3129	-145.7	5	W.
							l.			
L	-		1			eld Inspec	tion	Good	Fair I	Poor
		$\mathcal{O}$	170			ccess	tion	Good	F	P
Time sa	mplad	0	-20	2		ad Conditio	20	G	F	P
THE Sa	mpieu	01	1	AL		asing Cond		G	F	P
	/	$\left( \right) $	Le L	Oleris		ocking Cap		G	F	P
Weatha	r Conditions	-100	1A	511		ser Condit		G	F	P
weathe	Conditions	0		00		eld Inspec		Ves	No	<u>N/A</u>
		1	56 0			ell ID Visib		TY	N	N/A
Water	evel Start	X.	20			anding Wa		<u> </u>		N/A
Walei L		~				ear of Wee		×		N/A
		1-	74			leasuring P		$\langle \gamma \rangle$	N	N/A
Wator	evel Finish	ail	(			-	with MDNR	C.		N/A
water L	everimisti	V					e Performed	v .	(N)	N/A
							ation Norma	-		N/A
Name (N	MEC Field Sam	nler): Rijan	Orthald and Ri	ck Elgin			Calibration N		N	N/A
Name (n	viec rielu sam						ent Needed	Y	AD	N/A
		/-	T/Ve	1-2			ins from SAP		N	N/A
Sampler	Signature	//	10	F			ickness Cheo		N	N/A
Sampler		1				spectron and the fill				, -
Historica	al Data: Avera	ge of samp	ing events for	5/16 + 6/1	7					
Consti			Units	MW-6A	MW-7					
pH			S.U.	6.87	6.12	1				
	ic Conductance	e	umhos/cm	1.601	2.699					
	Well Depth		ft							
	ge GW Depth		ft	7.28	3.04					
- Avcide	or any prihai		1.4		0101					

2

800

800

ft

mL

Average GW Drop

2 System Volumes

(Min Purged Amount)

#### Asbury Landfill and Pond Groundwater Sampling Events Supplementary Field notes May 11, 12 and 13, 2020

On May 11, 2020, Ryan Ortbals and Rick Elgin mobilized to the Asbury Landfill to initiate the Groundwater Sampling Event and completed on May 12, 2020 with no major issues other than wet and rainy. In addition, we were able to sample one (1) monitoring well (MW-3) of the Asbury Pond to complete the day on May 12<sup>th</sup>.

On May 13, 2020 (raining), we initiated the groundwater sampling activities for the remaining monitoring wells at the Asbury Pond. At the first monitoring well (MW-7) for the days' activities, the flow-through meter slid off the front of the truck and struck my foot and landed onto the ground. The jarring of the meter shut it off. We were unable to get the meter turned back on. We changed out the batteries with new batteries but that did not get the meter restarted. We attempted to dry the battery points and assured a good contact between the meter and the batteries. The meter still did not turn back on. We contacted the rental equipment supplier and ordered another meter to be shipped to the MEC office.

Part of the equipment that we took to the Asbury sites was a portable pH meter from our equipment inventory. Continuing forward with the sampling event, the groundwater pH readings taken with the portable pH meter were within the normal range of historical sampling events. We utilized only the pH reading for this sampling event to establish stability prior to sample collection, with the exception of MW-3 that was collected on May 12, 2020.

We returned the malfunctioning flow-through cell and meter once the replacement equipment had arrived at MEC.

an

Rick Elgin



**APPENDIX 4** 

Analytical Results from Lab

# 🛟 eurofins

## Environment Testing America

## **ANALYTICAL REPORT**

#### Eurofins TestAmerica, Pittsburgh 301 Alpha Drive RIDC Park Pittsburgh, PA 15238 Tel: (412)963-7058

#### Laboratory Job ID: 180-105771-1

Client Project/Site: Asbury Ash Pond Sampling Event: Asbury Ash Pond

#### For:

Midwest Environmental Consultants 2009 East McCarty Street Suite 2 Jefferson City, Missouri 65101

Attn: Mr. Rick Elgin

athy Gartner

Authorized for release by: 6/2/2020 2:06:21 PM Cathy Gartner, Project Manager II

(615)301-5041 cathy.gartner@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

PA Lab ID: 02-00416

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Visit us at: www.eurofinsus.com/Env

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The

Expert

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#### Job ID: 180-105771-1

#### Laboratory: Eurofins TestAmerica, Pittsburgh

#### Narrative

Job Narrative 180-105771-1

**Case Narrative** 

#### Receipt

The samples were received on 5/14/2020 9:00 AM; the samples arrived in good condition, properly preserved, and where required, on ice. The temperature of the cooler at receipt time was 4.2°C

#### HPLC/IC

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

#### Metals

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

#### **General Chemistry**

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

Qualifiers

QC

RL RPD

TEF

TEQ

RER

**Quality Control** 

Relative Error Ratio (Radiochemistry)

Toxicity Equivalent Factor (Dioxin) Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Qualifiers		3
HPLC/IC Qualifier	Qualifier Description	4
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	
Metals Qualifier	Qualifier Description	5
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	6
General Che	mietry	
Qualifier	Qualifier Description	
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.	
		8
Glossary		
Abbreviation	These commonly used abbreviations may or may not be present in this report.	g
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	
CNF	Contains No Free Liquid	
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	
DL	Detection Limit (DoD/DOE)	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	44
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML MQL	Minimum Level (Dioxin) Method Quantitation Limit	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
FQL		

#### **Accreditation/Certification Summary**

**Client: Midwest Environmental Consultants** Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
California	State	2891	04-30-21
Connecticut	State	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Georgia	State	PA 02-00416	04-30-21
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	01-31-21
Kentucky (UST)	State	162013	04-30-21
Kentucky (WW)	State	KY98043	12-31-20
Louisiana	NELAP	04041	06-30-20
Maine	State	PA00164	03-06-22
Minnesota	NELAP	042-999-482	12-31-20
Nevada	State	PA00164	07-31-20
New Hampshire	NELAP	2030	04-05-21
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	04-01-21
North Carolina (WW/SW)	State	434	01-01-21
North Dakota	State	R-227	04-30-21
Oregon	NELAP	PA-2151	02-06-21
Pennsylvania	NELAP	02-00416	04-30-21
Rhode Island	State	LAO00362	12-31-20
South Carolina	State	89014	04-30-20 *
Texas	NELAP	T104704528	03-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Virginia	NELAP	10043	09-15-20
West Virginia DEP	State	142	02-01-21
Wisconsin	State	998027800	08-31-20

#### Laboratory: Eurofins TestAmerica, Nashville

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

Authority	Program	Identification Number	Expiration Date
Arizona	State Program	AZ0473	05-05-14 *

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

#### Sample Summary

#### Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond

ab Sample ID.	Client Sample ID	Matrix	Collected	Received	Asset
80-105771-1	MW-2	Water	05/13/20 12:20	05/14/20 09:00	
80-105771-2	MW-3	Water	05/12/20 12:10	05/14/20 09:00	
80-105771-3	MW-4	Water	05/13/20 12:05	05/14/20 09:00	
80-105771-4	MW-5	Water	05/13/20 11:05	05/14/20 09:00	
80-105771-5	MW-5A	Water	05/13/20 10:45	05/14/20 09:00	
80-105771-6	MW-6	Water	05/13/20 11:20	05/14/20 09:00	
80-105771-7	MW-6A	Water	05/13/20 10:00	05/14/20 09:00	
80-105771-8	MW-7	Water	05/13/20 08:20	05/14/20 09:00	
80-105771-9	Duplicate	Water	05/13/20 08:30	05/14/20 09:00	
80-105771-10	Field Blank	Water	05/13/20 11:30	05/14/20 09:00	

#### **Method Summary**

#### Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 9040C	pН	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Matrix: Water

Matrix: Water

8

Lab Sample ID: 180-105771-1

Lab Sample ID: 180-105771-2

Lab Sample ID: 180-105771-3

#### Client Sample ID: MW-2 Date Collected: 05/13/20 12:20 Date Received: 05/14/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrument	EPA 9056A ID: CHIC2100A		1			317023	06/01/20 10:20	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis Instrument	EPA 6020A ID: DORY		1			316446	05/24/20 01:57	RJR	TAL PIT
Total/NA	Analysis Instrument	EPA 9040C ID: NOEQUIP		1			316815	05/28/20 17:21	PMH	TAL PIT
Total/NA	Analysis Instrument	SM 2540C ID: NOEQUIP		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT

#### Client Sample ID: MW-3 Date Collected: 05/12/20 12:10 Date Received: 05/14/20 09:00

Batch Batch Dil Initial Final Batch Prepared Туре Prep Type Method Run Factor Amount Amount Number or Analyzed Analyst Lab 317023 Total/NA Analysis EPA 9056A 06/01/20 10:52 MJH TAL PIT 1 Instrument ID: CHIC2100A Total/NA Analysis EPA 9056A 5 317023 06/01/20 11:08 MJH TAL PIT Instrument ID: CHIC2100A **Total Recoverable** Prep 3005A 50 mL 50 mL 316211 05/21/20 17:02 JL TAL PIT Total Recoverable 05/24/20 02:14 RJR TAL PIT Analysis EPA 6020A 1 316446 Instrument ID: DORY Total/NA Analysis EPA 9040C 05/28/20 17:24 PMH TAL PIT 1 316815 Instrument ID: NOEQUIP Total/NA Analysis SM 2540C 1 100 mL 100 mL 315580 05/15/20 09:22 AVS TAL PIT Instrument ID: NOEQUIP

#### Client Sample ID: MW-4 Date Collected: 05/13/20 12:05 Date Received: 05/14/20 09:00

Batch Batch Dil Initial Final Batch Prepared Method Factor Prep Type Туре Run Amount Amount Number or Analyzed Analyst Lab 317023 Total/NA Analysis EPA 9056A 06/01/20 11:23 MJH TAL PIT Instrument ID: CHIC2100A Total/NA Analysis EPA 9056A 10 317023 06/01/20 11:39 MJH TAL PIT Instrument ID: CHIC2100A Total Recoverable 3005A 50 mL 50 mL 316211 05/21/20 17:02 JL TAL PIT Prep **Total Recoverable** Analysis EPA 6020A 1 316446 05/24/20 02:18 RJR TAL PIT Instrument ID: DORY Total/NA Analysis EPA 9040C 1 316815 05/28/20 17:26 PMH TAL PIT Instrument ID: NOEQUIP Total/NA Analysis SM 2540C 1 100 mL 100 mL 315655 05/16/20 07:17 AVS TAL PIT Instrument ID: NOEQUIP

Matrix: Water

**Matrix: Water** 

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Lab Sample ID: 180-105771-4

#### Client Sample ID: MW-5 Date Collected: 05/13/20 11:05 Date Received: 05/14/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrument	EPA 9056A ID: CHIC2100A		1			316984	05/30/20 20:20	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis Instrument	EPA 6020A ID: DORY		1			316446	05/24/20 02:21	RJR	TAL PIT
Total/NA	Analysis Instrument	EPA 9040C ID: NOEQUIP		1			316815	05/28/20 17:27	РМН	TAL PIT
Total/NA	Analysis Instrument	SM 2540C ID: NOEQUIP		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT

#### Client Sample ID: MW-5A Date Collected: 05/13/20 10:45 Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-5

Matrix: Water

Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrument	EPA 9056A t ID: CHIC2100A		2.5			316984	05/30/20 22:11	MJH	TAL PIT
Total/NA	Analysis Instrument	EPA 9056A t ID: CHIC2100A		25			316984	05/30/20 22:27	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis Instrument	EPA 6020A t ID: DORY		1			316446	05/24/20 02:25	RJR	TAL PIT
Total/NA	Analysis Instrument	EPA 9040C t ID: NOEQUIP		1			316815	05/28/20 17:29	РМН	TAL PIT
Total/NA	Analysis Instrument	SM 2540C t ID: NOEQUIP		1	50 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT

#### Client Sample ID: MW-6 Date Collected: 05/13/20 11:20 Date Received: 05/14/20 09:00

Prep Type Total/NA	Batch Type Analysis Instrumen	Batch Method EPA 9056A ti ID: CHIC2100A	Run	Dil Factor 1	Initial Amount	Final Amount	Batch Number 316984	Prepared or Analyzed 05/30/20 22:43	Analyst MJH	Lab TAL PIT
Total/NA	Analysis Instrumen	EPA 9056A t ID: CHIC2100A		10			317023	06/01/20 07:57	MJH	TAL PIT
Total Recoverable Total Recoverable	Prep Analysis Instrumen	3005A EPA 6020A t ID: DORY		1	50 mL	50 mL	316211 316446	05/21/20 17:02 05/24/20 02:35		TAL PIT TAL PIT
Total/NA	Analysis Instrumen	EPA 9040C t ID: NOEQUIP		1			316815	05/28/20 17:30	PMH	TAL PIT
Total/NA	Analysis Instrumen	SM 2540C t ID: NOEQUIP		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT

**Matrix: Water** 

Lab Sample ID: 180-105771-7

#### **Client Sample ID: MW-6A** Date Collected: 05/13/20 10:00 Date Received: 05/14/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrumer	EPA 9056A nt ID: CHIC2100A		1			317023	06/01/20 08:13	MJH	TAL PIT
Total/NA	Analysis Instrumer	EPA 9056A nt ID: CHIC2100A		10			317023	06/01/20 08:29	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis Instrumer	EPA 6020A nt ID: DORY		1			316446	05/24/20 02:39	RJR	TAL PIT
Total/NA	Analysis Instrumer	EPA 9040C nt ID: NOEQUIP		1			316815	05/28/20 17:32	PMH	TAL PIT
Total/NA	Analysis Instrumer	SM 2540C nt ID: NOEQUIP		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT

#### **Client Sample ID: MW-7** Date Collected: 05/13/20 08:20 Date Received: 05/14/20 09:00

#### Lab Sample ID: 180-105771-8 **Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis Instrumen	EPA 9056A t ID: CHIC2100A		2.5			317023	06/01/20 08:45	MJH	TAL PIT
Total/NA	Analysis Instrumen	EPA 9056A t ID: CHIC2100A		25			317023	06/01/20 09:00	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis Instrumen	EPA 6020A t ID: DORY		1			316446	05/24/20 02:42	RJR	TAL PIT
Total/NA	Analysis Instrumen	EPA 9040C t ID: NOEQUIP		1			316815	05/28/20 17:33	PMH	TAL PIT
Total/NA	Analysis Instrumen	SM 2540C t ID: NOEQUIP		1	50 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT

#### **Client Sample ID: Duplicate** Date Collected: 05/13/20 08:30 Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-9

Matrix: Water

Prep Type Total/NA	Batch Type Analysis Instrumen	Batch Method EPA 9056A at ID: CHIC2100A	Run	Dil Factor 2.5	Initial Amount	Final Amount	Batch Number 317023	Prepared or Analyzed 06/01/20 09:16	Analyst MJH	Lab TAL PIT
Total/NA	Analysis Instrumen	EPA 9056A at ID: CHIC2100A		25			317023	06/01/20 09:32	MJH	TAL PIT
Total Recoverable Total Recoverable	Prep Analysis Instrumen	3005A EPA 6020A tt ID: DORY		1	50 mL	50 mL	316211 316446	05/21/20 17:02 05/24/20 02:46		TAL PIT TAL PIT
Total/NA	Analysis Instrumen	EPA 9040C at ID: NOEQUIP		1			316815	05/28/20 17:35	PMH	TAL PIT
Total/NA	Analysis Instrumen	SM 2540C at ID: NOEQUIP		1	50 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT

Eurofins TestAmerica, Pittsburgh

#### **Client Sample ID: Field Blank** Date Collected: 05/13/20 11:30 Date Received: 05/14/20 09:00

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis Instrumen	EPA 9056A t ID: CHIC2100A		1			316984	05/30/20 20:04	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis Instrumen	EPA 6020A t ID: DORY		1			316446	05/24/20 02:49	RJR	TAL PIT
Total/NA	Analysis Instrumen	EPA 9040C t ID: NOEQUIP		1			316815	05/28/20 17:38	PMH	TAL PIT
Total/NA	Analysis Instrumen	SM 2540C t ID: NOEQUIP		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT

#### Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

#### Analyst References:

Lab: TAL PIT Batch Type: Prep JL = James Lyu Batch Type: Analysis AVS = Abbey Smith MJH = Matthew Hartman PMH = Paloma Hoelzle RJR = Ron Rosenbaum

## Lab Sample ID: 180-105771-10

**Matrix: Water** 

0.080

RL

10

RL

0.1

0.16

560

Result Qualifier

Result Qualifier

6.7 HF

Job ID: 180-105771-1

05/21/20 17:02 05/24/20 01:57

Analyzed

05/16/20 07:17

Analyzed

05/28/20 17:21

Prepared

Prepared

1

1

1

Dil Fac

Dil Fac

9

#### **Client Sample ID: MW-2 Date Collect Date Receiv**

Boron

Analyte

Analyte

pН

**General Chemistry** 

**Total Dissolved Solids** 

<b>Client Sample ID: MW-2</b>						La	ab Sample	ID: 180-105	5771-1	
Date Collected: 05/13/20 12:	20							Matrix	: Water	
Date Received: 05/14/20 09:	00									
Method: EPA 9056A - Anio Analyte	· · ·	<mark>atography</mark> Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	110		1.0	0.32	mg/L			06/01/20 10:20	1	
Fluoride	0.42		0.10	0.026	mg/L			06/01/20 10:20	1	
Sulfate	46		1.0	0.38	mg/L			06/01/20 10:20	1	
Method: EPA 6020A - Meta	ls (ICP/MS) - T	otal Recove	rable							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	c
Calcium	38		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 01:57	1	

0.039 mg/L

MDL Unit

10 mg/L

RL Unit

0.1 SU

D

D

Job ID: 180-105771-1

### **Client Sample ID: MW-3** Date Collected: 05/12/20 12:10 Date Received: 05/14/20 09:00

Date Received: 05/14/20 09:00									
Method: EPA 9056A - Anions	•								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	57		1.0	0.32	mg/L			06/01/20 10:52	1
Fluoride	0.17		0.10	0.026	mg/L			06/01/20 10:52	1
Sulfate	460		5.0	1.9	mg/L			06/01/20 11:08	5
_ Method: EPA 6020A - Metals	(ICP/MS) - T	otal Recove	rahlo						
Analyte	• •	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	100		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:14	1
Boron	0.10		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:14	1
 General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	910		10	10	mg/L			05/15/20 09:22	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	5.9	HF	0.1	0.1	SU			05/28/20 17:24	1

9

pH

Job ID: 180-105771-1

#### **Client Sample ID: MW-4** Lab Sample ID: 180-105771-3 Date Collected: 05/13/20 12:05 **Matrix: Water** Date Received: 05/14/20 09:00 Method: EPA 9056A - Anions, Ion Chromatography Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed 06/01/20 11:23 Chloride 9.7 1.0 0.32 mg/L 06/01/20 11:23 Fluoride 0.10 0.026 mg/L 0.12 3.8 mg/L 06/01/20 11:39 Sulfate 540 10 Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed Calcium 0.50 05/21/20 17:02 05/24/20 02:18 270 0.13 mg/L Boron 0.067 J 0.080 0.039 mg/L 05/21/20 17:02 05/24/20 02:18 **General Chemistry** Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed 10 05/16/20 07:17 **Total Dissolved Solids** 1500 10 mg/L RL D Analyte **Result Qualifier** RL Unit Prepared

7.1 HF

0.1

0.1 SU

Analyzed Dil Fac 05/28/20 17:26

9

Dil Fac

Dil Fac

Dil Fac

1

1

10

1

1

1

1

Eurofins TestAmerica, Pittsburgh

Job ID: 180-105771-1

Matrix: Water

Lab Sample ID: 180-105771-4

#### Client Sample ID: MW-5 Date Collected: 05/13/20 11:05 Date Received: 05/14/20 09:00

Date Received: 05/14/20 09:0	00								
Method: EPA 9056A - Anio						_			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.8		1.0	0.32	mg/L			05/30/20 20:20	1
Fluoride	0.34		0.10	0.026	mg/L			05/30/20 20:20	1
Sulfate	130		1.0	0.38	mg/L			05/30/20 20:20	1
_ Method: EPA 6020A - Meta	Is (ICP/MS) - T	otal Recove	rable						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	100		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:21	1
Boron	0.27		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:21	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	570		10	10	mg/L			05/16/20 07:17	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	7.5	HF	0.1	0.1	SU			05/28/20 17:27	1

Eurofins TestAmerica, Pittsburgh

# **Client Sample Results**

**Client: Midwest Environmental Consultants** Project/Site: Asbury Ash Pond

pH

Job ID: 180-105771-1

### **Client Sample ID: MW-5A** Lab Sample ID: 180-105771-5 Date Collected: 05/13/20 10:45 Matrix: Water Date Received: 05/14/20 09:00 Method: EPA 9056A - Anions, Ion Chromatography Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed 05/30/20 22:11 Chloride 75 2.5 0.80 mg/L 0.25 05/30/20 22:11 Fluoride 0.45 0.066 mg/L 9.5 mg/L 05/30/20 22:27 Sulfate 1200 25 Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed Calcium 0.50 05/21/20 17:02 05/24/20 02:25 260 0.13 mg/L 0.91 0.080 0.039 mg/L 05/21/20 17:02 05/24/20 02:25 Boron **General Chemistry** Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed 20 05/16/20 07:17 **Total Dissolved Solids** 2100 20 mg/L RL D Analyte **Result Qualifier** RL Unit Prepared

0.1

6.9 HF

0.1 SU

1 Dil Fac

Dil Fac

Dil Fac

2.5

2.5

25

1

1

1

Analyzed Dil Fac

05/28/20 17:29

Eurofins TestAmerica, Pittsburgh

Job ID: 180-105771-1

### **Client Sample ID: MW-6** Lab Sample ID: 180-105771-6 Date Collected: 05/13/20 11:20 **Matrix: Water** Date Received: 05/14/20 09:00 Method: EPA 9056A - Anions, Ion Chromatography Dil Fac Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed 05/30/20 22:43 Chloride 14 1.0 0.32 mg/L 1 05/30/20 22:43 Fluoride 0.27 0.10 0.026 mg/L 1 3.8 mg/L 06/01/20 07:57 10 Sulfate 880 10 Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable Analyte **Result Qualifier** RL MDL Unit D Prepared Dil Fac Analyzed Calcium 0.50 0.13 mg/L 05/21/20 17:02 05/24/20 02:35 250 1 Boron 0.32 0.080 0.039 mg/L 05/21/20 17:02 05/24/20 02:35 1 **General Chemistry** Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed Dil Fac 10 05/16/20 07:17 **Total Dissolved Solids** 1600 10 mg/L 1 RL D Analyte **Result Qualifier** RL Unit Prepared Analyzed Dil Fac 0.1 SU 0.1 05/28/20 17:30 7.5 HF pH 1

11 12

Q

Eurofins TestAmerica, Pittsburgh

# **Client Sample Results**

Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond Job ID: 180-105771-1

Q

### **Client Sample ID: MW-6A** Lab Sample ID: 180-105771-7 Date Collected: 05/13/20 10:00 **Matrix: Water** Date Received: 05/14/20 09:00 Method: EPA 9056A - Anions, Ion Chromatography Dil Fac Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed 06/01/20 08:13 Chloride 19 1.0 0.32 mg/L 1 06/01/20 08:13 Fluoride 0.10 0.026 mg/L 1 0.34 3.8 mg/L 06/01/20 08:29 10 Sulfate 710 10 Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable Analyte **Result Qualifier** RL MDL Unit D Prepared Dil Fac Analyzed Calcium 0.50 0.13 mg/L 05/21/20 17:02 05/24/20 02:39 190 1 0.42 0.080 0.039 mg/L 05/21/20 17:02 05/24/20 02:39 Boron 1 **General Chemistry** Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed Dil Fac 10 05/16/20 07:17 **Total Dissolved Solids** 1400 10 mg/L 1 RL D Analyte **Result Qualifier** RL Unit Prepared Analyzed Dil Fac 0.1 SU 0.1 05/28/20 17:32 pH 7.4 HF 1

Job ID: 180-105771-1

Matrix: Water

Lab Sample ID: 180-105771-8

### Client Sample ID: MW-7 Date Collected: 05/13/20 08:20 Date Received: 05/14/20 09:00

-									
Method: EPA 9056A - Anio Analyte		atography Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	44	Quaimer -	2.5		mg/L		Flepaleu	06/01/20 08:45	2.5
					0				2.5
Fluoride	0.24	J	0.25	0.066	0			06/01/20 08:45	
Sulfate	1600		25	9.5	mg/L			06/01/20 09:00	25
_ Method: EPA 6020A - Meta	Is (ICP/MS) - T	otal Recove	rable						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	480		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:42	1
Boron	0.26		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:42	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2800		20	20	mg/L			05/16/20 07:17	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.6	HF	0.1	0.1	SU			05/28/20 17:33	1

# **Client Sample Results**

Job ID: 180-105771-1

Matrix: Water

Lab Sample ID: 180-105771-9

## Client Sample ID: Duplicate Date Collected: 05/13/20 08:30 Date Received: 05/14/20 09:00

Method: EPA 9056A - Anio	ns, Ion Chrom	atography							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	41		2.5	0.80	mg/L			06/01/20 09:16	2.5
Fluoride	0.27		0.25	0.066	mg/L			06/01/20 09:16	2.5
Sulfate	1600		25	9.5	mg/L			06/01/20 09:32	25
_ Method: EPA 6020A - Meta	Is (ICP/MS) - T	otal Recove	arable						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	500		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:46	1
Boron	0.27		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:46	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2700		20	20	mg/L			05/16/20 07:17	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pН	6.6	HF	0.1	0.1	SU			05/28/20 17:35	1

# **Client Sample Results**

Job ID: 180-105771-1

## Client Sample ID: Field Blank Date Collected: 05/13/20 11:30 Date Received: 05/14/20 09:00

# Lab Sample ID: 180-105771-10

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.3		1.0	0.32	mg/L			05/30/20 20:04	1
Fluoride	0.67		0.10	0.026	mg/L			05/30/20 20:04	1
Sulfate	0.41	J	1.0	0.38	mg/L			05/30/20 20:04	1
Method: EPA 6020A - Metal	s (ICP/MS) - T	otal Recove	rable						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	0.36	J	0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:49	1
Boron	0.054	J	0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:49	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10		10	10	mg/L			05/16/20 07:17	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	67	HF	0.1	0.1	SU			05/28/20 17:38	1

# 5

10

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

**Client Sample ID: Matrix Spike** 

**Client Sample ID: Matrix Spike Duplicate** 

**Client Sample ID: Method Blank** 

**Client Sample ID: Lab Control Sample** 

**Prep Type: Total/NA** 

Prep Type: Total/NA

**Prep Type: Total/NA** 

**Prep Type: Total/NA** 

La	b	Sa	mple	ID: MI	B 180-31	6984/45	

Method: EPA 9056A - Anions, Ion Chromatography

### **Matrix: Water** Analysis Batch: 316984

-	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			05/30/20 19:49	1
Fluoride	ND		0.10	0.026	mg/L			05/30/20 19:49	1
Sulfate	ND		1.0	0.38	mg/L			05/30/20 19:49	1

### Lab Sample ID: LCS 180-316984/44 Matrix: Water Analysis Batch: 316984

-	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	50.0	52.3		mg/L		105	80 - 120	 -
Fluoride	2.50	2.60		mg/L		104	80 - 120	
Sulfate	50.0	48.2		mg/L		96	80 - 120	

### Lab Sample ID: 180-106396-D-1 MS **Matrix: Water**

## Analysis Batch: 316984

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	1.9		50.0	47.9		mg/L		92	80 - 120	
Fluoride	0.21		2.50	2.50		mg/L		92	80 - 120	
Sulfate	26		50.0	66.5		mg/L		82	80 - 120	

### Lab Sample ID: 180-106396-D-1 MSD **Matrix: Water**

Analysis Batch: 316984

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chloride	1.9		50.0	47.8		mg/L		92	80 - 120	0	15
Fluoride	0.21		2.50	2.46		mg/L		90	80 - 120	2	15
Sulfate	26		50.0	65.7		mg/L		80	80 - 120	1	15

### Lab Sample ID: MB 180-317023/6 **Matrix: Water**

### Analysis Batch: 317023

· ···· <b>,</b> ··· · ·····	МВ	МВ							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			06/01/20 06:38	1
Fluoride	ND		0.10	0.026	mg/L			06/01/20 06:38	1
Sulfate	ND		1.0	0.38	mg/L			06/01/20 06:38	1

### Lab Sample ID: LCS 180-317023/5 Matrix: Water

### Analysis Batch: 317023

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	50.0	51.8		mg/L		104	80 - 120	
Fluoride	2.50	2.60		mg/L		104	80 - 120	
Sulfate	50.0	48.2		mg/L		96	80 - 120	

Eurofins TestAmerica, Pittsburgh

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

	nions in	n unroma	Touran	nny (Cont	inued)						
ethod: EPA 9056A - A			lograp	., (							
.ab Sample ID: 180-105952 /atrix: Water	2-C-1 MS						CI	ient Sa	mple ID: I Prep Tyj		-
Analysis Batch: 317023											
·····, ··· · · · · · · · · · · · · · ·	Sample	Sample	Spike	MS	MS				%Rec.		
Analyte		Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Chloride	3.8		50.0	53.4		mg/L		99	80 - 120		
Fluoride	0.076	J	2.50	2.59		mg/L		100	80 - 120		
Sulfate	9.8		50.0	55.5		mg/L		91	80 - 120		
Lab Sample ID: 180-105952	2-C-1 MSD					Client	Samp	le ID: M	latrix Spik	e Dup	icate
Matrix: Water						<b>U</b> llolle	oump		Prep Ty		
Analysis Batch: 317023											
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	•	Qualifier	Added		Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chloride	3.8		50.0	53.0		mg/L		98	80 - 120	1	15
Fluoride	0.076	J	2.50	2.60		mg/L		101	80 - 120	0	15
Sulfate	9.8		50.0	55.3		mg/L		91	80 - 120	0	15
ethod: EPA 6020A - M	lotale (ICI										
ab Sample ID: MB 180-31	6211/1-A								ple ID: M		
Matrix: Water											rahla
							P	rep Typ	be: Total F		
Analysis Batch: 316446							Р	reр Тур	be: Total F Prep Ba		
-		MB MB							Prep Ba	itch: 31	6211
Analyte	Re	sult Qualifier			MDL Unit		D P	repared	Prep Ba Analyz	t <mark>ch: 31</mark> ed I	6211 Dil Fac
Analyte Calcium	Re	ND Qualifier		0.50	0.13 mg/L		$\frac{\mathbf{D}}{05/2}$	<b>repared</b> 1/20 17:0	Prep Ba Analyz 2 05/24/20	tch: 31 ed 01:36	<b>6211</b> Dil Fac
Analysis Batch: 316446 Analyte Calcium Boron	Re	sult Qualifier		0.50			$\frac{\mathbf{D}}{05/2}$	<b>repared</b> 1/20 17:0	Prep Ba Analyz	tch: 31 ed 01:36	6211 Dil Fac
Analyte Calcium Boron		ND Qualifier		0.50	0.13 mg/L		<b>D P</b> 05/2 05/2	<b>repared</b> 1/20 17:0 1/20 17:0	Prep Ba Analyz 2 05/24/20 2 05/24/20	t <b>ch: 31</b> red 01:36 01:36	6211 Dil Fac 1 1
Analyte Calcium Boron Lab Sample ID: LCS 180-31		ND Qualifier		0.50	0.13 mg/L		D P 05/2 05/2 nt Sar	repared 1/20 17:0 1/20 17:0 mple ID	Prep Ba Analyz 2 05/24/20 2 05/24/20 : Lab Con	tch: 31	6211 Dil Fac 1 1 mple
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water		ND Qualifier		0.50	0.13 mg/L		D P 05/2 05/2 nt Sar	repared 1/20 17:0 1/20 17:0 mple ID	Prep Ba Analyz 2 05/24/20 2 05/24/20 : Lab Com be: Total F	tch: 31	6211 Dil Fac 1 1 mple rable
Analyte Calcium Boron Lab Sample ID: LCS 180-31		ND Qualifier		0.50 0.080 C	0.13 mg/L		D P 05/2 05/2 nt Sar	repared 1/20 17:0 1/20 17:0 mple ID	Prep Ba Analyz 2 05/24/20 2 05/24/20 : Lab Con be: Total F Prep Ba	tch: 31	6211 Dil Fac 1 1 mple rable
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446		ND Qualifier	Spike	0.50 0.080 C	0.13 mg/L ).039 mg/L		D P 05/2 05/2 nt Sar	repared 1/20 17:0 1/20 17:0 mple ID	Prep Ba Analyz 2 05/24/20 2 05/24/20 : Lab Com be: Total F	tch: 31	6211 Dil Fac 1 1 mple rable
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte		ND Qualifier	Spike Added	0.50 0.080 C	0.13 mg/L 0.039 mg/L LCS Qualifier	Clie	D P 05/2 05/2 nt Sar P	repared 1/20 17:0 1/20 17:0 1/20 17:0 mple ID rep Typ	Prep Ba Analyz 05/24/20 2 05/24/20 2 05/24/20 : Lab Con be: Total F Prep Ba %Rec.	tch: 31	6211 Dil Fac 1 1 mple rable
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium		ND Qualifier	Spike	0.50 0.080 C LCS Result	0.13 mg/L 0.039 mg/L LCS Qualifier	Clies Unit mg/L	D P 05/2 05/2 nt Sar P	repared 1/20 17:0 1/20 17:0 mple ID rep Typ %Rec	Prep Ba Analyz 05/24/20 2 05/24/20 2 05/24/20 : Lab Con be: Total F Prep Ba %Rec. Limits	tch: 31	6211 Dil Fac 1 1 mple rable
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron	16211/2-A	ND Qualifier	Spike Added 25.0	0.50 0.080 C LCS Result 27.6	0.13 mg/L 0.039 mg/L LCS Qualifier	Clie	D P 05/2 05/2 nt Sar P	repared 1/20 17:0. 1/20 17:0 mple ID rep Tyr %Rec 111 94	Prep Ba Analyz 2 05/24/20 2 05/20 2 05/20	ttch: 31         red       I         01:36       01:36         ttrol Sa         Recove         ttch: 31	6211 Dil Fac
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771	16211/2-A	ND Qualifier	Spike Added 25.0	0.50 0.080 C LCS Result 27.6	0.13 mg/L 0.039 mg/L LCS Qualifier	Clies Unit mg/L	D P 05/2 0 0 0 0 0 0 0 0 0 0 0 0 0	repared 1/20 17:0 1/20 17:0 mple ID rep Typ %Rec 111 94 Cli	Prep Ba Analyz 2 05/24/20 2 05/20 2 05/24/20 2 05	itch: 31         ited       I         01:36       01:36         itrol Sa         Recove         itch: 31	6211 Dil Fac 1 mple rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water	16211/2-A	ND Qualifier	Spike Added 25.0	0.50 0.080 C LCS Result 27.6	0.13 mg/L 0.039 mg/L LCS Qualifier	Clies Unit mg/L	D P 05/2 0 0 0 0 0 0 0 0 0 0 0 0 0	repared 1/20 17:0 1/20 17:0 mple ID rep Typ %Rec 111 94 Cli	Prep Ba Analyz 2 05/24/20 2 05/24/20 2 05/24/20 2 105/24/20 2 05/24/20 2 05/24/20	etch: 31 ed I 01:36 1	6211 Dil Fac 1 mple rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water	16211/2-A I-1 MS	ND Qualifier	<b>Spike</b> <b>Added</b> 25.0 1.25	0.50 0.080 C LCS Result 27.6 1.17	0.13 mg/L 0.039 mg/L LCS Qualifier	Clies Unit mg/L	D P 05/2 0 0 0 0 0 0 0 0 0 0 0 0 0	repared 1/20 17:0 1/20 17:0 mple ID rep Typ %Rec 111 94 Cli	Prep Ba Analyz 2 05/24/20 2	etch: 31 ed I 01:36 1	6211 Dil Fac 1 mple rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446	16211/2-A I-1 MS Sample	Sample	Spike Added 25.0 1.25 Spike	0.50 0.080 C LCS Result 27.6 1.17 MS	0.13 mg/L 0.039 mg/L LCS Qualifier MS	Clier Unit mg/L mg/L	D P 05/2 05/2 05/2 05/2 05/2 P P	repared 1/20 17:0. 1/20 17:0. mple ID rep Typ %Rec 111 94 Cli rep Typ	Prep Ba Analyz 05/24/20 2 05/24/20 2 05/20 2 05/2	etch: 31 ed I 01:36 1	6211 Dil Fac 1 mple rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446 Analyte	16211/2-A I-1 MS Sample Result	ND Qualifier	Spike Added 25.0 1.25 Spike Added	0.50 0.080 C LCS Result 27.6 1.17 MS Result	0.13 mg/L 0.039 mg/L LCS Qualifier	Clies Unit mg/L mg/L Unit	D P 05/2 0 0 0 0 0 0 0 0 0 0 0 0 0	repared 1/20 17:0. 1/20 17:0. mple ID rep Typ %Rec %Rec %Rec	Prep Ba Analyz 05/24/20 2 05/24/20 2 05/20 2 05/20 0	etch: 31 ed I 01:36 1	6211 Dil Fac 1 mple rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446 Analyte Calcium	16211/2-A I-1 MS Sample Result 38	Sample	Spike Added 25.0 1.25 Spike Added 25.0	0.50 0.080 C LCS Result 27.6 1.17 MS Result 67.4	0.13 mg/L 0.039 mg/L LCS Qualifier MS	Clies Unit mg/L mg/L Unit mg/L	D P 05/2 05/2 05/2 05/2 05/2 P P	repared           1/20         17:0.           1/20         17:0.           1/20         17:0.           mple         ID           rep         Type           %Rec         111           94         Clipe           Crep         Type           %Rec         111           94         Clipe           Clipe         Type           %Rec         116	Prep Ba Analyz 2 05/24/20 2	etch: 31 ed I 01:36 1	6211 Dil Fac 1 mple rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446 Analyte Calcium	16211/2-A I-1 MS Sample Result	Sample	Spike Added 25.0 1.25 Spike Added	0.50 0.080 C LCS Result 27.6 1.17 MS Result	0.13 mg/L 0.039 mg/L LCS Qualifier MS	Clies Unit mg/L mg/L Unit	D P 05/2 05/2 05/2 05/2 05/2 P P	repared 1/20 17:0. 1/20 17:0. mple ID rep Typ %Rec %Rec %Rec	Prep Ba Analyz 05/24/20 2 05/24/20 2 05/20 2 05/20 0	etch: 31 ed I 01:36 1	6211 Dil Fac 1 mple rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-34 Matrix: Water Analysis Batch: 316446 Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446	16211/2-A I-1 MS Sample Result 38 0.16	Sample	Spike Added 25.0 1.25 Spike Added 25.0	0.50 0.080 C LCS Result 27.6 1.17 MS Result 67.4	0.13 mg/L 0.039 mg/L LCS Qualifier MS	Clies Unit mg/L mg/L Unit mg/L	D P 05/2 05/2 05/2 05/2 05/2 P P	repared 1/20 17:0. 1/20 17:0. mple ID rep Typ %Rec 111 94 Cli rep Typ %Rec 116 89	Prep Ba Analyz 2 05/24/20 2	etch: 31 ed I 01:36 trol Sa Recove tch: 31 Die ID: I Recove tch: 31	6211 Dil Fac
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron	16211/2-A I-1 MS Sample Result 38 0.16	Sample	Spike Added 25.0 1.25 Spike Added 25.0	0.50 0.080 C LCS Result 27.6 1.17 MS Result 67.4	0.13 mg/L 0.039 mg/L LCS Qualifier MS	Clies Unit mg/L mg/L Unit mg/L	D P 05/2 05/2 05/2 nt Sar P D P	repared 1/20 17:0 1/20 17:0 mple ID rep Typ %Rec 111 94 Cli rep Typ %Rec 116 89 Cli	Prep Ba Analyz 2 05/24/20 2 05/25 2	etch: 31 ed I 01:36 trol Sa Recove tch: 31 Die ID: I Recove tch: 31 Die ID: I	6211 Dil Fac
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water	16211/2-A I-1 MS Sample Result 38 0.16	Sample	Spike Added 25.0 1.25 Spike Added 25.0	0.50 0.080 C LCS Result 27.6 1.17 MS Result 67.4	0.13 mg/L 0.039 mg/L LCS Qualifier MS	Clies Unit mg/L mg/L Unit mg/L	D P 05/2 05/2 05/2 nt Sar P D P	repared 1/20 17:0 1/20 17:0 mple ID rep Typ %Rec 111 94 Cli rep Typ %Rec 116 89 Cli	Prep Ba Analyz 2 05/24/20 2 05/25 2 0	etch: 31 ed I 01:36 trol Sa Recove tch: 31 ole ID: I Recove tch: 31 ole ID: I Recove	6211 Dil Fac 1 1 mple rable 6211 MW-2 rable 6211 MW-2 rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron	16211/2-A I-1 MS Sample Result 38 0.16 I-1 MSD	Sample	Spike Added 25.0 1.25 Spike Added 25.0	0.50 0.080 C LCS Result 27.6 1.17 MS Result 67.4 1.27	0.13 mg/L 0.039 mg/L LCS Qualifier MS	Clies Unit mg/L mg/L Unit mg/L	D P 05/2 05/2 05/2 nt Sar P D P	repared 1/20 17:0 1/20 17:0 mple ID rep Typ %Rec 111 94 Cli rep Typ %Rec 116 89 Cli	Prep Ba Analyz 2 05/24/20 2	etch: 31 ed I 01:36 trol Sa Recove tch: 31 ole ID: I Recove tch: 31 ole ID: I Recove	6211 Dil Fac 1 1 mple rable 6211 MW-2 rable 6211 MW-2 rable 6211
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446 Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Analysis Batch: 316446	16211/2-A I-1 MS Sample Result 38 0.16 I-1 MSD Sample	Sample Qualifier	Spike Added 25.0 1.25 Spike Added 25.0 1.25	0.50 0.080 C LCS Result 27.6 1.17 MS Result 67.4 1.27 MSD	0.13 mg/L 0.039 mg/L LCS Qualifier	Clies Unit mg/L mg/L Unit mg/L	D P 05/2 05/2 05/2 05/2 P P P P	repared 1/20 17:0 1/20 17:0 mple ID rep Typ %Rec 111 94 Cli rep Typ %Rec 116 89 Cli	Prep Ba Analyz 2 05/24/20 2	etch: 31 ed I 01:36 trol Sa Recove tch: 31 ole ID: I Recove tch: 31 ole ID: I Recove	6211 Dil Fac
Analyte Calcium Boron Lab Sample ID: LCS 180-37 Matrix: Water Analysis Batch: 316446 Analyte Calcium Boron Lab Sample ID: 180-105771 Matrix: Water Calcium Calcium Boron Lab Sample ID: 180-105771 Matrix: Water	16211/2-A I-1 MS Sample Result 38 0.16 I-1 MSD Sample	Sample Qualifier Sample	Spike           Added           25.0           1.25           Spike           Added           25.0           1.25           Spike           Added           25.0           1.25	0.50 0.080 C LCS Result 27.6 1.17 MS Result 67.4 1.27 MSD	0.13 mg/L 0.039 mg/L LCS Qualifier MS Qualifier	Clier Unit mg/L mg/L Unit mg/L mg/L	D P 05/2 05/2 05/2 05/2 P P P P	repared 1/20 17:0. 1/20 17:0. mple ID rep Typ %Rec 111 94 Cli rep Typ %Rec 116 89 Cli rep Typ	Prep Ba           Analyz           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           2           05/24/20           80 - 120           80 - 120           80 - 120           9           9           9           9           9           9           9           9           9           9           9           9           9           9	etch: 31 etch: 31 off:36 off:36 off:36 etch: 31 off:10: 1 etch: 31 etch:	6211 Dil Fac 1 mple rable 6211 AW-2 rable 6211 AW-2 rable 6211 MW-2 rable 6211 RPD

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# Method: EPA 9040C - pH

	ample	Sample Qualifier	Spike Added 7.00		LCS Qualifier	Unit SU	D	%Rec 100	Prep Type: To %Rec. Limits 99 - 101	
Analyte pH Lab Sample ID: 180-105771-1 DU Matrix: Water Analysis Batch: 316815 Sa Analyte pH Lab Sample ID: 180-105771-10 D Matrix: Water	ample Result	Qualifier	Added	Result			D	100	Limits 99 - 101	
Lab Sample ID: 180-105771-1 DU Matrix: Water Analysis Batch: 316815 Sa Analyte PH Lab Sample ID: 180-105771-10 D Matrix: Water	ample Result	Qualifier	Added	Result			D	100	Limits 99 - 101	
Lab Sample ID: 180-105771-1 DU Matrix: Water Analysis Batch: 316815 Sa Analyte pH Lab Sample ID: 180-105771-10 D Matrix: Water	ample Result	Qualifier			Qualifier		D	100	99 - 101	
Lab Sample ID: 180-105771-1 DU Matrix: Water Analysis Batch: 316815 Sa Analyte pH Lab Sample ID: 180-105771-10 D Matrix: Water	ample Result	Qualifier	7.00	7.0		SU				
Matrix: Water Analysis Batch: 316815 Analyte pH Lab Sample ID: 180-105771-10 D Matrix: Water	ample Result	Qualifier						01		
Analyte PH Lab Sample ID: 180-105771-10 D Matrix: Water	Result	Qualifier						CII	ient Sample ID: Prep Type: To	
Analyte F pH Lab Sample ID: 180-105771-10 D Matrix: Water	Result	Qualifier								
Lab Sample ID: 180-105771-10 D Matrix: Water				DU	DU					RPI
Lab Sample ID: 180-105771-10 D Matrix: Water	6.7			Result	Qualifier	Unit	D		RPD	Lim
Matrix: Water		HF		6.7		SU			0.3	:
	U						C	lient Sa	ample ID: Field Prep Type: To	
	ample	Sample		DU	DU					RPI
		Qualifier		Result	Qualifier	Unit	D		RPD	Limi
<u>р</u> Н		HF		6.6		SU			0.9	
Method: SM 2540C - Solids,										
Analyte	Re	MB MB esult Qualifier		RL	MDL Unit	1	D Pi	repared	Analyzed	Dil Fa
Total Dissolved Solids		ND		10	10 mg/L			eparea	05/15/20 09:22	Dirra
Lab Sample ID: LCS 180-315580/ Matrix: Water	/1					Clie	nt Sar	nple ID:	: Lab Control S Prep Type: To	
Analysis Batch: 315580			Omilia	1.00	1.00				0/ D	
Analyte			Spike Added		LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
Total Dissolved Solids			269	228		mg/L		85	80 - 120	
Lab Sample ID: 180-105734-B-1   Matrix: Water Analysis Batch: 315580								Client	Sample ID: Dup Prep Type: To	tal/N
		Sample			DU					RPI
		Qualifier			Qualifier	Unit	D		RPD	Limi
Total Dissolved Solids	250			254		mg/L			0.4	10
	2						Clie	nt Sam	ple ID: Method Prep Type: To	
Lab Sample ID: MB 180-315655/2 Matrix: Water										
•										
Matrix: Water	_	MB MB esult Qualifier		RL	MDL Unit		D Pi	repared	Analyzed	Dil Fac

Job ID: 180-105771-1

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

Lab Sample ID: LCS 180-315 Matrix: Water Analysis Batch: 315655	655/1					Clie	ent Sar	nple ID	: Lab Contr Prep Type			
Analysis Batch. 010000			Spike	LCS	LCS				%Rec.			
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits			- 1
Total Dissolved Solids			192	222		mg/L		116	80 - 120			_
Lab Sample ID: 180-105771- Matrix: Water Analysis Batch: 315655	1 DU							CI	ient Sample Prep Type			
	Sample	Sample		DU	DU						RP	סי
Analyte	Result	Qualifier		Result	Qualifier	Unit	D			RPD	Lim	nit
Total Dissolved Solids	560			562		mg/L				0.5		10

# **QC** Association Summary

Job ID: 180-105771-1

# 11 12 13

# Analysis Batch: 316984

HPLC/IC

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-4	MW-5	Total/NA	Water	EPA 9056A	
180-105771-5	MW-5A	Total/NA	Water	EPA 9056A	
180-105771-5	MW-5A	Total/NA	Water	EPA 9056A	
180-105771-6	MW-6	Total/NA	Water	EPA 9056A	
180-105771-10	Field Blank	Total/NA	Water	EPA 9056A	
MB 180-316984/45	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-316984/44	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-106396-D-1 MS	Matrix Spike	Total/NA	Water	EPA 9056A	
180-106396-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 9056A	

## Analysis Batch: 317023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total/NA	Water	EPA 9056A	
180-105771-2	MW-3	Total/NA	Water	EPA 9056A	
180-105771-2	MW-3	Total/NA	Water	EPA 9056A	
180-105771-3	MW-4	Total/NA	Water	EPA 9056A	
180-105771-3	MW-4	Total/NA	Water	EPA 9056A	
180-105771-6	MW-6	Total/NA	Water	EPA 9056A	
180-105771-7	MW-6A	Total/NA	Water	EPA 9056A	
180-105771-7	MW-6A	Total/NA	Water	EPA 9056A	
180-105771-8	MW-7	Total/NA	Water	EPA 9056A	
180-105771-8	MW-7	Total/NA	Water	EPA 9056A	
180-105771-9	Duplicate	Total/NA	Water	EPA 9056A	
180-105771-9	Duplicate	Total/NA	Water	EPA 9056A	
MB 180-317023/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-317023/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-105952-C-1 MS	Matrix Spike	Total/NA	Water	EPA 9056A	
180-105952-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 9056A	

### **Metals**

### Prep Batch: 316211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total Recoverable	Water	3005A	
180-105771-2	MW-3	Total Recoverable	Water	3005A	
180-105771-3	MW-4	Total Recoverable	Water	3005A	
180-105771-4	MW-5	Total Recoverable	Water	3005A	
180-105771-5	MW-5A	Total Recoverable	Water	3005A	
180-105771-6	MW-6	Total Recoverable	Water	3005A	
180-105771-7	MW-6A	Total Recoverable	Water	3005A	
180-105771-8	MW-7	Total Recoverable	Water	3005A	
180-105771-9	Duplicate	Total Recoverable	Water	3005A	
180-105771-10	Field Blank	Total Recoverable	Water	3005A	
MB 180-316211/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-316211/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-105771-1 MS	MW-2	Total Recoverable	Water	3005A	
180-105771-1 MSD	MW-2	Total Recoverable	Water	3005A	

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total Recoverable	Water	EPA 6020A	316211

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# **Metals (Continued)**

## Analysis Batch: 316446 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-2	MW-3	Total Recoverable	Water	EPA 6020A	316211
180-105771-3	MW-4	Total Recoverable	Water	EPA 6020A	316211
180-105771-4	MW-5	Total Recoverable	Water	EPA 6020A	316211
180-105771-5	MW-5A	Total Recoverable	Water	EPA 6020A	316211
180-105771-6	MW-6	Total Recoverable	Water	EPA 6020A	316211
180-105771-7	MW-6A	Total Recoverable	Water	EPA 6020A	316211
180-105771-8	MW-7	Total Recoverable	Water	EPA 6020A	316211
180-105771-9	Duplicate	Total Recoverable	Water	EPA 6020A	316211
180-105771-10	Field Blank	Total Recoverable	Water	EPA 6020A	316211
MB 180-316211/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	316211
LCS 180-316211/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	316211
180-105771-1 MS	MW-2	Total Recoverable	Water	EPA 6020A	316211
180-105771-1 MSD	MW-2	Total Recoverable	Water	EPA 6020A	316211

## **General Chemistry**

### Analysis Batch: 315580

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-2	MW-3	Total/NA	Water	SM 2540C	
MB 180-315580/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-315580/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-105734-B-1 DU	Duplicate	Total/NA	Water	SM 2540C	

### Analysis Batch: 315655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total/NA	Water	SM 2540C	
180-105771-3	MW-4	Total/NA	Water	SM 2540C	
180-105771-4	MW-5	Total/NA	Water	SM 2540C	
180-105771-5	MW-5A	Total/NA	Water	SM 2540C	
180-105771-6	MW-6	Total/NA	Water	SM 2540C	
180-105771-7	MW-6A	Total/NA	Water	SM 2540C	
180-105771-8	MW-7	Total/NA	Water	SM 2540C	
180-105771-9	Duplicate	Total/NA	Water	SM 2540C	
180-105771-10	Field Blank	Total/NA	Water	SM 2540C	
MB 180-315655/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-315655/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-105771-1 DU	MW-2	Total/NA	Water	SM 2540C	

### Analysis Batch: 316815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total/NA	Water	EPA 9040C	
180-105771-2	MW-3	Total/NA	Water	EPA 9040C	
180-105771-3	MW-4	Total/NA	Water	EPA 9040C	
180-105771-4	MW-5	Total/NA	Water	EPA 9040C	
180-105771-5	MW-5A	Total/NA	Water	EPA 9040C	
180-105771-6	MW-6	Total/NA	Water	EPA 9040C	
180-105771-7	MW-6A	Total/NA	Water	EPA 9040C	
180-105771-8	MW-7	Total/NA	Water	EPA 9040C	
180-105771-9	Duplicate	Total/NA	Water	EPA 9040C	
180-105771-10	Field Blank	Total/NA	Water	EPA 9040C	
LCS 180-316815/1	Lab Control Sample	Total/NA	Water	EPA 9040C	

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Job ID: 180-105771-1

# **QC Association Summary**

Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond Job ID: 180-105771-1

# **General Chemistry (Continued)**

## Analysis Batch: 316815 (Continued)

Lab Sample ID	Client Sample ID	Prep Туре	Matrix	Method	Prep Batch
180-105771-1 DU	MW-2	Total/NA	Water	EPA 9040C	
180-105771-10 DU	Field Blank	Total/NA	Water	EPA 9040C	

# Chain of Custody Record



THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: RE	EAR	0	Lab PM Gartn	M: ner, Cat	ny			Carrier Tracking	No(s):	COC No: 490-52767-15725.1
Client Contact: Mr. Rick Elgin	Phone: 573-1	136-	9454	E-Mail:	:	@testame	ericainc	com			Page: Page 1 of 1
Company: Midwest Environmental Consultants				Í	9	<u> </u>			Requested		Job #:
Address: 2009 East McCarty Street Suite 2	Due Date Requeste	ed:				TT	T				Preservation Codes:
City:	TAT Requested (da	iys):									A - HCL M - Hexane B - NaOH N - None
Jefferson City State, Zip:	-1						sp				C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3
MO, 65101 Phone:	PO #:					ø	2540C_Calcd - Total Dissolved Solids				F - MeOHR - Na2S2O3G - AmchlorS - H2SO4
573-636-9454(Tel) Email:	Purchase Order	not required			(ON	ulfat	lved	5			H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone
relgin@mecpc.com					Yes or or No)	de, S	Disso	Boro			J-DI Water
Project Name: Asbury Ash Pond	Project #: 49010011				es	luori	otal	Ca and Boron			
Site:	SSOW#:					de, Fl	- T - P				
			Sample	Matrix	tered San MS/MSD	9056 Chloride, Fluoride, Sulfate	Calc	6020 Metals -		180-10577	1 Chain of Custody
		Sample	Type C=comp,	(W=water, S=solid, O=waste/oil,	rform	56 CI	40C	20 M			
Sample Identification	Sample Date	Time	G=grab) BT		Pe	and the second se	And a second second second	99 D			Special Instructions/Note:
mul-2 "	5-13-20	12:20	AND STREET	ZW	$\overline{\mathbf{n}}$	NX	NX	X			Field pH: Co.77
mul-3	12 1	12:10	1	zw.		1	1	1			Field pH: 5,72
Mall-11	13	1:05					++	+			Field pH: 1 49
mul-S	13	11:05				-+	+	+++-			Field pH: 50
mul-5A	13	In US	$\rightarrow$					++-			Field pH: 1 3
mul-a	13	11:20			H		++				Field pH: / zz
mil - 6A	113	10:00		1				++-			Field pH: 1/2
MILLER	1/31	8:10					-11	+			Field pH: 7.30
Died MW-7	$)$ $i\overline{3}$	8:30	D	V			11				Field pH:
Field Blank	12	11:30		-			V	W			Field pH:
Piero Diem	V () V										Field pH:
Pessible Hazard Identification					Sar			A fee may	be assessed if s	samples are retain	ined longer than 1 month)
Non-Hazard Flammable Skin Irritant	Poison B 🖵 Unki	nown 🗀 F	Radiological		- Cont	Return		nt	Disposal By L	ab Ar	rchive For Months ,Be,B,Cd,Ca,Cr,Co,Pb,,Mo, Li
						ecial instruc	ctions/C	C Requi			,Be,B,Cd,Ca,Cr,Co,Pb,,Mo, Li
Empty Kit Relinquished by: Relinquished by:		Date:		ompany	Time:	Received by	1	-17	Method	of Shipment:	Company 16
Relinquished by:	Date/Time:	) 12:	45	ME	-		GE	dt	X	Date/Time: 5-02	01245 Feder
				ompany		Received by	Jel	ulle.	Waton	Date/Time	19-20 Company APIT,
Relinquished by:	Date/Time:		Co	ompany		Received by				Date/Time:	2-100 Company
Custody Seals Intact: Custody Seal No.:					- 2	Cooler Temp	perature(	s) °C and Of	ther Remarks:		
										o La L	- Λ ω 4 τυ π
						$ \omega$					

6/2/2020

## Login Sample Receipt Checklist

Client: Midwest Environmental Consultants

### Login Number: 105771 List Number: 1 Creator: Watson, Debbie

Quantier	A	<b>C</b> ommonst
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 180-105771-1

List Source: Eurofins TestAmerica, Pittsburgh



**APPENDIX 5** 

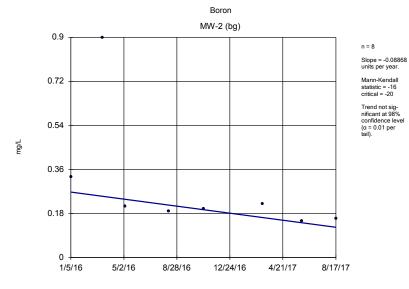
**Statistical Analysis** 



Sanitas<sup>™</sup> Output – Background

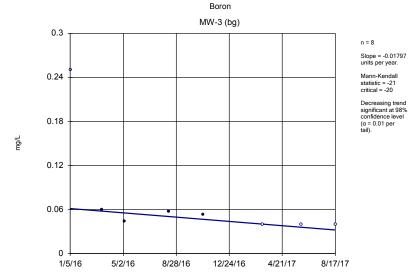
Trending Analysis

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Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

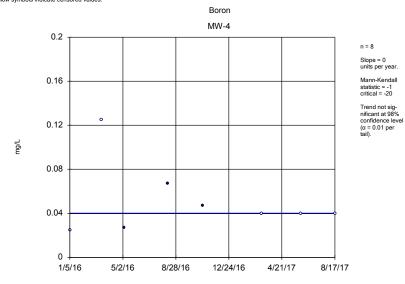
Sanitas<sup>™</sup> v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

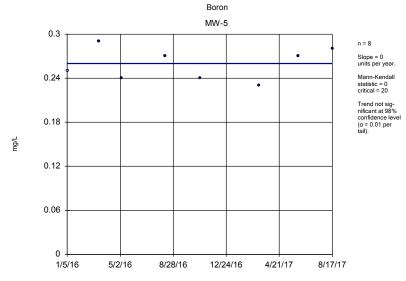
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 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

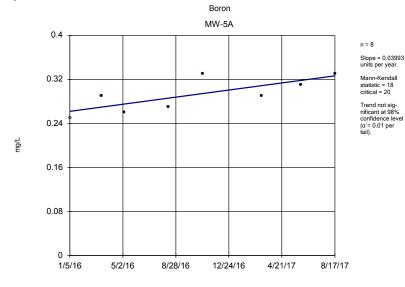
 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values.



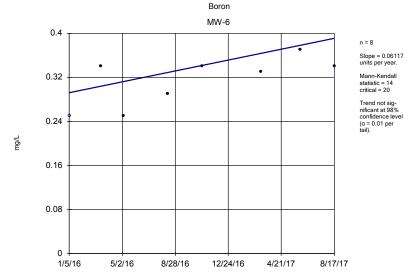
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

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Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

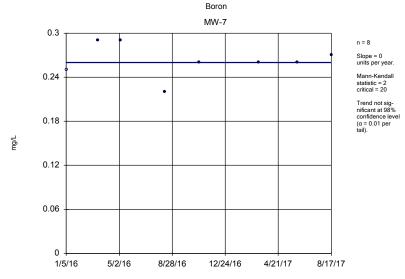
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 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

 The Empire District
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 Data: Asbury CCR Impoundments GW Baseline Database - App 3

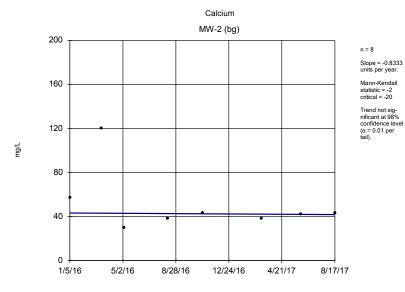
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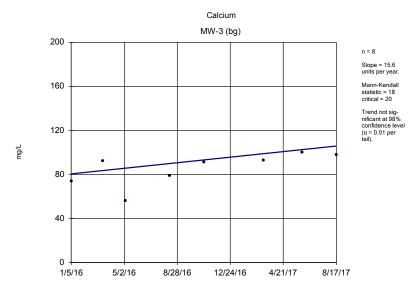


Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

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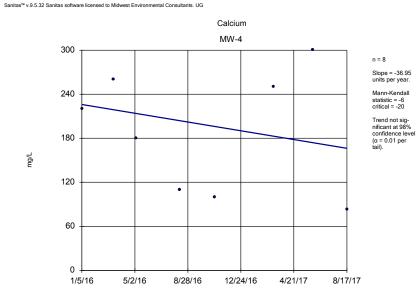
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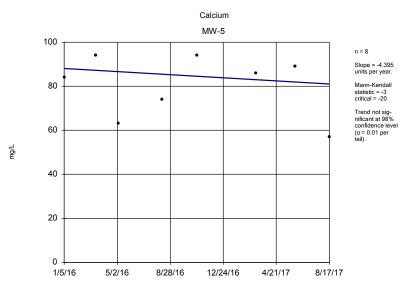
 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3



 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

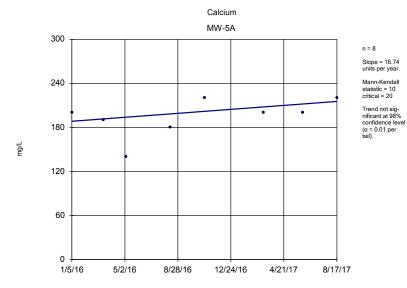
 The Empire District
 Client: Midwest Environmental Consultants
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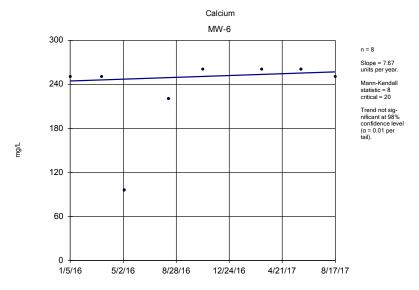


Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

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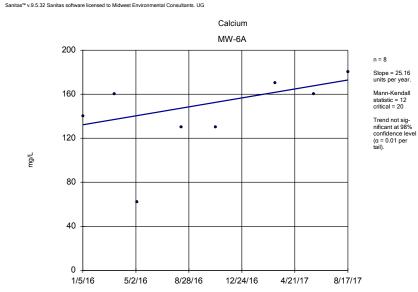






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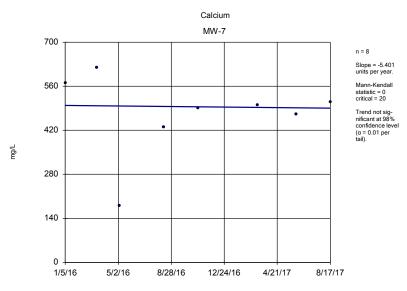
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

 The Empire District
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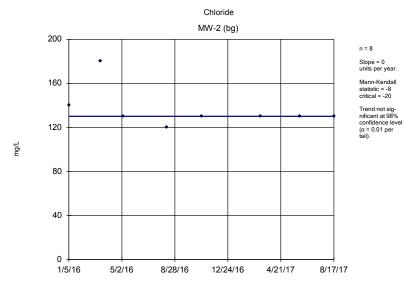
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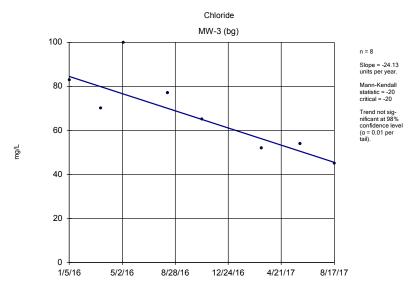


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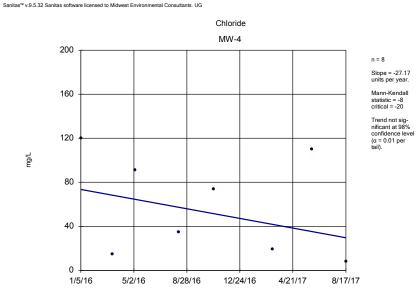
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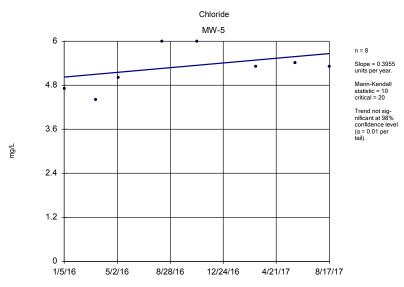
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

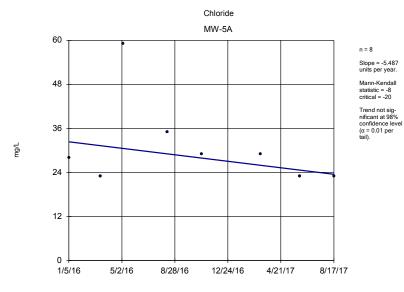
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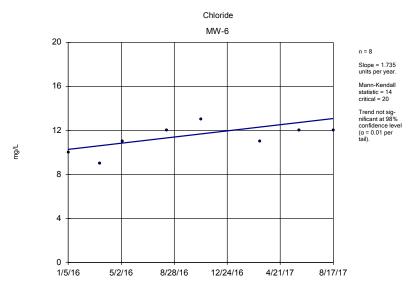


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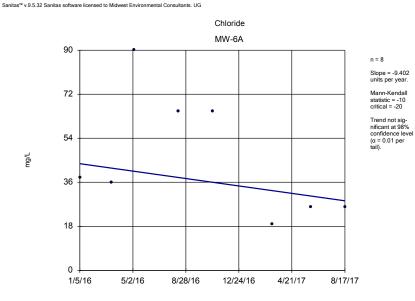
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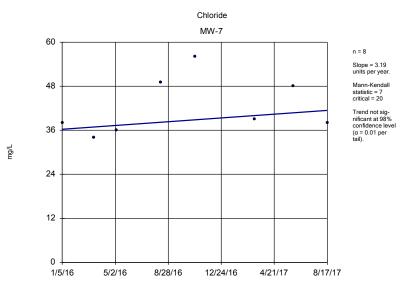
 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3



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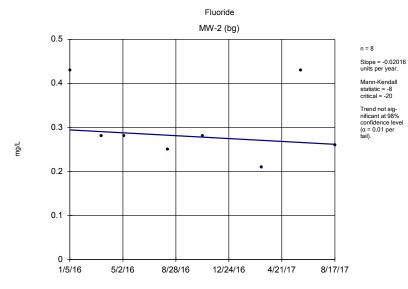
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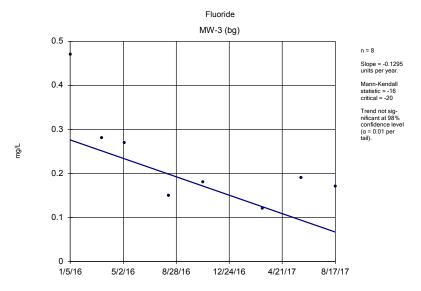
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 The Empire District
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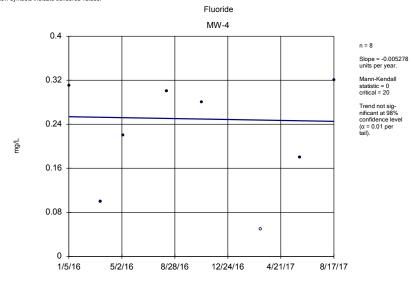
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 The Empire District
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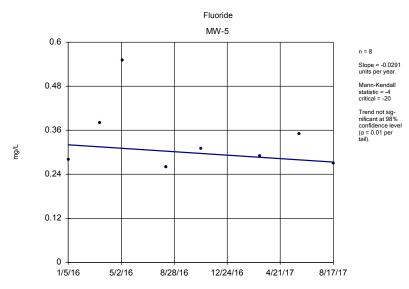
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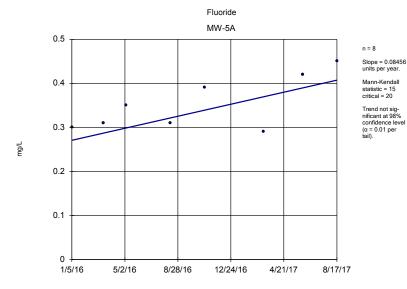
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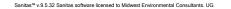
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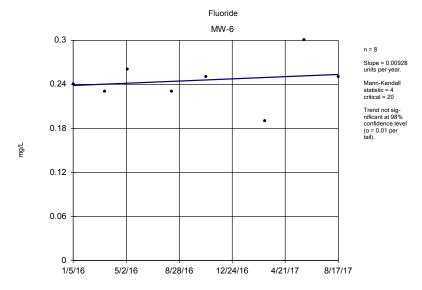


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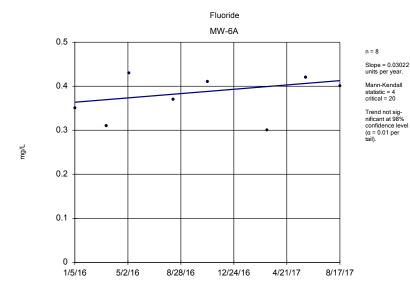




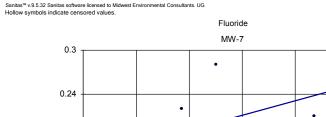
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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0.12

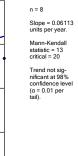
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Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

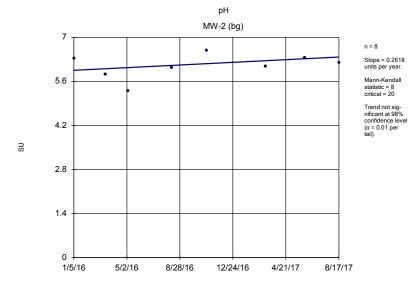
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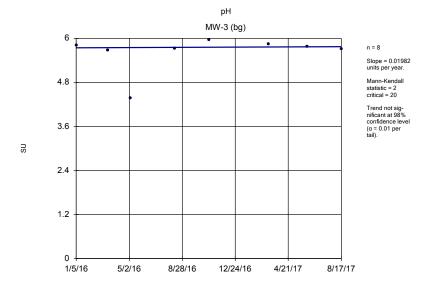
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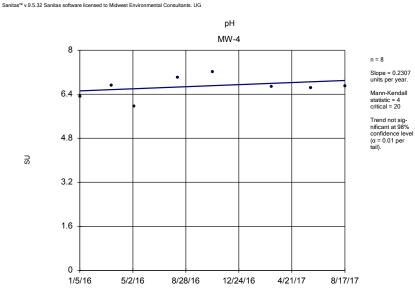
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 Data: Asbury CCR Impoundments GW Baseline Database - App 3





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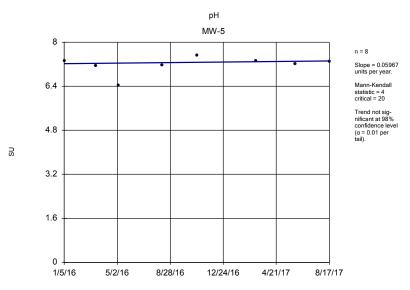
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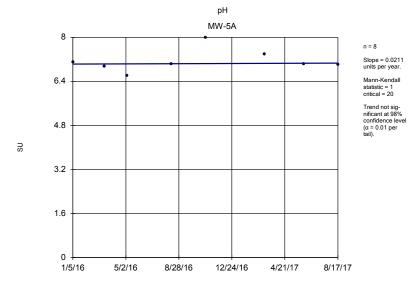
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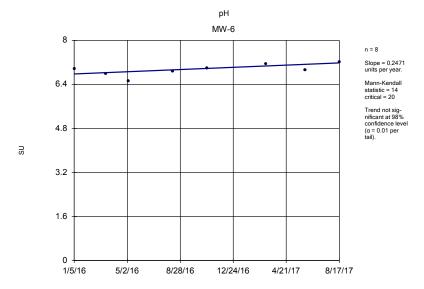


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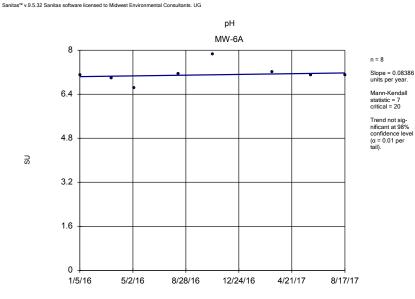






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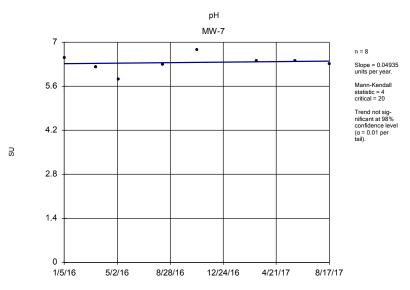
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

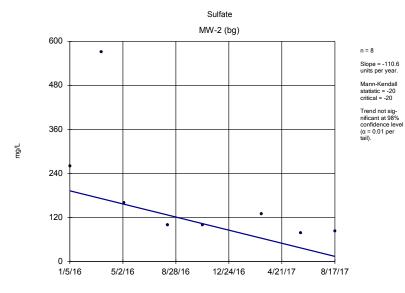
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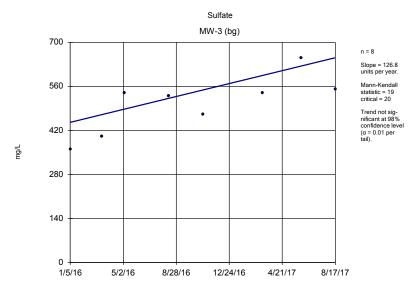


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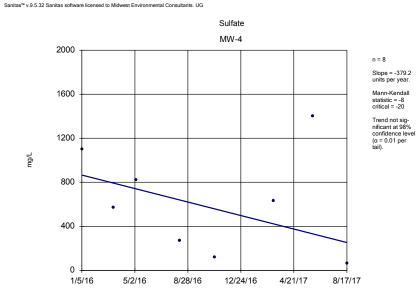
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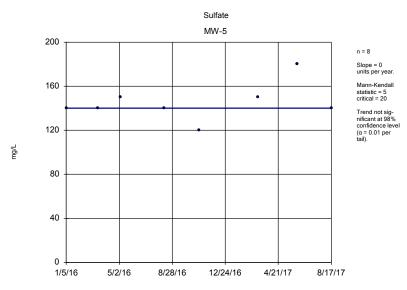
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



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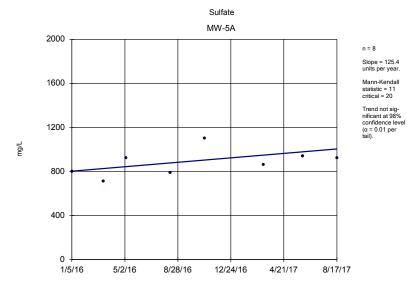
 The Empire District
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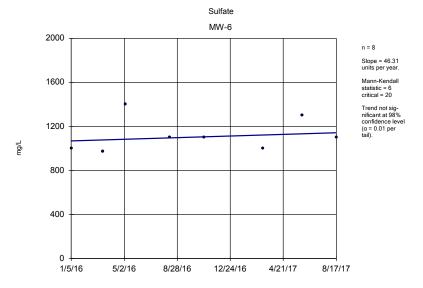


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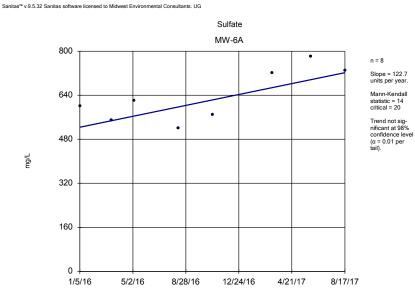






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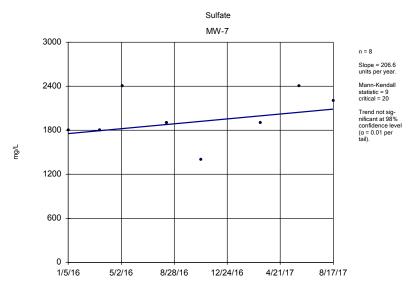
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



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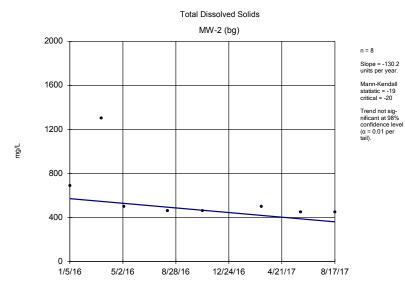
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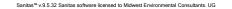
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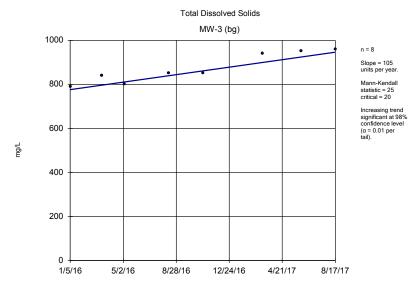


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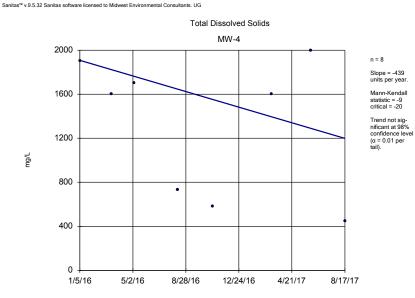
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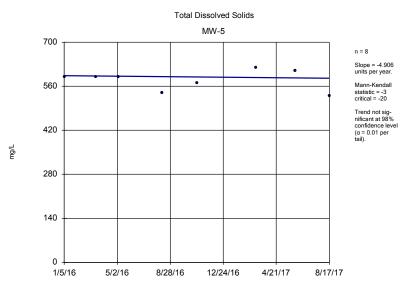
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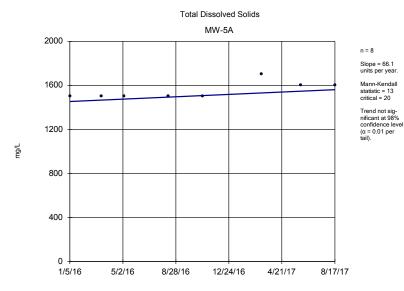
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Sanitas<sup>™</sup> v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

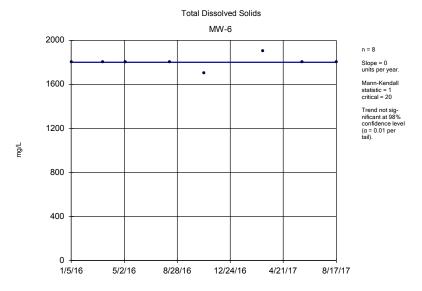


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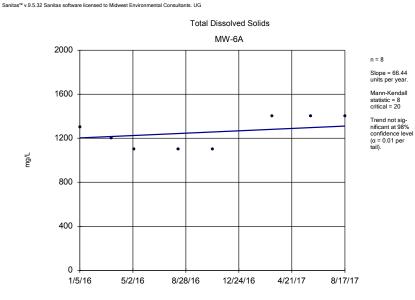


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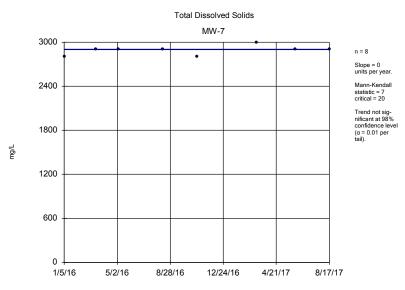
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:09 PM

 The Empire District
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 Data: Asbury CCR Impoundments GW Baseline Database - App 3

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Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

# **Trend Test**

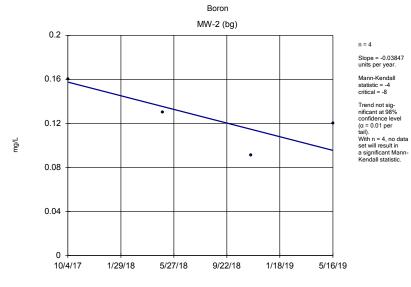
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	The Empire District	Client: Midwest Env	Ironmental Const	litants L	Jata: Asbury CCR In	npounamer	IS GW B	aseline Datat	base - App 3 on	ly Printed 1	(23/2018, 3:10 P	VI
<u>Constituent</u>		Well	Slope	Calc.	Critical	<u>Sig.</u>	N	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Boron (mg/L)		MW-2 (bg)	-0.08868	-16	-20	No	8	0	n/a	n/a	0.02	NP
Boron (mg/L)		MW-3 (bg)	-0.01797	-21	-20	Yes	8	50	n/a	n/a	0.02	NP
Boron (mg/L)		MW-4	0	-1	-20	No	8	62.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-5	0	0	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-5A	0.03993	18	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-6	0.06117	14	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-6A	0.08497	19	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-7	0	2	20	No	8	12.5	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-2 (bg)	-0.8333	-2	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-3 (bg)	15.6	18	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-4	-36.95	-6	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-5	-4.395	-3	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-5A	16.74	10	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-6	7.67	8	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-6A	25.16	12	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-7	-5.401	0	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-2 (bg)	0	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-3 (bg)	-24.13	-20	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-4	-27.17	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-5	0.3955	10	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-5A	-5.487	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-6	1.735	14	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-6A	-9.402	-10	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-7	3.19	7	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-2 (bg)	-0.02016	-8	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-3 (bg)	-0.1295	-16	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-4	-0.00	0	20	No	8	12.5	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-5	-0.0291	-4	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-5A	0.08456	15	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-6	0.00928	4	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-6A	0.03022	4	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-7	0.06113	13	20	No	8	12.5	n/a	n/a	0.02	NP
pH (SU)		MW-2 (bg)	0.2618	8	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-3 (bg)	0.01982	2	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-4	0.2307	4	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-5	0.05967	4	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-5A	0.0211	1	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-6	0.2471	14	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-6A	0.08386	7	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-7	0.04935	4	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-2 (bg)	-110.6	-20	-20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-3 (bg)	126.8	19	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-4	-379.2	-8	-20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-5	0	5	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-5A	125.4	11	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-6	46.31	6	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-6A	122.7	14	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-7	206.6	9	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-2 (bg)	-130.2	-19	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-3 (bg)	105	25	20	Yes	8	0	n/a	n/a	0.02	NP

# Trend Test

	The Empire District	Client: Midwest Environmental Consultants			Data: Asbury CCR Impoundments GW Baseline Database - App 3 only						Printed 1/23/2018, 3:10 PM		
<u>Constituent</u>		Well	Slope	Calc.	Critical	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method	
Total Dissolved Solids (mg/L)		MW-4	-439	-9	-20	No	8	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)		MW-5	-4.906	-3	-20	No	8	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)		MW-5A	66.1	13	20	No	8	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)		MW-6	0	1	20	No	8	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)		MW-6A	66.44	8	20	No	8	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)		MW-7	0	7	20	No	8	0	n/a	n/a	0.02	NP	

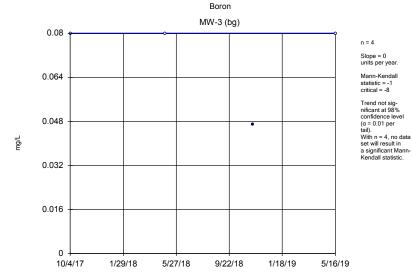
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 Analysis Run 12/4/2019 2:11 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

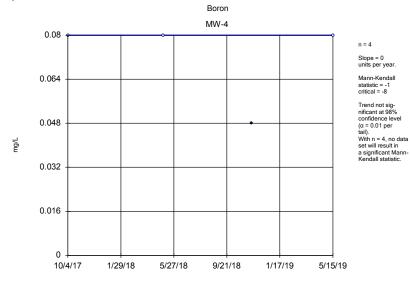
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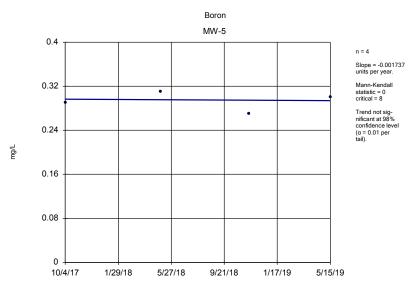
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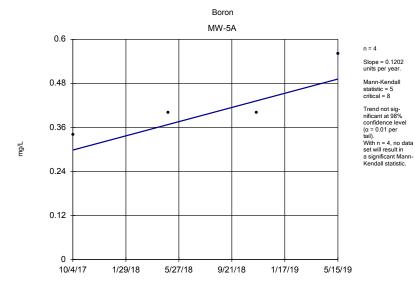
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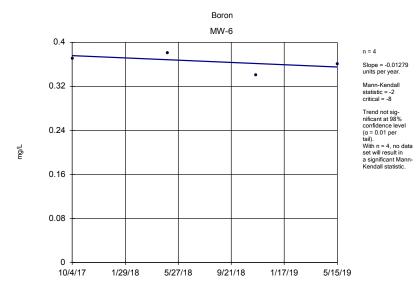
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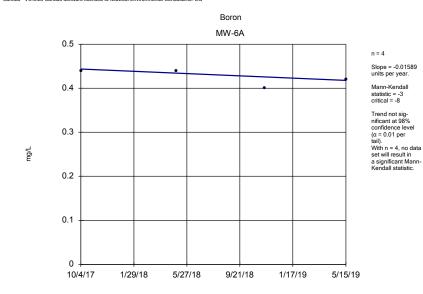
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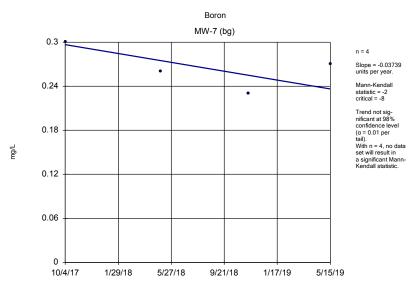
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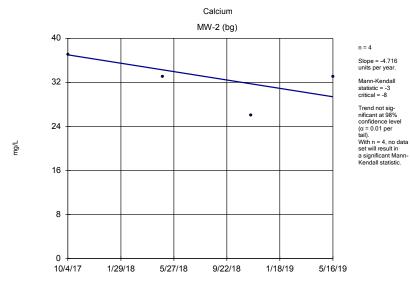


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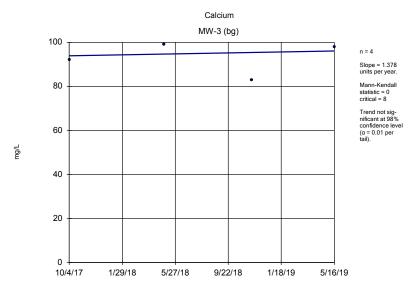
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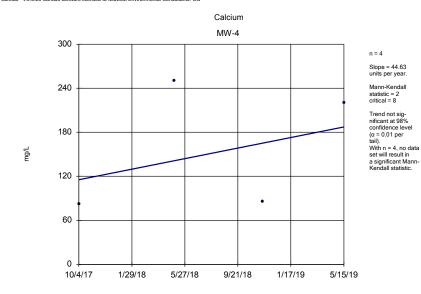
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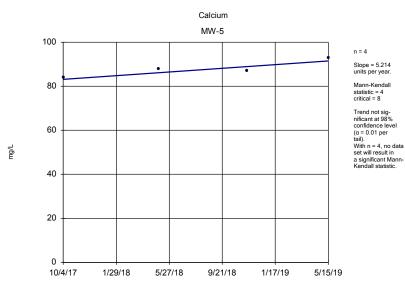
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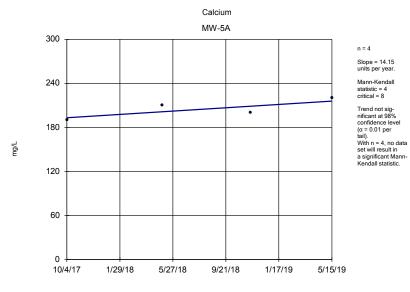


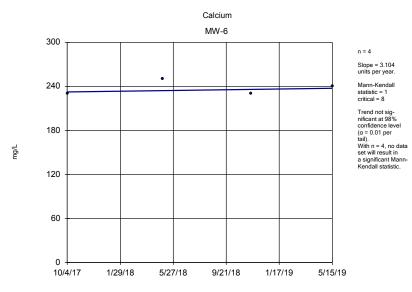
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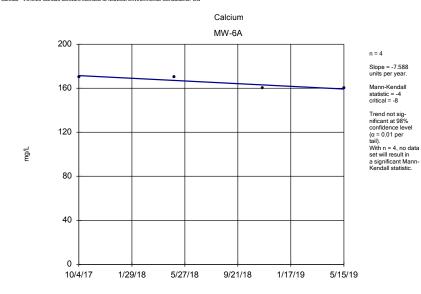




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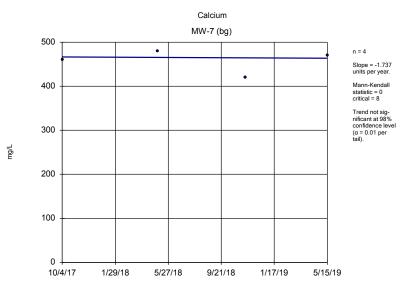
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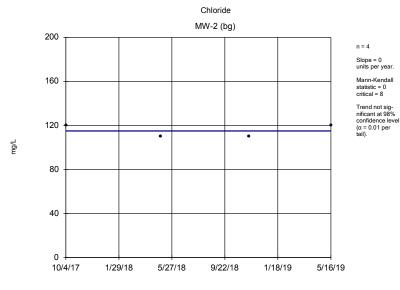
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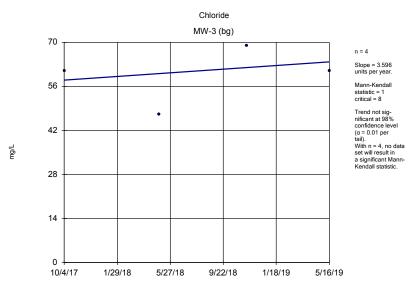


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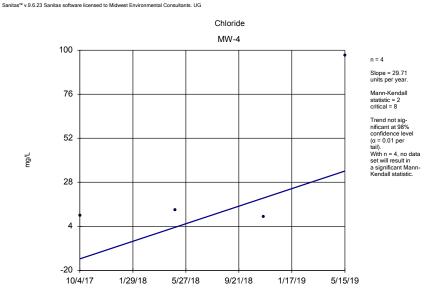
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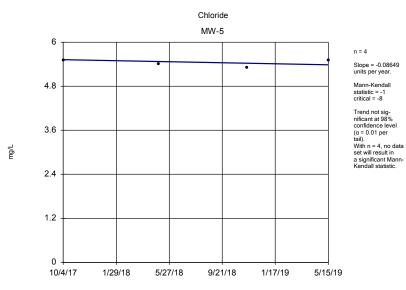
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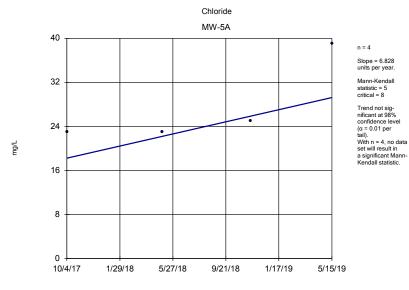
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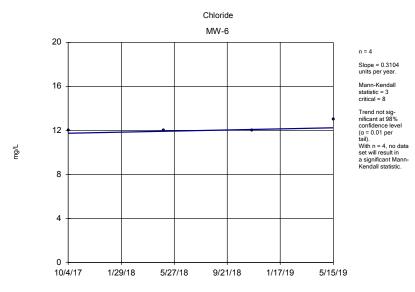


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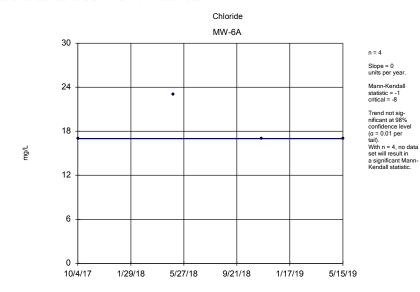




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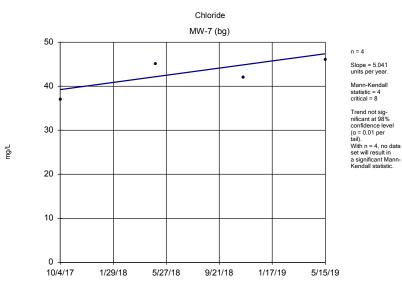
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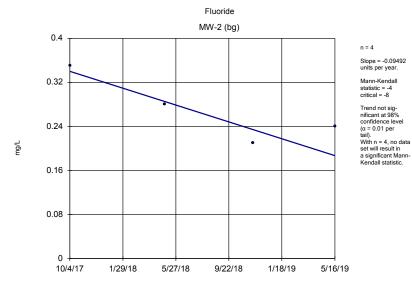
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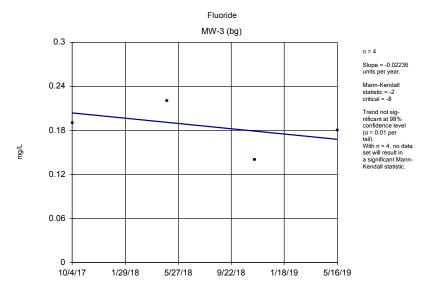
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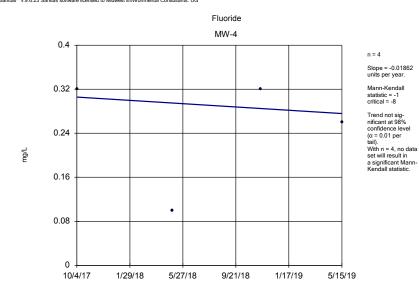
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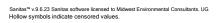
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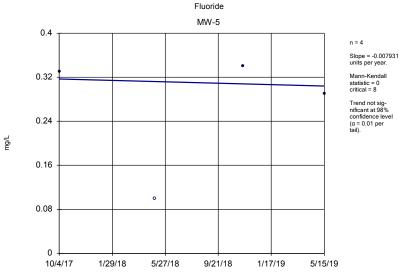
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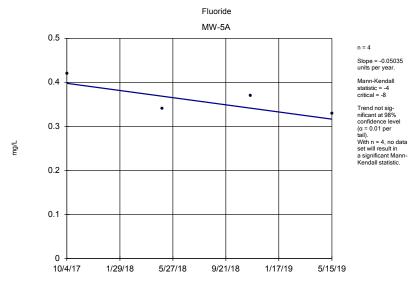
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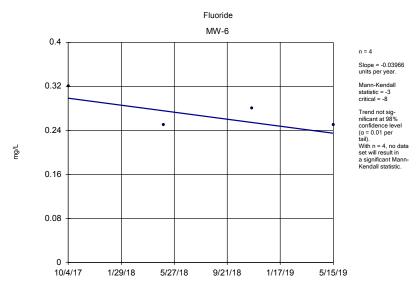




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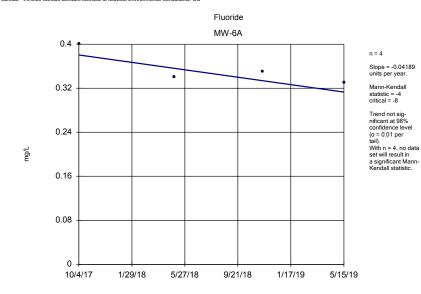




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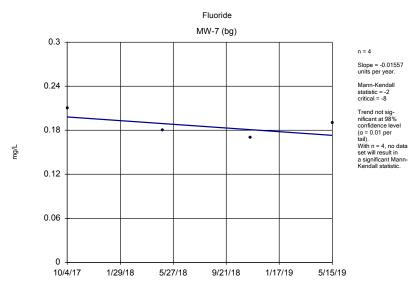
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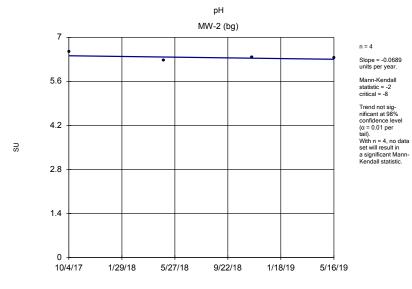
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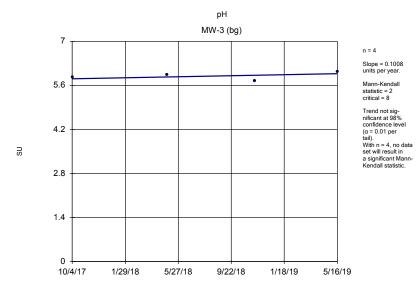
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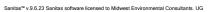


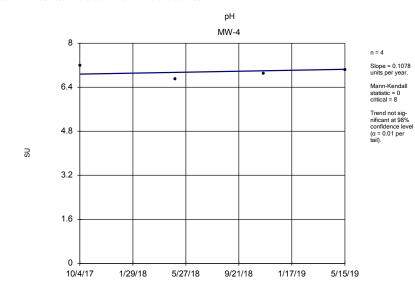




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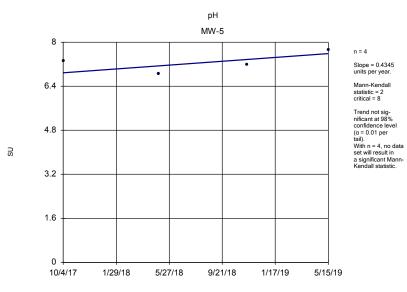


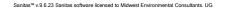


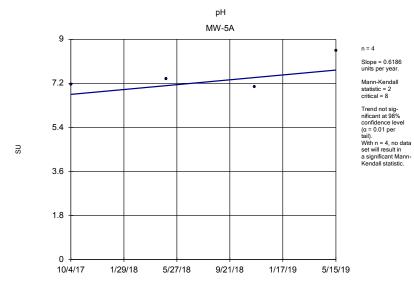
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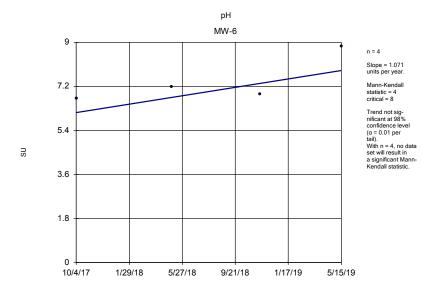
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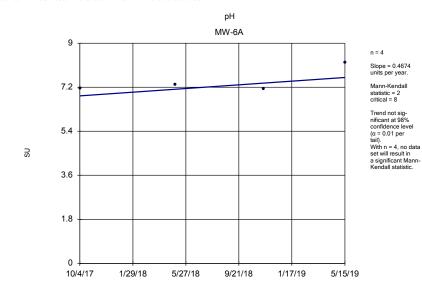




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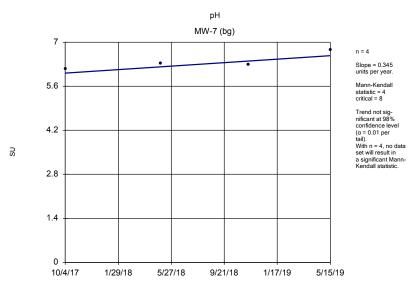
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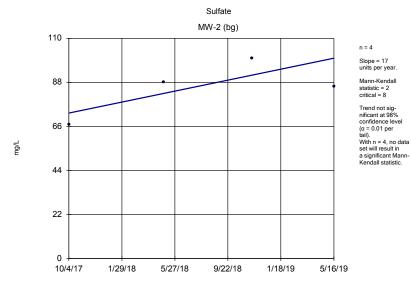
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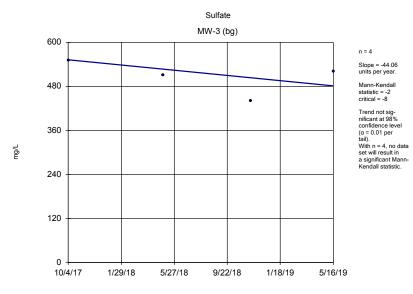
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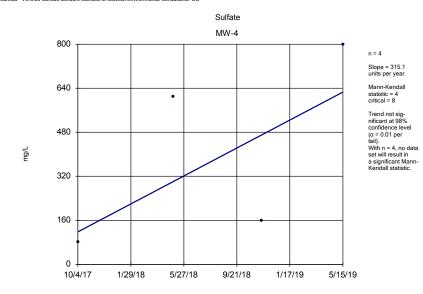




 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

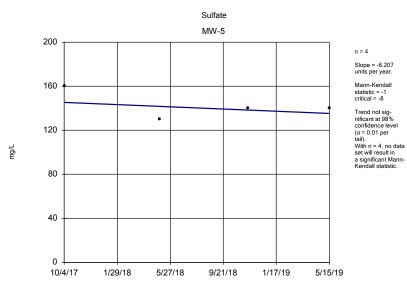
Sanitas<sup>114</sup> v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG



 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

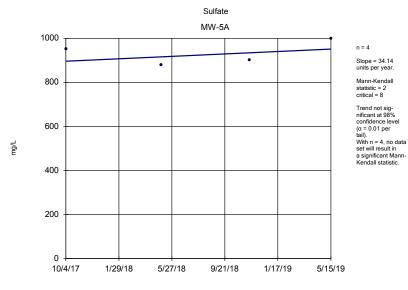
 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

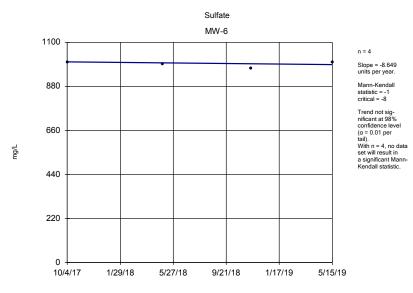
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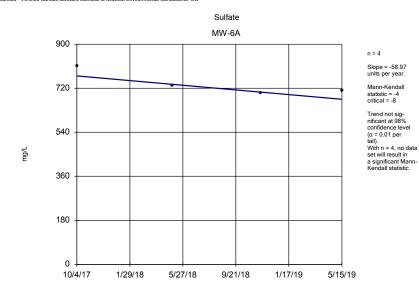




 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

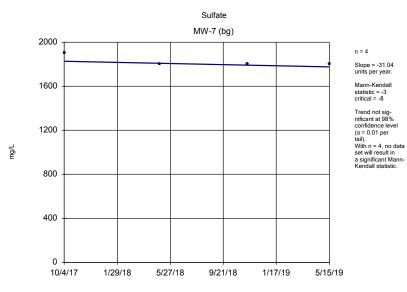
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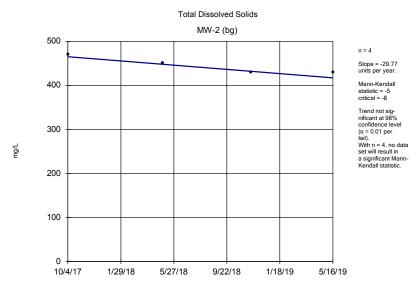
 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

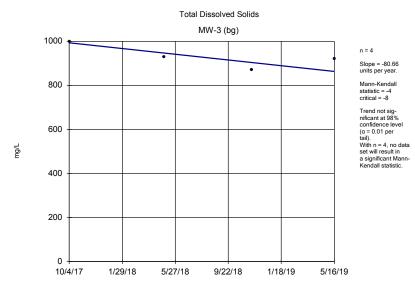
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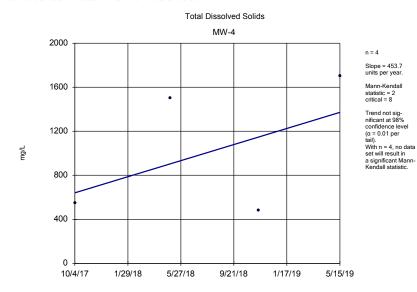
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 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

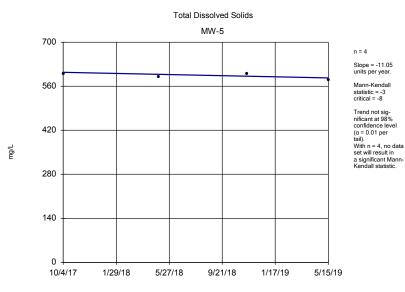
Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG



 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

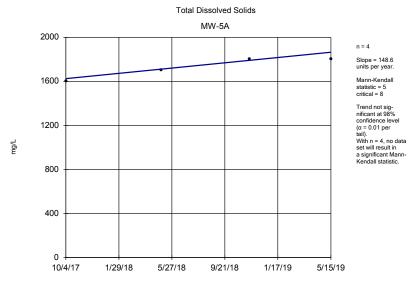
 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

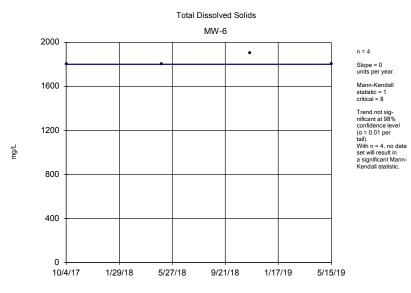
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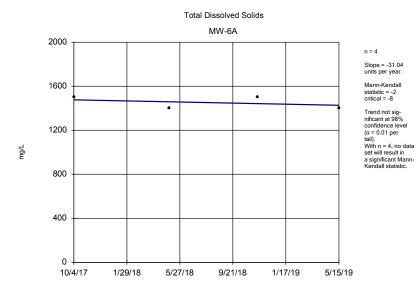




 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

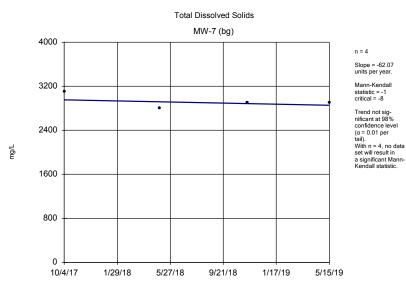
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 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

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### Trend Test

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background Printed 12/4/2019, 2:13 PM

	The Empire District Client. Mi			nis Dala. 11-	19 App 3 A	soury por	us with backy		u 12/4/2019, 2	. 13 F W	
<u>Constituent</u>	Well	Slope	Calc.	Critical	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Boron (mg/L)	MW-2 (bg)	-0.03847	-4	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-3 (bg)	0	-1	-8	No	4	75	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4	0	-1	-8	No	4	75	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5	-0.00	0	8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5A	0.1202	5	8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6	-0.01279	-2	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6A	-0.01589	-3	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-7 (bg)	-0.03739	-2	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2 (bg)	-4.716	-3	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3 (bg)	1.378	0	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4	44.63	2	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5	5.214	4	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5A	14.15	4	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6	3.104	1	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6A	-7.588	-4	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-7 (bg)	-1.737	0	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-2 (bg)	0	0	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-3 (bg)	3.596	1	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4	29.71	2	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5	-0.08649	-1	-8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5A	6.828	5	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6	0.3104	3	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6A	0	-1	-8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-7 (bg)	5.041	4	8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2 (bg)	-0.09492	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3 (bg)	-0.02236	-2	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4	-0.01862	-1	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5	-0.00	0	8	No	4	25	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5A	-0.05035	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6	-0.03966	-3	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6A	-0.04189	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-7 (bg)	-0.01557	-2	-8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-2 (bg)	-0.0689	-2	-8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-3 (bg)	0.1008	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-4	0.1078	0	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-5	0.4345	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-5A	0.6186	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-6	1.071	4	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-6A	0.4674	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-7 (bg)	0.345	4	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-2 (bg)	17	2	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3 (bg)	-44.06	-2	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4	315.1	4	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5	-6.207	-1 2	-8	No	4	0	n/a	n/a n/a	0.02	NP
Sulfate (mg/L)	MW-5A	34.14	2	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6	-8.649	-1	-8	No	4	0	n/a	n/a n/a	0.02	NP
Sulfate (mg/L)	MW-6A	-58.97	-4	-8	No	4 4	0	n/a	n/a n/a	0.02	NP
Sulfate (mg/L) Total Dissolved Solids (mg/L)	MW-7 (bg)	-31.04	-3 F	-8	No		0	n/a	n/a n/a	0.02	NP
Total Dissolved Solids (mg/L) Total Dissolved Solids (mg/L)	MW-2 (bg) MW-3 (bg)	-29.77 -80.66	-5 4	-8 -8	No	4 4	0 0	n/a n/a	n/a n/a	0.02 0.02	NP NP
Total Dissolved Solids (Hig/L)	www-s (by)	-00.00	-4	-0	No	4	U	n/a	n/a	0.02	INF"

## Trend Test

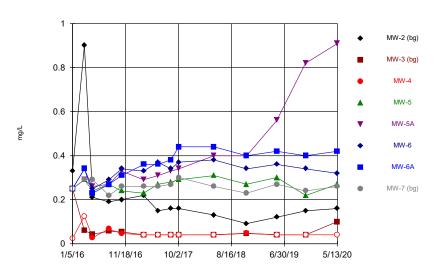
	The Empire District Client: Mic	dwest Environm	nental Consultants	5 Data: 11-	19 App 3 As	bury pond	ls with backg	round Printe	d 12/4/2019, 2:	13 PM	
<u>Constituent</u>	Well	<u>Slope</u>	Calc.	Critical	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Total Dissolved Solids (mg/L)	MW-4	453.7	2	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5	-11.05	-3	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5A	148.6	5	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6	0	1	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6A	-31.04	-2	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-7 (bg)	-62.07	-1	-8	No	4	0	n/a	n/a	0.02	NP



Sanitas<sup>™</sup> Output – Sampling Event

Time Series Analysis

Sanitas<sup>™</sup> v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values.



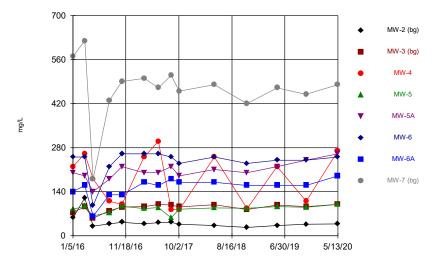
Boron

 Time Series
 Analysis Run 6/3/2020 2:31 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

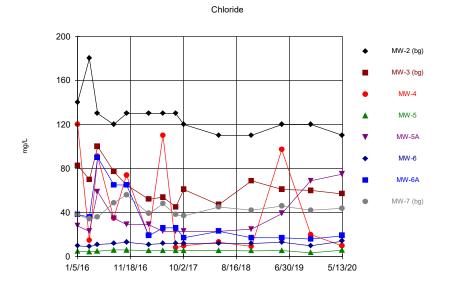
Calcium



 Time Series
 Analysis Run 6/3/2020 2:31 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 5-20 App 3 Asbury ponds with background



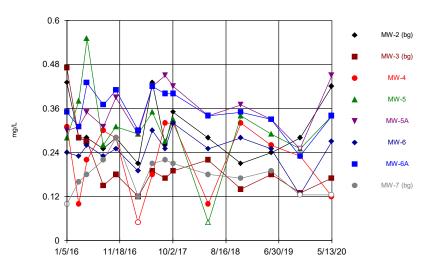


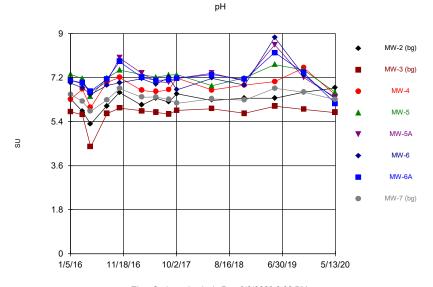
 Time Series
 Analysis Run 6/3/2020 2:31 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 5-20 App 3 Asbury ponds with background

Sanitas<sup>w</sup> v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values.

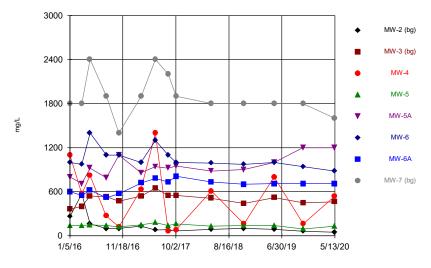
Fluoride





Sanitas<sup>™</sup> v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

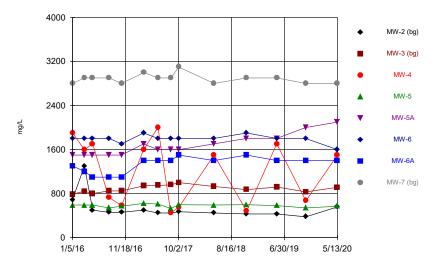


 Time Series
 Analysis Run 6/3/2020 2:32 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids



 Time Series
 Analysis Run 6/3/2020 2:32 PM

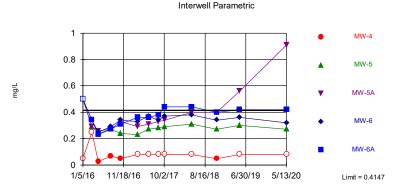
 The Empire District
 Client: Midwest Environmental Consultants
 Data: 5-20 App 3 Asbury ponds with background



# Sanitas<sup>™</sup> Output – Sampling Event

**Prediction Limits** 

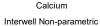
Sanitas<sup>w</sup> v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values. Exceeds Limit: MW-5A. MW-6A

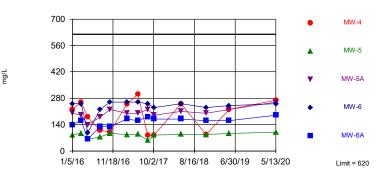


Boron

Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.3572, Std. Dev.=0.1513, n=39, 20.51% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.917, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit. Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Within Limit

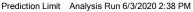




Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

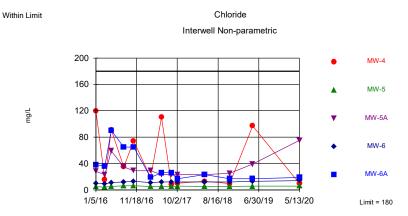
#### Prediction Limit Analysis Run 6/3/2020 2:38 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background



The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

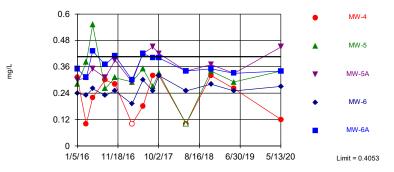


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Sanitas<sup>w</sup> v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values. Exceeds Limit: MW-5A

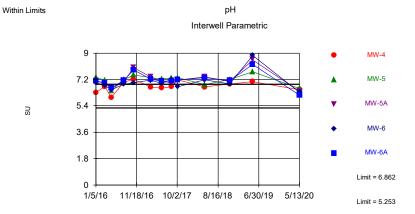
Fluoride

Interwell Parametric



Background Data Summary (based on square root transformation): Mean=0.4799, Std. Dev.=0.08269, n=39, 5.128% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9223, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

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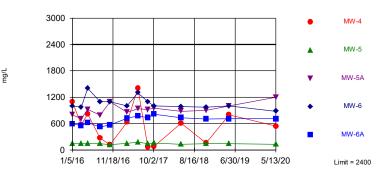
Background Data Summary (based on square transformation): Mean=37.34, Std. Dev.=5.141, n=39. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9271, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.000752. Comparing 5 points to limit.

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Within Limit

Sulfate





Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

#### Prediction Limit Analysis Run 6/3/2020 2:38 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

#### Prediction Limit Analysis Run 6/3/2020 2:39 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v 9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

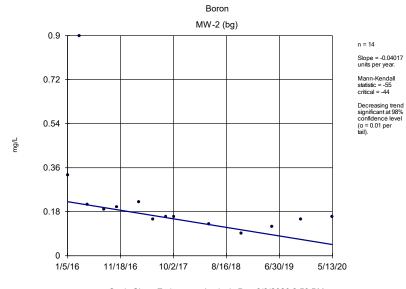
Total Dissolved Solids Within Limit Interwell Non-parametric 4000 MW-4 3200 MW-5 2400 ng/L MW-5A 1600 MW-6 800 MW-6A 0 1/5/16 11/18/16 10/2/17 8/16/18 6/30/19 5/13/20 Limit = 3100

Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

## Prediction Limit

	The Empire District Client: Midwest Environmental Consultants			Data: 5-20 App 3 Asbury ponds with background Printed 6/3/2020, 2:39 PM							
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	Method
Boron (mg/L)	MW-4	0.4147	n/a	5/13/2020	0.08ND	No	39	20.51	sqrt(x)	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-5	0.4147	n/a	5/13/2020	0.27	No	39	20.51	sqrt(x)	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-5A	0.4147	n/a	5/13/2020	0.91	Yes	39	20.51	sqrt(x)	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-6	0.4147	n/a	5/13/2020	0.32	No	39	20.51	sqrt(x)	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-6A	0.4147	n/a	5/13/2020	0.42	Yes	39	20.51	sqrt(x)	0.001504	Param Inter 1 of 2
Calcium (mg/L)	MW-4	620	n/a	5/13/2020	270	No	39	0	n/a	0.0012	NP Inter (normality)
Calcium (mg/L)	MW-5	620	n/a	5/13/2020	100	No	39	0	n/a	0.0012	NP Inter (normality)
Calcium (mg/L)	MW-5A	620	n/a	5/13/2020	260	No	39	0	n/a	0.0012	NP Inter (normality)
Calcium (mg/L)	MW-6	620	n/a	5/13/2020	250	No	39	0	n/a	0.0012	NP Inter (normality)
Calcium (mg/L)	MW-6A	620	n/a	5/13/2020	190	No	39	0	n/a	0.0012	NP Inter (normality)
Chloride (mg/L)	MW-4	180	n/a	5/13/2020	9.7	No	39	0	n/a	0.0012	NP Inter (normality)
Chloride (mg/L)	MW-5	180	n/a	5/13/2020	5.8	No	39	0	n/a	0.0012	NP Inter (normality)
Chloride (mg/L)	MW-5A	180	n/a	5/13/2020	75	No	39	0	n/a	0.0012	NP Inter (normality)
Chloride (mg/L)	MW-6	180	n/a	5/13/2020	14	No	39	0	n/a	0.0012	NP Inter (normality)
Chloride (mg/L)	MW-6A	180	n/a	5/13/2020	19	No	39	0	n/a	0.0012	NP Inter (normality)
Fluoride (mg/L)	MW-4	0.4053	n/a	5/13/2020	0.12	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-5	0.4053	n/a	5/13/2020	0.34	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-5A	0.4053	n/a	5/13/2020	0.45	Yes	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-6	0.4053	n/a	5/13/2020	0.27	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-6A	0.4053	n/a	5/13/2020	0.34	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
pH (SU)	MW-4	6.862	5.253	5/13/2020	6.49	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	MW-5	6.862	5.253	5/13/2020	6.59	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	MW-5A	6.862	5.253	5/13/2020	6.38	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	MW-6	6.862	5.253	5/13/2020	6.33	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	MW-6A	6.862	5.253	5/13/2020	6.13	No	39	0	x^2	0.000752	Param Inter 1 of 2
Sulfate (mg/L)	MW-4	2400	n/a	5/13/2020	540	No	39	0	n/a	0.0012	NP Inter (normality)
Sulfate (mg/L)	MW-5	2400	n/a	5/13/2020	130	No	39	0	n/a	0.0012	NP Inter (normality)
Sulfate (mg/L)	MW-5A	2400	n/a	5/13/2020	1200	No	39	0	n/a	0.0012	NP Inter (normality)
Sulfate (mg/L)	MW-6	2400	n/a	5/13/2020	880	No	39	0	n/a	0.0012	NP Inter (normality)
Sulfate (mg/L)	MW-6A	2400	n/a	5/13/2020	710	No	39	0	n/a	0.0012	NP Inter (normality)
Total Dissolved Solids (mg/L)	MW-4	3100	n/a	5/13/2020	1500	No	39	0	n/a	0.0012	NP Inter (normality)
Total Dissolved Solids (mg/L)	MW-5	3100	n/a	5/13/2020	570	No	39	0	n/a	0.0012	NP Inter (normality)
Total Dissolved Solids (mg/L)	MW-5A	3100	n/a	5/13/2020	2100	No	39	0	n/a	0.0012	NP Inter (normality)
Total Dissolved Solids (mg/L)	MW-6	3100	n/a	5/13/2020	1600	No	39	0	n/a	0.0012	NP Inter (normality)
Total Dissolved Solids (mg/L)	MW-6A	3100	n/a	5/13/2020	1400	No	39	0	n/a	0.0012	NP Inter (normality)

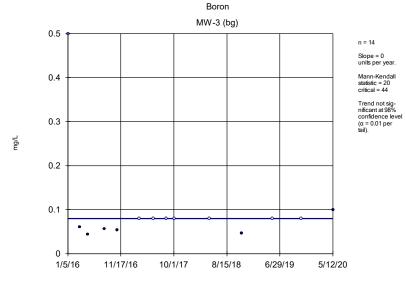
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 Sen's Slope Estimator
 Analysis Run 6/3/2020 2:59 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 5-20 App 3 Asbury ponds with background

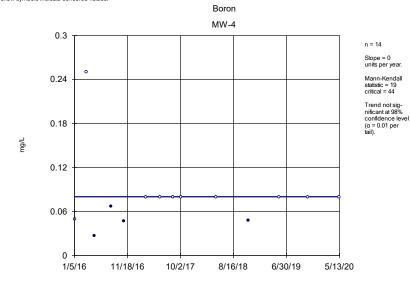
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Sen's Slope Estimator Analysis Run 6/3/2020 2:59 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

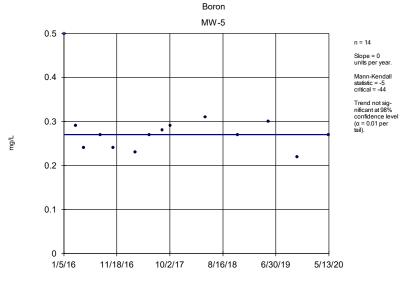
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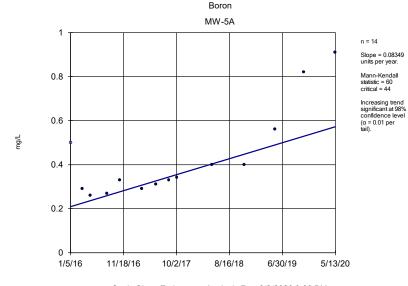
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 Analysis Run 6/3/2020 2:59 PM

 The Empire District
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 Data: 5-20 App 3 Asbury ponds with background

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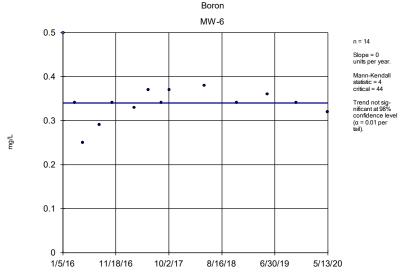
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 Analysis Run 6/3/2020 3:00 PM

 The Empire District
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 Data: 5-20 App 3 Asbury ponds with background

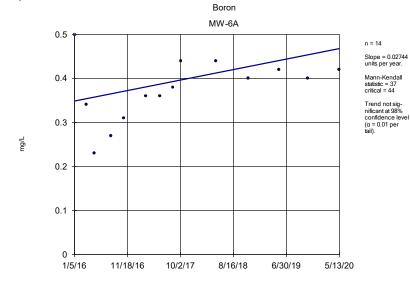
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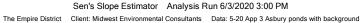


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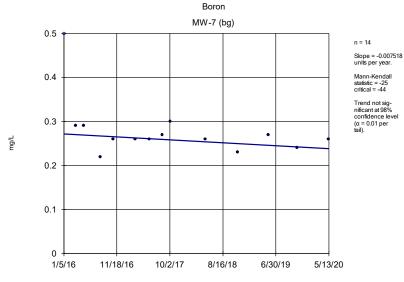
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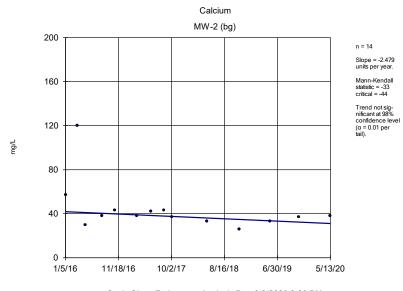


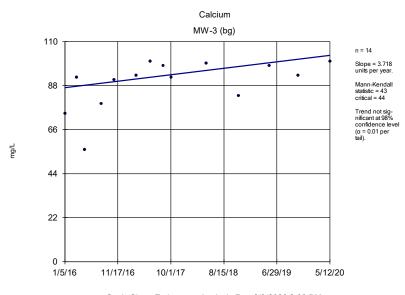
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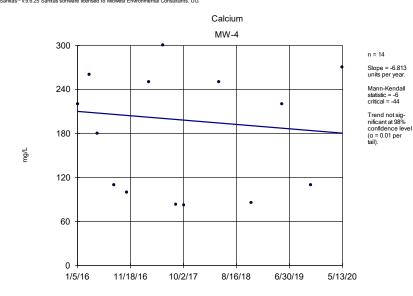




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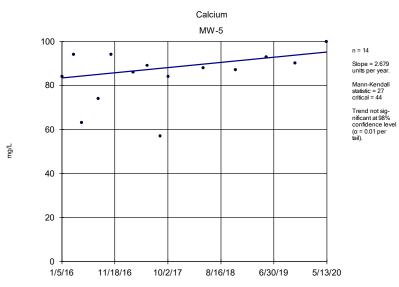




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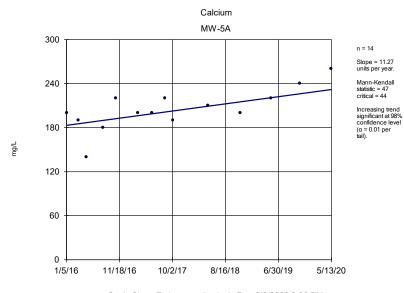
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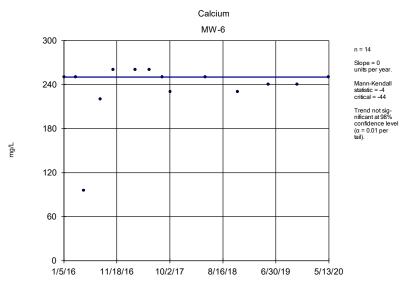
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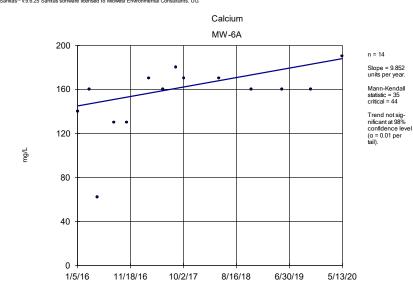


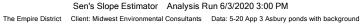


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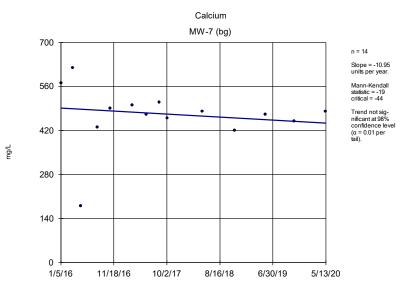
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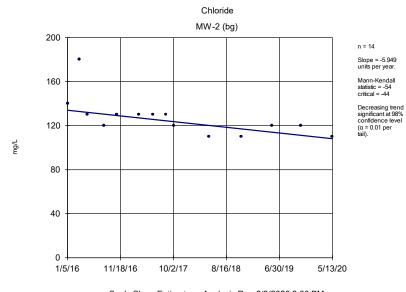


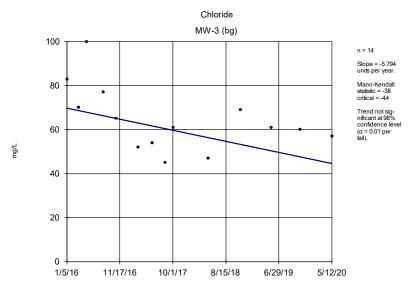


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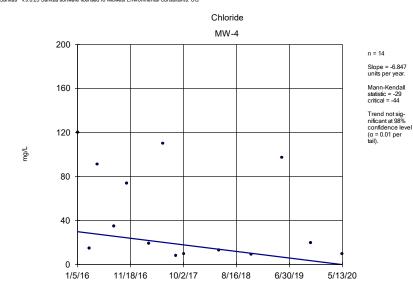




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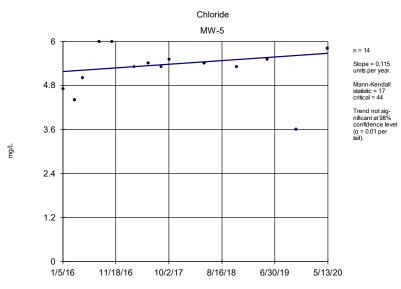
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 Analysis Run 6/3/2020 3:00 PM

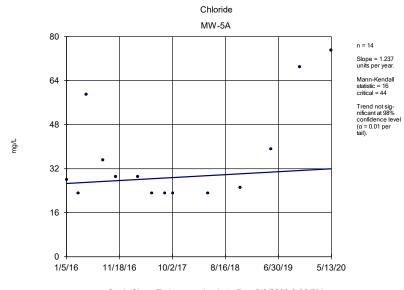
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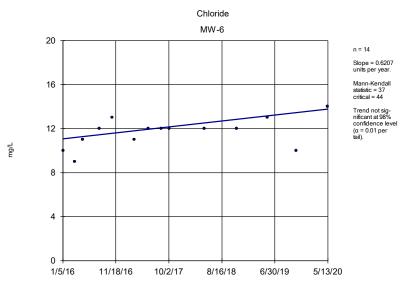
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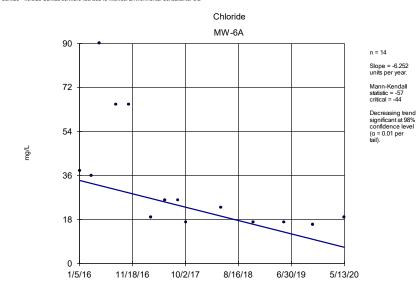




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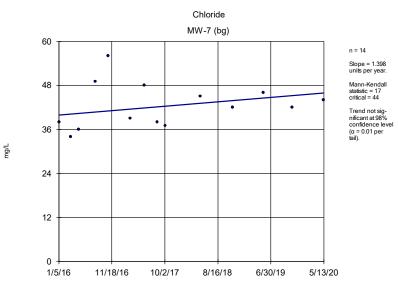
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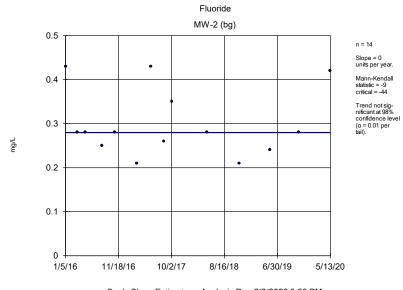
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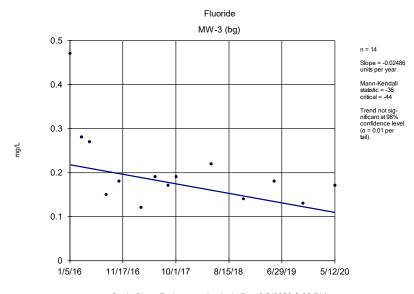
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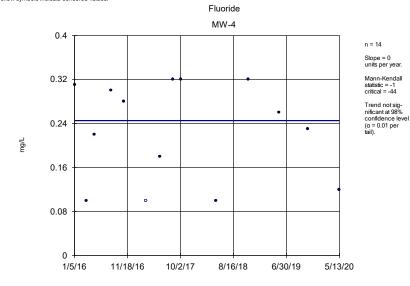




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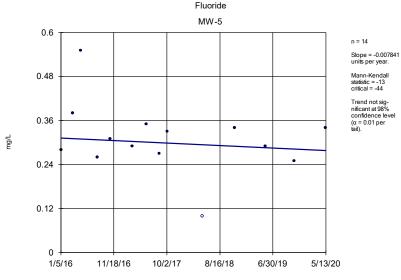
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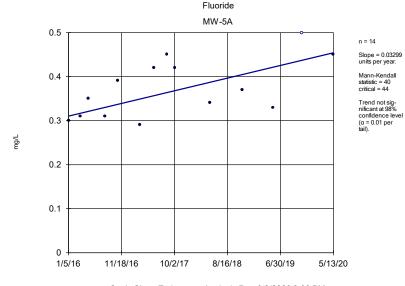
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 Analysis Run 6/3/2020 3:00 PM

 The Empire District
 Client: Midwest Environmental Consultants
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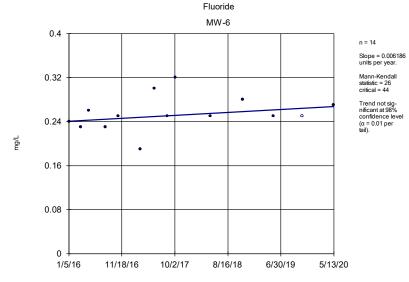
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 Analysis Run 6/3/2020 3:00 PM

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 Data: 5-20 App 3 Asbury ponds with background

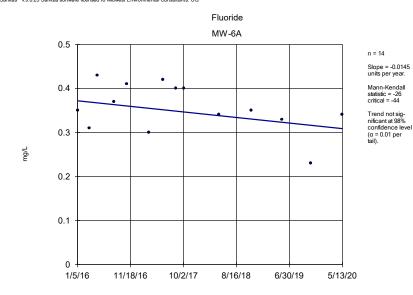
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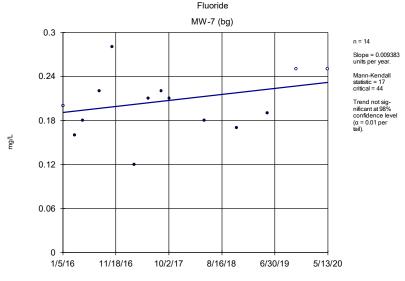
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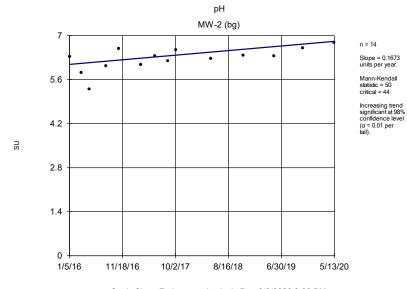
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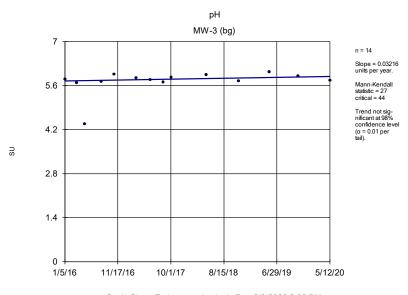
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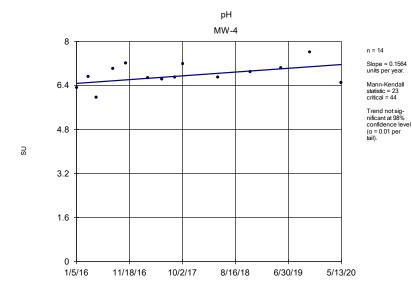


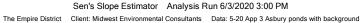


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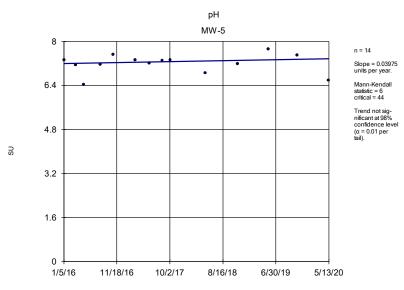
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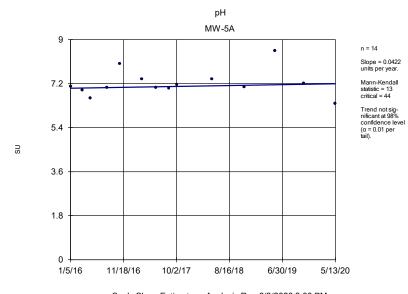


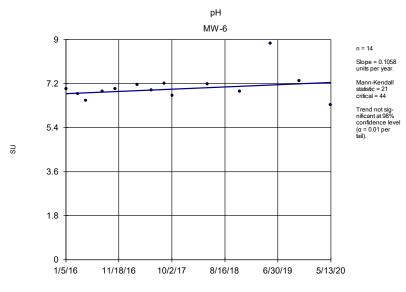
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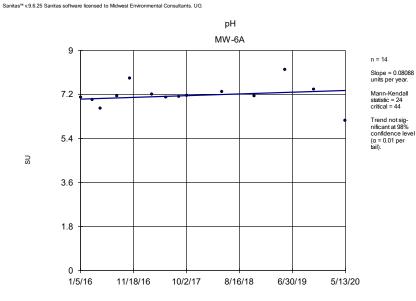
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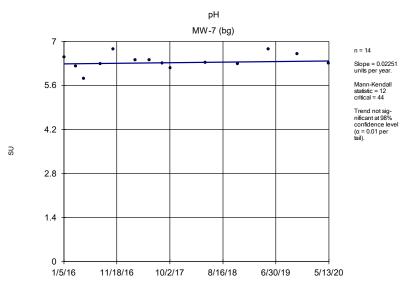
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 Analysis Run 6/3/2020 3:00 PM

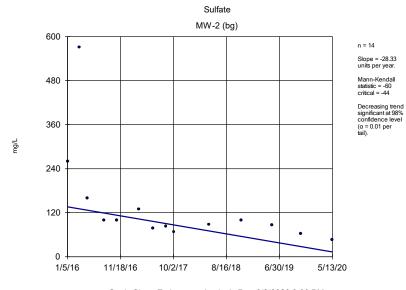
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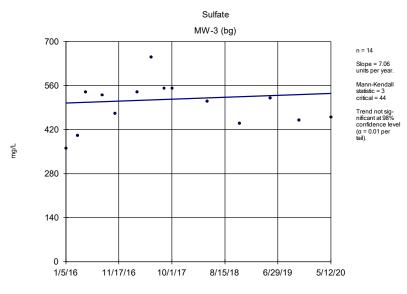
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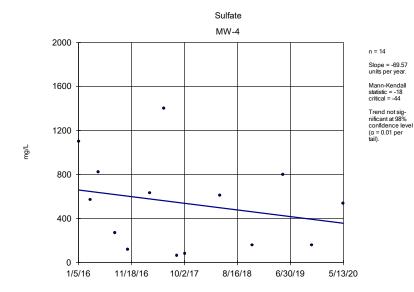




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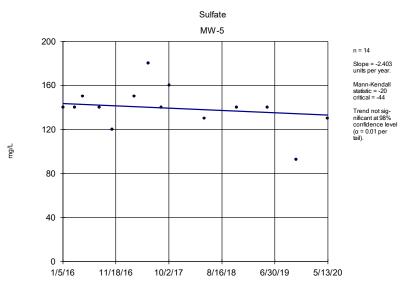
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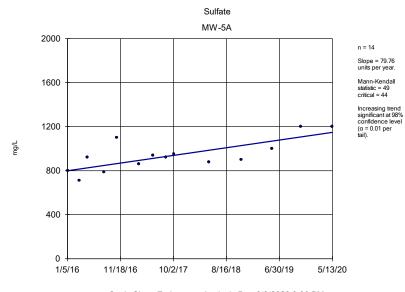
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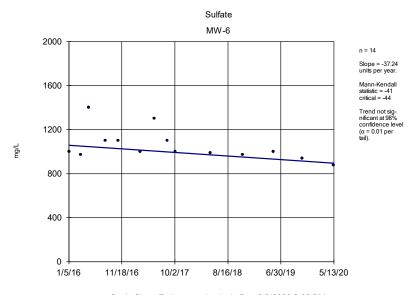
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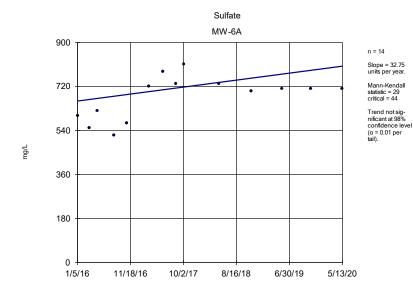


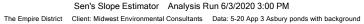


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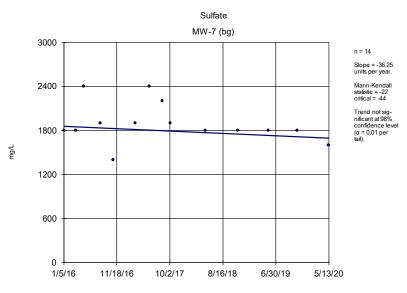
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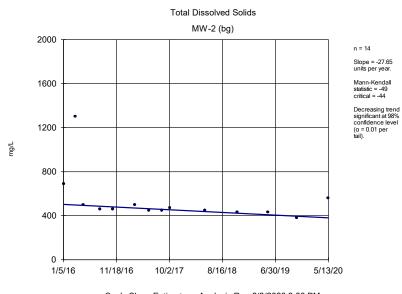


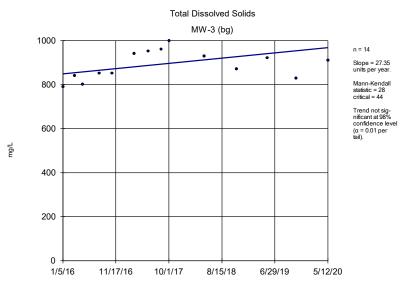
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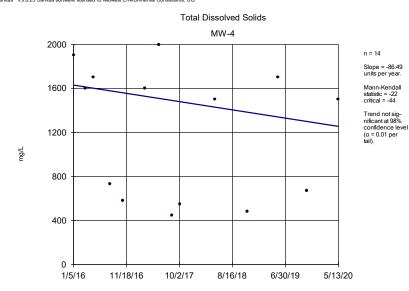




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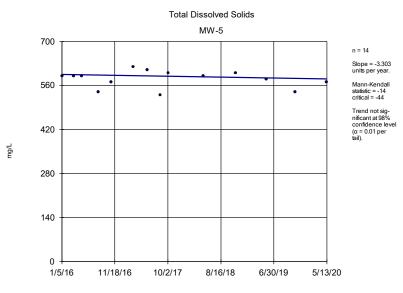
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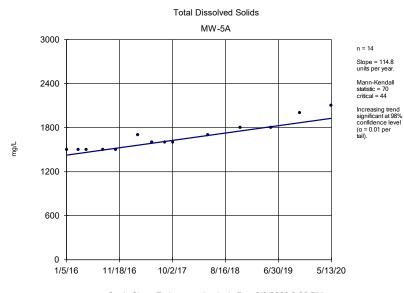
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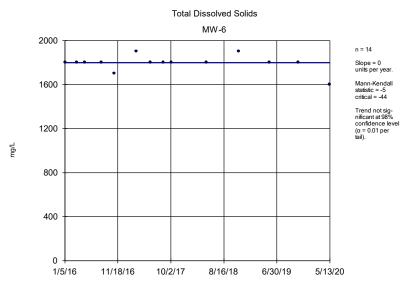
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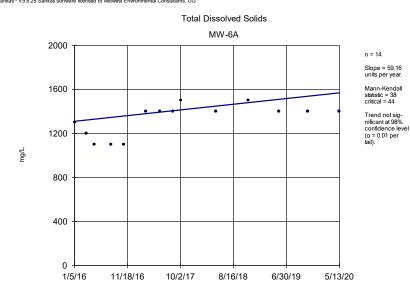




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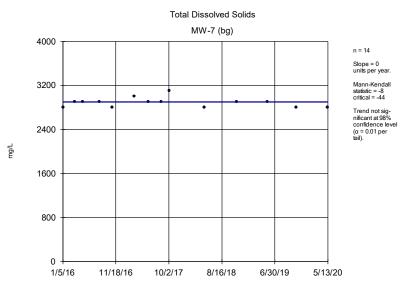
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 The Empire District
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### Trend Test

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background Printed 6/3/2020, 3:10 PM

				ints Data. J-2	.0 App 3 A	soury portu	S WILLI DACK	ground Finite	u 0/3/2020, 3.10		
Constituent	Well	Slope	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Boron (mg/L)	MW-2 (bg)	-0.04017	-55	-44	Yes	14	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-3 (bg)	0	20	44	No	14	57.14	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4	0	19	44	No	14	71.43	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5	0	-5	-44	No	14	7.143	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5A	0.08349	60	44	Yes	14	7.143	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6	0	4	44	No	14	7.143	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6A	0.02744	37	44	No	14	7.143	n/a	n/a	0.02	NP
Boron (mg/L)	MW-7 (bg)	-0.00	-25	-44	No	14	7.143	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2 (bg)	-2.479	-33	-44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3 (bg)	3.718	43	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4	-6.813	-6	-44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5	2.679	27	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5A	11.27	47	44	Yes	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6	0	-4	-44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6A	9.852	35	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-7 (bg)	-10.95	-19	-44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-2 (bg)	-5.949	-54	-44	Yes	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-3 (bg)	-5.794	-38	-44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4	-6.847	-29	-44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5	0.115	17	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5A	1.237	16	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6	0.6207	37	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6A	-6.252	-57	-44	Yes	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-7 (bg)	1.398	17	44	No	14	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2 (bg)	0	-9	-44	No	14	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3 (bg)	-0.02486	-36	-44	No	14	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4	0	-1	-44	No	14	7.143	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5	-0.00	-13	-44	No	14	7.143	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5A	0.03299	40	44	No	14	7.143	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6	0.006186	26	44	No	14	7.143	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6A	-0.0145	-26	-44	No	14	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-7 (bg)	0.009383	17	44	No	14	21.43	n/a	n/a	0.02	NP
pH (SU)	MW-2 (bg)	0.1673	50	44	Yes	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-3 (bg)	0.03216	27	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-4	0.1564	23	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-5	0.03975	6	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-5A	0.0422	13	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-6	0.1058	21	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-6A	0.08088	24	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-7 (bg)	0.02251	12	44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-2 (bg)	-28.33	-60	-44	Yes	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3 (bg)	7.06	3	44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4	-69.57	-18	-44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5	-2.403	-20	-44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5A	79.76	49	44	Yes	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6	-37.24	-41	-44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6A	32.75	29	44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-7 (bg)	-36.25	-22	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-2 (bg)	-27.65	-49	-44	Yes	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-3 (bg)	27.35	28	44	No	14	0	n/a	n/a	0.02	NP
		-									

## Trend Test

The Empire District	Client: Midwest Environmental Consultants	Data: 5-20 App 3 Asbury ponds with background	Printed 6/3/2020, 3:10 PM
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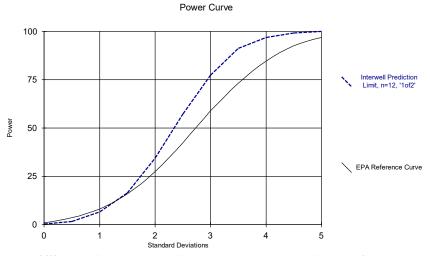
<u>Constituent</u>	Well	Slope	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	N	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Total Dissolved Solids (mg/L)	MW-4	-86.49	-22	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5	-3.303	-14	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5A	114.8	70	44	Yes	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6	0	-5	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6A	59.16	38	44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-7 (bg)	0	-8	-44	No	14	0	n/a	n/a	0.02	NP



# Sanitas<sup>™</sup> Output – Sampling Event

**Power Curve** 

Sanitas<sup>™</sup> v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG



Kappa = 2.292, based on 5 compliance wells and 7 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 6/3/2020 3:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background



**APPENDIX B** 

November 2020 Sampling Event

# 2020 Groundwater Monitoring, Sampling & Statistics Per EPA CCR Rule (CFR § 257.90-.98)

**November Sampling Event** 

# Asbury Generating Station CCR Impoundment Jasper County, MO

January 2021

**Prepared For**: The Empire District Electric Company 602 S. Joplin Avenue Joplin, Missouri 64801





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# **1.0 INTRODUCTION**

The EPA Coal Combustion Residual Regulations (40 CFR Part 257) (CCR Rule) require groundwater monitoring of CCR impoundment. This Asbury Generating Station CCR impoundment groundwater monitoring sampling report is in accordance with the EPA CCR Rule.

In accordance with the EPA CCR Rule (§ 257.90-.98) the status of the Groundwater Monitoring was placed on-line October 17, 2017, as required by the EPA CCR rule. On November 2, 2017 the facility received approval from Missouri Department of Natural Resources (MDNR) of their groundwater system (included in **Appendix 1**). Empire notified the MDNR "State Director" via e-mail when this document was posted on-line, as required in the CCR rule.

The EPA CCR Rule requires the annual groundwater report be prepared by January 31<sup>st</sup> of the following year. The first report was due January 31, 2018. This report was prepared in general accordance with the EPA CCR Rule for groundwater requirements. These regulations outline groundwater monitoring requirements and data evaluation methods. The annual groundwater report for the 2020 sampling events will be posted on-line within 30 days of placement in the operating record.

The purpose of the groundwater monitoring plan is to monitor the ground water quality surrounding the facility and to evaluate potential impacts and/or releases from facility operations. Background groundwater data was collected from January 2016 to August 2017. After the background data plus the first semi-annual sampling events, a reduced sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will generally be completed during the months of May and November. Statistical analysis for EPA Appendix III began after the first semi-annual sampling event was collected on October 4, 2017 to determine if a statistically significant increase (SSI) has occurred. If an SSI is verified, additional evaluation is required to determine if the SSI was caused by the CCR impoundment.

On November 10, 2020, a semi-annual sampling event was conducted per the EPA CCR Rule (§ 257.90-.98). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. For quality assurance and quality control measures, a duplicate sample at MW-5 was taken. These samples were preserved and submitted directly to the laboratory.

This report is a summary of the November 2020 sampling event and the findings of the statistical analysis of the results of the groundwater monitoring program at the Asbury Generating Station CCR Impoundment. Specific information of each sampling event can be obtained from the individual report which is part of the Asbury Operating Record.



# 2.0 SITE LOCATION

The site occupies the north half of Section 17, Township 30 North, and Range 33 West on the Asbury 7.5-Minute Quadrangle Map as seen in **Figure 1**. The site is located approximately 5.5 miles north-northeast of Asbury, Missouri, about 14 miles north-northwest of Joplin, Missouri. A map showing the locations of the monitoring wells is on **Figure 2**.

# 2.1 History

In March 1996, five (5) groundwater monitoring wells, MW-1 through MW-5, were installed around the perimeter of the Asbury Generating Station CCR impoundment. Monitoring wells MW-1, MW-2 and MW-3 were installed to a total depth of between 27.0 to 28.5 feet below ground surface (bgs). Monitoring wells MW-4 and MW-5 were installed to a total depth of 48 feet bgs. Each of the five monitoring wells was equipped with 10.0-foot well screens. The five wells were then developed, purged, and sampled in 1996.

In 2003, two (2) additional groundwater monitoring wells were installed and identified as MW-6 and MW-7. Both wells had 2-inch diameter PVC well casings installed to an approximate total depth of 44 feet below ground surface. Both wells were installed with an above ground steel protective cover. No other construction details such as well screen lengths were available for these two (2) wells. In December 2015, two (2) additional groundwater monitoring wells were installed and identified as MW-5A and MW-6A.

All wells are registered with MDNR – Missouri Geological Survey Program.

# 2.2 Site Geology

Drilling and subsurface investigation activities at the Site and as part of the MDNR approved CCR landfill Detailed Site Investigation (DSI) for the adjacent landfill area identified three (3) primary geologic units at the Site. These geologic units include the surficial soil layer, Warner Sandstone (uppermost aquifer), and Riverton Shale (confining unit). The information presented herein includes the primary elements of a site characterization work plan consistent with the MDNR guidance.

<u>Surficial Soil</u>. Soils at the site consist of a surficial unit of cohesive soils (e.g., CL, SC, ML, and CH) underlain by Pennsylvanian-age bedrock. Soil thickness at the Site ranges from approximately 15-25 feet.

<u>Warner Sandstone</u>. The Warner Sandstone (Sandstone) is the uppermost bedrock unit in south portion of the Site. In the north area of the Site, the Sandstone is overlain by the Riverton Shale (Shale). Based on the DSI information, the Sandstone and Shale can occur as alternating layers. The Sandstone and Shale are gradational in places and transition from shaley sandstone to sandy shale. According to the MDNR publication on the Pennsylvanian Subsystem in Missouri, the Warner Sandstone formation is described as follows: "Generally, the lower part is interbedded, very fine grained sandstone and claystone. The upper part is largely medium-bedded to massive channel fill sandstone. In places, the Warner consists primarily of shale and claystone, with only minor amounts of sandstone" and "ranges in thickness from 0 to 15m (49.2 ft.)."

The Sandstone is more than 25-30 feet thick in places and is generally medium hard and thin to medium bedded with occasional shale partings. The degree of induration of the Sandstone varies and generally increases with depth. Slug tests performed at selected DSI piezometers screened in



the Sandstone exhibited hydraulic conductivities ranging from approximately 1.3x10-4 cm/sec to 5.9x10-6 cm/sec. The slug test results are consistent with values for sandstone and shaley sandstone. The groundwater gradient is towards the east and Blackberry Creek.

<u>Riverton Shale</u>. Layers of the Riverton Shale (Shale) exhibited thicknesses ranging from approximately one foot to more than 10 feet. The Shale is generally dark gray to light gray. The Shale is mainly thin bedded with hardness ranging from soft to hard. Six packer tests were performed during the DSI to assess the hydraulic conductivity of the Shale. The packer test results ranged from approximately  $3.2 \times 10^{-6}$  cm/sec to  $4.9 \times 10^{-8}$  cm/sec. The packer test data indicates that the Shale is an effective confining unit.

According to the MDNR publication on the Pennsylvanian Subsystem in Missouri, the Riverton Shale formation is described as "dark gray to black, fine-grained, relatively brittle shale and contains as many as three coal beds, each of which is underlain by underclay" and "varies in thickness from a featheredge to more than 90 feet".

<u>Unnamed Coal</u>. The Shale includes coal seams in places that range in thickness from a few inches to approximately 1.5 feet. The coal is generally black to dark gray.

# 2.3 Groundwater Monitoring Network Design

The groundwater monitoring system for the CCR impoundment consists of nine (9) groundwater monitoring wells. Two (2) wells are considered upgradient. Two (2) wells are considered sidegradient; one is only monitored for groundwater elevation. The remaining five (5) wells are considered downgradient.

The groundwater monitoring wells (MWs) at the Asbury Generating Station are equipped with individual dedicated poly tubing to be connected to a peristaltic pump/controller at the surface. Low-flow, micro-purge and sampling techniques and technology are utilized to collect groundwater samples from the subject wells. The groundwater sampling procedures are discussed in further detail below.

# 2.4 Groundwater Monitoring Network

The locations of the monitoring wells are shown on **Figure 2**. The groundwater monitoring system for the site consists of the following monitoring wells:

- MW-1 Sidegradient (water level only)
- MW-2 Upgradient
- MW-3 Upgradient
- MW-4 Downgradient
- MW-5 Downgradient
- MW-5A Downgradient
- MW-6 Downgradient
- MW-6A Downgradient
- MW-7 Sidegradient

# 2.5 Seasonal Variation

Historical groundwater elevation data has been limited. However, adequate lengths of well screen have been utilized during the construction of the wells to accommodate typical seasonal groundwater elevation variations seen in southwest Missouri.



# 2.6 Groundwater Flow Direction

Historically, the seasonally high potentiometric surface indicated the groundwater flow direction to the east. **Figure 3** is a potentiometric map for this May 2018 sampling event.

Originally MW-7 was thought to be a downgradient well but review of the potentiometric mapping from the eight background sampling events revealed that the well is actually a sidegradient well. Therefore, the designation for MW-7 has been changed from a downgradient to a sidegradient well for compliance monitoring.



# 3.0 BASELINE GROUNDWATER DATA

# **3.1 Baseline Data Collection**

Per EPA CCR Rule § 257.94(b), the site initiated the detection monitoring program in January 2016 to include obtaining a minimum of eight (8) independent samples for each background and downgradient well. The eight (8) independent groundwater samples were obtained and analyzed as required by the CCR Rule under per the baseline groundwater monitoring plan. Background groundwater data was collected from January 2016 to August 2017.

Groundwater Monitoring Reports were completed for each sampling event and have been placed in the Operating Record. Summary tables of the results from each event are included in **Appendix 2**. A listing of each event is below:

- January 2016
- March 2016
- May 2016
- August 2016
- October 2016
- March 2017
- June 2017
- August 2017

Initial baseline monitoring was required at all monitoring wells. The sampling frequency was quarterly or more frequently for the first two (2) years. After the background data plus the first semi-annual sampling events, a reduced lower sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will be completed during the months of May and October.

The initial two (2) years of baseline and the first semi-annual detection monitoring included parameters listed in Appendix III and Appendix IV of the EPA CCR Rule. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. **Appendix 2** contains the list of constituents.

# **3.2 Background Data Analysis**

Sanitas<sup>™</sup> for Ground Water Version 9.2.13 was used to run the statistical analyses with settings used as recommended by the Sanitas<sup>™</sup> training course and user manual. The background data consisted of eight sampling events between January 2016 and August 2017 for both the Appendix III and IV constituents. Eight background events are needed for statistical analysis. An analysis of the Appendix III background data was conducted and is included in **Appendix 5**. Trending was found in Boron (MW-3) and Total Dissolved Solids (MW-3). MW-3 is an up-gradient well. Trending was not removed at that time; otherwise the site would be below the minimum of eight background samples needed to run statistics.

Four more sets of background data were available to add to the background data set for the November 2019 sampling event. The analysis of the additional data for the background data set was conducted and is included in **Appendix 5**. No trending was found in the additional four sets of data so they were added to the baseline data set to increase the statistical power of the background data.



## 4.0 GROUNDWATER SAMPLING EVENT

On November 10, 2020, eight (8) groundwater monitoring wells were sampled by Midwest Environmental Consultants (MEC) for the EPA CCR Rule Appendix III parameters. For quality assurance and quality control measures, a duplicate sample was taken at MW-5. The sampling protocol and methodology was to be conducted in accordance to the facility's Sampling and Analysis Plan. **Table 1** provides a list of the analytical methods employed by the subcontracted laboratory.

Table 1 – Analytical Methods						
Method Description						
9056A	Anions, Ion Chromatography					
6020A	Metals (ICP/MS)					
SM 2540C	Solids, Total Dissolved (TDS)					
Field Sampling	Field Sampling					

**Appendix 3** includes Monitoring Well Field Inspection sheets and field notes. The physical integrity of the wells was good. During sample collection each of the wells was monitored for pump discharge and formation recharge. Initially, a static water level for each well was recorded (**Table 2**). To ensure sufficient recharge while sampling, static water levels were collected during pumping. Prior to sample collection, field parameters for each well were measured with a flow-through meter. When the field parameters stabilized, samples for analytical testing were collected and placed on ice for hand delivery to the laboratory. At the conclusion of sample collection from each well, a final static water level measurement was obtained. The samples were collected in the appropriately pre-preserved sample containers and placed on ice for delivery.

Table 2 - Groundwater Sampling Field Parameters Summary During November 2020 Sampling Event								
WELL	STATIC WA (ft-B		PURGE RATE	STABILIZED				
ID	Initial	Final	(mL/min)	рН				
MW-1*	NT	NA	NA	NA				
MW-2	1.62	3.95	200	6.51				
MW-3	1.72	1.76	200	5.68				
MW-4	6.01	11.46	200	6.80				
MW-5	0.00	5.53	200	7.60				
MW-5A	9.42	15.02	200	6.72				
MW-6	9.20	14.07	200	6.96				
MW-6A	8.41	13.48	200	7.09				
MW-7	5.03	5.20	200	6.81				
* Water Level Only	NA – Not Applicab	le NT – Not Test	ed (inaccessible)					

\* Water Level Only NA – Not Applicable NT – Not Tested (inaccessible)

**Appendix 4** includes the initial analytical results for the sampling event. Included with this analytical report are sample information; chain of custody; wet chemistry data; and volatile data.



# 5.0 DATA VALIDATION PROCEDURES FOR GROUNDWATER MONITORING DATA

Midwest Environmental Consultants receives Data Packages from the analytical laboratory (Test America). The internal quality control/quality assurance case narratives and reported data are then reviewed. Generally the data validation procedures established by the U.S. Environmental Protection Agency *Contract Laboratory Program Functional Guidelines for Organic Data Review* and *Functional Guidelines for Inorganic Data Review* is followed. These guidelines are used to assign data qualifiers to the data. A formal data validation report for the site is not prepared; however, any significant issues are noted in the groundwater monitoring report.

MEC evaluates the data set for precision, accuracy, representativeness, comparability, and completeness (PARCC).

#### 5.1 Precision

<u>Laboratory Precision</u>. Laboratory quality control procedures to measure precision consist of laboratory control sample (LCS) analysis and analysis of matrix spike/matrix spike duplicates (MS/MSD). These analyses are used to define analytical variability.

<u>Field Precision</u>. Analyses of duplicate samples are used to define the total variability (replicability) of the sampling/analytical system as a whole. Field replicates are collected at a rate of one per sampling event.

#### 5.2 Accuracy

Accuracy is determined by calculating the percent recoveries for analyses of surrogate compounds, LCSs, continuing calibration check standards, and matrix spike samples. Acceptable percent recoveries are established for SW-846 and EPA methods. Field and laboratory blank analysis are also used to address measurement bias.

<u>Field Blanks.</u> Field blanks consisted of a trip blank and a field blank. One trip blank per cooler accompanies samples for volatile organic analyses.

<u>Laboratory Blanks.</u> Method blanks, artificial, matrix-less samples, are analyzed to monitor the laboratory analysis system for interferences and contamination from glassware, reagents, etc. Method blanks are taken through the entire sample preparation process. They are included with each batch of extractions or digestions prepared, or with each 20 samples, whichever is more frequent.

#### **5.3 Representativeness**

Representativeness expresses the degree to which sample data accurately and precisely reflect site condition. Representativeness of the data is determined by comparing actual sampling procedures to those delineated in the field sampling plan, comparing results from field replicate samples and reviewing the results of field blanks. Field notes are reviewed as part of our data validation process.

# 5.4 Comparability

Comparability expresses the confidence with which one data set can be compared to another data set measuring the same property. Comparability is ensured by using established and approved sample collection techniques and analytical methods, consistent basis of analysis, consistent reporting units, and analyzing standard reference materials.



# 5.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected under controlled laboratory conditions. Completeness is defined as the valid data percentage of the total tests requested. Valid data are defined as those where the sample arrived at the laboratory intact, properly preserved, in sufficient quantity to perform the requested analyses, and accompanied by a completed chain-of-custody form. Furthermore, the sample must have been analyzed within the specified holding time and in such a manner that analytical QC acceptance criteria were met.



# **6.0 STATISTICAL ANALYSIS**

# 6.1 Sampling Results

The constituents with results above the laboratory reporting limits are included in **Table 3**. The Test America laboratory analytical results are included in **Appendix 4**.

	Table 3 – Constituents Identified Above Laboratory Reporting Limits									
During November 2020 Sampling Event										
Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.16	<0.08J	<0.08J	0.25	1.9	0.32	0.38	0.22
Calcium	mg/L	NA	37	92	230	71	380	240	170	460
Chloride	mg/L	NA	120	62	4.4	6.4	170	13	25	39
Fluoride	mg/L	4.0	0.39	0.14	<0.1J	0.27	<0.1J	0.22	0.3	<0.1J
рН	SU	NA	6.51	5.68	6.8	7.6	6.72	6.96	7.09	6.81
Sulfate	mg/L	NA	56	530	550	160	2300	1200	850	2200
Total Dissolved Solids	mg/L	NA	430	860	1800	510	3200	1700	1500	2800

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

J = Trace value seen above minimum detection limit but below reporting limit (trace)

No constituents were detected above the Federal Safe Drinking Water maximum contaminant level (MCL) during the sampling event.

# 6.2 Statistical Analysis

The November 2019 sampling event report indicated confirmed intrawell prediction limits exceedances. Intrawell prediction limits were utilized per the facility's 2018 Groundwater Statistical Analysis Plan. The Annual Report recommending the site move into assessment monitoring was stamped on January 23, 2020 and submitted to the facility. However, in February MEC received an email from the facility. MDNR had forwarded EPA correspondence requesting that the site change their statistical evaluation method to interwell prediction limits. EPA CCR Rule 40 CFR § 257.94(e)(2) allows at alternative source demonstration to be completed if the statistically significant increases are result of the statistical evaluation rather than from a release from the facility. **Appendix 1** contains the MDNR/EPA correspondence.

Prediction interval analyses compare one or more observations to a limit set by background data. Interwell analyses compare observations from background wells, which include upgradient and sidegradient wells per EPA Unified Guidance definitions, and their relation to the observations for the downgradient wells. Intrawell analyses compare background observations to current observations of the same well. In order to appropriately characterize the groundwater beneath the site, the statistical methods utilized at the facility consider the following facts as they relate to site:

- Potential differences in geochemical characteristics of the groundwater caused by the differing lithologies in contact with the screened interval from well to well.
- Potential impacts of surface infiltration into the groundwater environment.

Due to varying geology in the state of Missouri, intrawell analyses had initially been deemed a more appropriate method. Municipal and demolition waste landfills in Missouri typically utilize intrawell prediction limits per MDNR. However, it was noted that the power curve for these



analyses was not considered strong yet. The data set consisted of only 13 sampling events from January 2016 to November 2019. EPA Unified Guidance recommends 20 or more sampling events for background data for intrawell prediction limits. A small data set triggers an SSI when there is even a slight increase in concentration. Sanitas also note to each exceedance "*Insufficient data to test for seasonality: data were not deseasonalized.*" Minor increases in concentration noted in the May and November 2019 sampling events did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated.

The EPA Unified Guidance Chapter 5.2.3 states "In groundwater data collection and testing, background conditions may not be static over time. Caution should be observed in removing observations which may signal a change in natural groundwater quality. Even when conditions have not changed, an apparently extreme measurement may represent nothing more than a portion of the background distribution that has yet to be observed. This is particularly true if the background data set contains fewer than 20 samples." Chapter 5.2.4 states "With such a small background sample, it can be difficult to develop an adequately powerful intrawell prediction level or control chart, even when retesting is employed (Chapter 19). Thus, additional background data will be needed to augment compliance well samples". Minor increases in concentrations did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated.

	Table 4 – EPA Review of Groundwater Reports
Facility	Asbury Power Plant
Location	Asbury, MO
Owner	Empire District Electric Company
Units	Upper Pond-unlined, South Pond-unlined, Lower Pond-unlined
	Surficial unit of clay, clayey sand, and silt approximately 15 to 25 feet
Goology	thick underlain by Warner Sandstone approximately 25-30 feet thick in
Geology	the southern portion of the site and the Riverton Shale in the northern
	area of the site
	Analytical results indicate consistent differences in contaminant
Problematic Use of	concentrations between upgradient and downgradient wells.
Intra Well	Consequently, interwell comparisons are feasible and would be
Comparisons	preferable in the absence of compelling reasons to use intra well
	analysis
<b>Problematic Alternate</b>	
Source Determination	
	While there are no boring logs in the documents to confirm that the
	wells are screened in the same geologic unit, consistency in the field
	parameters and the description of the geology suggest that the wells
Conclusions	are screened in the sandstone. The analytical results indicate
Conclusions	consistent differences in contaminant concentrations between
	upgradient and downgradient wells, consequently, interwell
	comparisons are feasible and would be preferable in the absence of
	compelling reasons to use intra wells analyses

MDNR made several requests per EPA in the correspondence located in **Appendix 1** which included the EPA review of the groundwater reports as seen in **Table 4**.



Sanitas<sup>™</sup> for Ground Water Version 9.6.25 was used to run the statistical analyses with settings used as recommended by the Sanitas<sup>™</sup> training course and user manual. Interwell prediction intervals were run per EPA's request. The Sanitas<sup>™</sup> output is included in **Appendix 5**.

Statistical analysis was performed on the Appendix III constituents from the November 2020 sampling event compared to the updated background dataset. Prediction interval analyses compare one or more observations to a limit set by background data. Interwell analyses compare observations from upgradient background wells and their relation to the observations for the downgradient wells. Intrawell analyses compare background observations to current observations of the same well. Due to varying geology in the state of Missouri, intrawell analyses had initially been deemed a more appropriate method. However, EPA has requested the site utilize interwell prediction limits.

Statistical analysis results are presented below for those constituents determined to have an exceeded a prediction limit. However, EPA's "Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities," March 2009, EPA 530/R-09-007 is referenced multiple times in the preamble of the EPA CCR regulations for groundwater sampling and analysis requirements. According to the EPA Unified Guidance, a prediction limit exceedance is not considered a statistically significant increase (SSI) until it is confirmed through retesting. SSIs generated by non-detectable results or with less than eight background events are considered statistically invalid.

**Table 5** lists the parameters with exceedances of prediction limits during the November 2020 sampling event, the associated monitoring wells, if the exceedance is initial versus confirmed, the predicted limit, the measured concentration, and the MCL set forth in the National Drinking Water Regulations. The MCL is the highest level of a contaminant that is allowed in drinking water.

Table 5 – Interwell Prediction Limit Exceedances Observed         During November 2020 Sampling Event									
Constituent	Monitoring Well	Initial vs. Confirmed	Predicted Limit	Measured Concentration	Drinking Water MCLs				
Boron (mg/L)	MW-5A	Confirmed	0.4147	1.9	NA/4.0 GWPS*				
pH (SU)	MW-5	Initial	6.88	7.6	NA				
pH (SU)	MW-6	Initial	6.88	6.96	NA				
pH (SU)	MW-6A	Initial	6.88	7.09	NA				
Total Dissolved Solids (mg/L)	MW-5A	Initial	3100	3200	NA				

NA = Not Applicable \*EPA proposed groundwater protection standard

# 6.3 Results Interpretation

The results of the EPA requested interwell prediction limit statistical analysis of the November 2020 sampling event indicate a confirmed exceedance for Boron (MW-5A). Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L but the results were below that limit. The facility will conduct an alternative source demonstration in the next 90 days per the EPA CCR Rule (§ 257.94).



The results for pH (MW-5, MW-6 and MW-6A) and total dissolved solids (MW-5A) indicated initial interwell prediction limit exceedances for the listed monitoring well during November 2020 sampling event. There are no current primary (health based) MCLs for pH or total dissolved solids. The facility plans to resample as part of the May 2021 sampling event.

During the May 2020 sampling event, Initial interwell prediction exceedances in boron (MW-5A and MW-6A) and fluoride (MW-5A) were noted. However, the initial prediction limit exceedances of boron (MW-6A) and fluoride (MW-5A) were not confirmed during the November 2020 sampling event.

Below is a discussion of the previous results for comparison.

# May 2020

The results of the EPA requested interwell prediction limit statistical analysis of the May 2020 sampling event indicate that the site is in compliance. The results for boron (MW-5A and MW-6A) and fluoride (MW-5A) indicated an initial interwell prediction limit exceedance for the listed monitoring well during May 2020 sampling event. There is a current primary (health based) MCL for fluoride of 4.0 mg/L but the result is below the limit. Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L but all results were below that limit. Trending was found to be significant for boron (MW-5A) but not significant in boron (MW-6A) and fluoride (MW-5A). Boron is also trending upward in MW-2 which is an up-gradient well. The facility plans to resample as part of the November 2020 sampling event. During the November 2019 sampling event, Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted. However, these initial prediction limit exceedances were not confirmed during the May 2020 sampling event.

# November 2019

The result for Chloride (MW-5A), pH (MW-4) and Sulfate (MW-5A) indicated an initial intrawell prediction limit exceedance for the listed monitoring well during the November 2019 sampling event. There is no current primary (health based) MCL for chloride, pH or sulfate.

During the May 2019, the result for Boron (MW-5A) indicated an initial intrawell prediction limit exceedance and Total Dissolved Solids (MW-5A) indicated a confirmed intrawell prediction limit exceedance. There is no current primary (health based) MCL for boron and total dissolved solids. These prediction limit exceedances were confirmed during the November 2019 sampling event. A resample of MW-5A was conducted on December 11, 2019. The results of the resample confirmed the exceedances and the site planned to move into assessment monitoring.

Table 6 – December 2019 Resample Result Comparison							
Constituent	MW-5A Resample						
Appendix III							
Boron	mg/L	NA	0.82	1.0			
Calcium	mg/L	NA	240	270			
Chloride	mg/L	NA	69	82			
Fluoride	mg/L	4.0	<0.5J	0.26			
рН	SU	NA	7.2	7			

Asbury Generating Station CCR Impoundment, GW Sampling Report



Sulfate	mg/L	NA	1200	1300
Total Dissolved Solids	mg/L	NA	2000	2200

However, in February MEC received an email from the facility. MDNR had forwarded EPA correspondence requesting that the site change their statistical evaluation method to interwell prediction limits. EPA CCR Rule 40 CFR § 257.94(e)(2) allows at alternative source demonstration to be completed if the statistically significant increases are result of the statistical evaluation rather than from a release from the facility. **Appendix 1** contains the MDNR/EPA correspondence.

The results of the EPA requested interwell prediction limit statistical analysis of the November 2019 sampling event indicate that the site is in compliance. Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted but have not been confirmed. There is no current primary (health based) Maximum Contamination Level (MCL) for pH. Trending was not found to be significant for pH in any well during the analysis of the background data set.

# May 2019

The result for Boron (MW-5A) and pH (MW-3(u), MW-5A, MW-6 and MW-6A) indicated an initial intrawell prediction limit exceedance for the listed monitoring well during the May 2019 sampling event. There is no current primary (health based) MCL boron or pH. The facility plans to resample as part of the November 2019 sampling event.

During the November 2018, the result for Total Dissolved Solids (MW-5A) indicated an initial intrawell prediction limit exceedance. There is no current primary (health based) MCL for total dissolved solids. This initial prediction limit exceedances was confirmed during the May 2019 sampling event. However, it should be noted that the power curve for these analyses is not considered strong. A small data set triggers an SSI when there is even a slight increase in concentration. The EPA Unified Guidance Chapter 5.2.4 states "With such a small background sample, it can be difficult to develop an adequately powerful intrawell prediction level or control chart, even when retesting is employed (Chapter 19). Thus, additional background data will be needed to augment compliance well samples".

Minor increases in concentrations did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated. It was also noted that higher levels of total dissolved solids were seen in the side-gradient well MW-7 demonstrating that a there was likely not a release from the facility. Therefore, the site will continue with detection monitoring on a semi-annual basis at this time.

#### November 2018

The result for Total Dissolved Solids (MW-5A) indicated an initial intrawell prediction limit exceedance for the listed monitoring well during the November 2018 sampling event. There is no current primary (health based) MCL for total dissolved solids. The facility plans to resample MW-5A for Total Dissolved Solids as part of the May 2019 sampling event.

During the May 2018, no intrawell prediction limits were exceeded. Therefore, there were no initial prediction limit exceedances to confirm during the November 2018 sampling event.

#### May 2018

No intrawell prediction limits were exceeded during the May 2018 sampling event.



The October 2017 results for Total Dissolved Solids (MW-7) indicated an exceedance of the predicted limit for the listed monitoring wells. However, this initial prediction limit exceedance was not confirmed during the May 2018 sampling event.

# October 2017

The result for Total Dissolved Solids (MW-7) indicated an initial intrawell prediction limit exceedance for the listed monitoring wells during the October 2017 sampling event. However, the result was below the tolerance limit. There is no current primary (health based) MCL for total dissolved solids.

Review of the Total Dissolved Solids in the duplicate sample taken from the same well (MW-7) shows a result of 3,000 mg/L, which would not be an exceedance of the intrawell prediction limit of 3,069 mg/L. Due to the variances between the sample and the duplicate, the site will re-evaluate MW-7 for Total Dissolved Solids during the next sampling event.

MW-7 is considered a sidegradient well, therefore no further action is needed for exceedances in sidegradient or upgradient wells.

# 6.4 Proposed Actions

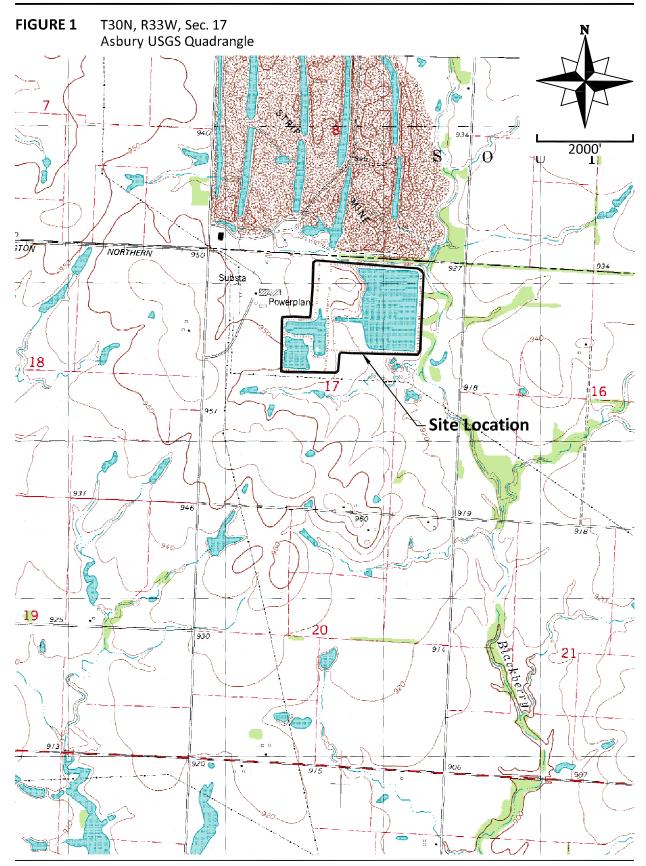
Statistical analysis will continue to be completed with interwell prediction limits per EPA's request. The results of the alternative source demonstration will determine if the site continues with the detection monitoring program on a semi-annual basis or moves into assessment monitoring per the EPA CCR Rule (§ 257.94).



**FIGURES** 



**Asbury Generating Station CCR Impoundment** Groundwater Sampling Event - November 2020 Site Location Map



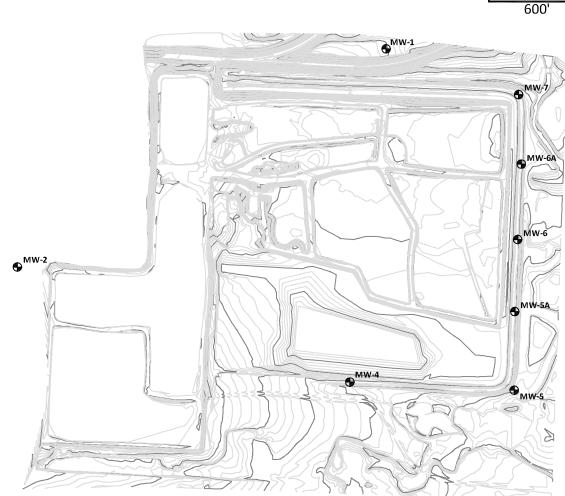
January 2021



Asbury Generating Station CCR Impoundment Groundwater Sampling Event - November 2020 Groundwater Monitoring System

# FIGURE 2





мw-3

Well ID	Northing	Easting
MW-1	435791.18*	2765165.35
MW-2	434428.46	2762861.37
MW-3	432842.77	2762720.80
MW-4	433709.99	2764938.99
MW-5	433659.27	2765966.23
MW-5A	434150.04	2765969.78
MW-6	434600.46	2765987.98
MW-6A	435071.44	2766010.46
MW-7	435505.42	2765993.13

\* Coordinate location is approximate

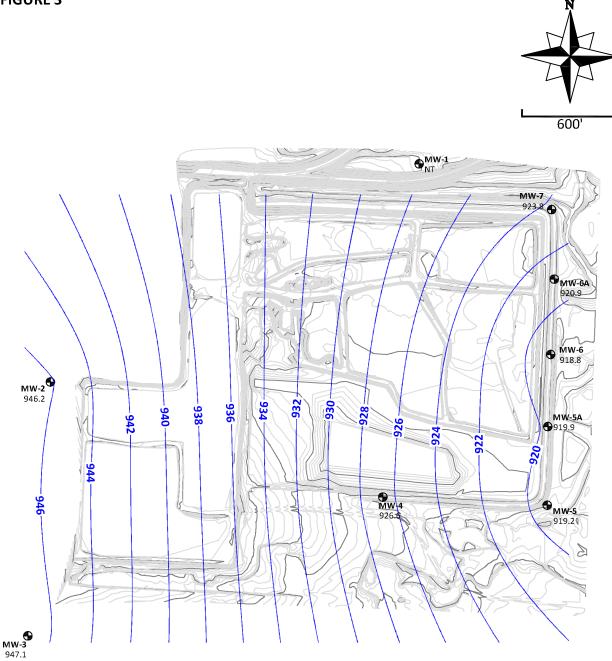
Legend

Monitoring Well



# Asbury Generating Station CCR Impoundment Groundwater Sampling Event - November 2020 Groundwater Piezometric Surface Map

## FIGURE 3



Well ID	Northing	Easting	Top Of Casing	Static Water Level (BTOC)	Static Water Level
MW-1	435791.18	2765165.35	933.4	NT	NT
MW-2	434428.46	2762861.37	947.8	1.6	946.2
MW-3	432842.77	2762720.80	948.8	1.7	947.1
MW-4	433709.99	2764938.99	932.6	6.0	926.6
MW-5	433659.27	2765966.23	919.2	0.0	919.2
MW-5A	434150.04	2765969.78	929.3	9.4	919.9
MW-6	434600.46	2765987.98	928.0	9.2	918.8
MW-6A	435071.44	2766010.46	929.3	8.4	920.9
MW-7	435505.42	2765993.13	928.8	5.0	923.8



€

Monitoring Well



**APPENDIX 1** 

**EPA/MDNR Correspondence** 



NOV 0 2 2017

Mr. Kavan Stull, Senior Environmental Coordinator Empire District 602 South Joplin Avenue Joplin, MO 64802

RE: Site Characterization Workplan

Dear Mr. Stull:

The Missouri Department of Natural Resources has reviewed the document "Site Characterization Workplan" dated May 16, 2017. The site has undergone extensive characterization regarding construction of a coal combustion residual (CCR) landfill near the CCR impoundments. The department's Water Protection Program has determined, through consulting with the Missouri Geological Survey, this characterization is sufficient and may be used in whole to complete the required monitoring of the sub-surface conditions at the site. Additional submittal of site characterization is not necessary, as the previous submittal meets the requirement for special condition 19(b) of the Missouri State Operating Permit MO-0095362. The facility may proceed with the next step laid out in the permit; special condition 19(c). Enclosed is the Missouri Geological Survey concurrence.

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to 10 CSR 20 1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Contact information for the AHC is by mail at Administrative Hearing Commission, United States Post Office Building, Third Floor, 131 West High Street, P.O. Box 1557, Jefferson City, MO 65102, by phone at 573-751-2422, by fax at 573-751-5018, and by website at <u>www.oa.mo.gov/ahc</u>.



Mr. Kavan Stull Page 2

If you have any questions, please do not hesitate to contact Ms. Pam Hackler by mail at Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176, by phone at 573-526-3386; or by email at <u>pam.hackler@dnr.mo.gov</u>. Thank you.

Sincerely,

WATER PROTECTION PROGRAM

lies

Michael J. Abbott, Chief Operating Permits Section

MJA/php

Enclosure

c: Mr. Randall Willoughby, Southwest Regional Office



#### MEMORANDUM

DATE:	October	18,	2017
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TO: Pam Hackler- WPP- Industrial Wastewater Unit

FROM: Fletcher N. Bone, Geologist, Environmental Geology Section, Geological Survey Program, MGS

hon n. Bono

SUBJECT:

Site characterization for existing CCR impoundments Asbury Power Plant Site Characterization Work Plan- CCR 37 21 22.66 Latitude, -94 35 4.79 Longitude, Jasper County, Missouri



SWR18011 Jasper County

October 18, 2017

The Missouri Geological Survey (MGS) has reviewed the documents titled, 'NPDES Permit MO-0095362 Asbury Power Plant, Jasper County, Missouri, Site Characterization Work Plan', prepared by Empire District Electric Company, dated September 8, 2017 and 'Site Characterization Work Plan, Coal Combustion Residuals Impoundments, Empire Electric Facility - Permit MO-0095362, Jasper County, Missouri, Geotechnology Project No. J021738.03', prepared by Geotechnology Inc., dated May 16, 2017. The MGS offers the following comment.

General Comment:

The MGS agrees that the existing Coal Combustion Residuals (CCR) impoundments (site 1) do not need further site characterization, at this time. The site characterization performed, as described in the Detailed Site Investigation Report (DSI), dated January 21, 2015, at the proposed CCR impoundment (site 2) that is approximately 1,000 feet south of the existing CCR impoundments (site 1), coupled with the geologic and hydrologic data provided that pertains to the existing CCR impoundments (site 1) (1996 to present data), provides adequate characterization of the geology and hydrology of the site 1. The geologic and hydrologic settings of both sites are similar, with geologic boring logs and potentiometric data of both sites being compared. The hydraulic conductivity testing conducted at the proposed CCR site (site 2) has demonstrated that there is a low potential for groundwater contamination for this area.

If you are in need of further assistance from our office or have questions regarding this evaluation please feel free to contact me at (573) 368-2161.



**APPENDIX 2** 

**Baseline Sampling Information** 

#### **EPA CCR Rule**

Appendix III to Part 257—Constituents for Detection Monitoring Boron Calcium Chloride Fluoride pH Sulfate Total Dissolved Solids (TDS)

# Appendix IV to Part 257—Constituents for Assessment Monitoring

Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Lead Lithium Mercury Molybdenum Selenium Thallium Radium 226 and 228 combined

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.33	<0.5 J	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J
Calcium	mg/L	NA	57	74	220	84	200	250	140	570
Chloride	mg/L	NA	140	83	120	4.7	28	10	38	38
Fluoride	mg/L	4	0.43	0.47	0.31	0.28	0.30	0.24	0.35	<0.2 J
рН	SU	NA	6.33	5.81	6.31	7.33	7.09	6.97	7.09	6.51
Sulfate	mg/L	NA	260	360	1100	140	800	1000	600	1800
Total Dissolved Solids	mg/L	NA	690	790	1900	590	1500	1800	1300	2800
				Append	ix IV					
Antimony	mg/L	0.006	<0.002	<0.002 J						
Arsenic	mg/L	0.01	<0.002 J	0.01	<0.01 J	<0.02 J	<0.01	<0.01	<0.01	<0.01
Barium	mg/L	2	0.044	0.0099	0.065	0.086	0.036	0.02	0.042	0.011
Beryllium	mg/L	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002 J	<0.002 J	<0.01 J	<0.01 J	<0.01 J	<0.01 J	<0.01	<0.01
Cobalt	mg/L	NA	<0.01 J	<0.01 J	0.046	<0.002 J	0.018	0.0022	0.02	0.014
Lead	mg/L	0.015	<0.002 J	<0.002	<0.01 J	<0.002 J	<0.002	<0.002	<0.002	<0.002 J
Lithium	mg/L	NA	0.057	0.15	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.002	<0.002 J	<0.002 J	<0.002 J	<0.01 J	<0.002	<0.01 J	<0.002
Selenium	mg/L	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Combined Radium	pCi/L	5	<0.477 J	<0.427 J	<2.08	<0.563 J	<0.392 J	<0.446 J	<0.306 J	<0.279 J

# 1<sup>st</sup> Baseline Event – January 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
Appendix III											
Boron	mg/L	NA	0.90	0.060	<0.25	0.29	0.29	0.34	0.34	0.29	
Calcium	mg/L	NA	120	92	260	94	190	250	160	620	
Chloride	mg/L	NA	180	70	15	4.4	23	9.0	36	34	
Fluoride	mg/L	4	0.28	0.28	0.10	0.38	0.31	0.23	0.31	0.16	
рН	SU	NA	5.82	5.68	6.72	7.15	6.94	6.79	6.98	6.22	
Sulfate	mg/L	NA	570	400	570	140	710	970	550	1800	
Total Dissolved Solids	mg/L	NA	1300	840	1600	590	1500	1800	1200	2900	
Appendix IV											
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002 J	<0.002	<0.002 J	<0.002	
Arsenic	mg/L	0.01	<0.002 J	0.024	0.0038	<0.002 J	0.0038	0.0026	0.0025	0.004	
Barium	mg/L	2	0.060	0.012	0.034	0.047	0.042	0.026	0.051	0.0089	
Beryllium	mg/L	0.004	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Cadmium	mg/L	0.005	0.0028	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002	<0.002 J	0.0034	<0.002	<0.002	<0.002	<0.002	<0.002	
Cobalt	mg/L	NA	0.017	0.0095	0.021	<0.002 J	0.02	0.0061	0.0063	0.016	
Lead	mg/L	0.015	<0.002 J	<0.002 J	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	
Lithium	mg/L	NA	0.20	0.15	0.074	0.074	0.14	0.22	0.14	0.30	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.002	<0.002 J	<0.002	<0.002 J	0.0041	<0.002 J	0.0038	<0.002	
Selenium	mg/L	0.05	<0.002	<0.002	<0.002	0.0021	0.0028	0.0031	0.0031	<0.002	
Thallium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Combined Radium	pCi/L	5	<0.337 J	<0.389 J	<0.84 J	<0.315 J	<0.336 J	<0.319 J	<0.348 J	<0.329 J	

# 2<sup>nd</sup> Baseline Event – March 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
Appendix III											
Boron	mg/L	NA	0.21	0.044	0.027	0.24	0.26	0.25	0.23	0.29	
Calcium	mg/L	NA	130	100	91	5	59	11	90	36	
Chloride	mg/L	NA	140	83	120	4.7	28	10	38	38	
Fluoride	mg/L	4	0.28	0.27	0.22	0.55	0.35	0.26	0.43	0.18	
рН	SU	NA	5.30	4.37	5.97	6.43	6.60	6.51	6.64	5.82	
Sulfate	mg/L	NA	160	540	820	150	920	1400	620	2400	
Total Dissolved Solids	mg/L	NA	500	800	1700	590	1500	1800	1100	2900	
Appendix IV											
Antimony	mg/L	0.006	<0.002 J								
Arsenic	mg/L	0.01	0.0013	0.027	0.01	0.0043	0.01	0.007	0.0037	0.0082	
Barium	mg/L	2	0.021	0.01	0.025	0.045	0.037	0.041	0.04	0.021	
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	mg/L	0.005	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002 J	<0.002 J	0.0025	<0.002 J					
Cobalt	mg/L	NA	0.0072	0.0073	0.0071	<0.0005J	0.00081	0.0035	<0.0005J	0.0037	
Lead	mg/L	0.015	<0.001 J	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001	<0.001 J	<0.001 J	
Lithium	mg/L	NA	<0.05 J	0.15	<0.05 J	0.074	0.16	0.31	0.12	0.22	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	0.0052	<0.005	<0.005	
Selenium	mg/L	0.05	<0.005	<0.005	<0.005 J	<0.005	<0.005 J	<0.005 J	<0.005	<0.005	
Thallium	mg/L	0.002	<0.001 J	<0.001	<0.001	<0.001	<0.001 J	<0.001 J	<0.001	< 0.001	
Combined Radium	pCi/L	5	<0.355	<0.427 J	<0.386 J	<0.402 J	<0.377 J	<0.357 J	<0.334 J	<0.333 J	

# 3<sup>rd</sup> Baseline Event – May 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
Appendix III											
Boron	mg/L	NA	0.19	0.057	0.067	0.27	0.27	0.29	0.27	0.22	
Calcium	mg/L	NA	38	79	110	74	180	220	130	430	
Chloride	mg/L	NA	120	77	35	6	35	12	65	49	
Fluoride	mg/L	4	0.25	0.15	0.3	0.26	0.31	0.23	0.37	0.22	
рН	SU	NA	6.04	5.73	7	7.17	7.04	6.88	7.14	6.29	
Sulfate	mg/L	NA	<0.005 J	<0.005	<0.005 J	<0.005 J					
Total Dissolved Solids	mg/L	NA	460	850	730	540	1500	1800	1100	2900	
	Appendix IV										
Antimony	mg/L	0.006	<0.002 J								
Arsenic	mg/L	0.01	<0.001 J	0.013	<0.001 J	<0.001 J	0.001	<0.001 J	<0.001 J	<0.001 J	
Barium	mg/L	2	0.023	<0.01 J	0.012	0.035	0.031	0.014	0.037	<0.01 J	
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	mg/L	0.005	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	
Cobalt	mg/L	NA	0.0052	0.0088	0.0038	<0.0005J	0.00075	<0.0005J	<0.0005J	0.015	
Lead	mg/L	0.015	<0.001 J	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001	<0.001 J	<0.001	
Lithium	mg/L	NA	<0.05 J	0.16	<0.05 J	0.078	0.16	0.22	0.11	0.34	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	<0.005	0.0067	<0.005	
Selenium	mg/L	0.05	<0.005 J	<0.005	<0.005 J	<0.005 J					
Thallium	mg/L	0.002	<0.001 J	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	<0.001	
Combined Radium	pCi/L	5	<0.424 J	<0.465 J	<0.833	<0.441 J	<0.435 J	<0.45 J	<0.484 J	<0.418 J	

# 4<sup>th</sup> Baseline Event – August 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
Appendix III											
Boron	mg/L	NA	0.2	0.053	0.047	0.24	0.33	0.34	0.31	0.26	
Calcium	mg/L	NA	43	91	100	94	220	260	130	490	
Chloride	mg/L	NA	130	65	74	6	29	13	65	56	
Fluoride	mg/L	4	0.28	0.18	0.28	0.31	0.39	0.25	0.41	0.28	
рН	SU	NA	6.59	5.95	7.21	7.51	8.00	6.98	7.85	6.75	
Sulfate	mg/L	NA	99	470	120	120	1100	1100	570	1400	
Total Dissolved Solids	mg/L	NA	460	850	580	570	1500	1700	1100	2800	
Appendix IV											
Antimony	mg/L	0.006	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002 J	<0.002	
Arsenic	mg/L	0.01	<0.001	0.014	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001 J	<0.001 J	
Barium	mg/L	2	0.028	<0.01 J	0.02	0.03	0.033	0.013	0.037	<0.01 J	
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	mg/L	0.005	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	
Cobalt	mg/L	NA	0.0051	0.0095	0.0013	0.00073	0.0072	<0.0005J	<0.0005J	0.014	
Lead	mg/L	0.015	<0.001 J	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	
Lithium	mg/L	NA	<0.05 J	0.17	<0.05	0.078	0.17	0.24	0.12	0.32	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	0.0066	<0.005	<0.005	
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005J	<0.005	
Thallium	mg/L	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Combined Radium	pCi/L	5	<0.436J	<0.478J	<0.535J	<0.503J	<0.498J	<0.464J	<0.453J	<0.424J	

# 5<sup>th</sup> Baseline Event – October 2016 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
Appendix III											
Boron	mg/L	NA	0.22	0.052	0.057	0.23	0.29	0.33	0.36	0.26	
Calcium	mg/L	NA	38	93	250	86	200	260	170	500	
Chloride	mg/L	NA	130	52	19	5.3	29	11	19	39	
Fluoride	mg/L	4	0.21	0.12	<0.1 J	0.29	0.29	0.19	0.3	0.12	
рН	SU	NA	6.07	5.84	6.67	7.32	7.38	7.15	7.21	6.40	
Sulfate	mg/L	NA	130	540	630	150	1100	1000	720	1900	
Total Dissolved Solids	mg/L	NA	500	940	1600	620	1700	1900	1400	3000	
Appendix IV											
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Arsenic	mg/L	0.01	<0.001	0.037	0.0022	0.0013	0.0014	<0.001 J	0.0043	<0.001 J	
Barium	mg/L	2	0.021	0.011	0.021	0.033	0.026	0.015	0.027	<0.01 J	
Beryllium	mg/L	0.004	<0.001 J	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001 J	
Cadmium	mg/L	0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002 J								
Cobalt	mg/L	NA	0.0071	0.0097	0.0096	<0.0005J	0.0022	0.0024	0.0017	0.014	
Lead	mg/L	0.015	<0.001	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	
Lithium	mg/L	NA	<0.05 J	0.17	0.072	0.076	0.16	0.23	0.14	0.32	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005 J	<0.005 J	<0.005	<0.005	<0.005 J	<0.005	<0.005 J	<0.005	
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Thallium	mg/L	0.002	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Combined Radium	pCi/L	5	0.575	1.63	0.287	1.50	0.803	2.68	1.73	1.62	

# 6<sup>th</sup> Baseline Event – March 2017 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7	
Appendix III											
Boron	mg/L	NA	<0.08J	<0.08J	0.034	0.27	0.31	0.37	0.36	0.26	
Calcium	mg/L	NA	42	100	300	89	200	260	160	470	
Chloride	mg/L	NA	130	54	110	5.4	23	12	26	48	
Fluoride	mg/L	4	0.43	0.19	0.18	0.35	0.42	0.3	0.42	0.21	
рН	SU	NA	6.35	5.78	6.62	7.22	7.04	6.93	7.09	6.41	
Sulfate	mg/L	NA	78	650	1400	180	940	1300	780	2400	
Total Dissolved Solids	mg/L	NA	450	950	2000	610	1600	1800	1400	2900	
Appendix IV											
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Arsenic	mg/L	0.01	<0.001J	0.1	0.0032	<0.001J	0.0037	<0.001	0.0018	<0.001	
Barium	mg/L	2	0.03	0.016	0.048	0.04	0.026	0.017	0.025	<0.01J	
Beryllium	mg/L	0.004	<0.001	0.0031	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	mg/L	0.005	<0.001J	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.1	<0.002	<0.002	<0.002J	<0.002	<0.002	<0.002	<0.002	<0.002	
Cobalt	mg/L	NA	0.004	0.0088	0.0042	<0.0005J	0.0045	0.00087	0.0059	0.0015	
Lead	mg/L	0.015	0.0033	0.001	0.0074	<0.001	<0.001	<0.001	<0.001	<0.001	
Lithium	mg/L	NA	<0.05J	0.18	0.053	0.085	0.18	0.25	0.15	0.34	
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Molybdenum	mg/L	NA	<0.005	<0.005J	<0.005	<0.005	<0.005J	<0.005	<0.005J	<0.005	
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Thallium	mg/L	0.002	<0.001	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	
Combined Radium	pCi/L	5	<0.397J	<0.337J	<0.403	<0.291J	<0.343J	<0.414J	<0.33J	<0.314J	

# 7<sup>th</sup> Baseline Event – June 2017 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
				Append	dix III					
Boron	mg/L	NA	0.16	<0.08J	<0.08J	0.28	0.33	0.34	0.38	0.27
Calcium	mg/L	NA	43	98	83	57	220	250	180	510
Chloride	mg/L	NA	130	45	8.1	5.3	23	12	26	38
Fluoride	mg/L	4	0.26	0.17	0.32	0.27	0.45	0.25	0.4	0.22
рН	SU	NA	6.2	5.7	6.7	7.3	7.0	7.2	7.1	6.3
Sulfate	mg/L	NA	82	550	63	140	920	1100	730	2200
Total Dissolved Solids	mg/L	NA	450	960	450	530	1600	1800	1400	2900
				Append	lix IV					
Antimony	mg/L	0.006	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002
Arsenic	mg/L	0.01	<0.001J	0.013	<0.001J	0.002	<0.001J	<0.001J	<0.001J	<0.001J
Barium	mg/L	2	0.024	0.01	0.018	0.027	0.023	0.018	0.021	<0.01J
Beryllium	mg/L	0.004	< 0.001	<0.001J	< 0.001	<0.001	<0.001	< 0.001	<0.001	<0.001J
Cadmium	mg/L	0.005	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002J	<0.002	0.0026	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.0036	0.01	0.00067	<0.0005J	0.0023	<0.0005J	0.0051	0.014
Lead	mg/L	0.015	< 0.001	<0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05J	0.17	<0.05J	0.073	0.18	0.22	0.15	0.32
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005J	<0.005	<0.005J	<0.005J	<0.005J	<0.005J	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium	mg/L	0.002	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.42J	<0.417J	<0.473	<0.476J	<0.383J	<0.389J	<0.291J	<0.346J

# 8<sup>th</sup> Baseline Event – August 2017 Sampling Event

NA = Not Applicable

<x = Less than reporting limit (nondetectable)</pre>

J = Trace value seen above minimum detection limit but below reporting limit (trace)



# **APPENDIX 3**

Monitoring Well Field Inspection Sheets and Field Notes

				Field	Samplir	ng Log		0		
Facility:	Asbury (	CCR (Perm	it #	)	Мо	8				. —
_	<b>formation</b> : of Well Purge	· Deristali	ic Dump with	2/9 - inch F	Nomotor Tu	Sample	Blind D	Ouplicate	Field Blan	k
Method	or well rulge	. renstan	ic Pump with			bing				
		Actual	Purge Volun	ne Removed:		mL post	pump calib	ration .		
Date / Ti	me Initiated:	(	-20 @	4:30	Date /	Time Comp	leted: <u>11 -</u>	-10-20 (	<u>a</u>	
	ged To Dryne		N	Petro	oleum or Ga	as Detected	1? Y N			
Purge Da	ata: 501	m/mi	N							
Time	Purge Rate (mL/min)	Cumulat Volum	e Tem		Condu	cific ctivity	Dissolved Oxygen	ORP		Other (Color, Clarity,
HI TI		(mL	) (°C	(SU)	(ms)	/cm)	( mg/L )	( MV)		Odor)
4.54	200	301	0 15,9	2 600	60	5 1	July	3.6		C
:36		1200	6.1	26.76	67	5 0	X.19	5905		
:38		1600	) <b>((</b> ), (	096.5	() "	6 1	171	43.5	7	
:40		220	0 17.	26.5	60	20	1.56	46-0		X
					-					
Time san	npled	l	40,40	)	Ac Pa	eld Inspecti ccess ad Condition using Condit	n	Good G G G	Fair F F F	Poor P P P
Weather	Conditions_[	Cloud	1 405	Wind		cking Cap & ser Conditional celd Inspection	& Lock on	G	F	P P
Water Le	vel Start	1.60	2'		W	ell ID Visibl anding Wat	е	Yes Y	N	<u>N/A</u> N/A N/A
		-	11			ear of Wee		Y	C. N	N/A
Waterle	vel Finish	3.9	5			easuring Po		Ŷ	N	N/A
vvater Le		L.					with MDNR Performed	Y Y	N N	N/A N/A
Name (M	IEC Field Sam		Canad Dials Cl	1			tion Norma		N	N/A
Name (IV	ice riela sam	pier): <u>Koss :</u>	S AND RICK EI	<u>sin</u>	• •		ion Normal ent Needed	(V)	N N/	a N/A
	<u>, (</u> , )	1	> 1/a		An	y deviation	ns from SAP	Y	N	N/A
Sampler !	Signature	A	1º	$\mathcal{T}$	Se	diment Thio	ckness Chec	ked Y	N	N/A
Historica	l Data: Averag	ge of sampl	ing events							
Constit	uent		Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
рН			S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
	Conductance	9	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total W	/ell Depth		ft	Level						

	Onics	INLAN T	IVIVV-2	14144-2	14144-4	14144-2	I TALAR-2
pН	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769
Total Well Depth	ft	Level					
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92
Average GW Drop	ft						
							-

DON'T

SAMPLE

mL

2 System Volumes

(Min Purged Amount)



800

800

800

800

800

7.86

				Field	Samplir	ng Log		2		
Facility:	Asbury	CCR (Permit #		)	Мо		elf ID: MW		Field Bla	-1.
	formation:					1	Blind D		ј пека вка	пк [].
Method	of Well Purge	: Peristaltic P	-		10-0	Ť				
		Actual Pu	ge Volume	Removed:	(200	mL post	pump calib			
		<u>11-</u> 11						20 @	<u>a</u>	
Well Pur	ged To Dryne	ss?: Y / N		Petro	leum or Ga	as Detected	I? Y / N			
Purge Da	ata:									
Time	Purge Rate (mL/min)	Cumulative Volume ( mL )	Temp. (°C)	. рН (SU)	Condu	cific ictivity /cm)	Dissolved Oxygen ( mg/L )	ORP ( MV)		Other (Color, Clarity, Odor)
2:16	200	600	16.09	5,97	103	34 .	5.17	76.5		Clouders
918		1000	16.05	5.30	103	8	3,40	72.0		0
:20		1400	16,00	5.71	103	9 0	2.66	69.2		
0.22		1800	15.95	5.68	103		2.28	64.0		
								1.0		
		0	195	~		eld Inspecti	ion	Good	Fair	Poor
Time san	npled		10/			ccess ad Conditio	n	e e	F F	P P
		Ma A	Var	A		asing Condit ocking Cap &		G	F	P
Weather	Conditions	lese	101		Ri	ser Conditio	on	G	F	P
		172				eld Inspecti ell ID Visibl		Yes Y	No	N/A
Water Le	vel Start	lold			St	anding Wat	er	(A)	(N	N/A
		176	(			ear of Weed easuring Po		(Y)	N	N/A N/A
Water Le	vel Finish	6069			Sp	lit sample v	with MDNR	Y	N	N/A
							Performed tion Normal	X		N/A N/A
Name (M	EC Field Sam	oler): <u>Ross S an</u>	d Rick Elgir	1	Equipme	ent Calibrat	ion Normal	Ø		/A
		T	11	2 '		edevelopme by deviation		Y Y	N N	N/A N/A
Sampler S	Signature	$\mathcal{A}$	D	1-		•	ckness Check		N.	N/A
Historical	Data: Averas	ge of sampling	events						$\sim$	
Constit			Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
рН			S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72

Constituent	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pН	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes		DON'T	000	800	800	800	800	800
(Min Purged Amount)	mL	SAMPLE	800					

	Facility:	Asbury	CCR (Permit #		)	Mc	onitoring W			-	
	Durge In	formation:					Sample	Blind D	ouplicate	Field Bla	ank 🔄.
	-		e: Peristaltic Pu	mp with 3	3/8 - inch Di	ameter Ti	ubing	с <u>х</u>			
		0		-		10 000	+				
			Actual Pure	ge Volume	Removed:	1600	mL pos	st pump calib	ration .		
	Date / Ti	me Initiated:	11 10	-20 @ `	3:5	7 Data (	Time Com	pleted: <u>11</u> -	10-20	-	
	Date / II	me minateu.		-20 @	U. ar	1			)	<u>a</u>	
	Well Pur	ged To Dryne	ss?: Y/N)		7 · Petro	leum or G	as Detecte	ed? Y/N		1	/
		<sub>ita:</sub> 50 r	1. Eak				vte			1/1/4	CAA.
ſ	Purge Da		y minu-			7 30		aup		10/-	) [ [
		Durge						V		C	Other
		Purge Rate	Cumulative	_			cific	Dissolved			(Color,
	Time	(mL/min)	Volume	Temp.				Oxygen	ORP		Clarity,
11.00	Time to		(mL)	(°C)	(SU)	(ms	/cm)	( mg/L )	(MV)		Odor)
4:03	X:5/8	200	600	19.0	56.91	12	18	2167	30,10		Clarder
:05	400		1000	15.10	6.80	14	63	1.84	27.1	T	4
:07	:02		1400	15.0-	76.20	15	06	1.24	14.5		
N.	/AV		1600	15.02	6.81	15	26	1.73	802	-	V
	/ × ×			- tog	0.00				007		- V
L						Fi	eld Inspec	tion	Good	<u> </u>	Poor
			14	i i M			ccess		G	F	P
	Time sam	npled	7	10			ad Conditio	on	G	F	P
			1.1		NI		asing Cond		G	F	P
			1 della	1109	1 sil		ocking Cap		G	F	Р
	Weather	Conditions	Min cg	901	000	Ri	ser Condit	tion	G	F	Р
			1 01	1	6		eld Inspec		Yes	Na	<u>N/A</u>
			601				ell ID Visik		Y	N	N/A
	Water Le	vel Start	0000				anding Wa		X	(N	N/A
			11/11/	0			ear of We		(A)	N	N/A
	Mahau La	and the factor	11070				easuring P		Q	N	7
	water Le	vel Finish						with MDNR	Y	<u> </u>	N/A
								e Performed			N/A
	Name (M	EC Field Sam	pler): <u>Ross S anc</u>	Dick Elgin				ation Normal ation Normal	m		N/A
	itanic (iti	cerreia sam		I MILA LIGIT	~			nent Needed	MAN		N/A
			T	1/20				ons from SAP	Y	K	N/A
	Sampler S	Signature	18	eg				ickness Chec		N	N/A
			T		)						
	Historical	Data: Averag	ge of sampling e	vents							
	Constit	uent	C	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
	рН			S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
		Conductance	e um	hos/cm	GW	0.786	1.132	2.083	0.841	1.769	.1.900
		ell Depth		ft	Level						
	Average	e GW Depth		ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
		e GW Drop		ft						ø	
		m Volumes		mL	DON'T	800	800	800	800	800	800
	(Min Pu	rged Amount	:)		SAMPLE	000					

Facility:	Asbury	CCR (Perm	it #	)	Mo		ell ID: MV		K	. 🗔
-	formation: of Well Purge		ic Pump with			bing	Blind I	3:	Field Bla	nk [].
		Actual	Purge Volume	Removed:	2000	mL post	t pump calib	oration .		
Date / Ti	me Initiated:	/	-20 @	3:18				- 10-20	<u>@</u>	
Well Pur	ged To Dryne	1. 2	Ø	Petro	leum or Ga	s Detected	d? Y / N	)		
Purge Da	ata: 0	ml/r	mint							
Time	Purge Rate (mL/min)	Cumulat Volum ( mL		pH (SU)	Spe Condu (mS/	ctivity	Dissolved Oxygen ( mg/L )	ORP ( MV)		Other (Color, Clarity, Odor)
3824	200	120	0 16.0	3767	7	0	565	22.0		С
:26		140	0 15.8	37.63	76	1.	5,40	2207	-	
128		160	0 15.8	5 Falal	74	18 4	5,16	23.1		
:36		2001	) 15.8	2 7.60	73	ğ.	499	23.7		
				1100			6	5.1		
Time san Weather	npled	Mard	3:30	) Wini	Ac Pa Ca Lo	eld Inspect ccess d Conditio sing Condi cking Cap & ser Conditio	n tion & Lock	Good G G G G G G	<u>Fair</u> F F F F	Poor P P P P P
Water Le	vel Start	0	01		W	eld Inspect ell ID Visibl anding Wat ear of Wee	le ter	Yes Y	No N N	<b>N/A</b> N/A N/A N/A
Water Le	vel Finish	2, 0	$\mathcal{T}$		Sp Ma	aintenance	oint with MDNR Performed ation Norma	Y Y		N/A N/A N/A N/A
Name (M Sampler S		pler): <u>Ross s</u>	S and Rick Elgin	a	Equipme Re An	ent Calibrat developme y deviatior	tion Normal ent Needed ns from SAP ickness Chec	(Y) Y	N N N N	N/A N/A N/A N/A
Historica	<b>Data</b> : Avera	To of same	ing oversta	/						
Constit		5C UI Sallipi	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH			S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
	: Conductance	9	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
	ell Depth		ft	Level						

1.24

800

0.4

800

5.39

800

1.32

800

6.92

800

7.86

800

Only

DON'T

SAMPLE

ft

ft

mL

Average GW Depth

Average GW Drop

2 System Volumes

Facility:	cility: <u>Asbury CCR (Permit #</u> ) Monitoring Well ID: <u>MW-57</u>									
						Sample	Blind D	Duplicate	Field Bla	ank .
Purge In	formation:					7	~			
Method	of Well Purge	: Peristal	tic Pump with	3/8 - inch D	iameter Tu	bing				
		Actua	l Purge Volum	e Removed:	2200	mL post	t pump calib	ration .		
			0	DUIT						
Date / Ti	me Initiated:		-20 @	1.20	Date / '	Time Comp	oleted: <u>11</u> -	20	@	
Well Pur	ged To Dryne	ss?: Y /	N	Petro	oleum or Ga	s Detected	1? Y / N			
Purge Da	ata: 50 m l	Juin								
	/									Other
	Purge	Cumulat	tive		Spe	cific	Dissolved			(Color,
	Rate	Volum	e Temp	. рн	Condu		Oxygen	ORP		Clarity,
Time	(mL/min)	(mL	) (°C)	(SU)	(mS/	· · ·	(mg/L)	(MV)		Odor)
2:51	200	1000	1 15,30	_	330	08 .	1.66	59.1		C
: 5,3		1401	0 154	6.7.	3 .73-	12	1.30	43.0		
:55		120	0 15.4	26.72	330	13	198	21.6		
57		226	0 5.4	1670	339	9	1.82	22.4	/	
		MAG	0 0000			-	(100	0.001		
					Fi	eld Inspect	ion	Good	Fair	Poor
			1. 0.1			the mopere	TOTT.		1 611	
		0	J' 1 11		Ac	cess		G	F	P
Time san	npled	L	s: 00			cess d Conditio	n	G	F	P
Time san	npled		<u> </u>	- 1 - 1	Pa	d Conditio		G	F F F	P P P
Time san	npled			alard.	Pa Ca	d Conditions	tion	G G	F	P P P P
	Conditions	Lidy	40s (	"la di	– Pa Ca / Lo	d Conditio	tion & Lock	G	F	P P
		hidy	<u>405 (</u>	What when	Pa Ca Lo Ris	d Condition sing Condit cking Cap &	tion & Lock on	G G G	F F F F	P P P P
Weather	Conditions	hidy	9:00 40s ( 41'	la di	Pa Ca Lo Ris <b>Fie</b>	d Condition sing Condit cking Cap & ser Condition	tion & Lock on <u>ion</u>	G G G	F	P P P P
	Conditions	hidy 7.	<u>}: 00</u> 40s ( 42'	Why a	Pa Ca Lo Ris <u>Fic</u> W	d Condition sing Condit cking Cap & ser Condition eld Inspect	tion & Lock on ion e	G G G	F F F F	P P P P P <b>N/A</b>
Weather	Conditions	hidy 9.	<u>9:00</u> <u>405 (</u> 42'	'la di	Pa Ca Lo Ris Fie W Sta Cle	d Condition sing Condition cking Cap & ser Condition eld Inspection ell ID Visible anding Wate ear of Wee	tion & Lock on ion ter ter ds	G G G	F F F N N N	P P P N/A N/A N/A
Weather Water Le	Conditions	1 hidy 7, 15,0	<u>9:00</u> <u>40s (</u> 42'	'ady	Pa Ca Lo Ris Fie W Sta Cle	d Condition sing Condition cking Cap & ser Condition ell ID Visible anding Wat ear of Week easuring Po	tion & Lock on <b>ion</b> ter ds pint	G G G	F F F N N N	P P P N/A N/A N/A
Weather Water Le	Conditions	hidy 9.1	9:00 40s( 42' 02'	Why	Pa Ca Lo Ris Fie W Sta Cle Sp	d Condition sing Condition cking Cap & ser Condition ell ID Visible anding Wat ear of Week easuring Po lit sample v	tion & Lock on <b>ion</b> ter ds oint with MDNR	G G G	F F F F	P P P P N/A N/A N/A N/A N/A
Weather Water Le	Conditions	1 1 1 15.0	9:00 40s ( 42' 02'	'ady	Pa Ca Lo Ri: Fie W St: Cle M Sp M	d Condition sing Condition cking Cap & ser Condition ell ID Visible anding Wate easuring Pol lit sample v aintenance	tion & Lock on <b>ion</b> le ter ds oint with MDNR Performed	G G G G G Ves	F F F N N N	P P P P N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le	Conditions	,	<u> </u>	'la di	Pa Ca Lo Ris Fie W Sta Cle Sp Ma De	d Condition sing Condition cking Cap & ser Condition ell ID Visible anding Wate easuring Wate easuring Pool lit sample wate aintenance contamina	tion & Lock on ion ter ds bint with MDNR Performed ition Normal	G G G G G Ves		P P P P N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le	Conditions	,	9:00 405( 42 02 S and Riek Elgin	Why and a second	Pa Ca Lo Ris Fie W W St: Clo Sp Clo Sp Mi De Equipme	d Condition sing Condition cking Cap & ser Condition ell ID Visible anding Wate easuring Por lit sample wate aintenance contamina ent Calibrat	tion & Lock on ion ter ds bint with MDNR Performed ition Normal	G G G G G G G G G G G G G G G G G G G		P P P N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le	Conditions	,	<u> </u>	2/w dy	Pa Ca Lo Ris Fie W W Cle St Cle Sp Mi Sp Equipme Re	d Condition ising Condition cking Cap & ser Condition ell ID Visible anding Wate easuring Wate easuring Pool lit sample wate aintenance contamina ent Calibrate development	tion & Lock on ion ter ds bint with MDNR Performed tion Normal cion Normal	G G G G G Ves		P P P P N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M	Conditions vel Start vel Finish IEC Field Samp	,	<u> </u>	Why and	Pa Ca Lo Ris Fie W W Sta Cle Sp Ma Sp Equipme Re An	d Condition ising Condition cking Cap & ser Condition ell ID Visible anding Wat ear of Week easuring Po- lit sample wat aintenance contamina ent Calibrat development y deviation	tion & Lock on ion ter ds bint with MDNR Performed tion Normal cion Normal ent Needed as from SAP	G G G G G G G G G G G G G G G G G G G		P P P N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M	Conditions	,	<u> </u>	Why and a start of the start of	Pa Ca Lo Ris Fie W W Sta Cle Sp Ma Sp Equipme Re An	d Condition ising Condition cking Cap & ser Condition ell ID Visible anding Wat ear of Week easuring Po- lit sample v aintenance contamina ent Calibrat development y deviation	tion & Lock on ion ter ds bint with MDNR Performed tion Normal cion Normal	G G G G G G G G G G G G G G G G G G G		P P P P N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S	Conditions vel Start vel Finish IEC Field Samp	oler): <u>Ross</u>	S and Rick Elgin	July J	Pa Ca Lo Ris Fie W W Sta Cle Sp Ma Sp Equipme Re An	d Condition ising Condition cking Cap & ser Condition ell ID Visible anding Wat ear of Week easuring Po- lit sample v aintenance contamina ent Calibrat development y deviation	tion & Lock on ion ter ds bint with MDNR Performed tion Normal cion Normal ent Needed as from SAP	G G G G G G G G G G G G G G G G G G G		P P P N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S	Conditions	oler): <u>Ross</u>	S and Rick Elgin	WW-1	Pa Ca Lo Ris Fie W W Sta Cle Sp Ma Sp Equipme Re An	d Condition ising Condition cking Cap & ser Condition ell ID Visible anding Wat ear of Week easuring Po- lit sample v aintenance contamina ent Calibrat development y deviation	tion & Lock on ion ter ds bint with MDNR Performed tion Normal cion Normal ent Needed as from SAP	G G G G G G G G G G G G G G G G G G G		P P P N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S	Conditions	oler): <u>Ross</u>	S and Rick Elgin	<u>j</u>	Pa Ca Lo Ris Fie W W Sta Cla Sp Ma Sp Ma Sp Ma Sp Ma Sp Se	d Condition ising Condition cking Cap & ser Condition ell ID Visible anding Wate easuring Wate easuring Wate easuring Pool lit sample wate aintenance contamina ent Calibrat development y deviation diment Thio	tion & Lock on ion ter ds pint with MDNR Performed tion Normal ent Needed ns from SAP ckness Chec	G G G G Y Y Y Y Y Ked Y		P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S Historica DH	Conditions	oler): <u>Ross</u>	S and Rick Elgin	MW-1	Pa Ca Lo Ris Fie W W Sta Cle M Sp Ma Sp Ma Sp Ma Sp Ma Sp Ma Sp	d Condition ising Condition cking Cap & ser Condition ell ID Visible anding Wate easuring Wate easuring Wate easuring Po- lit sample wate aintenance contamina ent Calibrat development y deviation diment Thion	tion & Lock on ion ter ds bint with MDNR Performed ation Normal ent Needed as from SAP ckness Chec	G G G G V Y Y Y Y Ked Y		P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S Historica Constit pH Specific	Conditions	oler): <u>Ross</u>	S and Rick Elgin ing events Units S.U.	MW-1 NO TEST	Pa Ca Lo Ris Fie W W Sta Cle M Sp Ma Sp Ma De Equipme Re An Se MW-2 5.83	d Condition sing Condition cking Cap & ser Condition ell ID Visible anding Wate easuring Wate easuring Pool lit sample wate aintenance contamina ent Calibrat development y deviation diment Thio MW-3 5.08	tion & Lock on ion ter ds bint with MDNR Performed ition Normal ent Needed as from SAP ckness Chec MW-4 6.30	G G G G Y Y Y Y Y Y X Y Ked Y Y X Y Y Y Y X Y Y Y Y Y Y Y Y Y Y Y	F F F F NO N N N N N N N N N N N N N N N	P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler S Historica Sampler S Historica DH Specific Total W	Conditions	oler): <u>Ross</u>	S and Rick Elgin ing events Units S.U. umhos/cm	MW-1 NO TEST GW	Pa Ca Lo Ris Fie W W Sta Cle M Sp Ma Sp Ma De Equipme Re An Se MW-2 5.83	d Condition sing Condition cking Cap & ser Condition ell ID Visible anding Wate easuring Wate easuring Pool lit sample wate aintenance contamina ent Calibrat development y deviation diment Thio MW-3 5.08	tion & Lock on ion ter ds bint with MDNR Performed ition Normal ent Needed as from SAP ckness Chec MW-4 6.30	G G G G Y Y Y Y Y Y X Y Ked Y Y X Y Y Y Y X Y Y Y Y Y Y Y Y Y Y Y	F F F F NO N N N N N N N N N N N N N N N	P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

DON'T

SAMPLE

mL

800

800

800

2 System Volumes

(Min Purged Amount)

1

800

800

Facility:	Asbury (	CCR (Perm	it #	nitoring W Sample	eli ID: <u>MW</u> Blind D	J- 🕢	Field Bla				
-	formation: of Well Purge	: Peristal	ic Pump with	3/8 - inch D	iameter Tu					2:40	)
		Actua	Purge Volume	e Removed:	pu	mL post	t pump calib	ration .			
Date / Ti	me Initiated:	<u>11- U</u>	-20 @ 0	2:24	_ Date / 1	Fime Comp	oleted: <u>11 -</u>	-10-20	<u>@</u>		
Well Pur	ged To Dryne	ss?: Y/	N	Petro	leum or Ga	s Detected	1? Y / N				
Purge Da	ata: 50 m	1/min	/								
Time	Purge Rate (mL/min)	Cumulat Volum ( mL		. pH (SU)	Spec Condu (mS/	ctivity	Dissolved Oxygen ( mg/L )	ORP ( MV)		Othe (Colo Clarit Odor	or, ty,
2:27	200	600	1 15.5	6 725	171	4	4.29	51.0		C	,
:29		1000	) 15.5	3 7.14	1 17 4	14	3,18	564		1	
131		140	1) 154	7 7 MI	175	-1	2.65	5107			
:35		120	0 154	a 1.01	175	-0	2 31	5del		ali	1
			V WOL	9 6.96		7	Q- 120	Vacu		¥	_
					EL.	lal la air a d		(D) = 1	Fals		
		$\sim$	175			eld Inspect	lon	Good	<u>Fair</u>	Poor	
Time sam	ipled				Pa	cess d Conditio		G	F	P P	
	Conditions	loudy	405	vinde	Pa Ca Lo Ris	d Conditio sing Condi cking Cap ser Conditi	tion & Lock on	G G G G	F F F	Р Р Р	
	Conditions _	?/00dy 9. 2	405 0'	vinde	Pa Ca Lo Ris Fie Va Sta	d Conditio sing Condi cking Cap ser Conditi eld Inspect ell ID Visibl anding Wa	tion & Lock on <u>ion</u> le ter	G G G	F F F No	P P P N/A N/A	
Weather Water Le	Conditions	1000 dy 9. 2 14. 0	405, 0' 7'	Vinde	Pa Ca Lo Ris Fie W/ Sta Cle Sp	d Conditio sing Condi cking Cap a ser Conditi eld Inspect ell ID Visible anding Wa ear of Wee easuring Po lit sample	tion & Lock on <b>ion</b> le ter ds oint with MDNR	G G G Yes	F F F	P P P <b>N/A</b> N/A N/A N/A	
Weather Water Le Water Le	Conditions vel Start vel Finish		405 0' 7'	Vinde	Pa Ca Lo Ris Fie Sta Cle Sp Ma De	d Conditio sing Condi cking Cap a ser Conditi eld Inspect anding Wa ear of Wee easuring Po lit sample antenance contamina	tion & Lock on i <u>ion</u> le ter ds oint with MDNR e Performed ation Normal	G G G Yes Y Y		P P P N/A N/A N/A N/A N/A N/A N/A	
Weather Water Le Water Le	Conditions vel Start vel Finish		405 0 7 Sand Rick Elgin	vinde	Pa Ca Lo Ris Fie Wa Sta Cle Sp Ma De Equipme	d Conditio sing Condi cking Cap a ser Conditi eld Inspect anding Wa ear of Wee easuring Po lit sample aintenance contamina ent Calibrat	tion & Lock on i <u>ion</u> le ter ds oint with MDNR e Performed ation Normal	G G G Yes Y Y		P P P N/A N/A N/A N/A N/A N/A	
Weather Water Le Water Le	Conditions vel Start vel Finish EC Field Samp			vinde	Pa Ca Lo Ris Fie Wa Sta Cle Ma Cle Ma Equipme Re An	d Conditio sing Condi cking Cap a ser Conditi eld Inspect ell ID Visible anding Wa ear of Wee easuring Po lit sample aintenance contamina ent Calibrat developme y deviation	tion & Lock on i <u>ion</u> le ter ds oint with MDNR e Performed ation Normal	G G G G Y Y Y Y Y Y Y Y Y		P P P N/A N/A N/A N/A N/A N/A N/A	
Weather Water Le Water Le Name (M Sampler S	Conditions vel Start vel Finish EC Field Samp Signature	oler): <u>Ross</u>	S and Rick Elgin	vindy	Pa Ca Lo Ris Fie Wa Sta Cle Ma Cle Ma Equipme Re An	d Conditio sing Condi cking Cap a ser Conditi eld Inspect ell ID Visible anding Wa ear of Wee easuring Po lit sample aintenance contamina ent Calibrat developme y deviation	tion & Lock on ion le ter oint with MDNR e Performed ation Normal ent Needed ns from SAP	G G G G Y Y Y Y Y Y Y Y Y		P P P N/A N/A N/A N/A N/A N/A	
Weather Water Le Water Le Name (M Sampler S	Conditions vel Start vel Finish EC Field Samp Signature Data: Average	oler): <u>Ross</u>	S and Rick Elgin		Pa Ca Lo Ris Fie Wa Sta Cle Sp Ma De Equipme Re An Sea	d Conditio sing Condi cking Cap a ser Conditi eld Inspect ell ID Visible anding Wa ear of Wee easuring Po- lit sample aintenance contamina ent Calibrat developme y deviation diment Thi	tion & Lock on ion le ter ods oint with MDNR e Performed ation Normal tion Normal ent Needed hs from SAP ickness Chec	G G G G Y Y Y Y Y Y Ked Y		P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	
Weather Water Le Water Le Name (M Sampler S Historica Constit	Conditions vel Start vel Finish EC Field Samp Signature Data: Average	oler): <u>Ross</u>	S and Rick Elgin	 MW-1	Pa Ca Lo Ris Fie Wa Sta Cle Ma De Equipme Re An Sec MW-2	d Conditio sing Condi cking Cap a ser Conditi eld Inspect ell ID Visible anding Wa ear of Wee easuring Po lit sample contamina ent Calibrat developme y deviation diment Thi	tion & Lock on ion le ter ods oint with MDNR e Performed ation Normal ent Needed hs from SAP ickness Chec	G G G G Y Y Y Y Y Y Ked Y	F F F NO N N N N N N N N N N N N N N N N	P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	
Weather Water Le Water Le Name (M Sampler S Historical DH	Conditions vel Start vel Finish EC Field Samp Signature Data: Averag	pler): <u>Ross</u>	S and Rick Elgin ing events Units S.U.	MW-1 NO TEST	Pa Ca Lo Ris Fie W/ Sta Cle Me Sp Ma De Equipme Re An Sec MW-2 5.83	d Conditio sing Condi cking Cap a ser Conditi eld Inspect ell ID Visible anding Wa ear of Wee easuring Po lit sample aintenance contamina ent Calibrat developme y deviation diment Thi MW-3 5.08	tion & Lock on ion le ter ods oint with MDNR e Performed ation Normal tion Normal ent Needed ns from SAP ickness Chec	G G G G Y Y Y Y Y Y Y Ked Y Ked Y	F F F NO N N N N N N N N N N N N N N N N	P P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	
Weather Water Le Water Le Name (M Sampler S Historica DH Specific	Conditions vel Start vel Finish EC Field Samp Signature Data: Average	pler): <u>Ross</u>	S and Rick Elgin	 MW-1	Pa Ca Lo Ris Fie Wa Sta Cle Ma De Equipme Re An Sec MW-2	d Conditio sing Condi cking Cap a ser Conditi eld Inspect ell ID Visible anding Wa ear of Wee easuring Po lit sample contamina ent Calibrat developme y deviation diment Thi	tion & Lock on ion le ter ods oint with MDNR e Performed ation Normal ent Needed hs from SAP ickness Chec	G G G G Y Y Y Y Y Y Ked Y	F F F NO N N N N N N N N N N N N N N N N	P P P N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	

5.39 ft Only 1.24 0.4 1.32 6.92 7.86 ft 800 DON'T 800 800 800 800 mL 800 SAMPLE

Average GW Drop

2 System Volumes

Facility	/: Asbury (	CCR (Perm	it #	)	Мо	nitoring W	ell ID: <b>MV</b>	V- GA		
						Sample	Blind D	Duplicate	Field Blan	<b>k</b> .
_	Information:			_		(				
Metho	d of Well Purge	e: Peristali	ic Pump with	3/8 - inch D	iameter Tu	bing				
		Actua	Purge Volum	e Removed:	2000	mL post	t pump calib	ration.		
Date /	Time Initiated:	5- (		1:52	Date /	Fime Comp	oleted: <u>5</u> –	10 -20- (	<u>@</u>	
	urged To Dryne			Petro	oleum or Ga	is Detected	d? Y / 🔊			
Purge	Data: 50	mb/n	lin						1	
Time	Purge Rate (mL/min)	Cumulat Volum ( ml	e Temp	. рН (SU)	Condu	cific ctivity /cm)	Dissolved Oxygen ( mg/L )	ORP ( MV)		Other (Color, Clarity, Odor)
1:56	200 /	2 no	11 9	971	7 11.4	6	5 15	4.20	1	A
100	200	800	1000	1 6:0			JIN	117		
- 29		isa	1612	6 1.19	169	1 9	0.02	Tord		
2:00		1600	) (6.2	4710	16-	39	4,85	44.1		
:02	•	200	0 16.14	1 7.09	162	7	4.72	45.3		
							<u>e</u>			
h		he	1.00		Fi	eld inspect	tion	Good	Fair	Poor
			Q:05	)		cess		G	F	Р
Time s	ampled	1 C				d Conditio		G	F	Р
		1 1	115 /	111		ising Condi cking Cap a		G G	F	P
Weath	er Conditions	had	756	100 m		ser Conditi		G	F	P
			. /	0		eld Inspect		Yes	No	<u>N/A</u>
		S	41			ell ID Visibl		Y	N	N/A
Water	Level Start		<i>v</i>			anding Wa		X	(N/	N/A
		18.4	151			ear of Wee easuring Po		(V)	N N	N/A
Water	Level Finish	$( \cup i )$				-	with MDNR	Y	N	N/A N/A
							e Performed	Y	N	N/A
					De	contamina	ation Norma	I 🔨	N	N/A
Name (	MEC Field Sam	pler): <u>Ross</u>	S and Rick Elg	in			alibration No	ormai Y	N	N/A
			1	1 2		-	ent Needed	KARD-		N/A
Sample	r Signature		NE	1			ns from SAP ickness Chec	ked Y	N N	N/A N/A
-			10	1				incu i		14773
	cal Data: Averag	ge of samp	I manual second s	: 5/16 + 6/1	7					
	tituent		Units	MW-6A	MW-7					
pH			S.U.	6.87	6.12					
	fic Conductance	9	umhos/cm	1.601	2.699					
	Well Depth		ft	7.00	2.04					
	age GW Depth age GW Drop		ft ft	7.28	3.04					
Avera	Be an nich		IL							

Y

800

800

mL

2 System Volumes

				Field	Sampling Log	5	$\sim$		
Facility:	Asbury (	CCR (Permit	#	)		Well ID: MV			
-	formation: of Well Purge	: Peristalti	: Pump with :	3/8 - inch D	Samp iameter Tubing	le 🔀 🛛 Blind [	Duplicate	Field Blank	<u> </u> .
	Ū		·	-	-				
				~	mL g	ost pump calib	ration.		
Date / T	ime Initiated:	5- /	-20 @ (	1:28	Date / Time Co	ompleted: <u>5 –</u>	10 <sub>-20- @</sub>	)	
Well Pur	ged To Dryne	ss?: Y/K	3 /	Petro	leum or Gas Dete	cted? Y / 🔊			
Purge D	ata: <u>50</u>	up/	nIN		1				
Time	Purge Rate (mL/min)	Y Cumulati Volume ( ml	Temp.	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen ( mg/L )	ORP ( MV)		Other (Color, Clarity, Odor)
1:31	¥ 200		16.80	7.01	2557	807	326		10
:34			11.71	190	2549	7:32	28.7		Ĭ
-7 6			16.7	36.89	11546	198	101		
137			1000		1655	610	2/01		1
101			160 %	36.8	2333	5:03	2413		V I
			e. 10		Field Insp	ection	Good	<u>Fair</u>	Poor
			1: UN		Field Insp Access	ection	G	<u>Fair</u> F	Poor P
Time sar	npled	l	:40		Access Pad Cond	ition	G		
		l	1:40	1500	Access Pad Cond Casing Co	ition ndition	G	F	P P P
(A	·B.)	11):	1:40 1. 4	150	Access Pad Cond Casing Co Locking C	ition ndition ap & Lock	G	F F F	P P P P
(A		Wire	1;40 1y, 4	15° Ci	Access Pad Cond Casing Co Locking C Riser Con	ition ndition ap & Lock dition	<b>a</b> <b>b</b> <b>a</b> <b>a</b>	F	P P P P
(A	·B.)	Wird	1;40 Ly, y	1500	Access Pad Cond Casing Co Locking C Riser Con Field Insp	ition ndition ap & Lock dition <u>ection</u>	<b>a</b> <b>b</b> <b>a</b> <b>a</b>	F F F	P P P P <u>N/A</u>
(A) Weather	Conditions	Wite	1; 40 1y, 4	15° Ci	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V	ition ndition ap & Lock dition <u>ection</u> isible	G G G V E S V E S V E S	F F F F	P P P P <u>N/A</u> N/A
(A) Weather	·B.)	Wii Wii 5.03	1;40 14,4 3	15° C	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing	ition ndition ap & Lock dition ection isible Water	<b>a</b> <b>b</b> <b>a</b> <b>a</b>	F F F No	P P P P <u>N/A</u> N/A
(A) Weather	Conditions	Wii 5.0	1;40 14, 4 3	15° C	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V	ition ndition ap & Lock dition dition ection sible Water Veeds	G G G V E S V E S V E S	F F F V V	P P P <u>N/A</u> N/A N/A N/A
('A Weather Water Le	Conditions_	Uii 5.0 5.20	(; 40 -4, 4 3	15° C	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin	ition ndition ap & Lock dition ection sible Water Veeds g Point	G G G G G G G G G G G G G G G Y S Y	F F F No	P P P <u>N/A</u> N/A N/A N/A
('A Weather Water Le	Conditions	U Wii 5.0 5.20	1;40 14, 4 3	15° C	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam	ition ndition ap & Lock dition ection sible Water Veeds g Point ole with MDNR	G G G G G G G G G G G G G G G G G G G	F F F F N R R N N	P P P M/A N/A N/A N/A N/A N/A
('A Weather Water Le	Conditions_	Uii 5.20	1;40 14, 4 3	15° C	Access Pad Cond Casing Co Locking Co Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena	ition ndition ap & Lock dition ection sible Water Veeds g Point	Y Y Y Y Y Y Y	F F F V V	P P P N/A N/A N/A N/A N/A N/A N/A
(A Weather Water Le	Conditions_	Wii 5.0 5.20	4, 4 3	15° (1	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split samp Maintena Decontan	ition andition ap & Lock dition ection sible Water Veeds g Point ole with MDNR nce Performed	I	F F F F N R R N N	P P P M/A N/A N/A N/A N/A N/A
(A Weather Water Le	Conditions_ evel Start	Wii 5.0 5.20	4, 4 3	15°C	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split samp Maintena Decontan Equipmen	ition andition ap & Lock dition ection isible Water Veeds g Point ole with MDNR nce Performed nination Norma	I ormal	F F F F N R R N N	P P P P N/A N/A N/A N/A N/A N/A N/A
(A Weather Water Le Name (N	Conditions evel Start evel Finish 1EC Field Samp	Wii 5.0 5.20	4, 4 3	15° (1	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena Decontan Equipmen Redevelo Any devia	ition ndition ap & Lock dition ection sible Water Veeds g Point ble with MDNR nce Performed nination Norma nt Calibration N pment Needed tions from SAP	I ormal	F F F F F N Z N N Z N N	P P P P <u>N/A</u> N/A N/A N/A N/A N/A N/A N/A
(A Weather Water Le Name (N	Conditions_ evel Start	Wii 5.0 5.20	4, 4 3	15° (1	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena Decontan Equipmen Redevelo Any devia	ition ndition ap & Lock dition <u>ection</u> isible Water Veeds g Point ble with MDNR nce Performed nination Norma at Calibration N poment Needed	I ormal	F F F F F N Z N N Z N N	P P P P N/A N/A N/A N/A N/A N/A N/A N/A
(A) Weather Water Le Name (N Sampler	Conditions_ evel Start evel Finish IEC Field Samp Signature	With $5.20^{\circ}$ pler): Ross S	and Bick Elgi	j-	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split samp Maintena Decontan Equipmer Redevelo Any devia Sediment	ition ndition ap & Lock dition ection sible Water Veeds g Point ble with MDNR nce Performed nination Norma nt Calibration N pment Needed tions from SAP	I ormal	F F F F F N Z N N Z N N	P P P P <u>N/A</u> N/A N/A N/A N/A N/A N/A N/A
(A) Weather Water Le Name (N Sampler	Conditions evel Start evel Finish IEC Field Samp Signature il Data: Average	With $5.20^{\circ}$ pler): Ross S	and Bick Elgi	5/16 + 6/17	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena Decontan Equipmer Redevelo Any devia Sediment	ition ndition ap & Lock dition ection sible Water Veeds g Point ble with MDNR nce Performed nination Norma nt Calibration N pment Needed tions from SAP	I ormal	F F F F F N Z N N Z N N	P P P P <u>N/A</u> N/A N/A N/A N/A N/A N/A N/A
(A Weather Water Le Name (N Sampler Historica	Conditions evel Start evel Finish IEC Field Samp Signature il Data: Average	With $5.20^{\circ}$ pler): Ross S	and Bick Elgi	5/16 + 6/17 MW- 6A	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena Decontan Equipmen Redevelo Any devia Sediment	ition ndition ap & Lock dition ection sible Water Veeds g Point ble with MDNR nce Performed nination Norma nt Calibration N pment Needed tions from SAP	I ormal	F F F F F N Z N N Z N N	P P P P <u>N/A</u> N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler Historica DH	Conditions evel Start evel Finish IEC Field Samp Signature il Data: Average	With 5,0 5,20 pler): Ross S	and Bick Elgi rg events for: Units	5/16 + 6/17	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena Decontan Equipmer Redevelo Any devia Sediment	ition ndition ap & Lock dition ection sible Water Veeds g Point ble with MDNR nce Performed nination Norma nt Calibration N pment Needed tions from SAP	I ormal	F F F F F N Z N N Z N N	P P P P <u>N/A</u> N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler Historica Constit PH Specifi	Conditions evel Start evel Finish IEC Field Samp Signature I Data: Average tuent	With 5,0 5,20 pler): Ross S	and Bick Elging rg events for: Units S.U.	5/16 + 6/17 MW- 6A 6.87	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena Decontan Equipmer Redevelo Any devia Sediment	ition ndition ap & Lock dition ection sible Water Veeds g Point ble with MDNR nce Performed nination Norma nt Calibration N pment Needed tions from SAP	I ormal	F F F F F N Z N N N Z N N	P P P P <u>N/A</u> N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler Historica Specifi Total V	Conditions_ evel Start evel Finish AEC Field Samp Signature I Data: Average tuent c Conductance	With 5,0 5,20 pler): Ross S	and Bick Elgi rg events for: Units S.U. umhos/cm	5/16 + 6/17 MW- 6A 6.87	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena Decontan Equipmer Redevelo Any devia Sediment	ition ndition ap & Lock dition ection sible Water Veeds g Point ble with MDNR nce Performed nination Norma nt Calibration N pment Needed tions from SAP	I ormal	F F F F F N Z N N N Z N N	P P P P <u>N/A</u> N/A N/A N/A N/A N/A N/A N/A
Weather Water Le Water Le Name (M Sampler Historica DH Specifi Total V Averag	Conditions evel Start evel Finish AEC Field Samp Signature al Data: Average tuent c Conductance Vell Depth	With 5,0 5,20 pler): Ross S	and Bick Elgi ng events for: Units S.U. umhos/cm ft	5/16 + 6/17 MW- 6A 6.87 1.601	Access Pad Cond Casing Co Locking C Riser Con Field Insp Well ID V Standing Clear of V Measurin Split sam Maintena Decontan Equipmer Redevelo Any devia Sediment	ition ndition ap & Lock dition ection sible Water Veeds g Point ble with MDNR nce Performed nination Norma nt Calibration N pment Needed tions from SAP	I ormal	F F F F F N Z N N N Z N N	P P P P <u>N/A</u> N/A N/A N/A N/A N/A N/A N/A

1	1
1	
1	1

800

800

mL



**APPENDIX 4** 

Analytical Results from Lab

# 🛟 eurofins

# Environment Testing America

# **ANALYTICAL REPORT**

## Eurofins TestAmerica, Pittsburgh 301 Alpha Drive RIDC Park Pittsburgh, PA 15238 Tel: (412)963-7058

# Laboratory Job ID: 180-113553-1

Client Project/Site: Asbury Ash Pond Sampling Event: Asbury Ash Pond

# For:

Midwest Environmental Consultants 2009 East McCarty Street Suite 2 Jefferson City, Missouri 65101

Attn: Mr. Rick Elgin

athy Gartner

Authorized for release by: 11/30/2020 11:20:01 AM

Cathy Gartner, Project Manager II (615)301-5041 Cathy.Gartner@Eurofinset.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

PA Lab ID: 02-00416



Visit us at: www.eurofinsus.com/Env

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### Job ID: 180-113553-1

### Laboratory: Eurofins TestAmerica, Pittsburgh

### Narrative

Job Narrative 180-113553-1

### Comments

No additional comments.

### Receipt

The samples were received on 11/12/2020 9:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.1° C and 3.3° C.

### GC Semi VOA

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

### Metals

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

### Field Service / Mobile Lab

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

### **General Chemistry**

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

# Qualifiers

4
5
0
8
9

# **Accreditation/Certification Summary**

**Identification Number** 

19-033-0

PH-0688

E871008

004375

E-10350

162013

04041

KY98043

PA00164

PA00164

2030

PA005

11182

R-227

89014

058448

10043

998027800

142

P-Soil-01

PA-2151

02-00416

LAO00362

T104704528

P330-16-00211

PA001462019-8

434

042-999-482

PA 02-00416

2891

**Expiration Date** 

06-27-21

04-30-21

09-30-20

06-30-21

04-30-21

06-30-21

01-31-21

04-30-21

12-31-20 06-30-21

03-06-22

12-31-20

07-31-21

04-05-21

06-30-21

04-01-21

12-31-21

04-30-21

02-06-21

04-30-21

12-31-20

04-30-21

03-31-21

07-31-21

06-26-22

06-26-22

05-31-21

09-14-21

02-01-21

08-31-21

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

Program

State

State

State

State

NELAP

NELAP

NELAP

State

State

State

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NELAP

State

State

NELAP

NELAP

State

State

NELAP

Federal

NELAP

NELAP

State

State

**US Federal Programs** 

**US Federal Programs** 

**Client: Midwest Environmental Consultants** Project/Site: Asbury Ash Pond

Authority

California

Florida

Georgia

Illinois

Kansas

Louisiana

Minnesota

New Jersey

North Dakota

Pennsylvania

Rhode Island

South Carolina

US Fish & Wildlife

West Virginia DEP

New York

Oregon

Texas

USDA

USDA

Virginia

Wisconsin

Utah

Nevada

Maine

Kentucky (UST)

Kentucky (WW)

New Hampshire

North Carolina (WW/SW)

Connecticut

Arkansas DEQ

Laboratory: Eurofins TestAmerica, Pittsburgh

Job ID: 180-113553-1

# 5

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Sample Summary

### Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond

ab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset
80-113553-1	MW-2	Water	11/10/20 16:40	11/12/20 09:00	
80-113553-2	MW-3	Water	11/10/20 14:25	11/12/20 09:00	
80-113553-3	MW-4	Water	11/10/20 16:10	11/12/20 09:00	
80-113553-4	MW-5	Water	11/10/20 15:30	11/12/20 09:00	
30-113553-5	MW-5A	Water	11/10/20 15:00	11/12/20 09:00	
0-113553-6	MW-6	Water	11/10/20 14:35	11/12/20 09:00	
0-113553-7	MW-6A	Water	11/10/20 14:05	11/12/20 09:00	
0-113553-8	MW-7	Water	11/10/20 13:40	11/12/20 09:00	
0-113553-9	Duplicate	Water	11/10/20 15:35	11/12/20 09:00	
0-113553-10	Field Blank	Water	11/10/20 14:40	11/12/20 09:00	

# **Method Summary**

### Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 9040C	рН	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
Field Sampling	Field Sampling	EPA	TAL PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Matrix: Water

Lab Sample ID: 180-113553-1

### Client Sample ID: MW-2 Date Collected: 11/10/20 16:40 Date Received: 11/12/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrumen	EPA 9056A t ID: CHICS2100B		1			338140	11/23/20 12:16	EPS	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis Instrumen	EPA 6020A tt ID: NEMO		1			337906	11/19/20 17:43	RJR	TAL PIT
Total/NA	Analysis Instrumen	EPA 9040C t ID: NOEQUIP		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis Instrumen	SM 2540C t ID: NOEQUIP		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
Total/NA	Analysis Instrumen	Field Sampling t ID: NOEQUIP		1			337272	11/10/20 17:40	FDS	TAL PIT

### Client Sample ID: MW-3 Date Collected: 11/10/20 14:25 Date Received: 11/12/20 09:00

# Lab Sample ID: 180-113553-2

Matrix: Water

5

8

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis Instrument	EPA 9056A ID: CHICS2100B		1			338140	11/23/20 12:49	EPS	TAL PIT
Total/NA	Analysis Instrument	EPA 9056A ID: CHICS2100B		5			338140	11/23/20 13:05	EPS	TAL PIT
Total Recoverable Total Recoverable	Prep Analysis Instrument	3005A EPA 6020A t ID: NEMO		1	50 mL	50 mL	337453 337906	11/17/20 15:33 11/19/20 17:46		TAL PIT TAL PIT
Total/NA	Analysis Instrument	EPA 9040C t ID: NOEQUIP		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis Instrument	SM 2540C t ID: NOEQUIP		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
Total/NA	Analysis Instrument	Field Sampling t ID: NOEQUIP		1			337272	11/10/20 15:25	FDS	TAL PIT

### Client Sample ID: MW-4 Date Collected: 11/10/20 16:10 Date Received: 11/12/20 09:00

### Lab Sample ID: 180-113553-3 Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrumer	EPA 9056A nt ID: CHICS2100B		1			338140	11/23/20 13:22	EPS	TAL PIT
Total/NA	Analysis Instrumer	EPA 9056A nt ID: CHICS2100B		10			338140	11/23/20 13:38	EPS	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis Instrumer	EPA 6020A nt ID: NEMO		1			337906	11/19/20 17:48	RJR	TAL PIT
Total/NA	Analysis Instrumer	EPA 9040C nt ID: NOEQUIP		1			338342	11/24/20 09:55	AVS	TAL PIT

### **Client Sample ID: MW-4** Date Collected: 11/10/20 16:10 Date Received: 11/12/20 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analvst	Lab
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337288	11/16/20 12:08		TAL PIT
Total/NA	Analysis Instrumer	Field Sampling nt ID: NOEQUIP		1			337272	11/10/20 17:10	FDS	TAL PIT

### **Client Sample ID: MW-5** Date Collected: 11/10/20 15:30 Date Received: 11/12/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrument	EPA 9056A ID: CHICS2100B		1			338140	11/23/20 13:55	EPS	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis Instrument	EPA 6020A ID: NEMO		1			337906	11/19/20 17:51	RJR	TAL PIT
Total/NA	Analysis Instrument	EPA 9040C ID: NOEQUIP		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis Instrument	SM 2540C ID: NOEQUIP		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
Total/NA	Analysis Instrument	Field Sampling		1			337272	11/10/20 16:30	FDS	TAL PIT

### **Client Sample ID: MW-5A** Date Collected: 11/10/20 15:00 Date Received: 11/12/20 09:00

### Batch Batch Dil Initial Final Batch Prepared Method Prep Type Туре Run Factor Amount Amount Number or Analyzed Analyst Lab Total/NA Analysis EPA 9056A 2.5 338140 11/23/20 14:27 EPS TAL PIT Instrument ID: CHICS2100B Total/NA Analysis EPA 9056A 25 338140 11/23/20 14:44 EPS TAL PIT Instrument ID: CHICS2100B **Total Recoverable** 3005A 50 mL 50 mL 337453 11/17/20 15:33 TJO TAL PIT Prep Total Recoverable Analysis EPA 6020A 1 337906 11/19/20 17:59 RJR TAL PIT Instrument ID: NEMO Total/NA Analysis EPA 9040C 338342 11/24/20 09:55 AVS TAL PIT 1 Instrument ID: NOEQUIP Total/NA Analysis SM 2540C 1 25 mL 100 mL 337288 11/16/20 12:08 GRB TAL PIT Instrument ID: NOEQUIP Total/NA Analysis Field Sampling 337272 11/10/20 16:00 FDS TAL PIT 1 Instrument ID: NOEQUIP

### Lab Sample ID: 180-113553-3 Matrix: Water

Lab Sample ID: 180-113553-4

Lab Sample ID: 180-113553-5

Matrix: Water

Matrix: Water

**Matrix: Water** 

### **Client Sample ID: MW-6** Date Collected: 11/10/20 14:35 Date Received: 11/12/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrument	EPA 9056A ID: CHICS2100B		1			338140	11/23/20 17:43	EPS	TAL PIT
Total/NA	Analysis Instrument	EPA 9056A ID: CHICS2100B		10	1 mL	1.0 mL	338140	11/23/20 18:00	EPS	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis Instrument	EPA 6020A ID: NEMO		1			337906	11/19/20 18:01	RJR	TAL PIT
Total/NA	Analysis Instrument	EPA 9040C ID: NOEQUIP		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis Instrument	SM 2540C ID: NOEQUIP		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 15:35	FDS	TAL PIT

### **Client Sample ID: MW-6A** Date Collected: 11/10/20 14:05 Date Received: 11/12/20 09:00

Instrument ID: NOEQUIP

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrumen	EPA 9056A t ID: CHICS2100B		1			338140	11/23/20 18:49	EPS	TAL PIT
Total/NA	Analysis Instrumen	EPA 9056A t ID: CHICS2100B		10			338140	11/23/20 19:05	EPS	TAL PIT
Total Recoverable Total Recoverable	Prep Analysis Instrumen	3005A EPA 6020A t ID: NEMO		1	50 mL	50 mL	337453 337906	11/17/20 15:33 11/19/20 18:04		TAL PIT TAL PIT
Total/NA	Analysis Instrumen	EPA 9040C t ID: NOEQUIP		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis Instrumen	SM 2540C t ID: NOEQUIP		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
Total/NA	Analysis Instrumen	Field Sampling t ID: NOEQUIP		1			337272	11/10/20 15:05	FDS	TAL PIT

### **Client Sample ID: MW-7** Date Collected: 11/10/20 13:40 Date Received: 11/12/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			338140	11/23/20 19:21	EPS	TAL PIT
	Instrumer	nt ID: CHICS2100B								
Total/NA	Analysis	EPA 9056A		25			338140	11/23/20 19:38	EPS	TAL PIT
	Instrumer	nt ID: CHICS2100B								
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 18:06	RJR	TAL PIT
	Instrumer	nt ID: NEMO								

Eurofins TestAmerica, Pittsburgh

Lab Sample ID: 180-113553-8

# Lab Sample ID: 180-113553-7 Matrix: Water

Matrix: Water

### Job ID: 180-113553-1

**Matrix: Water** 

Matrix: Water

Lab Sample ID: 180-113553-8

Lab Sample ID: 180-113553-9

### Client Sample ID: MW-7 Date Collected: 11/10/20 13:40 Date Received: 11/12/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis Instrumer	SM 2540C at ID: NOEQUIP		1	50 mL	100 mL	337289	11/16/20 12:15	GRB	TAL PIT
Total/NA	Analysis Instrumer	Field Sampling t ID: NOEQUIP		1			337272	11/10/20 14:40	FDS	TAL PIT

### Client Sample ID: Duplicate Date Collected: 11/10/20 15:35 Date Received: 11/12/20 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrumen	EPA 9056A t ID: CHICS2100B		1			338140	11/23/20 19:54	EPS	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis Instrumen	EPA 6020A tt ID: NEMO		1			337906	11/19/20 18:09	RJR	TAL PIT
Total/NA	Analysis Instrumen	EPA 9040C t ID: NOEQUIP		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis Instrumen	SM 2540C t ID: NOEQUIP		1	100 mL	100 mL	337289	11/16/20 12:15	GRB	TAL PIT
Total/NA	Analysis Instrumen	Field Sampling t ID: NOEQUIP		1			337272	11/10/20 16:35	FDS	TAL PIT

### Client Sample ID: Field Blank Date Collected: 11/10/20 14:40 Date Received: 11/12/20 09:00

### Lab Sample ID: 180-113553-10 Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis Instrument	EPA 9056A ID: CHICS2100B		1			338140	11/23/20 22:05	EPS	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis Instrument	EPA 6020A ID: NEMO		1			337906	11/19/20 18:12	RJR	TAL PIT
Total/NA	Analysis Instrument	EPA 9040C ID: NOEQUIP		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis Instrument	SM 2540C ID: NOEQUIP		1	100 mL	100 mL	337289	11/16/20 12:15	GRB	TAL PIT

### Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond

Analyst References:

Lab: TAL PIT Batch Type: Prep TJO = Tyler Oliver Batch Type: Analysis AVS = Abbey Smith EPS = Evan Scheuer FDS = Sampler Field GRB = Gabriel Berghe RJR = Ron Rosenbaum

Job ID: 180-113553-1

### Client Sample ID: MW-2 Date Collected: 11/10/20 16:40 Date Received: 11/12/20 09:00

# Lab Sample ID: 180-113553-1

Matrix: Water

Method: EPA 9056A - Anion			ы	MDI	Unit	Б	Drepared	Apolyzod	
Analyte		Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fac
Chloride	120		1.0		mg/L			11/23/20 12:16	1
Fluoride	0.39		0.10	0.044	0			11/23/20 12:16	1
Sulfate	56		1.0	0.38	mg/L			11/23/20 12:16	1
Method: EPA 6020A - Metals	s (ICP/MS) - To	otal Recover	rable						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	37		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:43	1
Boron	0.16		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:43	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	430		10	10	mg/L			11/16/20 12:08	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	6.7	HF	0.1	0.1	SU			11/24/20 09:55	1
Method: Field Sampling - Fi	eld Sampling								
Analyte	· · ·	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac

**Client: Midwest Environmental Consultants** Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Lab Sample ID: 180-113553-2

# **Client Sample ID: MW-3** Date Collected: 11/10/20 14:25

Method: EPA 9056A - Anior	ns, Ion Chroma	atography							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	62		1.0	0.32	mg/L			11/23/20 12:49	1
Fluoride	0.14		0.10	0.044	mg/L			11/23/20 12:49	1
Sulfate	530		5.0	1.9	mg/L			11/23/20 13:05	5
Method: EPA 6020A - Metal	s (ICP/MS) - To	otal Recover	rable						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	92		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:46	1
Boron	0.056	J	0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:46	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	860		10	10	mg/L			11/16/20 12:08	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	5.9	HF	0.1	0.1	SU			11/24/20 09:55	1
Method: Field Sampling - F	ield Sampling								
Analyte	· · ·	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.68				SU			11/10/20 15:25	1

Matrix: Water

Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond Job ID: 180-113553-1

Matrix: Water

Lab Sample ID: 180-113553-3

### Client Sample ID: MW-4 Date Collected: 11/10/20 16:10 Date Received: 11/12/20 09:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.4		1.0	0.32	mg/L			11/23/20 13:22	1
Fluoride	0.093	J	0.10	0.044	mg/L			11/23/20 13:22	1
Sulfate	550		10	3.8	mg/L			11/23/20 13:38	10
Method: EPA 6020A - Metals	s (ICP/MS) - To	otal Recover	able						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	230		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:48	1
Boron	0.039	J	0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:48	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1800		10	10	mg/L			11/16/20 12:08	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	7.1	HF	0.1	0.1	SU			11/24/20 09:55	1
Method: Field Sampling - Fi	eld Sampling								
Analyte	• •	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.80				SU			11/10/20 17:10	1

Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond Job ID: 180-113553-1

Matrix: Water

9

Lab Sample ID: 180-113553-4

### Client Sample ID: MW-5 Date Collected: 11/10/20 15:30 Date Received: 11/12/20 09:00

Jate Received: 11/12/20 09:0 -									
Method: EPA 9056A - Anior									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.4		1.0	0.32	mg/L			11/23/20 13:55	1
Fluoride	0.27		0.10	0.044	mg/L			11/23/20 13:55	1
Sulfate	160		1.0	0.38	mg/L			11/23/20 13:55	1
- Method: EPA 6020A - Metal	s (ICP/MS) - To	otal Recove	rable						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	71		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:51	1
Boron	0.25		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:51	1
- General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	510		10	10	mg/L			11/16/20 12:08	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	7.9	HF	0.1	0.1	SU			11/24/20 09:55	1
- Method: Field Sampling - F	ield Sampling								
Analyte		Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.60				SU			11/10/20 16:30	1

Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond Job ID: 180-113553-1

### **Client Sample ID: MW-5A** Lab Sample ID: 180-113553-5 Date Collected: 11/10/20 15:00 Matrix: Water Date Received: 11/12/20 09:00 Method: EPA 9056A - Anions, Ion Chromatography Analyte Result Qualifier RL MDL Unit D Dil Fac Prepared Analyzed 2.5 0.80 mg/L 11/23/20 14:27 Chloride 170 2.5 0.25 11/23/20 14:27 Fluoride 0.24 J 0.11 mg/L 2.5 Sulfate 2300 25 9.5 mg/L 11/23/20 14:44 25 Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable Result Qualifier RL MDL Unit D Prepared Dil Fac Analyte Analyzed 11/17/20 15:33 Calcium 380 0.13 mg/L 11/19/20 17:59 0.50 1 Boron 1.9 0.080 0.039 mg/L 11/17/20 15:33 11/19/20 17:59 1 **General Chemistry** Analyte RL MDL Unit **Result Qualifier** D Prepared Analyzed Dil Fac 11/16/20 12:08 **Total Dissolved Solids** 3200 40 40 mg/L 1 RL RL Unit D Analyte **Result Qualifier** Prepared Analyzed Dil Fac SU pН 7.0 HF 0.1 0.1 11/24/20 09:55 1 Method: Field Sampling - Field Sampling Analyte **Result Qualifier** RL NONE Unit D Prepared Analyzed Dil Fac รบ 11/10/20 16:00 pН 6.72

Client: Midwest Environmental Consultants Project/Site: Asbury Ash Pond Job ID: 180-113553-1

Matrix: Water

Lab Sample ID: 180-113553-6

### Client Sample ID: MW-6 Date Collected: 11/10/20 14:35 Date Received: 11/12/20 09:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13		1.0	0.32	mg/L			11/23/20 17:43	1
Fluoride	0.22		0.10	0.044	mg/L			11/23/20 17:43	1
Sulfate	1200		10	3.8	mg/L			11/23/20 18:00	10
Method: EPA 6020A - Metals	(ICP/MS) - To	otal Recover	able						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	240		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:01	1
Boron	0.32		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:01	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1700		10	10	mg/L			11/16/20 12:08	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	7.2	HF	0.1	0.1	SU			11/24/20 09:55	1
Method: Field Sampling - Fie	d Sampling								
Analyte	· · ·	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
PH	6.96				SU			11/10/20 15:35	1

**Client: Midwest Environmental Consultants** Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

# **Client Sample ID: MW-6A** Date Collected: 11/10/20 14:05 Date Received: 11/12/20 09:00

Method: EPA 9056A - Anion	s, Ion Chroma	atography							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25		1.0	0.32	mg/L			11/23/20 18:49	1
Fluoride	0.30		0.10	0.044	mg/L			11/23/20 18:49	1
Sulfate	850		10	3.8	mg/L			11/23/20 19:05	10
Method: EPA 6020A - Metals	s (ICP/MS) - To	otal Recove	rable						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	170		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:04	1
Boron	0.38		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:04	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		10	10	mg/L			11/16/20 12:08	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	7.5	HF	0.1	0.1	SU			11/24/20 09:55	1
Method: Field Sampling - Fi	eld Sampling								
Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.09				SU			11/10/20 15:05	1

**Client: Midwest Environmental Consultants** Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Lab Sample ID: 180-113553-8

Analyzed

11/23/20 19:21

11/23/20 19:21

D

Prepared

### **Client Sample ID: MW-7** Date Collected: 11/10/20 13:40 Date Received: 11/12/20 09:00 Method: EPA 9056A - Anions, Ion Chromatography Analyte Result Qualifier RL MDL Unit Chloride 2.5 0.80 mg/L 39 0.25 Fluoride 0.11 mg/L 0.16 J

Sulfate	2200		25	9.5	mg/L			11/23/20 19:38	25	
Method: EPA 6020A - Meta	uls (ICP/MS) - To	otal Recove	rable							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Calcium	460		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:06	1	
Boron	0.22		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:06	1	
General Chemistry										1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids	2800		20	20	mg/L			11/16/20 12:15	1	
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac	
рН	6.7	HF	0.1	0.1	SU			11/24/20 09:55	1	
	Field Sampling									
Analyte	· · · ·	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac	I
pH	6.81				SU			11/10/20 14:40	1	

Matrix: Water

Dil Fac

2.5

2.5

Job ID: 180-113553-1

9

### Client Sample ID: Duplicate Date Collected: 11/10/20 15:35 Date Received: 11/12/20 09:00

# Lab Sample ID: 180-113553-9 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.4		1.0	0.32	mg/L			11/23/20 19:54	1
Fluoride	0.28		0.10	0.044	mg/L			11/23/20 19:54	
Sulfate	170		1.0	0.38	mg/L			11/23/20 19:54	
Method: EPA 6020A - Metal	s (ICP/MS) - To	otal Recover	able						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	71		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:09	1
Boron	0.24		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:09	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	540		10	10	mg/L			11/16/20 12:15	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
рН	7.8	HF	0.1	0.1	SU			11/24/20 09:55	
Method: Field Sampling - F	ield Sampling								
Analyte	· · · ·	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.60				SU			11/10/20 16:35	

Job ID: 180-113553-1

### Client Sample ID: Field Blank Date Collected: 11/10/20 14:40 Date Received: 11/12/20 09:00

# Lab Sample ID: 180-113553-10

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13		1.0	0.32	mg/L			11/23/20 22:05	1
Fluoride	1.4		0.10	0.044	mg/L			11/23/20 22:05	1
Sulfate	ND		1.0	0.38	mg/L			11/23/20 22:05	1
Method: EPA 6020A - Metal	s (ICP/MS) - To	otal Recove	rable						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	0.39	J	0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:12	1
Boron	ND		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:12	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	33		10	10	mg/L			11/16/20 12:15	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pН	7.1	HF	0.1	0.1	SU			11/24/20 09:55	1

Lab Sample ID: MB 180-338140/30

**Matrix: Water** 

Analyte

Chloride

Fluoride

Sulfate

Analysis Batch: 338140

Method: EPA 9056A - Anions, Ion Chromatography

MB MB

ND

ND

ND

**Result Qualifier** 

Job ID: 180-113553-1

Prep Type: Total/NA

Dil Fac

**Client Sample ID: Method Blank** 

Analyzed

Prepared

D

10

### 11/23/20 15:49 1 11/23/20 15:49 1 11/23/20 15:49 1 **Client Sample ID: Method Blank**

Prep Type: Total/NA

Prep Type: Total/NA

### Lab Sample ID: MB 180-338140/6 Matrix: Water Analysis Batch: 338140

### MB MB Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed Dil Fac Chloride 0.32 mg/L 11/23/20 06:32 ND 1.0 1 Fluoride 0.10 ND 0.044 mg/L 11/23/20 06:32 1 0.38 mg/L Sulfate ND 11/23/20 06:32 1.0 1

RL

1.0

1.0

0.10

MDL Unit

0.32 mg/L

0.044 mg/L

0.38 mg/L

# Lab Sample ID: LCS 180-338140/29

### **Matrix: Water** Analysis Batch: 338140

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	50.0	49.4		mg/L		99	80 - 120	
Fluoride	2.50	2.54		mg/L		102	80 - 120	
Sulfate	50.0	47.8		mg/L		96	80 - 120	

# Lab Sample ID: LCS 180-338140/5

### **Matrix: Water** Analysis Batch: 338140

Analysis Datch. 550140	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	50.0	49.9		mg/L		100	80 - 120	 
Fluoride	2.50	2.59		mg/L		104	80 - 120	
Sulfate	50.0	49.0		mg/L		98	80 - 120	

### Lab Sample ID: 180-113523-C-1 MS **Matrix: Water**

# Analysis Batch: 338140

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	ND	F1	50.0	72.9	F1	mg/L		146	80 - 120	
Fluoride	0.18		2.50	2.49		mg/L		92	80 - 120	
Sulfate	5.8		50.0	47.2		mg/L		83	80 - 120	

### Lab Sample ID: 180-113523-C-1 MSD **Matrix: Water**

### Analysis Batch: 338140

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chloride	ND	F1	50.0	73.4	F1	mg/L		147	80 - 120	1	15
Fluoride	0.18		2.50	2.60		mg/L		97	80 - 120	4	15
Sulfate	5.8		50.0	53.9		mg/L		96	80 - 120	13	15

**Client Sample ID: Lab Control Sample** 

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

**Client Sample ID: Matrix Spike** 

Prep Type: Total/NA

# Prep Type: Total/NA

**Client Sample ID: Matrix Spike Duplicate** 

### Mathad: EDA 9056A Ani Ch 4/ . 10 4.5 . .

Lab Sample ID: 180-113523	B-C-17 MS						CI	ient Sar	nple ID: I	Matrix S	Spike
Matrix: Water							•	ionic our	Prep Ty		
Analysis Batch: 338140											<b>u</b>
Analysis Daten. 000140	Sample	Sampla	Spike	ме	MS				%Rec.		
•	•	•	Spike	-	-	11.9	_	0/ <b>D</b>			
Analyte		Qualifier	Added		Qualifier	Unit	D	%Rec	Limits		
Chloride	9.1		50.0	59.9		mg/L		101	80 - 120		
Fluoride	ND		2.50	2.60		mg/L		104	80 - 120		
Sulfate	0.51	J	50.0	50.7		mg/L		100	80 - 120		
Lab Sample ID: 180-113523	8-C-17 MSD	)				<b>Client S</b>	amp	le ID: M	atrix Spil	ke Dup	licat
Matrix: Water									Prep Ty	pe: Tot	al/N
Analysis Batch: 338140											
	Sample	Sample	Spike	мер	MSD				%Rec.		RP
Analyta		Qualifier	Added	-	Qualifier	Unit	<b>D</b>	%Rec	Limits	RPD	
Analyte					<u>uanner</u>	Unit	D				Lim
Chloride	9.1		50.0	61.1		mg/L		104	80 - 120	2	1
Fluoride	ND		2.50	2.74		mg/L		110	80 - 120	5	1
Sulfate	0.51	J	50.0	52.7		mg/L		104	80 - 120	4	1
lethod: EPA 6020A - M	etals (ICF	P/MS)									
Lab Sample ID: MB 180-33	7453/1-A						Clie	nt Sam	ple ID: M	ethod I	Blan
Matrix: Water									e: Total I		
Analysis Batch: 337906									Prep Ba		
Analysis Datch. 337300		МВ МВ							гтер Бо	aten. 50	J/ 4J
						_	_				
-	Re	sult Qualifier	RL		MDL Unit	D		repared	Analyz		Dil Fa
-	Re	ND Qualifier	<b>RL</b> 0.50		MDL Unit	D		repared 7/20 15:33			Dil Fa
Calcium	Re					<u>D</u>	11/1	7/20 15:33		17:38	Dil Fa
Calcium Boron		ND	0.50		0.13 mg/L		11/1 <sup>°</sup> 11/1 <sup>°</sup>	7/20 15:33 7/20 15:33	3 11/19/20 3 11/19/20	17:38 17:38	
Analyte Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Wator		ND	0.50		0.13 mg/L		11/1 <sup>-</sup> 11/1 <sup>-</sup> t Sar	7/20 15:33 7/20 15:33 7/20 15:33	<ul> <li>11/19/20</li> <li>11/19/20</li> <li>11/19/20</li> <li>Lab Cor</li> </ul>	17:38 17:38 <b>htrol Sa</b>	impl
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water		ND	0.50		0.13 mg/L		11/1 <sup>-</sup> 11/1 <sup>-</sup> t Sar	7/20 15:33 7/20 15:33 7/20 15:33	11/19/20 11/19/20 Lab Cor be: Total	17:38 17:38 htrol Sa Recove	mpl erab
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water		ND	0.50	0	0.13 mg/L 0.039 mg/L		11/1 <sup>-</sup> 11/1 <sup>-</sup> t Sar	7/20 15:33 7/20 15:33 7/20 15:33	<ul> <li>11/19/20</li> <li>11/19/20</li> <li>11/19/20</li> <li>Lab Cor</li> <li>De: Total I</li> <li>Prep Ba</li> </ul>	17:38 17:38 htrol Sa Recove	mpl erab
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906		ND	0.50 0.080 Spike	0 LCS	0.13 mg/L 0.039 mg/L LCS		11/1 <sup>-</sup> 11/1 <sup>-</sup> t Sar	7/20 15:33 7/20 15:33 7/20 15:33 7/20 15:33 7/20 15:33	Lab Cor E: Total Prep Ba %Rec.	17:38 17:38 htrol Sa Recove	impl erabl
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906		ND	0.50	0 LCS	0.13 mg/L 0.039 mg/L		11/1 <sup>-</sup> 11/1 <sup>-</sup> t Sar	7/20 15:33 7/20 15:33 7/20 15:33	<ul> <li>11/19/20</li> <li>11/19/20</li> <li>11/19/20</li> <li>Lab Cor</li> <li>De: Total I</li> <li>Prep Ba</li> </ul>	17:38 17:38 htrol Sa Recove	mpl erab
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte		ND	0.50 0.080 Spike	0 LCS	0.13 mg/L 0.039 mg/L LCS	Clien	11/1 <sup>*</sup> 11/1 <sup>*</sup> t Sar P	7/20 15:33 7/20 15:33 7/20 15:33 7/20 15:33 7/20 15:33	Lab Cor E: Total Prep Ba %Rec.	17:38 17:38 htrol Sa Recove	mpl erab
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium		ND	0.50 0.080 Spike Added	0 LCS Result	0.13 mg/L 0.039 mg/L LCS	Clien	11/1 <sup>*</sup> 11/1 <sup>*</sup> t Sar P	7/20 15:33 7/20 15:33 mple ID: Prep Typ	11/19/20           11/19/20           Lab Cor           ce: Total I           Prep Ba           %Rec.           Limits	17:38 17:38 htrol Sa Recove	mpl erab
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron	37453/2-A	ND	0.50 0.080 Spike Added 25.0	LCS Result 26.0	0.13 mg/L 0.039 mg/L LCS	Clien Unit mg/L	11/1 <sup>*</sup> 11/1 <sup>*</sup> t Sar P	7/20 15:33 7/20 15:33 mple ID: Prep Typ <u>%Rec</u> 104 92	Lab Cor be: Total l Prep Ba %Rec. Limits 80 - 120	17:38 17:38 <b>Atrol Sa</b> <b>Recove</b> <b>atch: 33</b>	impl erab 3745
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553	37453/2-A	ND	0.50 0.080 Spike Added 25.0	LCS Result 26.0	0.13 mg/L 0.039 mg/L LCS	Clien Unit mg/L	11/1 <sup>*</sup> 11/1 <sup>*</sup> t Sar P  D	7/20 15:33 7/20 15:33 nple ID: Prep Typ <u>%Rec</u> 104 92	II/19/20           II/19/20           Lab Cor           De: Total I           Prep Ba           %Rec.           Limits           80 - 120           80 - 120           ample ID:	17:38 17:38 htrol Sa Recove atch: 33 Field I	impl erab 3745 3745
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water	37453/2-A	ND	0.50 0.080 Spike Added 25.0	LCS Result 26.0	0.13 mg/L 0.039 mg/L LCS	Clien Unit mg/L	11/1 <sup>*</sup> 11/1 <sup>*</sup> t Sar P  D	7/20 15:33 7/20 15:33 nple ID: Prep Typ <u>%Rec</u> 104 92	11/19/20           11/19/20           Lab Cor           be: Total I           Prep Ba           %Rec.           Limits           80 - 120           80 - 120           ample ID:           be: Total I	17:38 17:38 Atrol Sa Recove atch: 33 Field I Recove	impl rabl 3745 Blan
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water	37453/2-A 3-10 MS	ND ND	0.50 0.080 Spike Added 25.0 1.25	0 LCS Result 26.0 1.14	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L	11/1 <sup>*</sup> 11/1 <sup>*</sup> t Sar P  D	7/20 15:33 7/20 15:33 nple ID: Prep Typ <u>%Rec</u> 104 92	III/19/20         III/19/20         III/19/20         Lab Cor         pe: Total I         Prep Ba         %Rec.         Limits         80 - 120         ample ID:         pe: Total I         Prep Ba	17:38 17:38 Atrol Sa Recove atch: 33 Field I Recove	impl rabl 3745 Blan
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906	37453/2-A 8-10 MS Sample	ND ND 	0.50 0.080 Spike Added 25.0 1.25 Spike	0 LCS Result 26.0 1.14	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	11/1 <sup>1</sup> 11/1 <sup>1</sup> t Sar P  P	7/20 15:33 7/20 15:33 mple ID: rep Typ <u>%Rec</u> 104 92 Client Sa rep Typ	II/19/20         II/19/20         Lab Cor         re: Total I         Prep Ba         %Rec.         Limits         80 - 120         80 - 120         ample ID:         prep Ba         %Rec.         With the second	17:38 17:38 Atrol Sa Recove atch: 33 Field I Recove	impl rabl 3745 Blan erabl
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906 Analyte	37453/2-A 3-10 MS Sample Result	ND ND Sample Qualifier	0.50 0.080 Spike Added 25.0 1.25 Spike Added	LCS Result 26.0 1.14 MS Result	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	11/1 <sup>*</sup> 11/1 <sup>*</sup> t Sar P  D	7/20 15:33 7/20 15:33 mple ID: rep Typ <u>%Rec</u> %Rec %Rec	III/19/20           II/19/20           II/19/20           Lab Cor           pe: Total I           Prep Ba           %Rec.           Limits           80 - 120           80 - 120           ample ID:           pe: Total I           Prep Ba           %Rec.           Limits           %Rec.           Limits	17:38 17:38 Atrol Sa Recove atch: 33 Field I Recove	ampl erabl 3745 Blan erabl
Calcium Boron Lab Sample ID: LCS 180-33	37453/2-A 8-10 MS Sample	ND ND Sample Qualifier	0.50 0.080 Spike Added 25.0 1.25 Spike	0 LCS Result 26.0 1.14	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	11/1 <sup>1</sup> 11/1 <sup>1</sup> t Sar P  P	7/20 15:33 7/20 15:33 mple ID: rep Typ <u>%Rec</u> 104 92 Client Sa rep Typ	II/19/20         II/19/20         Lab Cor         re: Total I         Prep Ba         %Rec.         Limits         80 - 120         80 - 120         ample ID:         prep Ba         %Rec.         With the second	17:38 17:38 Atrol Sa Recove atch: 33 Field I Recove	Blan Blan
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906 Analyte Calcium	37453/2-A 3-10 MS Sample Result	ND ND Sample Qualifier	0.50 0.080 Spike Added 25.0 1.25 Spike Added	LCS Result 26.0 1.14 MS Result	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	11/1 <sup>1</sup> 11/1 <sup>1</sup> t Sar P  P	7/20 15:33 7/20 15:33 mple ID: rep Typ <u>%Rec</u> %Rec %Rec	III/19/20           II/19/20           II/19/20           Lab Cor           pe: Total I           Prep Ba           %Rec.           Limits           80 - 120           80 - 120           ample ID:           pe: Total I           Prep Ba           %Rec.           Limits           %Rec.           Limits	17:38 17:38 Atrol Sa Recove atch: 33 Field I Recove	impl rab 3745 Blan erab
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron	37453/2-A 3-10 MS Sample Result 0.39 ND	ND ND Sample Qualifier	0.50           0.080           Spike           Added           25.0           1.25           Spike           Added           25.0	0 LCS Result 26.0 1.14 MS Result 26.2	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	<u>11/1</u> 11/1 <b>t Sar</b> P _ D P	7/20 15:33 7/20 15:33 mple ID: rep Typ <u>%Rec</u> 104 92 Client Sa rep Typ <u>%Rec</u> 103 91	II/19/20	T7:38 17:38 Atrol Sa Recove atch: 33 Field I Recove atch: 33	ampl erabl 3745 Blan erabl 3745
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553	37453/2-A 3-10 MS Sample Result 0.39 ND	ND ND Sample Qualifier	0.50           0.080           Spike           Added           25.0           1.25           Spike           Added           25.0	0 LCS Result 26.0 1.14 MS Result 26.2	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	<u>11/1</u> 11/1 t Sar P D C P	7/20       15:33         7/20       15:33         7/20       15:33 <b>nple ID:</b> 15:33 <b>prep Typ</b>	II/19/20	Time Field I	ampi erabi 3745 Blan erabi 3745 Blan
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553	37453/2-A 3-10 MS Sample Result 0.39 ND	ND ND Sample Qualifier	0.50           0.080           Spike           Added           25.0           1.25           Spike           Added           25.0	0 LCS Result 26.0 1.14 MS Result 26.2	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	<u>11/1</u> 11/1 t Sar P D C P	7/20       15:33         7/20       15:33         7/20       15:33 <b>nple ID:</b> 15:33 <b>prep Typ</b>	II/19/20	Time Field I	ampi erabi 3745 Blan erabi 3745 Blan
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906 Analyte	37453/2-A 3-10 MS Sample Result 0.39 ND	ND ND Sample Qualifier	0.50           0.080           Spike           Added           25.0           1.25           Spike           Added           25.0	0 LCS Result 26.0 1.14 MS Result 26.2	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	<u>11/1</u> 11/1 t Sar P D C P	7/20       15:33         7/20       15:33         7/20       15:33 <b>nple ID:</b> 15:33 <b>prep Typ</b>	II/19/20	Time field I Field I Recove Time field I Recove Time field I Recove Time field I Recove	ampl srabl 3745 31an srabl 3745 31an srabl
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Calcium Boron Lab Sample ID: 180-113553 Matrix: Water	87453/2-A 8-10 MS Sample Result 0.39 ND 8-10 MSD	ND ND Sample Qualifier J	0.50           0.080           Spike           Added           25.0           1.25           Spike           Added           25.0	0 LCS Result 26.0 1.14 MS Result 26.2 1.13	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	<u>11/1</u> 11/1 t Sar P D C P	7/20       15:33         7/20       15:33         7/20       15:33 <b>nple ID:</b> 15:33 <b>prep Typ</b>	II/19/20         II/10/20         II/10/20         II/10/20         II/10/20         II/10/20         II/10/20         II/10/20	Time field I Field I Recove Time field I Recove Time field I Recove Time field I Recove	Blan Blan Blan Blan Blan Blan Blan Blan
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906	8-10 MS Sample Result 0.39 ND 8-10 MSD Sample	ND ND Sample Qualifier J	0.50           0.080           Spike           Added           25.0           1.25           Spike           Added           25.0           1.25	0 LCS Result 26.0 1.14 MS Result 26.2 1.13	0.13 mg/L 0.039 mg/L LCS Qualifier MS Qualifier	Clien mg/L mg/L Unit mg/L mg/L	11/1 <sup>1</sup> 11/1 <sup>1</sup> t Sar P _ D P _ D P	7/20 15:33         7/20 15:33         mple ID:         rep Typ <u>%Rec</u> 104         92         Client Sa         %Rec         103         91         Client Sa         91	11/19/20         11/19/20         11/19/20         Lab Cor         prep Ba         %Rec.         Limits         80 - 120         ample ID:         prep Ba         %Rec.         Limits         80 - 120         ample ID:         prep Ba         %Rec.         Limits         75 - 125         75 - 125         pe: Total I         Prep Ba         %Rec.         Prep Ba         %Rec.         mple ID:         %Rec.	Time Field I Recove atch: 33 Field I Recove atch: 33 Field I Recove atch: 33	Blan Blan Blan Blan Blan Blan Blan Blan
Calcium Boron Lab Sample ID: LCS 180-33 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water Analysis Batch: 337906 Analyte Calcium Boron Lab Sample ID: 180-113553 Matrix: Water	8-10 MS Sample Result 0.39 ND 8-10 MSD Sample	ND ND Sample Qualifier J Sample Qualifier	0.50           0.080           Spike           Added           25.0           1.25           Spike           Added           25.0           1.25	0 LCS Result 26.0 1.14 MS Result 26.2 1.13	0.13 mg/L 0.039 mg/L LCS Qualifier	Clien Unit mg/L mg/L	11/1 <sup>1</sup> 11/1 <sup>1</sup> t Sar P _ D P _ D P	7/20       15:33         7/20       15:33         7/20       15:33 <b>nple ID:</b> 15:33 <b>prep Typ</b>	11/19/20         11/19/20         11/19/20         Lab Cor         prep Ba         %Rec.         Limits         80 - 120         80 - 120         ample ID:         prep Ba         %Rec.         Limits         75 - 125         75 - 125         ample ID:         pe: Total I         Prep Ba         %Rec.         Limits         75 - 125         ample ID:         pe: Total I         Prep Ba         %Rec.         Limits         75 - 125         ample ID:         pe: Total I         Prep Ba	Time field I Field I Recove Time field I Recove Time field I Recove	ampl srabl 3745 Slan srabl 3745 Slan srabl

Spike

Added

7.00

LCS LCS

DU DU

5.9

7.0

Result Qualifier Unit

Result Qualifier Unit

SU

SU

Lab Sample ID: LCS 180-338342/1

Lab Sample ID: 180-113548-D-2 DU

Method: EPA 9040C - pH

Analysis Batch: 338342

Analysis Batch: 338342

**Matrix: Water** 

**Matrix: Water** 

Analyte

Analyte

pН

pН

Prep Type: Total/NA

Prep Type: Total/NA

RPD

0.3

RPD

Limit

2

**Client Sample ID: Lab Control Sample** 

D %Rec

D

100

%Rec.

Limits

99 - 101

**Client Sample ID: Duplicate** 

# 10

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

Sample Sample

5.9

**Result Qualifier** 

Lab Sample ID: MB 180-337288 Matrix: Water	/ <mark>2</mark>									(	Clie	ent Sam	ple ID: Method Prep Type: To	
Analysis Batch: 337288														
Analysis Baten. 001200		мв	МВ											
Analyte	Re		Qualifier		RL		MDL	Unit		D	Pr	repared	Analyzed	Dil Fac
Total Dissolved Solids		ND			10			mg/L					11/16/20 12:08	1
Lab Sample ID: LCS 180-33728	8/1								Cli	ient	Sar	nple ID:	Lab Control S	Sample
Matrix: Water													Prep Type: To	
Analysis Batch: 337288														
-				Spike		LCS	LCS	;					%Rec.	
Analyte				Added		Result	Qua	lifier	Unit		D	%Rec	Limits	
Total Dissolved Solids				714		662			mg/L		_	93	80 - 120	
Lab Sample ID: 180-113548-D-2	DU											Client	Sample ID: Du	plicate
Matrix: Water													Prep Type: To	otal/NA
Analysis Batch: 337288														
:	Sample	San	nple			DU	DU							RPD
Analyte	Result	Qua	lifier			Result	Qua	lifier	Unit		D		RPD	) Limit
Total Dissolved Solids	530					545			mg/L		_		2	2 10
Lab Sample ID: MB 180-337289	/ <mark>2</mark>									(	Clie	nt Sam	ple ID: Method	l Blank
Matrix: Water													Prep Type: To	otal/NA
Analysis Batch: 337289														
		MB	MB											
Analyte	Re	sult	Qualifier		RL	I		Unit		D	Pr	repared	Analyzed	Dil Fac
Total Dissolved Solids		ND			10		10	mg/L					11/16/20 12:15	1
Lab Sample ID: LCS 180-33728	9/1								Cli	ient	Sar	nple ID:	Lab Control S	Sample
Matrix: Water													Prep Type: To	otal/NA
Analysis Batch: 337289														
				Spike		LCS	LCS	i					%Rec.	
Analyte				Added		Result	Qua	lifier	Unit		D	%Rec	Limits	
Total Dissolved Solids				714		654			mg/L			92	80 - 120	

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

Lab Sample ID: 180-11355 Matrix: Water Analysis Batch: 337289	3-9 DU					Clie	ent Sample Prep Ty		
	Sample	Sample	DU	DU					RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D		RPD	Limit
Total Dissolved Solids	540		 545		mg/L			1	10

# **QC** Association Summary

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# HPLC/IC

#### Analysis Batch: 338140

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total/NA	Water	EPA 9056A	
180-113553-2	MW-3	Total/NA	Water	EPA 9056A	
180-113553-2	MW-3	Total/NA	Water	EPA 9056A	
180-113553-3	MW-4	Total/NA	Water	EPA 9056A	
180-113553-3	MW-4	Total/NA	Water	EPA 9056A	
180-113553-4	MW-5	Total/NA	Water	EPA 9056A	
180-113553-5	MW-5A	Total/NA	Water	EPA 9056A	
180-113553-5	MW-5A	Total/NA	Water	EPA 9056A	
180-113553-6	MW-6	Total/NA	Water	EPA 9056A	
180-113553-6	MW-6	Total/NA	Water	EPA 9056A	
180-113553-7	MW-6A	Total/NA	Water	EPA 9056A	
180-113553-7	MW-6A	Total/NA	Water	EPA 9056A	
180-113553-8	MW-7	Total/NA	Water	EPA 9056A	
180-113553-8	MW-7	Total/NA	Water	EPA 9056A	
180-113553-9	Duplicate	Total/NA	Water	EPA 9056A	
180-113553-10	Field Blank	Total/NA	Water	EPA 9056A	
MB 180-338140/30	Method Blank	Total/NA	Water	EPA 9056A	
MB 180-338140/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-338140/29	Lab Control Sample	Total/NA	Water	EPA 9056A	
LCS 180-338140/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-113523-C-1 MS	Matrix Spike	Total/NA	Water	EPA 9056A	
180-113523-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 9056A	
180-113523-C-17 MS	Matrix Spike	Total/NA	Water	EPA 9056A	
180-113523-C-17 MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 9056A	

### **Metals**

#### Prep Batch: 337453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total Recoverable	Water	3005A	
180-113553-2	MW-3	Total Recoverable	Water	3005A	
180-113553-3	MW-4	Total Recoverable	Water	3005A	
180-113553-4	MW-5	Total Recoverable	Water	3005A	
180-113553-5	MW-5A	Total Recoverable	Water	3005A	
180-113553-6	MW-6	Total Recoverable	Water	3005A	
180-113553-7	MW-6A	Total Recoverable	Water	3005A	
180-113553-8	MW-7	Total Recoverable	Water	3005A	
180-113553-9	Duplicate	Total Recoverable	Water	3005A	
180-113553-10	Field Blank	Total Recoverable	Water	3005A	
MB 180-337453/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-337453/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-113553-10 MS	Field Blank	Total Recoverable	Water	3005A	
180-113553-10 MSD	Field Blank	Total Recoverable	Water	3005A	

#### Analysis Batch: 337906

Lab Sample ID 180-113553-1	Client Sample ID MW-2	Prep Type Total Recoverable	Matrix Water	EPA 6020A	<b>Prep Batch</b> 337453
180-113553-2	MW-3	Total Recoverable	Water	EPA 6020A	337453
180-113553-3	MW-4	Total Recoverable	Water	EPA 6020A	337453
180-113553-4	MW-5	Total Recoverable	Water	EPA 6020A	337453
180-113553-5	MW-5A	Total Recoverable	Water	EPA 6020A	337453

# Metals (Continued)

## Analysis Batch: 337906 (Continued)

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
180-113553-6	MW-6	Total Recoverable	Water	EPA 6020A	337453
180-113553-7	MW-6A	Total Recoverable	Water	EPA 6020A	337453
180-113553-8	MW-7	Total Recoverable	Water	EPA 6020A	337453
180-113553-9	Duplicate	Total Recoverable	Water	EPA 6020A	337453
180-113553-10	Field Blank	Total Recoverable	Water	EPA 6020A	337453
MB 180-337453/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	337453
LCS 180-337453/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	337453
180-113553-10 MS	Field Blank	Total Recoverable	Water	EPA 6020A	337453
180-113553-10 MSD	Field Blank	Total Recoverable	Water	EPA 6020A	337453

## **General Chemistry**

## Analysis Batch: 337288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total/NA	Water	SM 2540C	
180-113553-2	MW-3	Total/NA	Water	SM 2540C	
180-113553-3	MW-4	Total/NA	Water	SM 2540C	
180-113553-4	MW-5	Total/NA	Water	SM 2540C	
180-113553-5	MW-5A	Total/NA	Water	SM 2540C	
180-113553-6	MW-6	Total/NA	Water	SM 2540C	
180-113553-7	MW-6A	Total/NA	Water	SM 2540C	
MB 180-337288/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-337288/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-113548-D-2 DU	Duplicate	Total/NA	Water	SM 2540C	

#### Analysis Batch: 337289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
180-113553-8	MW-7	Total/NA	Water	SM 2540C		
180-113553-9	Duplicate	Total/NA	Water	SM 2540C		
180-113553-10	Field Blank	Total/NA	Water	SM 2540C		
MB 180-337289/2	Method Blank	Total/NA	Water	SM 2540C		
LCS 180-337289/1	Lab Control Sample	Total/NA	Water	SM 2540C		
180-113553-9 DU	Duplicate	Total/NA	Water	SM 2540C		

## Analysis Batch: 338342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total/NA	Water	EPA 9040C	
180-113553-2	MW-3	Total/NA	Water	EPA 9040C	
180-113553-3	MW-4	Total/NA	Water	EPA 9040C	
180-113553-4	MW-5	Total/NA	Water	EPA 9040C	
180-113553-5	MW-5A	Total/NA	Water	EPA 9040C	
180-113553-6	MW-6	Total/NA	Water	EPA 9040C	
180-113553-7	MW-6A	Total/NA	Water	EPA 9040C	
180-113553-8	MW-7	Total/NA	Water	EPA 9040C	
180-113553-9	Duplicate	Total/NA	Water	EPA 9040C	
180-113553-10	Field Blank	Total/NA	Water	EPA 9040C	
LCS 180-338342/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-113548-D-2 DU	Duplicate	Total/NA	Water	EPA 9040C	

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## Field Service / Mobile Lab

#### Analysis Batch: 337272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total/NA	Water	Field Sampling	
180-113553-2	MW-3	Total/NA	Water	Field Sampling	
180-113553-3	MW-4	Total/NA	Water	Field Sampling	
180-113553-4	MW-5	Total/NA	Water	Field Sampling	
180-113553-5	MW-5A	Total/NA	Water	Field Sampling	
180-113553-6	MW-6	Total/NA	Water	Field Sampling	
180-113553-7	MW-6A	Total/NA	Water	Field Sampling	
180-113553-8	MW-7	Total/NA	Water	Field Sampling	
180-113553-9	Duplicate	Total/NA	Water	Field Sampling	

Job ID: 180-113553-1

# Chain of Custody Record



THE LEADER IN ENVIRONMENTAL TESTING

	Client Information	Sampler: KE	FARS		Lab I Gar	PM: tner, C	athy				Carrier Tracking No(s	):	COC No: 490-52767-157	25.1
1	Client Contact: Mr. Rick Elgin	Phone 573	-636	-949	E-Ma	ail:		estame	ricainc	com			Page:	
1	Company:	12:0	0.0	/ [ "		iy.garti		estame			and the second		Page 1 of 1 Job #:	
ł	Midwest Environmental Consultants Address:	Due Date Reque	stod.							na				des:
	2009 East McCarty Street Suite 2		3	7D									Co	M - Hexane
	City: Jefferson City	TAT Requested	days):											N - None
1	State, Zip:	1							ds					O - AsNaO2 P - Na2O4S
	MO, 65101 Phone:	PO #:				-			Solids	-	180-113553 Chain of Cu	stody		Q - Na2SO3 R - Na2S2O3
	573-636-9454(Tel)	Purchase Ord	er not require	d		(0)		lfate	/ed		LTTTT	1 1 1	H - Ascorbic Acid	S - H2SO4 T - TSP Dodecahydrate
	Email: relgin@mecpc.com	WO #:				No)	-	, Su	solv	Boron		w l	I - Ice J - DI Water	U - Acetone V - MCAA
	Project Name: Asbury Ash Pond	Project #: 49010011				(Yes		ride	Dis	d B		ainer	K - EDTA L - EDA	W - ph 4-5 Z - other (specify)
	Site:	49010011 SSOW#:	and the approximation of			nple (Ye:		Fluo	Tota	Ca and		containers	Other:	
				r		d Sal		ide,	- 03			of		
				Sample	Matrix (w=water,	Field Filtered Sample (Yes or Perform MS/MSD (Yes or No)		9056 Chloride, Fluoride, Sulfate	2540C_Calcd - Total Dissolved	6020 Metals		Number		
			Sample	Type (C=comp,	S=solid, O=waste/oil,	Id Fi		56 C	40C	20 M		al Ni		
ъ	Sample Identification	Sample Date	Time		BT=Tissue, A=Air	Per Fie		Company of the local division of	COLUMN DATASAN	discreted.		Total	Special I	nstructions/Note:
Page	10/1/ 0	11 10 1	11 MA		ation Code:	AY A		N	No. of Contraction of	D			[Field all:	
ω	1114FJ	11-10-2	4.40	G	GW	11		X	X	X			Field pH: (	0151
30 of	MW-3	11-11-20	2:25	1						1			Field pH:	5.68
ώ	MW-4	11-10-20	7:10										Field pH:	6.80
	MW-5	1	3:30			Π				1			Field pH:	7.60
	MW - 5A		3:00						1	$\square$			Field pH: 0	6.72
	MW-6		2:35							T			Field pH:	6.96
	MW-6A		2:05										Field pH:	7.09
	MU-7		1:40										Field pH:	6.81
	$Q_{\mu\rho}$ (MW-5)		3:35		X								Field pH:	7.60
	Fire & DIAKIK		200	V				Y	V	A			Field pH: 7	
		C	2:40										Field pH:	
	Possible Hazard Identification					Sa	ample	Dispo	sal ( A	fee	may be assessed if samp	les are retair	ned longer than	1 month)
	Non-Hazard Flammable Skin Irritant Pois Deliverable Requested: I, II, III, IV, Other (specify)	son B 💭 Un	known	Radiologica	al		R	eturn T	o Clier	nt	Disposal By Lab	Arc	chive For	Months
						S	beciai	Instruc	lions/G	IC RE	equirements: 6020A/60100	: - Sb,As,Ba,E	Be,B,Cd,Ca,Cr,C	o,Pb,,Mo, Li
	Empty Kit Relinquished by:	Lan	Date:			Time	-				Method of Ship	ment:		
	Relinquished by:	Date/Time:	11-20	1:30	Company	1	Rece	ived by:	Fre	10	Dat	e/Time:	20 1:30	company 6C
11	Relinquished by:	Date/Time:			Company		Rece	ived by:		_	Dat	erTime:	L.	Company
30/:	Relinquished by:	Date/Time:			Company			ived by:	-		Dat	e/Time:	920	Company
11/30/2020	Custody Seals Intact: Custody Seal No.:						Cooler Temperature(s) °C and Other Remarks:							
0	Δ Yes Δ No													
dines.								-	<u>ک</u>	12	2 3 9	∞ ¬	ი თ	A W A

# Login Sample Receipt Checklist

**Client: Midwest Environmental Consultants** 

Job Number: 180-113553-1

# 5 6 7 8 9 10 11 12 13

Login Number: 113553		List Source: Eurofins TestAmerica, Pittsburgh
List Number: 1		
Creator: Say, Thomas C		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td></td> <td></td>		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		

Residual Chlorine Checked.



**APPENDIX 5** 

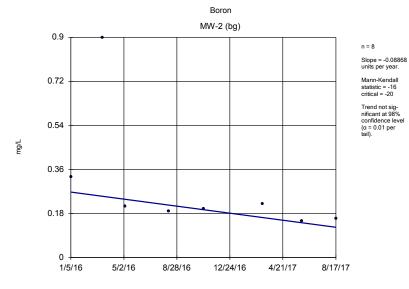
**Statistical Analysis** 



Sanitas<sup>™</sup> Output – Background

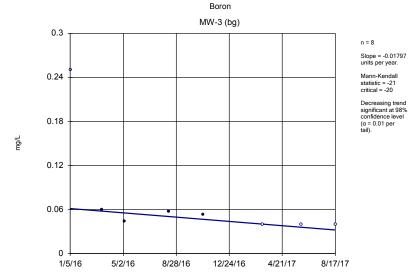
Trending Analysis

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Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

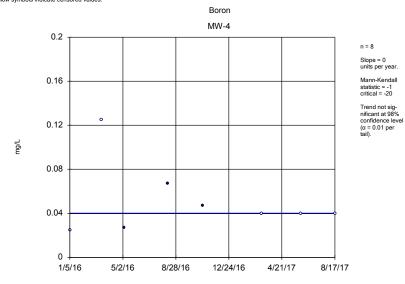
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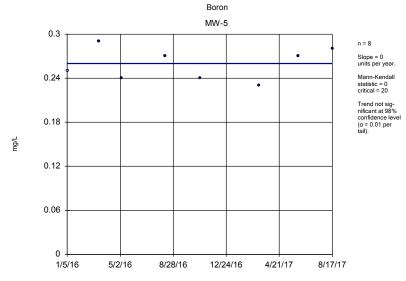
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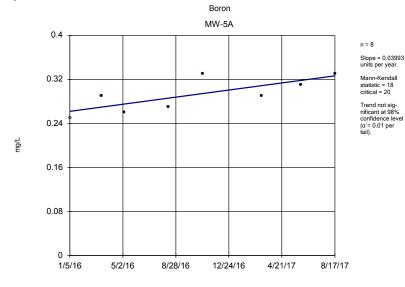
 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

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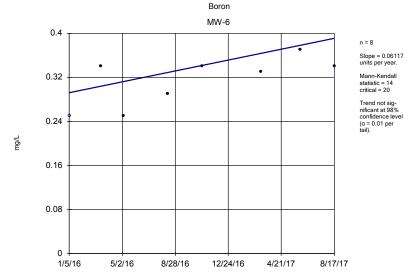
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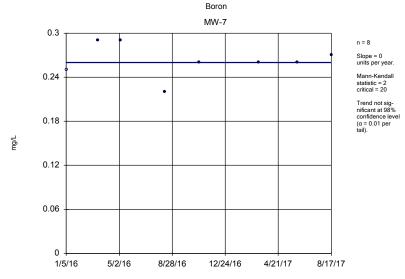
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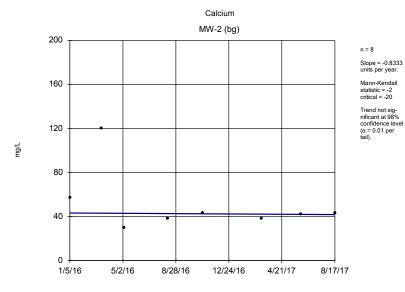
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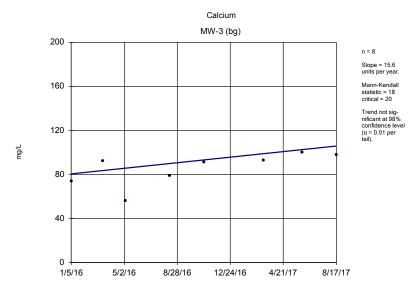


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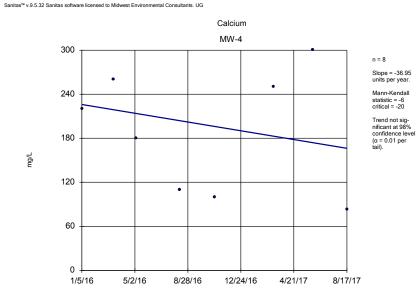
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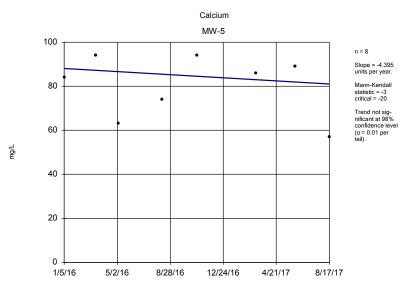
 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3



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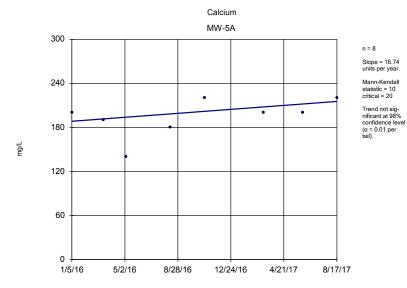
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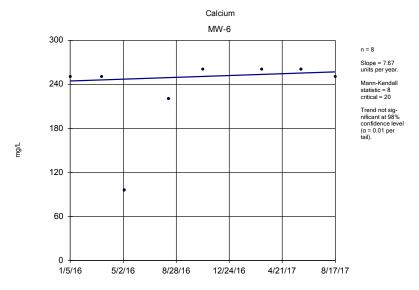


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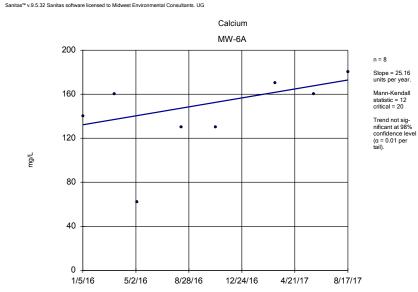






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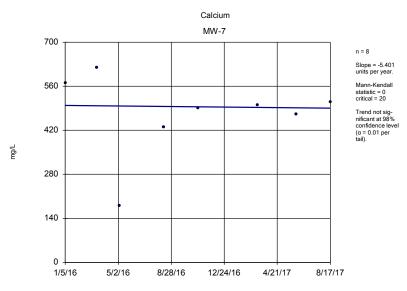
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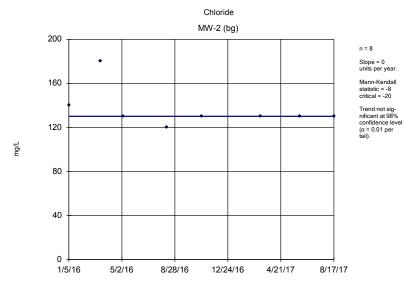
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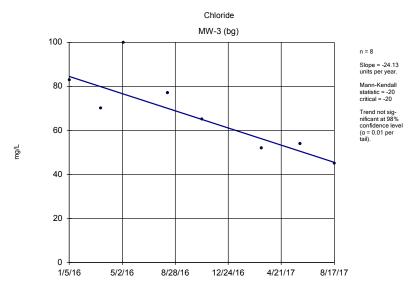


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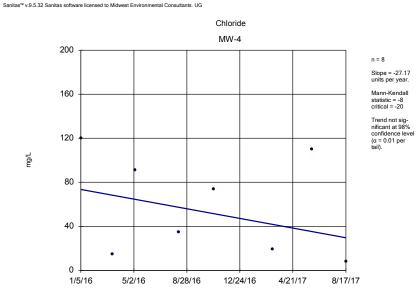
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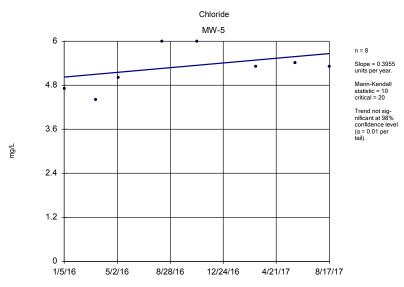
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

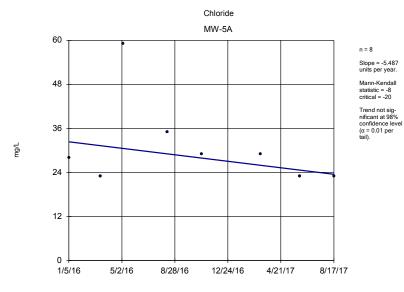
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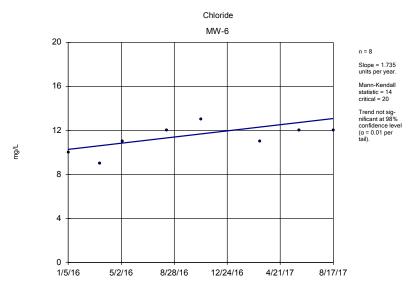


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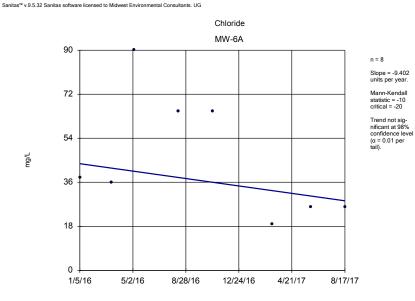
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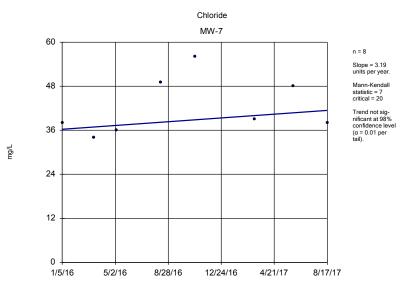
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 Data: Asbury CCR Impoundments GW Baseline Database - App 3



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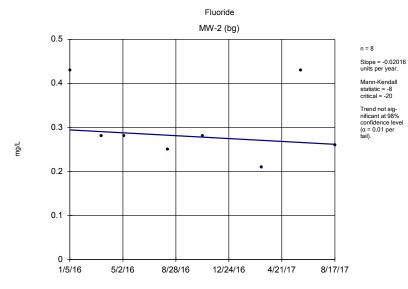
 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

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Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

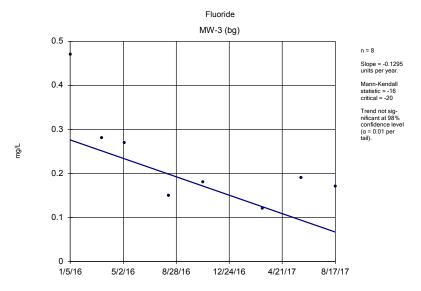
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 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

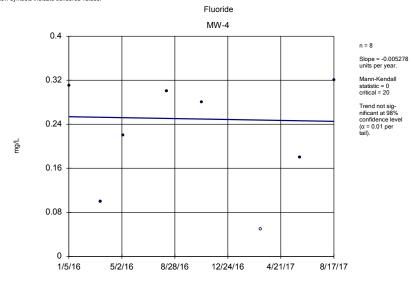
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 Sen's Slope Estimator
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 The Empire District
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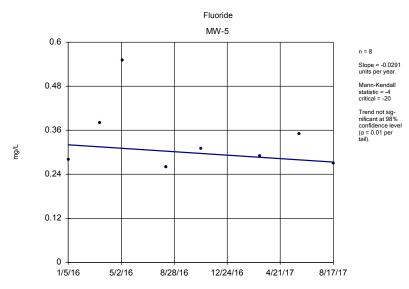
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 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

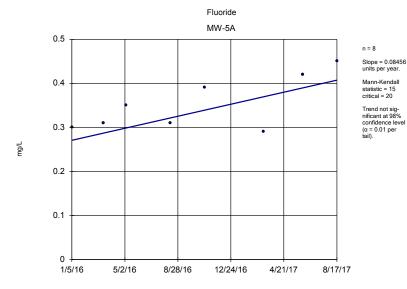
 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

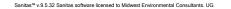
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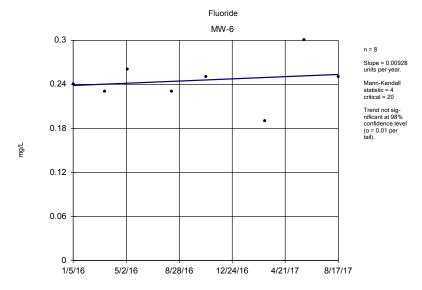


Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

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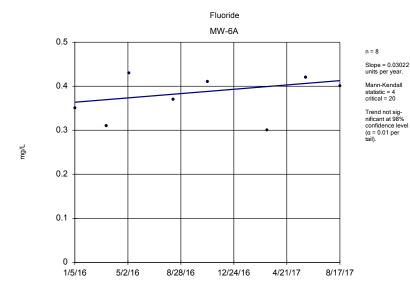




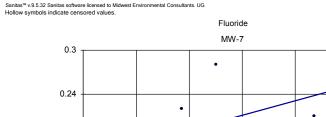
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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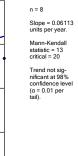
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Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

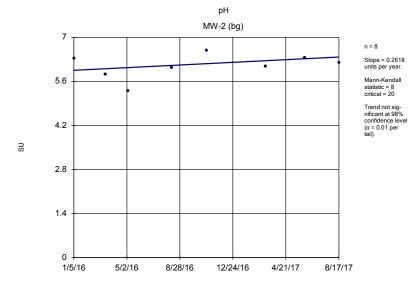
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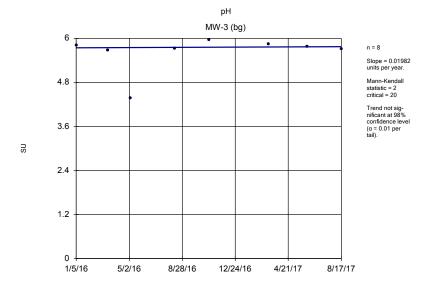
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 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

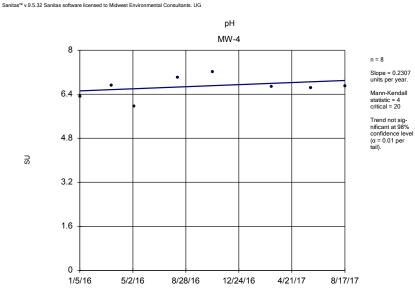
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Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

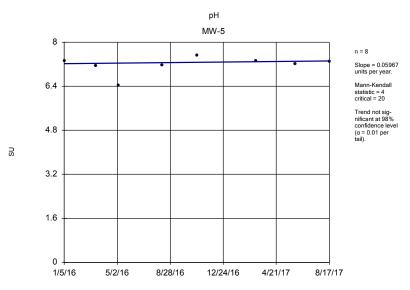
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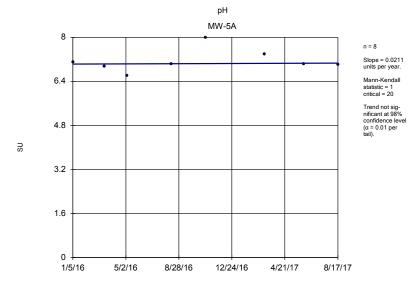
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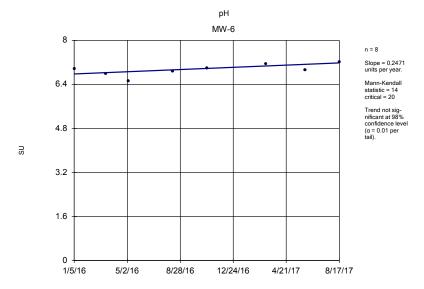


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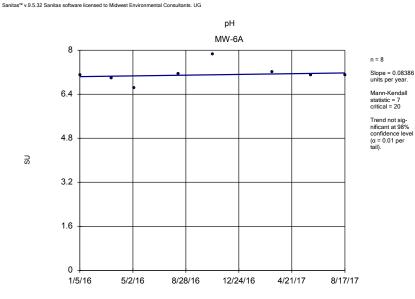






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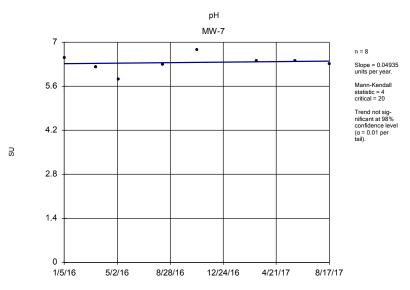
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 Sen's Slope Estimator
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 The Empire District
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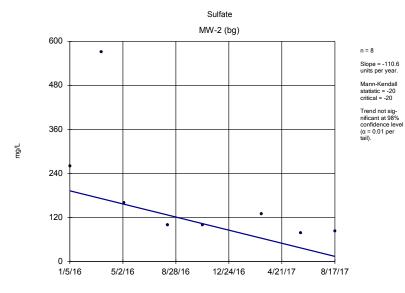
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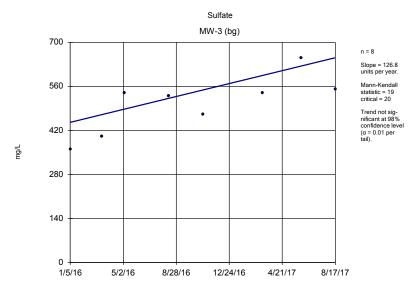


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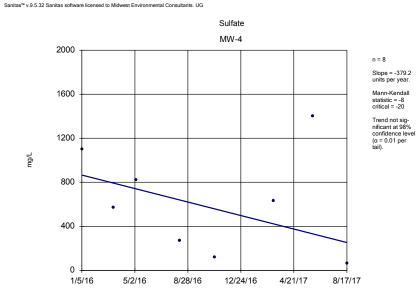
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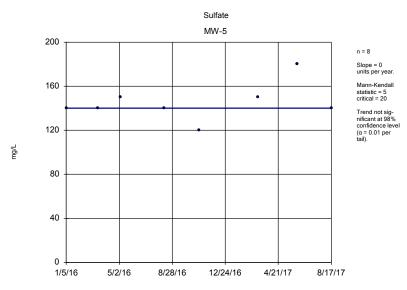
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 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:08 PM

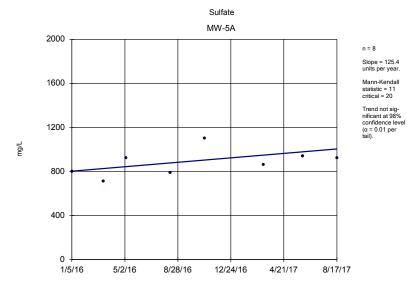
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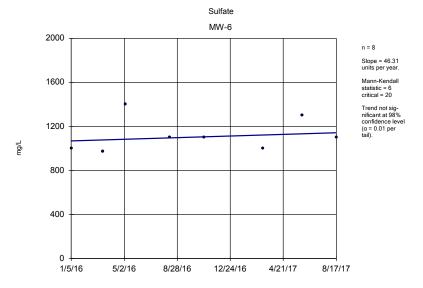


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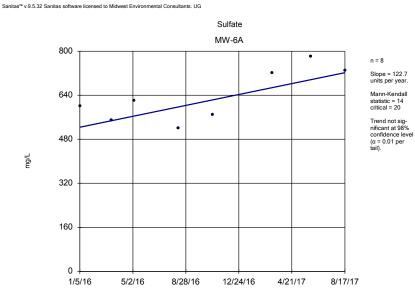






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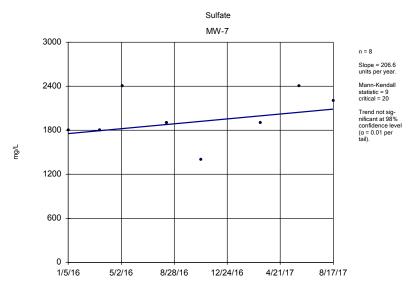
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



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 Analysis Run 1/23/2018 3:08 PM

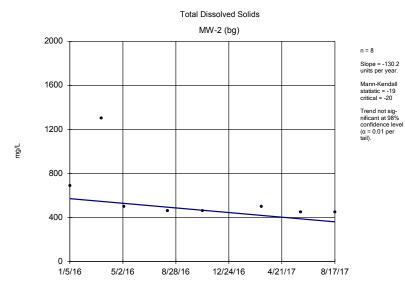
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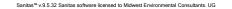
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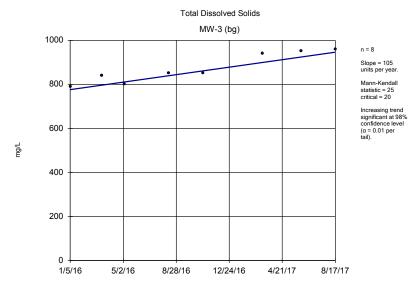


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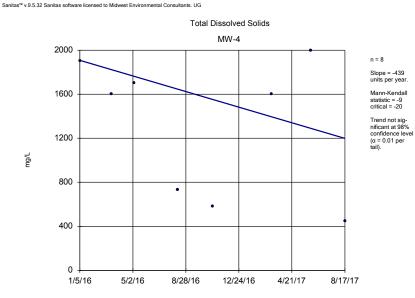
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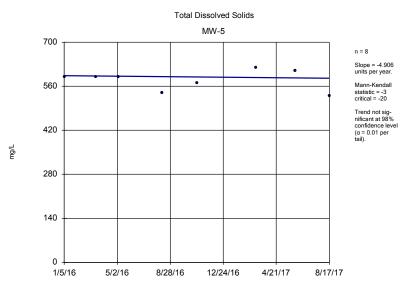
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



 Sen's Slope Estimator
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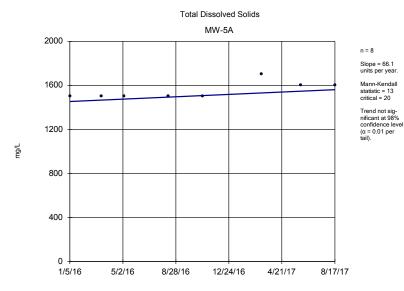
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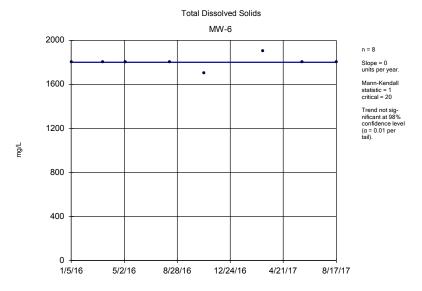


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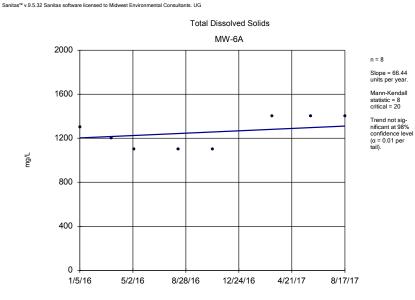


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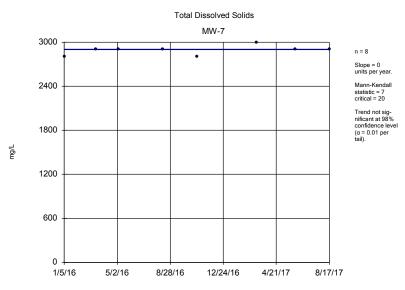
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3



 Sen's Slope Estimator
 Analysis Run 1/23/2018 3:09 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: Asbury CCR Impoundments GW Baseline Database - App 3

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Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

# **Trend Test**

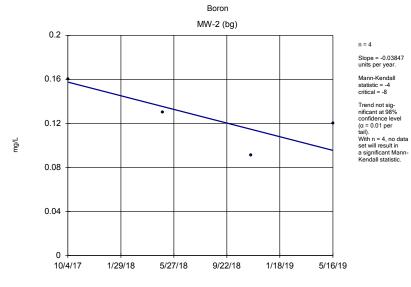
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3 only Printed 1/23/2018, 3:10 PM

	The Empire District	Client: Midwest Env	Ironmental Const	litants L	Jata: Asbury CCR In	npounamer	IS GW B	aseline Datat	base - App 3 on	ly Printed 1	(23/2018, 3:10 P	M
<u>Constituent</u>		Well	Slope	Calc.	Critical	<u>Sig.</u>	N	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Boron (mg/L)		MW-2 (bg)	-0.08868	-16	-20	No	8	0	n/a	n/a	0.02	NP
Boron (mg/L)		MW-3 (bg)	-0.01797	-21	-20	Yes	8	50	n/a	n/a	0.02	NP
Boron (mg/L)		MW-4	0	-1	-20	No	8	62.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-5	0	0	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-5A	0.03993	18	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-6	0.06117	14	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-6A	0.08497	19	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)		MW-7	0	2	20	No	8	12.5	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-2 (bg)	-0.8333	-2	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-3 (bg)	15.6	18	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-4	-36.95	-6	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-5	-4.395	-3	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-5A	16.74	10	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-6	7.67	8	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-6A	25.16	12	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)		MW-7	-5.401	0	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-2 (bg)	0	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-3 (bg)	-24.13	-20	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-4	-27.17	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-5	0.3955	10	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-5A	-5.487	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-6	1.735	14	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-6A	-9.402	-10	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)		MW-7	3.19	7	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-2 (bg)	-0.02016	-8	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-3 (bg)	-0.1295	-16	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-4	-0.00	0	20	No	8	12.5	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-5	-0.0291	-4	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-5A	0.08456	15	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-6	0.00928	4	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-6A	0.03022	4	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)		MW-7	0.06113	13	20	No	8	12.5	n/a	n/a	0.02	NP
pH (SU)		MW-2 (bg)	0.2618	8	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-3 (bg)	0.01982	2	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-4	0.2307	4	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-5	0.05967	4	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-5A	0.0211	1	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-6	0.2471	14	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-6A	0.08386	7	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)		MW-7	0.04935	4	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-2 (bg)	-110.6	-20	-20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-3 (bg)	126.8	19	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-4	-379.2	-8	-20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-5	0	5	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-5A	125.4	11	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-6	46.31	6	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-6A	122.7	14	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)		MW-7	206.6	9	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-2 (bg)	-130.2	-19	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-3 (bg)	105	25	20	Yes	8	0	n/a	n/a	0.02	NP

# Trend Test

	The Empire District	Client: Midwest Environmental Consultants			Data: Asbury CCR Impoundments GW Baseline Database - App 3 only					Printed 1/23/2018, 3:10 PM		
<u>Constituent</u>		Well	Slope	Calc.	Critical	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Total Dissolved Solids (mg/L)		MW-4	-439	-9	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-5	-4.906	-3	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-5A	66.1	13	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-6	0	1	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-6A	66.44	8	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)		MW-7	0	7	20	No	8	0	n/a	n/a	0.02	NP

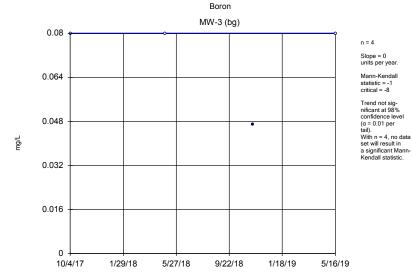
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 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:11 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

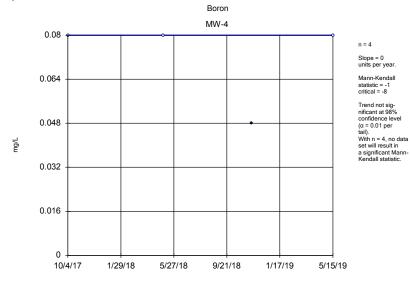
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 The Empire District
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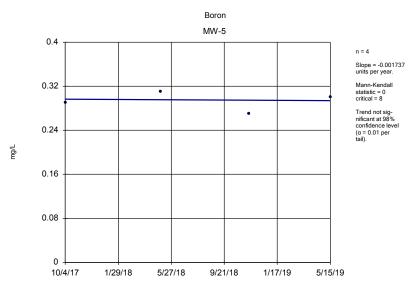
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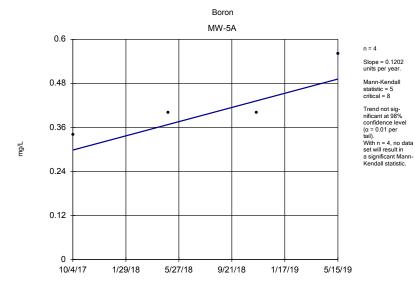
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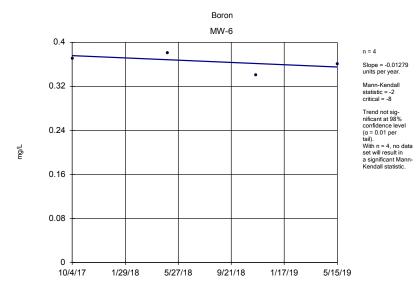
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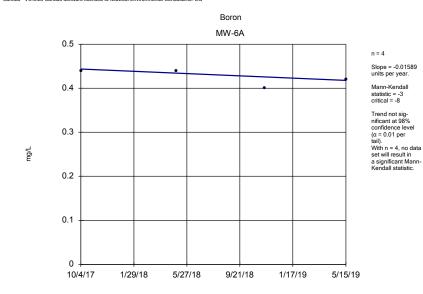
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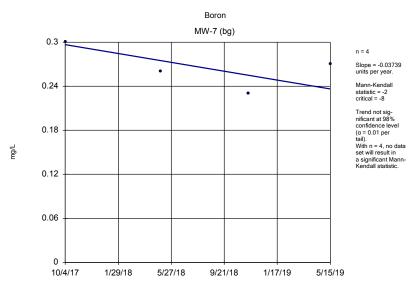
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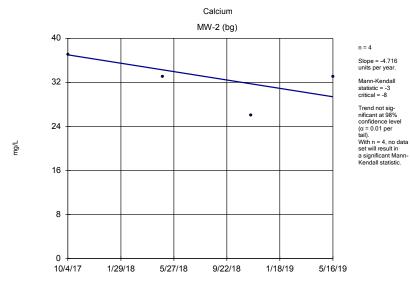
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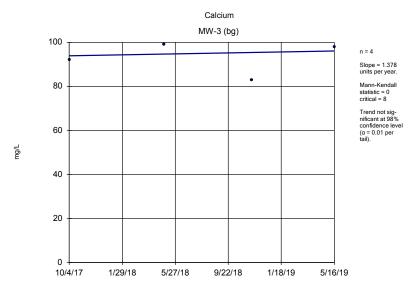
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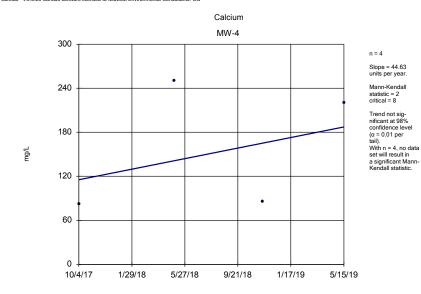




 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:11 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

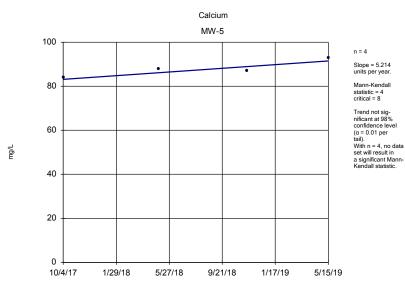
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 Sen's Slope Estimator
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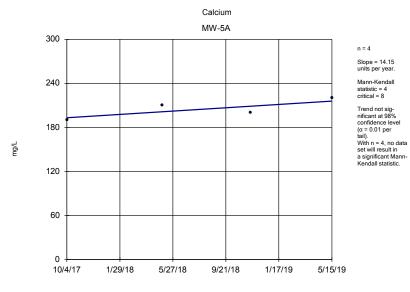
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 Data: 11-19 App 3 Asbury ponds with background

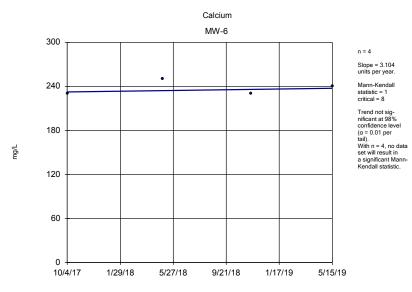
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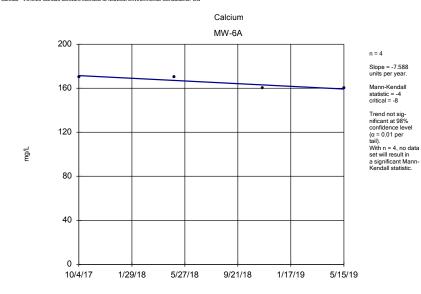




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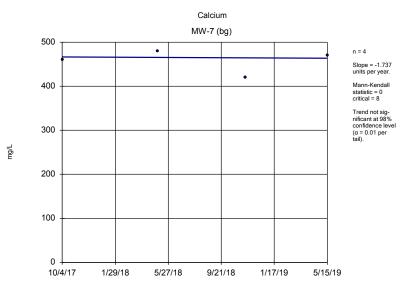
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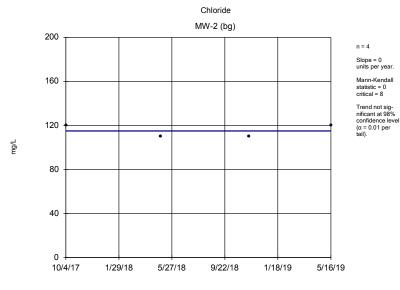
 The Empire District
 Client: Midwest Environmental Consultants
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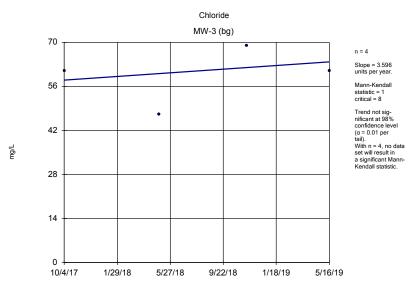


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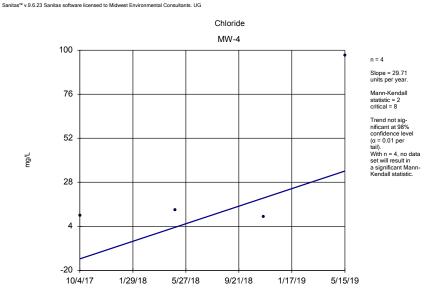
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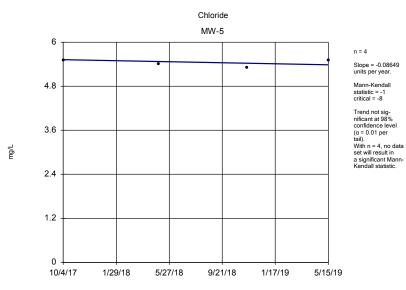
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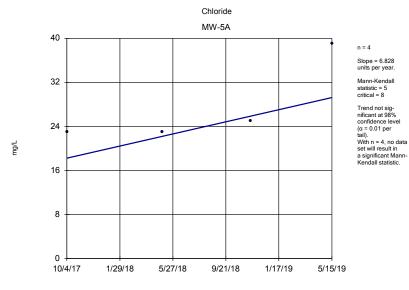
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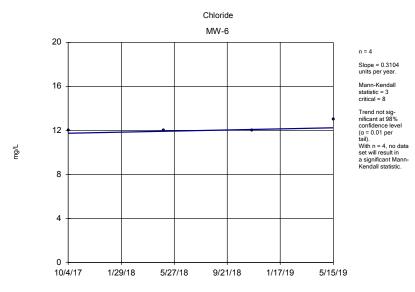


Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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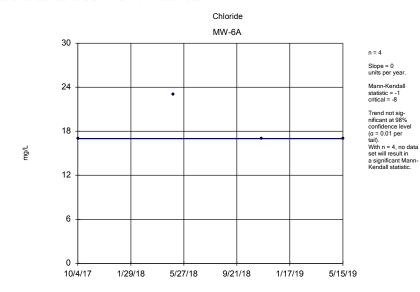




 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:11 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

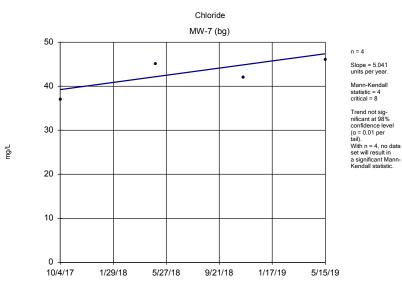
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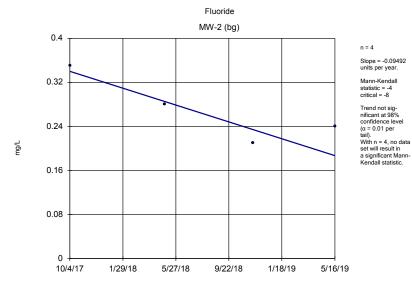
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 Analysis Run 12/4/2019 2:11 PM

 The Empire District
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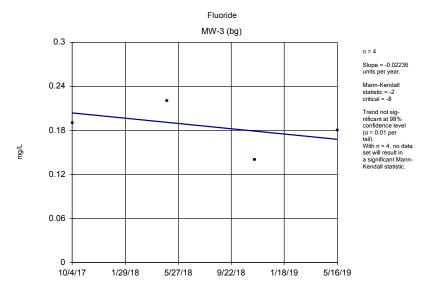
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 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:11 PM

 The Empire District
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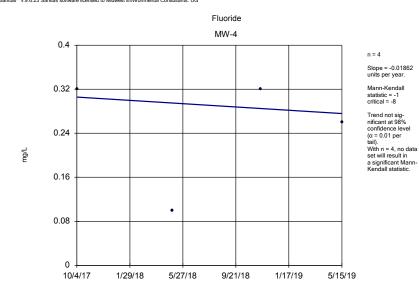
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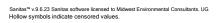
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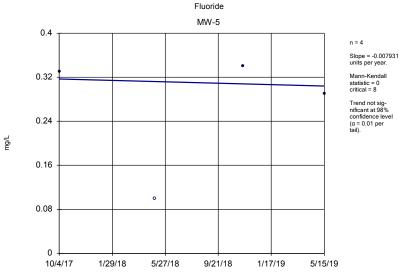
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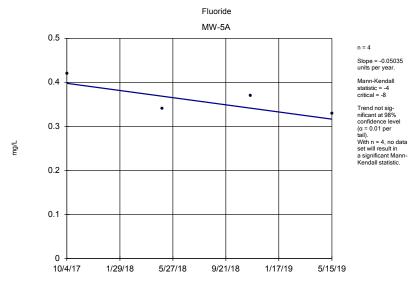
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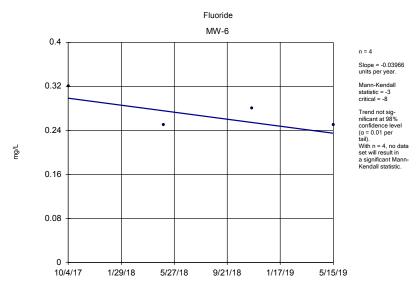




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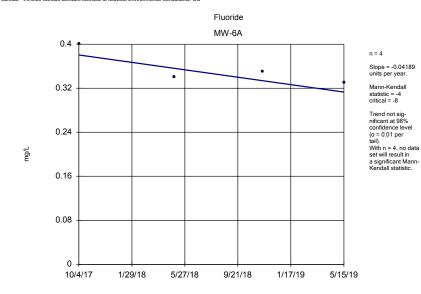




 Sen's Slope Estimator
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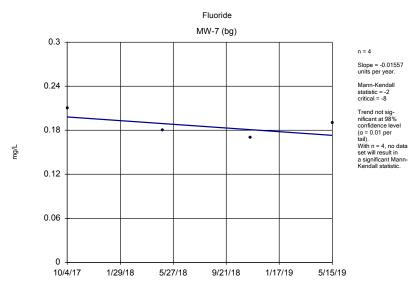
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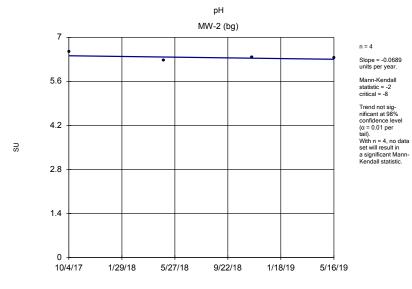
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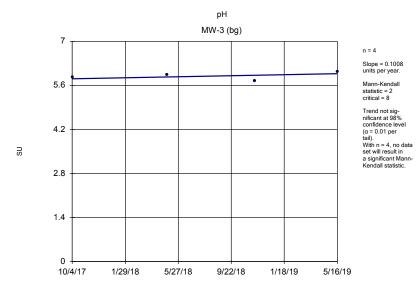
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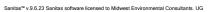


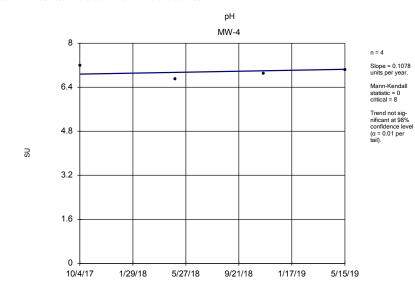




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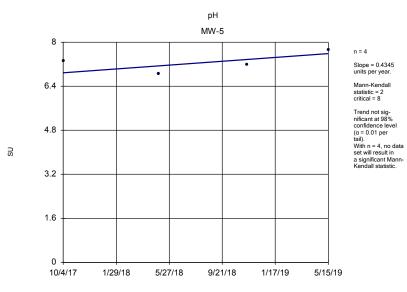


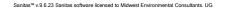


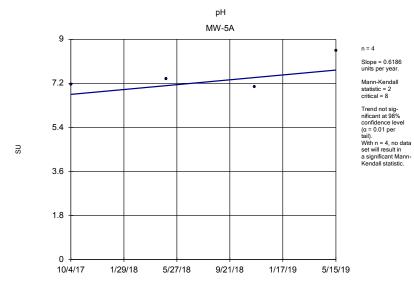
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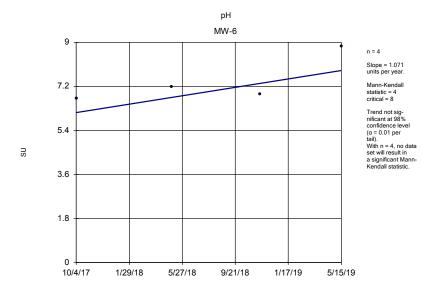
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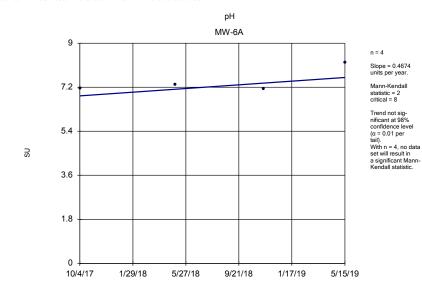




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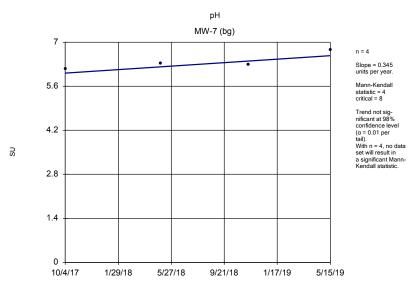
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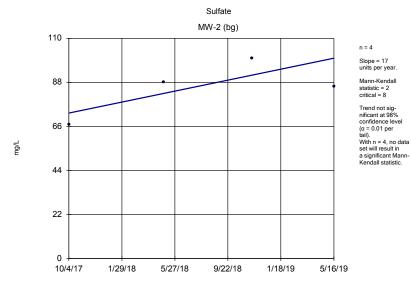
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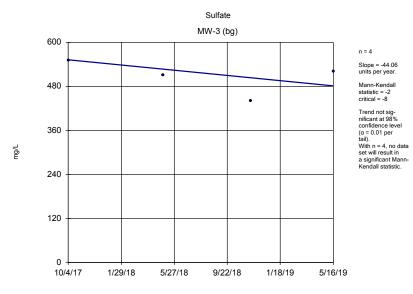
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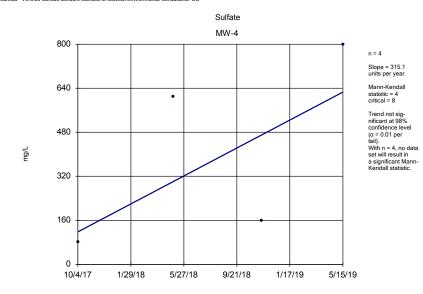




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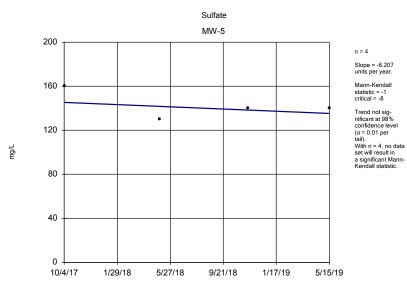
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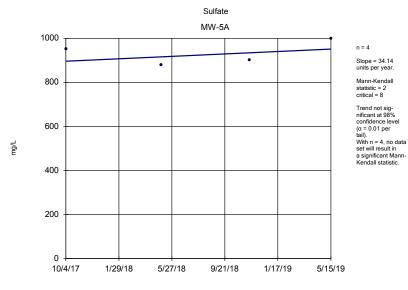
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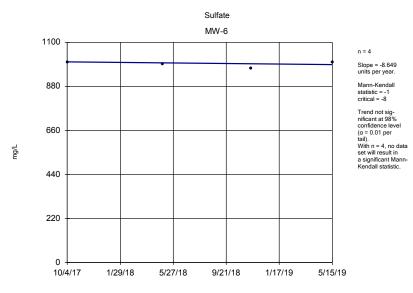
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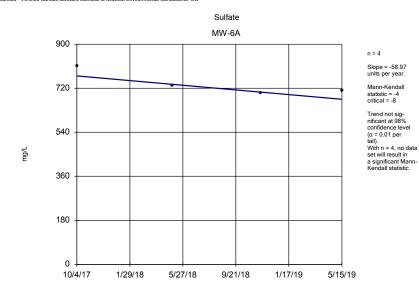




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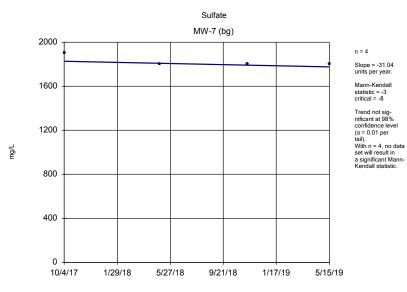
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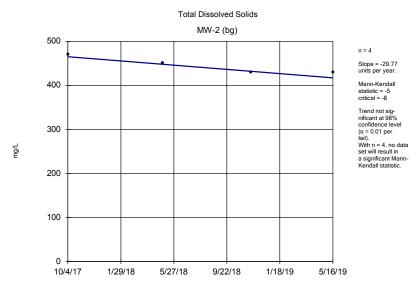
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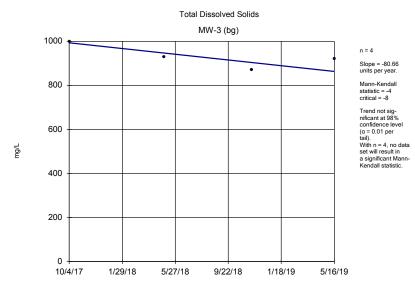
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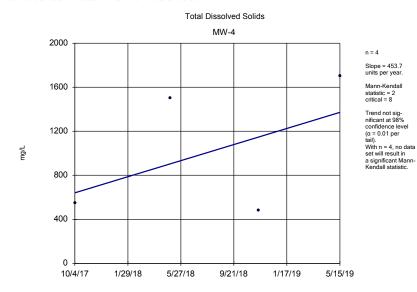
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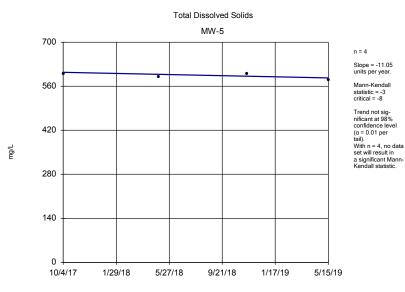
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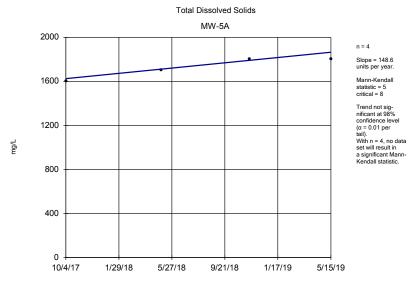


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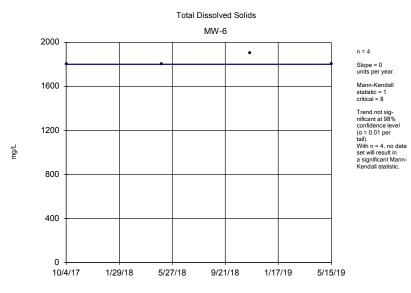
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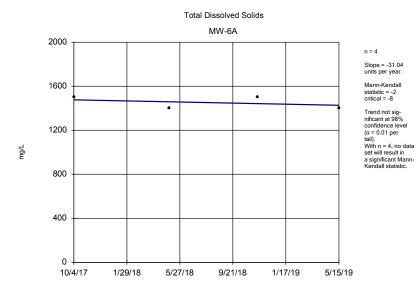
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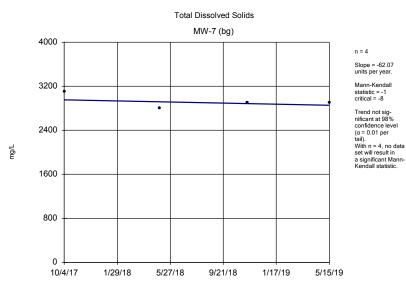
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 Sen's Slope Estimator
 Analysis Run 12/4/2019 2:12 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-19 App 3 Asbury ponds with background

### Trend Test

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background Printed 12/4/2019, 2:13 PM

				nis Dala. 11-	Data. 11-19 App 5 Asbury points with background Finned 12/4/2019, 2.15 Fin							
<u>Constituent</u>	Well	Slope	Calc.	Critical	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method	
Boron (mg/L)	MW-2 (bg)	-0.03847	-4	-8	No	4	0	n/a	n/a	0.02	NP	
Boron (mg/L)	MW-3 (bg)	0	-1	-8	No	4	75	n/a	n/a	0.02	NP	
Boron (mg/L)	MW-4	0	-1	-8	No	4	75	n/a	n/a	0.02	NP	
Boron (mg/L)	MW-5	-0.00	0	8	No	4	0	n/a	n/a	0.02	NP	
Boron (mg/L)	MW-5A	0.1202	5	8	No	4	0	n/a	n/a	0.02	NP	
Boron (mg/L)	MW-6	-0.01279	-2	-8	No	4	0	n/a	n/a	0.02	NP	
Boron (mg/L)	MW-6A	-0.01589	-3	-8	No	4	0	n/a	n/a	0.02	NP	
Boron (mg/L)	MW-7 (bg)	-0.03739	-2	-8	No	4	0	n/a	n/a	0.02	NP	
Calcium (mg/L)	MW-2 (bg)	-4.716	-3	-8	No	4	0	n/a	n/a	0.02	NP	
Calcium (mg/L)	MW-3 (bg)	1.378	0	8	No	4	0	n/a	n/a	0.02	NP	
Calcium (mg/L)	MW-4	44.63	2	8	No	4	0	n/a	n/a	0.02	NP	
Calcium (mg/L)	MW-5	5.214	4	8	No	4	0	n/a	n/a	0.02	NP	
Calcium (mg/L)	MW-5A	14.15	4	8	No	4	0	n/a	n/a	0.02	NP	
Calcium (mg/L)	MW-6	3.104	1	8	No	4	0	n/a	n/a	0.02	NP	
Calcium (mg/L)	MW-6A	-7.588	-4	-8	No	4	0	n/a	n/a	0.02	NP	
Calcium (mg/L)	MW-7 (bg)	-1.737	0	8	No	4	0	n/a	n/a	0.02	NP	
Chloride (mg/L)	MW-2 (bg)	0	0	8	No	4	0	n/a	n/a	0.02	NP	
Chloride (mg/L)	MW-3 (bg)	3.596	1	8	No	4	0	n/a	n/a	0.02	NP	
Chloride (mg/L)	MW-4	29.71	2	8	No	4	0	n/a	n/a	0.02	NP	
Chloride (mg/L)	MW-5	-0.08649	-1	-8	No	4	0	n/a	n/a	0.02	NP	
Chloride (mg/L)	MW-5A	6.828	5	8	No	4	0	n/a	n/a	0.02	NP	
Chloride (mg/L)	MW-6	0.3104	3	8	No	4	0	n/a	n/a	0.02	NP	
Chloride (mg/L)	MW-6A	0	-1	-8	No	4	0	n/a	n/a	0.02	NP	
Chloride (mg/L)	MW-7 (bg)	5.041	4	8	No	4	0	n/a	n/a	0.02	NP	
Fluoride (mg/L)	MW-2 (bg)	-0.09492	-4	-8	No	4	0	n/a	n/a	0.02	NP	
Fluoride (mg/L)	MW-3 (bg)	-0.02236	-2	-8	No	4	0	n/a	n/a	0.02	NP	
Fluoride (mg/L)	MW-4	-0.01862	-1	-8	No	4	0	n/a	n/a	0.02	NP	
Fluoride (mg/L)	MW-5	-0.00	0	8	No	4	25	n/a	n/a	0.02	NP	
Fluoride (mg/L)	MW-5A	-0.05035	-4	-8	No	4	0	n/a	n/a	0.02	NP	
Fluoride (mg/L)	MW-6	-0.03966	-3	-8	No	4	0	n/a	n/a	0.02	NP	
Fluoride (mg/L)	MW-6A	-0.04189	-4	-8	No	4	0	n/a	n/a	0.02	NP	
Fluoride (mg/L)	MW-7 (bg)	-0.01557	-2	-8	No	4	0	n/a	n/a	0.02	NP	
pH (SU)	MW-2 (bg)	-0.0689	-2	-8	No	4	0	n/a	n/a	0.02	NP	
pH (SU)	MW-3 (bg)	0.1008	2	8	No	4	0	n/a	n/a	0.02	NP	
pH (SU)	MW-4	0.1078	0	8	No	4	0	n/a	n/a	0.02	NP	
pH (SU)	MW-5	0.4345	2	8	No	4	0	n/a	n/a	0.02	NP	
pH (SU)	MW-5A	0.6186	2	8	No	4	0	n/a	n/a	0.02	NP	
pH (SU)	MW-6	1.071	4	8	No	4	0	n/a	n/a	0.02	NP	
pH (SU)	MW-6A	0.4674	2	8	No	4	0	n/a	n/a	0.02	NP	
pH (SU)	MW-7 (bg)	0.345	4	8	No	4	0	n/a	n/a	0.02	NP	
Sulfate (mg/L)	MW-2 (bg)	17	2	8	No	4	0	n/a	n/a	0.02	NP	
Sulfate (mg/L)	MW-3 (bg)	-44.06	-2	-8	No	4	0	n/a	n/a	0.02	NP	
Sulfate (mg/L)	MW-4	315.1	4	8	No	4	0	n/a	n/a	0.02	NP	
Sulfate (mg/L)	MW-5	-6.207	-1 2	-8	No	4	0	n/a	n/a n/a	0.02	NP	
Sulfate (mg/L)	MW-5A	34.14	2	8	No	4	0	n/a	n/a	0.02	NP	
Sulfate (mg/L)	MW-6	-8.649	-1	-8	No	4	0	n/a	n/a n/a	0.02	NP	
Sulfate (mg/L)	MW-6A	-58.97	-4	-8	No	4 4	0	n/a	n/a n/a	0.02	NP	
Sulfate (mg/L) Total Dissolved Solids (mg/L)	MW-7 (bg)	-31.04	-3 F	-8	No		0	n/a	n/a n/a	0.02	NP	
Total Dissolved Solids (mg/L) Total Dissolved Solids (mg/L)	MW-2 (bg) MW-3 (bg)	-29.77 -80.66	-5 4	-8 -8	No	4 4	0 0	n/a n/a	n/a n/a	0.02 0.02	NP NP	
Total Dissolved Solids (Hig/L)	www-s (by)	-00.00	-4	-0	No	4	U	n/a	n/a	0.02	INF"	

## Trend Test

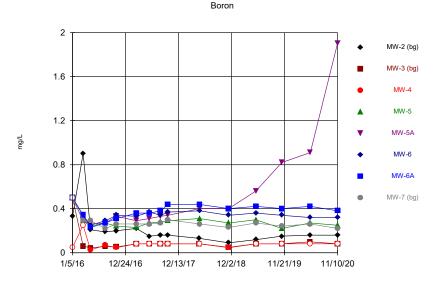
	The Empire District Client: Mi	trict Client: Midwest Environmental Consultants			Data: 11-19 App 3 Asbury ponds with background					Printed 12/4/2019, 2:13 PM		
<u>Constituent</u>	Well	<u>Slope</u>	Calc.	Critical	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method	
Total Dissolved Solids (mg/L)	MW-4	453.7	2	8	No	4	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)	MW-5	-11.05	-3	-8	No	4	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)	MW-5A	148.6	5	8	No	4	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)	MW-6	0	1	8	No	4	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)	MW-6A	-31.04	-2	-8	No	4	0	n/a	n/a	0.02	NP	
Total Dissolved Solids (mg/L)	MW-7 (bg)	-62.07	-1	-8	No	4	0	n/a	n/a	0.02	NP	



Sanitas<sup>™</sup> Output – Sampling Event

Time Series Analysis

Sanitas<sup>™</sup> v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values.

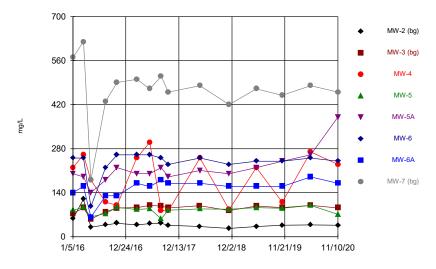


 Time Series
 Analysis Run 12/2/2020 1:29 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-20 App 3 Asbury ponds with background

Sanitas<sup>™</sup> v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG

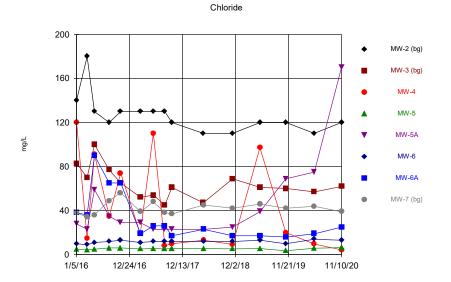
Calcium



 Time Series
 Analysis Run 12/2/2020 1:29 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG

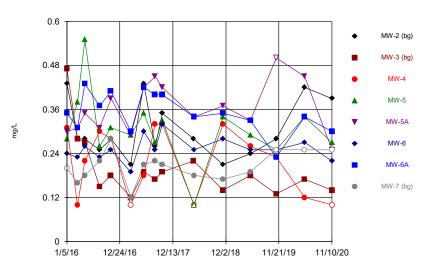


 Time Series
 Analysis Run 12/2/2020 1:29 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-20 App 3 Asbury ponds with background

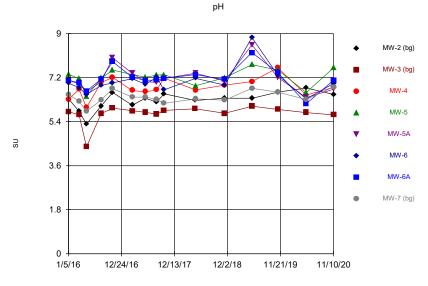
Sanitas  $^{\rm w}$  v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values.

Fluoride



 Time Series
 Analysis Run 12/2/2020 1:29 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-20 App 3 Asbury ponds with background



 Time Series
 Analysis Run 12/2/2020 1:29 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-20 App 3 Asbury ponds with background

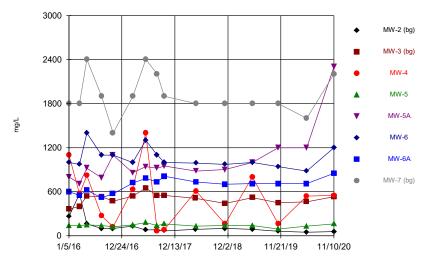
Total Dissolved Solids

MW-2 (bg)

٠

Sanitas™ v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

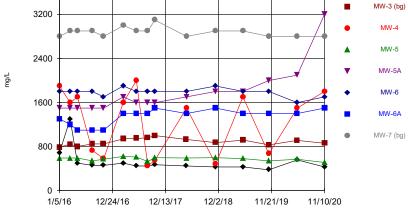


 Time Series
 Analysis Run 12/2/2020 1:29 PM

 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG

4000



 Time Series
 Analysis Run 12/2/2020 1:29 PM

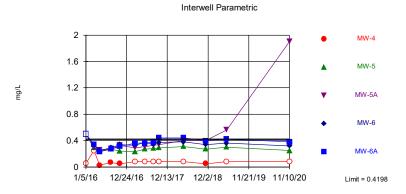
 The Empire District
 Client: Midwest Environmental Consultants
 Data: 11-20 App 3 Asbury ponds with background



# Sanitas<sup>™</sup> Output – Sampling Event

**Prediction Limits** 

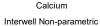
Sanitas<sup>w</sup> v9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values. Exceeds Limit: MW-5A

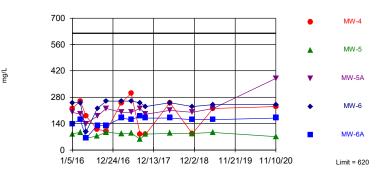


Boron

Background Data Summary (based on cube root transformation) (after Kaplan-Meier Adjustment): Mean=0.4907, Std. Dev=0.1361, n=39, 23.08% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9378, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit. Sanitas™ v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG

Within Limit

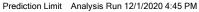




Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

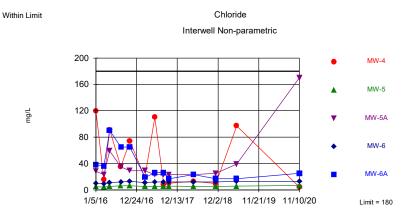
#### Prediction Limit Analysis Run 12/1/2020 4:45 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background



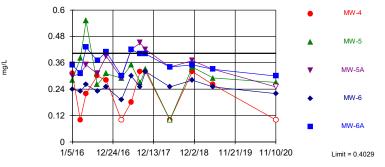
The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

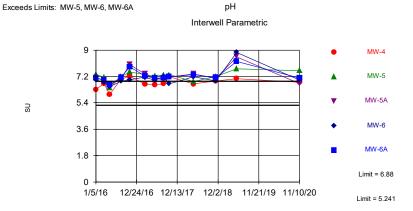
Santas<sup>11</sup> v 95.27 Santas software licensed to Midwest Environmental Consultants. UG Hollow symbols indicate censored values. Fluoride Within Limit Fluoride Interwell Parametric



Background Data Summary (based on square root transformation): Mean=0.4783, Std. Dev.=0.08255, n=39, 5.128% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.934, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

### Prediction Limit Analysis Run 12/1/2020 4:45 PM The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Sanitas<sup>TM</sup> v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG



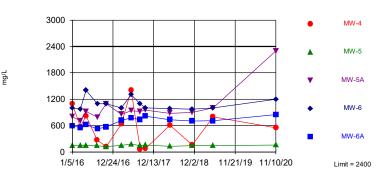
Background Data Summary (based on square transformation): Mean=37.4, Std. Dev.=5.24, n=39. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9363, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.000752. Comparing 5 points to limit.

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Within Limit

Sulfate





Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

#### Prediction Limit Analysis Run 12/1/2020 4:45 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

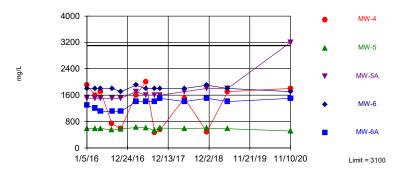
#### Prediction Limit Analysis Run 12/1/2020 4:45 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Sanitas™ v 9 6 27 Sanitas software licensed to Midwest Environmental Consultants LIG

Exceeds Limit: MW-5A

Total Dissolved Solids Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

### **Prediction Limit**

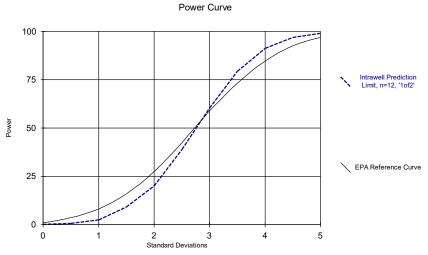
The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background Printed 12/1/2020, 4:46 PM Constituent Well Upper Lim. Lower Lim. Observ. %NDs Transform Method Date Sig. Bg N Alpha Boron (mg/L) MW-4 0.4198 n/a 11/10/2020 0.08ND No 39 23.08 x^(1/3) 0.001504 Param Inter 1 of 2 MW-5 0.4198 11/10/2020 0.25 39 23.08 x^(1/3) 0.001504 Param Inter 1 of 2 Boron (mg/L) n/a No MW-5A 0.4198 39 Boron (mg/L) n/a 11/10/2020 1.9 Yes 23.08 x^(1/3) 0.001504 Param Inter 1 of 2 0.4198 Boron (mg/L) MW-6 n/a 11/10/2020 0.32 No 39 23.08 x^(1/3) 0.001504 Param Inter 1 of 2 MW-6A 0.4198 11/10/2020 0.38 39 23.08 x^(1/3) 0.001504 Param Inter 1 of 2 Boron (mg/L) n/a No Calcium (mg/L) MW-4 620 n/a 11/10/2020 230 39 0 0.0012 NP Inter (normality) ... No n/a Calcium (mg/L) MW-5 620 11/10/2020 39 0.0012 n/a 71 0 n/a NP Inter (normality) .. No Calcium (mg/L) MW-5A 620 n/a 11/10/2020 380 No 39 0 n/a 0.0012 NP Inter (normality) ... Calcium (mg/L) MW-6 620 n/a 11/10/2020 240 39 0 0.0012 NP Inter (normality) ... No n/a Calcium (mg/L) MW-6A 620 n/a 11/10/2020 170 39 0 0.0012 NP Inter (normality) .. No n/a Chloride (mg/L) MW-4 180 n/a 11/10/2020 4.4 No 39 0 n/a 0.0012 NP Inter (normality) ... Chloride (mg/L) MW-5 180 n/a 11/10/2020 39 0 0.0012 NP Inter (normality) ... 6.4 No n/a Chloride (mg/L) MW-5A 180 n/a 11/10/2020 170 No 39 0 n/a 0.0012 NP Inter (normality) ... Chloride (mg/L) MW-6 180 n/a 11/10/2020 13 No 39 0 n/a 0.0012 NP Inter (normality) ... MW-6A Chloride (mg/L) 180 n/a 11/10/2020 25 No 39 0 n/a 0.0012 NP Inter (normality) ... Fluoride (mg/L) MW-4 0.4029 11/10/2020 0.1ND 39 5.128 0.001504 Param Inter 1 of 2 n/a No sqrt(x) MW-5 39 Fluoride (mg/L) 0.4029 n/a 0.27 5.128 0.001504 Param Inter 1 of 2 11/10/2020 No sqrt(x) Fluoride (mg/L) MW-5A 0.4029 n/a 11/10/2020 0.25ND No 39 5.128 0.001504 Param Inter 1 of 2 sqrt(x) Fluoride (mg/L) MW-6 0.4029 n/a 11/10/2020 0.22 39 5.128 0.001504 Param Inter 1 of 2 No sqrt(x) 39 Fluoride (mg/L) MW-6A 0.4029 n/a 11/10/2020 0.3 5.128 0.001504 Param Inter 1 of 2 No sqrt(x) MW-4 11/10/2020 39 0.000752 Param Inter 1 of 2 pH (SU) 6.88 5.241 6.8 No 0 x^2 pH (SU) MW-5 6.88 5.241 11/10/2020 7.6 Yes 39 0 x^2 0.000752 Param Inter 1 of 2 pH (SU) MW-5A 6.88 5.241 11/10/2020 6.72 No 39 0 x^2 0.000752 Param Inter 1 of 2 pH (SU) MW-6 6.88 5.241 11/10/2020 6.96 Yes 39 0 x^2 0.000752 Param Inter 1 of 2 pH (SU) MW-6A 6.88 5.241 11/10/2020 7.09 Yes 39 0 x^2 0.000752 Param Inter 1 of 2 Sulfate (mg/L) MW-4 2400 n/a 11/10/2020 550 No 39 0 n/a 0.0012 NP Inter (normality) ... Sulfate (mg/L) MW-5 2400 n/a 11/10/2020 160 39 0 0.0012 NP Inter (normality) .. No n/a Sulfate (mg/L) MW-5A 2400 n/a 11/10/2020 2300 No 39 0 n/a 0.0012 NP Inter (normality) ... Sulfate (mg/L) MW-6 2400 n/a 11/10/2020 1200 No 39 0 n/a 0.0012 NP Inter (normality) ... Sulfate (mg/L) MW-6A 2400 n/a 11/10/2020 850 No 39 0 n/a 0.0012 NP Inter (normality) ... MW-4 Total Dissolved Solids (mg/L) 3100 n/a 11/10/2020 1800 No 39 0 n/a 0.0012 NP Inter (normality) ... Total Dissolved Solids (mg/L) MW-5 3100 n/a 11/10/2020 510 No 39 0 n/a 0.0012 NP Inter (normality) ... Total Dissolved Solids (mg/L) MW-5A 3100 n/a 11/10/2020 3200 39 0 0.0012 NP Inter (normality) ... Yes n/a Total Dissolved Solids (mg/L) MW-6 0 0.0012 3100 n/a 11/10/2020 1700 39 NP Inter (normality) .. No n/a Total Dissolved Solids (mg/L) MW-6A 3100 n/a 11/10/2020 1500 39 0 0.0012 NP Inter (normality) ... No n/a



## Sanitas<sup>™</sup> Output – Sampling Event

**Power Curve** 

Sanitas<sup>™</sup> v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG



Kappa = 2.73, based on 18 compliance wells and 5 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 12/1/2020 4:47 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background